Problem Drinking / Problem Gambling: A Study of Co-morbid Individuals in N.S.W.

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Executive Summary

Project Background

The Casino Community Benefit Fund funded the research proposal of Alcohol Concern in 1998. Having completed the first stage involving a draft literature review, it was decided that the project would be conducted from the University of Western Sydney in 2000. The project began in May 2000 and was completed in January 2001.

The aim of the project, as detailed in the original application, was to determine the proportion of problem drinkers who are problem gamblers and the proportion of problem gamblers that are problem drinkers, in order to define a population that could benefit from intervention or treatment.

Objectives of the project included:

- Provide an up-to-date appraisal of the scientific knowledge in respect to the extent and nature of problem drinking / problem gambling co-morbidity;
- Generate recent Australian data on the extent to which problem drinking and problem gambling overlap;
- Provide a reappraisal of opportunities for intervention or treatment.

Study Approach

Three studies were undertaken:

1) Respondents already in treatment for problem drinking and/or problem gambling.
2) Respondents replied to advertising for either problem drinkers or problem gamblers not currently seeking treatment.
3) Respondents were regular Electronic Gaming Machine (EGM) gamblers attending their local club.

Measurement

The questionnaire comprised two empirically validated and reliable psychometric measures for problem gambling and problem drinking. In addition, demographic

characteristics were included in all three studies, and questions relating to treatment patterns and treatment services were included in the first study.

Problem Drinking

The Alcohol Use Disorder Identification Test (AUDIT) was used to screen for problem drinking in all three studies. The AUDIT is a 10-item questionnaire which covers domains of problem drinking such as heavy regular alcohol consumption, frequency of intoxication, signs of dependence risk, alcohol related accidents, and others' concerns regarding drinking behaviour. Scores range from 0 to 40, with a cut-off score of 8 indicating problem drinking.

Problem Gambling

The South Oaks Gambling Screen (SOGS) was used to screen problem gambling across all three studies. The SOGS contains 20 questions regarding problem gambling behaviour such as family and job disruption, lying about gambling involvement, chasing losses, and borrowing or committing illegal acts to access money to pay gambling debts. Scores range from 0 to 20, and a cut-off score of 5 was used to indicate those 'at risk' of harmful impacts i.e. problem gambling.

Results Summary

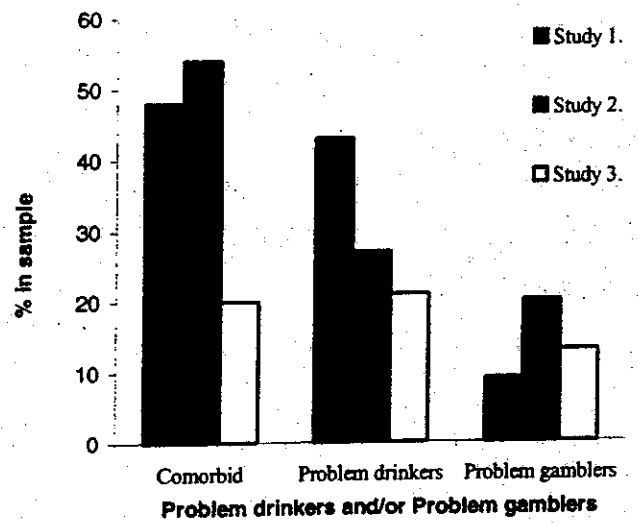

Figure 1. Problem drinking and/or problem gambling co-morbidity in N.S.W. Results from study 1. (Treatment services), Study 2. (Phone-in survey), and Study 3. (Regular EGM players)

Study 1. The Incidence of Co-morbid Problem Drinking / Problem Gambling in a Sample of Respondents Attending Treatment Services for Alcohol, Gambling or Alcohol and Gambling Problems in N.S.W.

This study found that substantial numbers of respondents attending treatment services for alcohol or gambling actually experienced co-morbid problem gambling / problem drinking at the start of their current treatment program. The data in figure 1 show that 38% of respondents attending services for alcohol problems had co-morbid gambling problems at the start of treatment and. Of the respondents receiving treatment for gambling problems, 48% of respondents had co-morbid drinking problems.

Demographic Profile of Co-morbid Respondents Receiving Treatment

- Co-morbid respondents attending treatment services for either alcohol or gambling problems were mainly males aged between 30 and 39.
- Most co-morbid respondents spoke English as their first language.
- The School Certificate was the highest level of education level reached by most co-morbid respondents.
- Respondents in alcohol services were mainly unemployed and earning between $0 and $10,000 per annum. Those in treatment for gambling were mainly working full time and reported earning less than $10,000 per annum.
- Respondents in treatment for alcohol problems were married, divorced or single. Those in gambling services were mainly single.

Co-morbid Respondents in Treatment

- A large proportion of co-morbid respondents attending treatment services for either alcohol or gambling problems were not formally assessed by treatment services for their co-morbid condition.
- Almost 100% of respondents in treatment reported alcohol and/or gambling problems for more than 12 months prior to seeking help.
- The majority of co-morbid respondents in alcohol services had been receiving treatment for more than 12 months and those in gambling services had been in treatment for one month or less.

Study 2. The Incidence of Co-morbid Problem Drinking / Problem Gambling in a Sample of Respondents with Alcohol and Gambling Problems and Not Attending Treatment Services in N.S.W.

This study provided information on co-morbid problem drinkers / problem gamblers in N.S.W. that were not receiving treatment. The data in Figure 1. show that 54% of total sample of self-identified problem drinkers and problem gamblers not receiving treatment were assessed to have co-morbid problem drinking / problem gambling. Fifty per cent of respondents replying to advertising for problem drinkers had co-morbid drinking and gambling problems. Of the respondents that phoned-in for gambling problems, 58% had co-morbid drinking and gambling.

Demographic Profile of Co-morbid Respondents Not Receiving Treatment

- The majority of co-morbid respondents replying to advertising for problem drinking or problem gambling were males aged between 30-39.
- Respondents spoke English as their first language.
- The highest level of education was the School Certificate.
- 50% of co-morbid respondents worked full-time, with the majority of those phoning in for alcohol problems earning between $10,001 to $20,000 or $30,001 to $40,000 annually, and most phoning in for gambling problems earning between $40,001 to $50,000 annually.
- It was common for respondents phoning in for alcohol problems to be separated or divorced, while those calling in for gambling problems were mainly single.

Study 3. The Incidence of Co-morbid Problem Drinking / Problem Gambling in a Sample of Regular Electronic Gaming Machine Players (EGM) in Western Sydney

This study aimed to provide information regarding regular EGM players that were assessed as co-morbid problem drinkers / problem gamblers. The data in Figure 1. show that 20% of the respondents who regularly play EGM's in clubs in Western Sydney have co-morbid drinking and gambling problems, 13% have gambling problems exclusively, and 21% are problem drinkers.

Demographic Profile of Co-morbid Respondents Who Regularly Play EGM's

- Co-morbid respondents in this study were generally aged between 20 to 29 and evenly split between males and females.
- The highest level of education reached was the School Certificate.
- Around half of the sample spoke English as their first language.
- Respondents earned between $10,001 and $20,000 per annum.

Implications and Recommendations for Intervention and Treatment of Co-morbid Problem Drinking / Problem Gambling in N.S.W

Implications and Recommendations for Intervention and Treatment of Co-morbid Problem Drinking/Problem Gambling in N.S.W.

From the regular EGM player sample through those attending treatment for either problem to the self-identified problem drinker or gambler currently not receiving treatment, there is an increasing co-morbidity from 1 in 5 to 1 in 2.

Implications for harm minimisation/early intervention:

The younger age and the equal proportion of men and women in the EGM player sample compared with those in treatment in which males predominate may represent an earlier stage in the development of more severe co-morbid problems. Regular EGM players, and probably those who prefer other forms of continuous forms of gambling (Productivity Commission, 1999) are therefore a group that merit significant attention in the planning and delivery of harm minimisation/early intervention for both excessive alcohol use and problem gambling.

Implications for treatment service delivery:

Equity of access to services: the differences in the proportions of men and women attending treatment services compared with the sample of EGM players raises the question of how this comes about and whether it is an indication of problems of access for women problem gamblers.

Assessment procedures: The high co-morbidity in clinical samples combined with the fact that the present research also established that very few of either the gambling or alcohol service centres have formal assessment procedures

that evaluate both addictive behaviours is a cause for concern. Given the high co-morbidity found in both service populations routine screening for both alcohol and gambling problems should be service delivery/funding requirement. The use of standardised measures such as the AUDIT and the SOGS (or the recently validated Australian measure soon to be released in Victoria) are the best options.

Treatment delivery: the treatment of co-morbid problems involving both alcohol and gambling is likely to be significantly more complex than for either problem alone. Although there is good face validity to the assumption that the two addictive behaviours will interact to maintain each other and to precipitate relapse the process has yet to be studied longitudinally. However there must exist a wealth of clinical expertise in centres that offer services for both problems. This knowledge needs to drawn upon and included in service training and treatment manuals. It seems essential in the light of the information from the present series of studies that individual therapists working in either gambling or alcohol services should be professionally trained to assess and treat both conditions, especially when presenting as a co-morbid condition.

Conclusion;

Health service planning for the addictive behaviours needs to fully explore the implications flowing from the high co-morbidity levels found in the present sequence of studies between excessive alcohol use and problem gambling. The implications range across all aspects from harm minimisation/early intervention to treatment delivery itself.

Problem Drinking / Problem Gambling: A Study of Co-morbid Individuals in N.S.W.

1.0 Project Background

The Casino Community Benefit Fund funded the research proposal of Alcohol Concern in 1998. Having completed the first stage involving a draft literature review, it was negotiated with the CCBF that the project be managed from the University of Western Sydney in 2000. The project began in May 2000 and was completed in Jan 2001.

The aim of the project, as detailed in the original application, was to determine the proportion of problem drinkers who are problem gamblers and the proportion of problem gamblers that are problem drinkers, in order to define a population that could benefit from changes and improvements to intervention or treatment.

Objectives of the project included:

- Provide an up-to-date appraisal of the scientific knowledge in respect to the extent and nature of problem drinking / problem gambling co-morbidity;
- Generate recent Australian data on the extent to which problem drinking and problem gambling overlap;
- Provide a reappraisal of opportunities for intervention or treatment.

2.0 Literature Review

1. Introduction

This review is part of a project that aims to assess the extent to which co-morbid problem gambling and problem drinking occur in N.S.W, in order to define a population that could benefit from intervention or treatment. The project was initiated after a number of studies in other jurisdictions indicated high levels of co-morbidity and the international development of combined addiction programs, in particular those that address both problem drinking and problem gambling.

2. Definition and prevalence of problem gambling

Gambling is a socially accepted form of leisure activity in Australia. While many people enjoy controlled gambling over many years without manifesting adverse effects, others can experience serious problems almost immediately (Blaszczynski, Walker, Sagris & Dickerson, 1999). In this sense gambling behaviour can be seen to belong on a continuum with normal gambling at one end and problem gambling at the other (Dickerson, Walker, Legg England & Hinchy, 1990).

Problem gambling refers to those persons whose gambling activities have become uncontrolled resulting in harm to themselves, their family, which may extend to the greater community (Dickerson, McMillen, Hallebone, Volberg & Wooley, 1997; Productivity Commission, 1999). Comings and Rosenthal (1996) note that problem gambling can be referred to as the 'hidden' and 'pure' addiction, that being an extension of common socially accepted behaviour and not associated with the intake of a psychoactive substance. Terms such as 'compulsive', 'addictive', 'excessive' and 'pathological' have been used synonymously to describe problem gambling, however, the term 'problem gambling' will be used here as it makes fewer assumptions of causality (Dickerson, 1991).

Since 1980 the Diagnostic Statistical Manual of Mental Disorders (DSM-III), now in its 4th edition (APA, 1994), first included 'pathological gambling' under the classification of Impulse Control Disorders. These are characterised by the failure to resist impulses, drives to perform harmful acts to oneself or others, an increased sense of tension or arousal, and an experience of pleasure, gratification, or release at the time of the act.

Under the classification of Impulse Disorders, pathological gambling is viewed in terms of a mental disorder. According to the DSM-IV, a person diagnosed as a pathological gambler would be involved in persistent and recurrent maladaptive gambling behaviour characterised by such things as a preoccupation with gambling, repeated unsuccessful attempts to control, cut back or stop gambling, gambling to escape dysphoria, chasing lost cash from a previous gambling session, lying to family members to conceal the extent of involvement, jeopardising significant relationships and committing illegal acts to finance gambling.

It is well recognised that uncontrolled gambling is likely to lead to possible financial and psychological problems. These problems include high levels of depression and suicidal ideation, agitation, substance abuse, family and marital discord. The cost to the individual and society is registered in loss of productivity, employment, and the cost of criminal activities associated with maintaining high rates of gambling behaviour (Blaszczynski et al., 1999).

The extent, to which these problems occur, in part lies in the expansion of gambling over the last two decades in Australia. Up until the late 80s legal gambling was confined to lotteries and racing in most States, with poker machines only operating in clubs in N.S.W. Recent legislative changes in most states and territories have resulted in the proliferation of existing and new forms of gambling throughout Australia (Productivity Commission, 1999). The increase in gaming activity, in particular EGM play, has increased revenue for industry stake-holders and state governments.

Gaming net takings amounted to $11.1 billion between 1997 to 1998, indicating a rise of 42% since 1994-1995 data. Much of this growth has come from poker and electronic gaming machines accounting for $6.1 billion (58%) of the net takings alone. Approximately $1 billion of the net takings were from casino gaming tables, $1.1 billion from off-course TAB sales, and $1 billion from lotteries, lotto-style games and football pools (ABS, 1998).

The most recent figures on problem gambling prevalence in Australia have come from the Productivity Commissions report into Australia's Gaming Industries in 1999. The findings from the report indicate 2.1% of the adult Australian population are problem gamblers losing over $3 billion from gambling in 1998. This is an increase since Dickerson and Baron's (1996) National survey on the extent of problem gambling in Australia, which estimated problem gambling of the order of 1.16% of the population.

The Productivity Commission's report indicate the costs of problem gambling including financial and emotional impacts on the gamblers and on others, with at least five other individuals affected to varying degrees. Around 60% of problem gamblers in treatment indicate that they suffer depression as a result of gambling, one in ten gamblers indicated contemplated suicide and nearly half of those in treatment reported

losing time from work in the last year. Relationship break-up due to gambling was reported by 11.3% problem gamblers in treatment, and 13% of problem gamblers sought help for violent behaviour due to gambling (Productivity Commission, 1999).

3. Definition and prevalence of problem drinking

If within the Australian community gambling is a socially accepted activity, the same is true of drinking alcohol. However, excessive usage or problem drinking refers to the repetitive intake of alcohol such that intake harms the drinkers health, social life and finances, due to the inability to control the occasions or amount of drinking (Keller, 1982).

A number of terms have been used to categorise a person who encounters problems associated with his/her alcohol consumption. Terms such as 'alcohol abuse', 'alcohol dependence' are used in the literature to describe characteristics of problems associated with the level of alcohol involvement (Jarlais & Hubbard, 1997). Abuse often refers to alcohol use that gives rise to short-term acute personal or social consequences. The psychiatric diagnosis of dependence requires evidence of adverse consequences of alcohol use over an extended period of time (Jarlais & Hubbard, 1997).

The current DSM-IV defines problem drinking under the term 'substance dependence'. This clinical term has evolved over the past decade and includes both psychological and physiological aspects such as tolerance (the need to increase amounts of alcohol to achieve a desired effect), withdrawal (where abrupt cessation of alcohol causes a cluster of physical symptoms), drinking more than intended, unsuccessful attempts to cut down or control drinking, and social, occupational and recreational activities are given up because of alcohol abuse (DSM-IV, 1994).

According to the Australian National Health and Medical Research Council (NHMRC) 'National Drinking Guidelines' 2000, alcohol problems can be characterised as those relating to *dependence*: withdrawal symptoms, loss of control, and social disintegration, *regular use*: cirrhosis of the liver, cognitive impairment, pancreas damage, heart and blood disease and ulcers and, *intoxication*: alcohol-related violence, risky behaviours, road trauma and falls.

It is accepted that problem drinkers differ (perhaps only in degree) in a variety of defining features such as genetic predisposition, presenting symptoms, drinking patterns, extent of dependence, antecedent personality characteristics, co-morbid psychopathology, the age of onset, and the speed in which alcohol dependence develops and the severity of alcohol-related consequences appear (Babor, 1994). It is likely, therefore, that problem drinking varies along a continuum of severity, rather than representing distinct disease entities (Mann, Hermann & Heinz, 2000).

The Australian Institute of Health and Welfare (AIHW) published the National Drug Strategy Household Survey in Australia in 1998 that quantified the prevalence alcohol usage in the community, along with alcohol-related injury and mortality. For example, of the 10,000 households surveyed in 1998, the prevalence of regular drinking (at least weekly) was highest in the 30-39 years age group for males at 65%, and for females 44%. In 1998, 14% males and 6% females consumed alcohol on a daily basis and at least 8% of males and 4% of females were drinking at hazardous or harmful levels. In 1997 alcohol killed 3,668 people in Australia, second only to tobacco-related deaths. The main cause of death from alcohol was alcoholism and alcoholic liver cirrhosis (27%), road injuries (12%) and cancer (8%) (AIHW, 2000).

4. The existence of co-morbid problem drinking / problem gambling in clinical and non-clinical samples

Previous studies suggest that problem gambling and problem drinking may be more likely than chance to occur together (Daghestani, Elenz & Crayton, 1996). Because most legalised gambling venues sell or provide alcohol to patrons while they are gambling, it seems probable or even expected that co-morbid alcohol and gambling problems will occur. Most of the research on the rates of co-morbid problem drinking / problem gambling have come from studies examining clinical samples and only a few exist on incidence in non-clinical samples. While these studies are silent on aetiology, they provide information on the extent to which these problems coexist.

Clinical research on incidence rates of problem drinking / problem gambling co-morbidity is well established. Research has assessed the extent of both problem gambling found in problem drinking patients, and problem drinking found in problem

gambling patients. For example, Spunt et al. (1998) reports that studies from clinical samples of pathological gamblers suggest that they have higher rates of alcoholism than the general population, and that rates of pathological gambling are four to ten times higher for substance abusers than for the general population.

5. Rates of Problem Gambling in Clinical Samples of Substance Abuse

Studies that report rates of pathological gambling in substance abusing patients in the United States have been generally consistent in their findings. In most cases, these studies have used the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987), which is a valid and reliable instrument used for the identification of problem gamblers in alcohol and drug treatment. Scores range from 0 to 20, and a score of 5 and above has been found to indicate problem gambling while reducing the number of false negatives and false positive classifications (Abbott & Volberg, 1996).

Results of a study by McCormick (1993) reveal that of the 2,171 substance abusers in treatment, 9.9 % that abused alcohol scored 5 or more on the SOGS. Ciarrocchi's (1993), study of 467 substance abusing patients found 10.7% scoring 5 or more on SOGS. Feigelman, Kleinman, Lesieur, Millman and Lesser (1995) found 10% problem gamblers scoring 5 or more on SOGS in a sample of 220 methadone patients receiving treatment in New York. Lejoyeux, Feuche, Loi, Solomon and Ades (1999) found 8.9% of alcohol abusers meeting the criteria for problem gambling in a sample of patients receiving treatment for an Impulse Control disorder. Lesieur, Blume and Zoppa (1986) found 5% of the 458 patients being treated for alcohol problems at the South Oaks Hospital scored 5 or more on SOGS. In addition, Lesieur et al. found that 34% of their patients being treated for alcohol and drugs reported gambling while drinking or using drugs 'some of the time', while 5% reported 'most' or 'all of the time'.

Higher rates of co-morbid substance abuse and problem gambling have been found in other studies. For example, Daghestani et al. (1996) found a rate of 33% of problem gamblers (i.e. scoring 5 or more on the SOGS) in a sample of 276 substance abusers. In a study of 462 patients in methadone treatment programs in New York (Spunt, Lesieur, Hunt & Cahill, 1995), 30% of the sample were problem gamblers scoring 5

or more on SOGS, and 47% of the sample used alcohol just prior to or during gambling. The results indicated further that alcohol was more likely to be consumed while gambling than cocaine (23%), marijuana (17%) or other drugs (10%). A study examining rates of pathological gambling amongst Native Americans and Caucasian patients (N=85) in treatment for alcohol dependence found 22% Native Americans (versus 7% in Caucasians) scoring 5 or higher on SOGS having co-morbid gambling problems (Elia & Jacobs, 1993).

6. Rates of Substance Abuse in Clinical Samples of Problem Gamblers

A small number of studies in the U.S. on problem gamblers in treatment reveal similarly high rates of co-morbid substance abuse. For instance, Ramirez, McCormick, Russo and Taber (1983) found 39% of pathological gamblers undergoing treatment at the Veteran Administration Medical Centre met the criteria for alcohol misuse or drug misuse in the last year, and 47% of the sample met the criteria at some point in their life. Ciarrocchi and Richardson (1989) found 34% of 186 patients admitted to a private psychiatric hospital for problem gambling had co-morbid alcohol problems. Templer, Kaiser and Siscoe (1993) found problem gambling to be significantly correlated with scores on the Mac Andrews Alcoholism Scale. Linden, Pope and Jonas (1986) reported 52% alcohol abuse rate with Gamblers Anonymous members. Similarly, Lesieur and Blume (1991) found that 52% of 50 women problem gamblers attending Gamblers Anonymous had abused alcohol and/or drugs at some time in their lives. The authors report that the rate of substance abuse in this sample of women was two or three times higher than in the general female population.

The overlap between problem drinking and problem gambling shown in studies indicating rates of problem gambling in substance abusing patients, and rates of substance abuse in problem gambling patients demonstrate the extreme end of co-morbidity. However, problems associated with clinical samples include self-selection bias by those with more severe problems admitting themselves into treatment facilities (Sharpe, in press). Retrospective data collected in treatment services may blur results; thus, the validity of such results needs to be questioned. The extent to which problem drinking and problem gambling co-morbidity occur may be better understood by research assessing rates in large non-clinical samples.

7. Non-clinical Samples with Problem Drinking / Problem Gambling Co-morbidity

Most recent studies on non-clinical co-morbid samples have come from Australia, Canada, New Zealand and the United States and include both survey based and experimental designs. The results indicate high rates of co-morbid problem drinking / problem gambling in non-clinical samples.

In 1998, an Australian research team evaluated the social and economic impact of regular gambling in NSW by household survey (Dickerson, Allcock, Blaszczynski, Maddern, Nicholls & Williams, 1998). Researchers interviewed 299 participants on the extent of problem gambling and problem drinking using the SOGS and the Alcohol Use Disorder Identification Test (AUDIT) respectively. AUDIT is a valid and reliable measure for identifying problem drinking with a score of 8 or more indicating alcohol problems (Conigrave, Hall & Saunders, 1995; Barry & Fleming, 1993). Results indicated that almost 40% of men and 15% of women at risk of gambling problems associated with continuous forms of gambling (eg. Electronic Gaming Machines (EGM), casino, racing and cards) scored greater than 8 on AUDIT, whereas less than 5% of women and approximately 20% men at risk of problems associated with discontinuous forms of gambling (eg. Lotto, Oz lotto, Powerball, and the Lottery) scored above 8 on AUDIT. More recently, the Productivity Commission's (1999) National inquiry into the economic, individual and social impacts of gambling in Australia revealed that around one in five severe problem gamblers were reported to be suffering from co-morbid alcoholism or other chemical dependencies.

In 1994, Smart and Ferris conducted a study, which examined the relationship between alcohol, drugs and gambling in Ontario, Canada. Using a telephone survey approach, 2,016 randomly selected Ontario adults participated and results indicated problem gambling was significantly related to problem drinking, smoking and other

drug use. The most significant predictors of problem gambling were expenditure on gambling, alcohol dependence and age.

In the United States, a study examining the association between problem gambling and other psychiatric disorders using data from the St. Louis epidemiological catchment area indicated that of the 161 individuals assessed to be problem gamblers, 44% met the criteria for alcohol dependence. Among the problem gamblers with alcohol problems, gambling problems occurred within two years of the onset of alcoholism in 65% of cases (Cunningham-Williams, Cottler, Compton & Spitznagel, 1998).

In a seven year follow-up study on frequent and problem gambling in New Zealand, Abbott, Williams and Volberg (1999) found that 40% lifetime probable pathological gamblers experienced alcohol-related problems in 1991, and 54% of those people continued to experience alcohol-related problems in 1999.

In Australia, an interesting study by Kyngdon and Dickerson (1999) examined the interaction of alcohol and gambling in an experimental setting. Regular EGM male gamblers either drank three alcoholic drinks or three placebo drinks before gambling on a simulated EGM. Results revealed that those in the alcohol group played twice as many trials as those in the placebo group, with significantly more players losing all of their original cash staked (50% Vs 15% in the placebo group). The authors remarked that relatively small quantities of alcohol (before and during a gambling session) might have a significant effect on psychological processes that underlie control over gambling. Baron & Dickerson's (1999) earlier finding was that drinking alcohol contributed to one in eight gamblers reporting difficulty resisting urges to start playing EGMs after consuming at least two standard alcoholic drinks while in the gaming venue i.e. a bar/hotel.

College samples in the United States also reveal high rates of concurrent drinking and gambling problems. For example, Lesieur et al. (1991), in a sample of 1,771 university students 5.5% problem gamblers SOGS scores correlated significantly with measures of alcohol abuse. In a study examining overlapping addictions in college men and women, Greenberg, Lewis & Dodd (1999) reported that men scored higher

than women did on addictions to alcohol, cigarettes, gambling, television and the Internet. Women scored higher on caffeine and chocolate. Barnes, Welte, Hoffman and Dintcheff (1999), in a study exploring the predictors of gambling and alcohol behaviour among youth in New York, found that impulsivity, moral disengagement and delinquency predicted alcohol consumption and gambling. The authors suggest that parental alcohol and gambling modelling is at work in the socialisation process and treatment may need to take this into account.

It has been argued that these very high rates of co-morbidity in clinical and non-clinical samples should direct researchers to pursue common underlying factors such as genetic, biological and socio-cultural aspects in both problem drinking and problem gambling (Ciarrocchi, 1987). An account of these factors is needed so that programs for prevention and intervention can be developed. From the work on co-morbid substance abuse and problem gambling to date, several socio-demographic details on these combined conditions have emerged.

In clinical studies, there appears to be a general trend for the co-morbid clients to be Caucasian males, aged between 36 and 44 (on average), equally either married or divorced, to have completed less education than needed to obtain the High School Certificate, and to be currently working full-time in semi-skilled or unskilled jobs (Daghestani et al., 1996; Lesieur & Blume, 90; Lesieur et al., 1986; McCormick, 1993; Elia & Jacobs, 1993; Ciarrocchi, 1993; Lejoyeux et al., 1999; Feigelman et al., 1995; Carriocchi & Richardson, 1989). Co-morbid individuals were more likely to have criminal charges against them, with three or more convictions found in some samples (Ciarrocchi, 1993; Ciarrocchi & Richardson, 1989; Feigelman et al., 1995). Carriocchi (1993) found 100% of participants to be depressed, 66% to have chronic medical problems, 42% to have attempted suicide, and to have greater difficulty with social and family life. Carriocchi and Richardson (1989) found 7% participants to have reported a loss of a parent before the age of 18; and 27% reported problem gambling in fathers, 12% in mothers, while 41% reported alcohol problems in fathers compared to 18% in mothers.

In non-clinical samples a similar picture emerges. Most often co-morbid participants appear to be Caucasian males aged between 36 and 44 (on average), married and

employed (Black & Moyer, 1998; Cunningham-Williams et al., 1998; Smart and Black, 1994; Abbott, Williams & Volberg, 1999). Youth, college and university co-morbid samples appear to be male, aged between 18-24 (on average), and not married (Barnes et al., 1999; Greenberg et al., 1999; Lesieur et al., 1991).

8. The relationship between problem gambling and problem drinking: are they kindred disorders?

The most popular perception is that problem (pathological) gambling and alcohol dependence are kindred disorders. The frequent co-occurrence of chemical dependence and problem gambling in individuals in clinical and non-clinical samples provides evidence of a relationship between the two (Blume, 1994). Lesieur and Heineman (1988) report that commonalities include states of arousal which elevate or depress normal states of awareness; that they exist in overlapping social domains; they often engage in concert or sequence; patterns of relapse and abstinence appear similar; self-help approaches are equivalent; and treatment approaches resemble one another.

The DSM has acknowledged that pathological gambling is similar to psychoactive substance abuse by modelling the criteria for that disorder on those for psychoactive substance dependence. Tolerance and withdrawal, symptoms of substance dependence, are indicated in symptoms of pathological gambling as outlined in the DSM-IV (see criteria 2. & 4. respectively). Although there is no empirical evidence of tolerance or withdrawal in problem gambling, there is a belief that psychological dependency is apparent in those manifesting impaired control over their gambling behaviour (Blaszczynski et al., 1999). Abstinence and relapse in both pathological gambling and substance misuse have been reported (Lesieur & Rosenthal, 1999).

Whether or not problem (or pathological) gambling belongs among the addictions has been questioned (Shaffer, 1999). A review of this literature will not be discussed here. However, Shaffer suggests that for an addiction to emerge as a feasible scientific construct, whether psychoactive drug use or pathological gambling is of concern, investigators need to establish a "gold standard" against which the presence or absence of the disorder can be judged. To do this, the benchmark must be

independent of the disorder being judged, and he suggests, that evidence is more likely to come from neurogenetic or biobehavioural attributes. So far, neurological and biological research have established the role of variants of the DRD2 gene and abnormalities in dopaminergic pathways as a risk factor in problem gambling and other impulsive addictive behaviours (Comings, Rosenthal, Lesieur, Rugle, Muhleman, Chiu & Gade, 1996; Comings, Gade, Wu, Chiu, Dietz, Muhleman, Saucier, Rosenthal, Rugle & MacMurray, 1997; McElroy, Hudson, Harrison, Pope, Keck & Aizley, 1992).

9. Treatment for Problem Drinking

Alcohol dependence has been described as a chronic disorder posing heavy burden on patients, their families and on society (Garbutt, West, Carey, Lohr & Crews, 1999). Treatment for this disease consists of detoxification and rehabilitation. Detoxification ameliorates the symptoms of withdrawal such as craving (Swift, 1999). Craving has been defined as an overpowering urge or desire for alcohol during acute withdrawal (Wetterling, Veltrup & Junghanns, 1997). Rehabilitation on the other hand helps the patient avoid future problems with alcohol. Most rehabilitation treatments are psychosocial and comprise individual and group therapy, residential treatment in alcohol-free settings, and self-help groups such as Alcoholics Anonymous (AA) (Swift, 1999).

Drinking behaviour has been shown to correlate with several neurotransmitter systems in the brain including opioidergic, glutamatergic, GABAergic, serotonergic, and dopaminergic systems as well as several neurohormones such as thyro-tropin-releasing and adrenocorticotrophic hormones (Litten & Allen, 1998). As a consequence of this multi-determination basis to alcohol dependence, several strains of drug therapies have been developed in the hope of reducing drinking consumption. Empirical evidence for using pharmacological treatment is well documented and reviews on which types of medications are effective have been undertaken.

Garbutt et al. (1999) evaluated 375 controlled trials to ascertain the efficacy of five categories of drugs used to treat alcohol dependence – Disulfiram, Naltrexone, Acomprosate, and various serotonergic agents (including selective serotonergic re-

uptake inhibitors), and Lithium. The researchers graded quality of the individual articles on a scale of 0-100 and analysed strength of evidence for each drug class. Accordingly, each drug class was classified as: (A) strong and consistent evidence of efficacy in studies with large sample sizes and/or high quality, (B) mixed evidence of efficacy, (C) evidence of lack of efficacy, and (I) insufficient evidence). The analyses revealed categories (A) Naltrexone and Acomprosate for reducing relapse to heavy drinking, (B) Disulfiram, (C) Lithium and (I) serotonergic agents. Swift's (1999) review of drug therapy for alcohol dependence concurs with Garbutt's et al. work.

In a critical review of pharmacological treatment of alcohol dependence Moncrieff and Drummond (1997) argue that many studies have methodological inadequacies that affect the generalisability of results including the failure to test the integrity of double blind designs (for example some drugs have side-effects that are distinguishable to drug administrators); exclusion of early drop outs from analysis; and drug therapy undermining self-efficacy if success is attributed unjustly to the drug rather than personal actions. Self-efficacy is important in successful relapse prevention and this can be further promoted in psychosocial therapy associated with rehabilitation. It has been noted that drug therapy in conjunction psychosocial treatment appears most efficacious (O'Malley, Jaffe & Chang, 1996; Litten & Allen, 1998).

10. Treatment for Problem Gambling

With the expansion of legalised gambling in Australia there has been an increase in problem gambling. Public awareness of this problem is growing and there is now a greater need for treatment designed for helping problem gamblers. The Productivity Commission (1999) reported that there is little reliable information on which treatment approaches work best and additional expenditure on monitoring and evaluation would be a good investment.

Treatment approaches for problem gambling include psychodynamic, behaviour therapy, cognitive therapy, cognitive-behavioural therapy, self-help groups and pharmacotherapy. The effectiveness of these treatments is uncertain as most studies have been based on case reports, and very few controlled treatment outcome studies have been conducted. As such, explorations involving the efficacy of treatment for

problem gamblers are in its infancy (DeCaria, Hollander, Crossman, Wong, Mosovich & Cherkasky, 1996).

Psychodynamic treatment relates to low ego strength, narcissism and grief associated with giving up gambling. Behaviourists tend to view gambling as a learned behaviour that is originated and maintained by positive and negative reinforcement (Anderson & Brown, 1984) and early studies on behavioural treatments mostly focused on aversive techniques (Barker & Miller, 1966; Koller, 1972). Other behavioural techniques such as progressive muscle relaxation, imaginal desensitisation and imaginal relaxation have been used with some success to treat the problem gambler (Blaszczynski, McConaghy & Frankova, 1991; McConaghy, Armstrong, Blaszczynski & Allcock, 1988). Cognitive therapy's basic premise is that individuals' distorted beliefs and attitudes about gambling are activating and maintaining the undesirable behaviour (Gaboury & Ladouceur, 1989) and the aim of the treatment is to challenge these inaccurate cognitions so that gambling behaviour can be modified.

A combination of techniques such as relaxation training, imaginal and in vivo exposure, cognitive restructuring and relapse prevention have been shown to be efficacious in reducing urges to gamble and abstinence from the behaviour (Sharpe & Tarrier, 1992; Bujold, Ladouceur & Sylvian, 1994; Sylvian, Ladouceur & Boisvert, 1997).

There has been limited research into pharmacological treatments (Crockford & el-Guebaly, 1998; Moskowitz, 1980; Hollander, Frenkel & DeCaria, 1992). Given the high rates of co-morbidity between problem gambling and depression (Blaszczynski & McConaghy, 1989; McCormick, Russo & Ramirez, 1984) research into the pharmacolgical treatment for depression may reduce the association between negative mood states and gambling (Petry & Armentano, 1999). The most recent critical review of "best practice" for intervention with problem gambling was published by the Department of Human Services, Victoria (O'Connor, Ashenden, Raven & Allsop, 2000)

Turning to self-help for problem gambling, some researchers argue that attending Gambler Anonymous self-help group (GA) may reduce gambling activity only

temporarily, without making a significant and lasting impact. For example, Brown's (1985) research found that of the 232 attendees of GA meetings in Scotland, only 7.53% maintained abstinence after one year, and 7.30% remained abstinent through to a second year.

11. Combined treatment for co-morbid problem drinking / problem gambling

Since the American Psychiatric Association added pathological gambling to the Impulse Control Disorders in 1980, some alcohol and other substance misuse treatment facilities have added problem gambling to their array of services and other facilities have initiated separate programs for problem gambling. However, there have been limited studies on the efficacy of multi-modal approaches to treatment problem drinking and problem gambling.

Lesieur and Blume (1991) report follow-up results of 72 problem gambling patients following treatment in a combined alcohol, substance misuse and problem gambling treatment program. The treatment program included psychotherapy, group counselling, lectures, films, psychodrama, psycho-education, and 12 step self-help sessions (i.e. Alcoholic Anonymous, Gamblers Anonymous, and Narcotics Anonymous). Using the Addiction Severity Index modified for problem gambling patients reduced their intake of alcohol, other drugs and their gambling, and they improved in legal, family/social, and psychological functioning. The authors concluded that combined treatment is an effective way of dealing with patients that initially identified themselves as having problems with gambling, and for those whose problems were discovered after systematic screening for alcohol and other substance misuse.

An earlier follow-up study on a multi-modal treatment program was applied to 124 patients in a Veteran's Administration Clinic utilising group and individual psychotherapy approach along with GA meetings. All patients received the same treatment. Sixty two participants replied to the follow-up questionnaire and 55% reported complete abstinence for at least one year since discharge, and 92% reported less gambling than before (Russo, Taber, McCormick, & Ramirez, 1984).

Bond (1998) describes the development of a substance abuse treatment program (SATP) in several UK prisons. This program treats inmates whose chronic alcohol, drug and gambling addictions have contributed to their offending history. This 12-week program incorporates group and individual therapy, goal planning, weekly assignments relating to problems associated with their addiction and relapse support. Unfortunately, treatment outcome research has yet to be conducted.

3.0 Psychometric Measurement of Problem Drinking and Problem Gambling

3.1 Problem Drinking

The Alcohol Use Disorder Identification Test (AUDIT) was employed as the standard measure to identify the frequency and extent of problem drinking in these studies. The AUDIT has been developed as a screening instrument for the detection of problem drinkers whose current alcohol consumption has become hazardous or harmful to their health (Babor, de la Fuente, Saunders, Grant, 1992).

The 10 questions that comprise the AUDIT were selected from a 150 item assessment schedule that was administered to 1888 persons attending primary health care centres in Australia, Norway, Switzerland, Bulgaria and Mexico. These items were selected on the basis of their representativeness, high correlation with alcohol consumption, high face validity, and ability to determine light drinkers from heavy drinkers (Saunders, Aasland, Babor, de la Fuente, Grant, 1993).

The AUDIT measure contains three sub-categories with three questions on Hazardous Alcohol Consumption, three questions on Alcohol Dependence, and four questions relating to Harmful Alcohol Use (Babor et al., 1992).

Hazardous Alcohol Use asks questions referring to the frequency of drinking, typical quantity and frequency of heavy drinking. Alcohol Dependence questions refer to the incidence of morning drinking, impaired control over drinking and the increased salience of drinking. The questions relating to Harmful Alcohol Use refer to the incidence of guilt followed by drinking, blackouts, alcohol related injuries and others concerns about drinking. Babor et al. (1992) found these three domains to have high

intra-scale reliability across the collaborating health care centres with different cultural backgrounds.

The cut-off points for the AUDIT are determined by the relationship between sensitivity and specificity for hazardous alcohol consumption, dependence symptoms, and alcohol problems in the last year using the receiver operating characteristic (ROC) analysis. The cut-off point of 8 for Hazardous Alcohol Use ranged from 95 to 100%, Alcohol Dependence symptoms varied from 93 to 100%, and Harmful Alcohol Use in the last year ranged from 91 to 100%. Reliability for the cut-off score of 8 has been found in further studies (Conigrave, Hall & Saunders, 1995; Barry & Fleming 1993). AUDIT scores range from zero to forty and the questionnaire takes approximately 2 to 3 minutes to complete (Chan-Pensley, 1999).

In this report the term "problem drinking" has been used to refer to respondents who score 8 or more on AUDIT.

3.2 Problem Gambling

The South Oaks Gambling Screen (SOGS) was used to determine the presence of problem gambling in these studies. This measure has been widely used for detecting problem gambling in epidemiological (Dickerson, 1996;Volberg, 1996; Abbott, Williams & Volberg, 1999) and clinical studies (Blume, 1989; Lesieur & Blume, 1990; Daghestani, Elenz & Crayton, 1996).

Devised by Lesieur and Blume (1987), SOGS is based on the criteria for Pathological Gambling outlined in the DSM-III (1980), and the 20 questions of Gamblers Anonymous (GA) (Shepherd, 1996). The SOGS instrument contains 20 questions regarding problem gambling behaviour such as family and job disruption, lying about gambling involvement, chasing losses, and borrowing or committing illegal acts to access money to pay gambling debts.

The development of SOGS involved 1,616 persons. The sample comprised university students, members of GA, hospital employees, and patients with diagnoses of substance abuse and/or pathological gambling (Lesieur & Blume, 1987). Several studies have used SOGS to reliably screen alcoholic, drug-dependent, and other

patients for pathological gambling (Briggs, Goodin & Nelson, 1996; Daghestani et. al, 1996; Castellani & Rugle, 1995; Ciarrocchi, 1993; McCormick, 1993; Lesieur & Heineman, 1988).

Following the Productivity Commissions' use of SOGS in a national survey into problem gambling in Australia in 1999, we used a variant of the SOGS in which people were asked about their gambling behaviours over the last 12 months. This is different to the original SOGS, which asks questions regarding lifetime experiences associated with gambling.

Lesieur and Blume (1987) validated the original SOGS in a clinical setting using a cut-off score of 3 or 4 to indicate problem gambling. Researchers in Australia (< biblio >) have contested this cut-off score. Researchers in New Zealand have found that a score of 5 or more to be a more reliable cut-off point for detecting problem gambling whilst reducing the number of false negative and false positive classifications (Abbott & Volberg, 1996).

In Australia, as reviewed in the Productivity Commission report (1999), scores of 5 and above have been interpreted as gamblers "at risk" of significant gambling related harmful impacts. Throughout this report, the term "problem gambler" has been used to refer to respondents who score 5 or more on the SOGS.

4. Study 1. The Incidence of Co-morbid Problem Drinking / Problem Gambling Prior to Treatment in a Sample of Respondents Attending Treatment Services for Alcohol, Gambling, or Alcohol and Gambling problems in N.S.W.

4.1 Design, Sample Selection and Recruitment

Treatment Services:

- Two lists of alcohol and gambling treatment services in N.S.W. were obtained from the Alcohol and Drug Information Services, at St. Vincent's Hospital, and from the Casino Community Benefit Fund respectively. Initially, this information aided in the selection of potential participating treatment services. The treatment

services contacted were mainly in-patient and out-patient clinics that utilise psychological and pharmacological treatments in the detoxification, rehabilitation, therapy and counselling for alcohol and/or gambling problems.

- A convenience sampling method was employed to select potential treatment services, and snowball sampling aided the selection of further services. Consent was gained through verbal and written communication with each treatment service. Treatment service participation included agreeing to be involved in the distribution of questionnaires to willing clients attending treatment services for problems associated with drinking and/or gambling.
- Thirty three drug and alcohol and/or gambling treatment services were contacted in N.S.W. Twenty five treatment services (76%) consented to be part of the study. However, we received completed questionnaires from only 18 treatment services (55%): Five drug and alcohol services, four gambling services and nine alcohol and gambling services. Twelve treatment services were located in the Sydney metropolitan area, three in Newcastle, two in the Mid Western Rural Area of N.S.W., and one treatment service in Wollongong.
- 864 questionnaires were distributed amongst the 25 treatment services. The exact number of questionnaires distributed to each service depended on the number of clients attending each service within the designated four-week data collection period. A total of 146 (14%) questionnaires were returned. Twenty four questionnaires were incomplete and discarded from analyses.

Respondents attending treatment services:

- Treatment service clinic managers, counsellors, psychologists, or treatment facilitators agreeing to be involved in the study were given the responsibility of determining which clients would be appropriate respondents for the study. Thus, a convenience sampling method was employed in their selection of potential respondents.
- The criteria for respondent selection was as follows:
    1) Each respondent was attending a treatment service for a presenting alcohol and/or gambling problem.
    2) Each respondent was at least 18 years of age.

3) Each respondent could read and comprehend the questionnaire so that it could be completed accurately and confidently.

- Each client that consented to be part of the study was given a questionnaire along with a pre-paid envelope so that they could fill out the questionnaire in their own time and post back to the university. This method of data collection was chosen to ensure confidentiality of client information and to avoid any coercion associated with completing the questionnaire in the treatment setting.
- The questionnaire comprised of the measure for problem drinking (AUDIT) and the measure for problem gambling (SOGS). The questionnaire also contained demographic questions along with treatment pattern questions (see Appendix A). The statement: "Please answer all questions as if you had just sought help, for the first time, for your alcohol and/or gambling problem from the treatment service or recovery program you are currently attending" appeared at the beginning of the questionnaire. All questions in the AUDIT and SOGS measures were phrased retrospectively with each question prefixed by "Just before you sought help..."

4.2 Sample Size

One hundred and twenty two complete questionnaires were included in the analysis. The total number of returned and complete questionnaires from respondents attending alcohol and/or gambling treatment services can be found below in Table 1.

Table 1.

Returned Completed Questionnaires From Respondents Attending Treatment Services in N.S.W.

Treatment Service	Questionnaires
Alcohol	84
Gambling	23
Alcohol & Gambling	15
Total	**122**

4.3 The Incidence of Problem Drinking and/or Problem Gambling Co-morbidity in N.S.W. Treatment Services

This study was designed to assess rates of co-morbidity prior to current treatment in respondents attending treatment services for alcohol and/or gambling problems. Rather than collecting information regarding the presence of alcohol and/or gambling

problems during treatment, when the treatment process itself may have altered the picture significantly, more valid data was obtained from respondents' memory of their drinking and/or gambling immediately prior to treatment. As such, the results of this study are retrospective and caution must be taken in their interpretation.

The number of questionnaires that indicated problem drinking, problem gambling and co-morbid problem drinking / problem gambling prior to current treatment are represented in the following Table 2. Problem drinking refers to respondents' scores of 8 or more on AUDIT exclusively; problem gambling refers to scores of 5 or more on SOGS exclusively; and co-morbid problem drinking / problem gambling refers to scores of 5 or more on SOGS as well as scores of 8 or more on AUDIT.

Table 2.

Rates of Problem Drinking and/or Problem Gambling Co-morbidity Among Respondents Attending Treatment Services in N.S.W.

Treatment Service	**Problem Drinking**	**Problem Gambling**	**Co-morbid**	**Total respondents**
Alcohol	n=52	n=0	n=32	84
Gambling	n=1	n=11	n=11	23
Alcohol & Gambling	n=0	n=0	n=15	15
Total	**53**	**11**	**58**	**122**

Table 2. shows that of the 84 respondents attending treatment services for alcohol problems 32 (38%) were co-morbid problem drinkers/problem gamblers prior to treatment and 52 (62%) were exclusively problem drinkers. Of the 23 respondents receiving treatment for gambling problems, 1 (4%) respondent was a problem drinker, 11 (48%) respondents were problem gamblers, and 11 respondents (48%) had co-morbid drinking/gambling problems prior to treatment. All the respondents receiving treatment for both alcohol and gambling problems were shown to have co-morbid patterns of problem drinking/problem gambling prior to treatment.

4.4 Co-morbidity Results and Drinking Patterns of Co-morbid Respondents Receiving Treatment for Alcohol and/or Gambling Problems

Below in Table 3. are descriptive statistics relating to co-morbid respondents SOGS scores of 5 over and AUDIT scores of 8 or over, as well as AUDIT scores on the three sub-categories of AUDIT (hazardous drinking, alcohol dependence, and harmful alcohol use). Additionally, this table presents scores relating to the number of standard drinks consumed on a typical drinking day; the per cent of occasions respondents drink alcohol when they gamble; and scores relating to the number of standard drinks consumed over a typical gambling session.