Table 43 : Mean scores on Gambling Belief Questionnaire by treatment condition

Total scale score	Total n = 36 m (SD)	CTG n =18 m (SD)	IDCTG n = 8 m (SD)	ID n = 9 m (SD)
Pre treatment	19.9 (8.1)	22.9 (8.5)	18.4 (6.3)	15.7 (6.9)
Post treatment	10.8 (8.9)	13.2 (10.1)	9.7 (8.7)	7.7 (5.8)

This finding raises an interesting question about the mode of action of the specific treatment techniques. Clients in both CT conditions showed a reduced level of cognitive distortions following treatment, suggesting that CT was successful in changing beliefs. Interestingly however clients in the ID group showed a decrease on the scale. A question for further investigation is whether ID reduces gambling behaviour in the manner hypothesised by the conceptual model, that is by reducing the arousal trigged by gambling related cues or whether it produces change by altering the individuals cognitions about gambling.

7.28 Review of one month findings

In summary this study found that gambling problems decreased following treatment with ID, group CT or a combined group IDCT approach. At one month follow-up 68% of clients who completed treatment reported they no longer experienced ongoing problems with gambling, and 79% were rated as showing a moderate or great improvement. Levels of perceived self-control also increased from pre to post treatment. There were no differences between the three treatment conditions in terms gambling behaviour, ongoing gambling related problems, or levels of preoccupation, urge and self-control over gambling at the one-month follow-up.

These findings provide promising signs that if used appropriately the less costly home based imaginal desensitisation program may be as efficacious as an inpatient ID program. Initial rates of improvement among clients who completed the ID program were comparable to those reported by Blaszczynski, McConaghy and Frankova (1991).

Compliance with the home use tape is an issue that requires further investigation. In the current study, clients who did not use the tape between the first and second treatment interviews were rated as non-completers. This is stricter than would be used in a clinical setting where clients would not be rated as non-completers after one failed attempt to learn a treatment strategy.

Although clients improved following treatment, caution is needed before drawing any firm conclusions about the relative efficacy and effectiveness of home use ID or CT based on one-month follow-up data. Long-term follow-up data is needed to establish whether treatment gains are maintained or whether clients in one condition improve to a greater or lesser degree over time. Both treatment strategies employed in the current study (CT and ID) are skill-based techniques. As clients become more familiar with using these techniques it may be that we see an improvement in their gambling status. Alternatively, it may be that over time clients forget or cease to use these skills. In this situation we may see a return to uncontrolled gambling. With this in mind, six and 12-month follow-up interviews have been conducted. Results from these interviews are presented in the following section.

7.29 Management of ongoing gambling related problems

At completion of treatment clients were invited to re-contact the clinic at any time if they were still experiencing problems with gambling. No client re-contacted prior to the one-month follow-up. At the one-month review clients who reported ongoing problems were offered ongoing assistance. In the initial phase ongoing assistance comprised review and reinforcement of treatment approach to which they had been allocated. Where this was unsuccessful, individual cognitive therapy was undertaken. If there were ongoing problems for reasons unrelated to gambling clients were referred to an appropriate agency or back to their original referrer for ongoing management.

Eleven (23.9%) clients were offered ongoing assistance for gambling at the one-month follow-up appointment. Of these clients, 4 (8.7% of the total sample) reported that ongoing work/time commitments interfered with ongoing attendance, three clients did not attend their appointments or contact the service, and four attended more than one additional session.

7.30 Six-month outcome

7.31 Follow-up completion rates

Six-month follow-up data has been collected from 24 (52.2%) of clients who completed treatment; full interview data was obtained from 22 (91.7%) clients and partial data was available for two (8.3%) clients (see Table 44). Five (10.9%) clients could not be contacted to complete this follow-up. As data collection is ongoing the results presented below should be considered preliminary. Reported percentages are expressed as a percentage of clients completing the follow-up. Accordingly, caution is needed before drawing any conclusion based on the data.

The majority of six-month follow-up interviews were conducted by telephone. It had been intended that these interviews would be conducted in person. However, clients did not respond to letters asking them to re-contact the clinic and arrange an appointment. When subsequently contacted by telephone by an independent interviewer, most clients reported that they had forgotten to ring or were too busy to attend in person. No client refused to complete the six-month interview over the telephone. This finding is consistent with the study reported in Russo, Taber, McCormick and Ramirez (1984) and Taber, McCormick and Ramirez (1987) where it was found that relatively few clients attended follow-up interviews (48%) but when such interviews were conducted via the telephone response rates increased markedly (86%).

Where interviews were conducted via telephone the questionnaire battery (including the GBQ, SIS, BDI, and the STAI-Y) was mailed to clients to complete and return in a postage-paid envelope. Despite reminder calls not all clients returned these questionnaires (See Table 44). Consequently, number of cases varies across analyses and cell size is reported in each table.

To date, no client who was offered and accepted ongoing assistance at the one-month follow-up has completed the six-month follow-up. Three of the eight clients who declined ongoing assistance are included in these results. Two could not be contacted and the remaining three clients have yet to reach six-month post treatment.

Table 44: Six month follow-up completion rates by treatment condition

	Total n (%)	CGT n (%)	IDCGT n (%)	IID n (%)
Interview	24 (52.2)	12 (60.0)	6 (42.9)	6 (50.0)

•

7.32 Gambling behaviour

Of those who completed the follow up, 56.5% were abstinent or participating in controlled gambling episodes during the month prior to the six-month assessment: 34.8 % reported uncontrolled gambling in this period, and the remaining 8.7% reported one to two gambling episodes that displayed at least one feature of uncontrolled gambling. Table 45 presents six-month follow-up gambling behaviour data for each treatment group. The pattern of gambling behaviour did not differ between treatment conditions.

Table 45: Gambling behaviour at six-month follow-up

	Total n = 24 n (%)	CTG n = 12 n (%)	IDCTG n = 6 n (%)	IID n= 5 n (%)
Abstinent	11 (45.8)	6 (50.0)	3 (50.0)	2 (40.0)
Controlled	3 (12.5)	1 (8.3)	1 (16.7)	1 (20.0)
1-2 sessions	2 (8.3)	0 (0.0)	1 (16.7)	0 (0.0)
Uncontrolled	8 (33.3)	5 (41.7)	1 (16.7)	2 (40.0)

These ratings are based on the reported behaviour during the one-month period prior to the six-month assessment. Two clients reported a different pattern of gambling behaviour during this month time frame and to the previous five months since the one-month assessment. One individual reported controlled gambling up until three weeks prior to the six-month assessment when they reported uncontrolled gambling. The second individual reported two episode of uncontrolled gambling in the five-month period but was abstinent during the one month before assessment. No other clients would have been placed in a different category if ratings were based on gambling behaviour over entire five-month period since the one-month follow-up.

Comparison of reported gambling behaviour at one and six-month follow up is presented in Table 46. Results showed that 56.4% of clients reported no change in their gambling behaviour from the one month to six-month follow-up. Half of the clients who reported one to two uncontrolled sessions at one month have completed the six-month follow-up. The majority of these clients (83.3%) reported repeated uncontrolled gambling during the month prior to 6-month assessment. This suggests that uncontrolled episodes shortly after treatment may be a predictor of relapse. Two clients who reported abstinence or controlled gambling at one month and who have completed the six-month follow-up reported an episode of uncontrolled gambling episode at six months. No client reporting repeated uncontrolled gambling at one month who has completed the six-month follow-up has achieved abstinence or controlled gambling.

Table 46: Comparison of one month and six month gambling behaviour

	One month gambling			
	Abstinent n (%)	**Controlled n (%)**	**1-2 session n (%)**	**Uncontrolled n (%)**
Six month gambling				
Abstinent	7 (30.4)	2 (8.6)	2 (8.7)	
Controlled		3 (13.0)		
One to two sessions	1 (4.3)		1 (4.3)	
Uncontrolled	1 (4.3)		5 (21.7)	2 (8.7)

Note: Entries in the shaded diagonal indicate no change in gambling behaviour, entries above the diagonal indicate an improvement in gambling outcome and entries below the diagonal indicate a decline in outcome.

7.33 Self-reported problems

Five clients (22.7%) reported experiencing some ongoing problem related to gambling; two (9.5%) reported problems because of continued gambling, one (4.8%) reported being troubled by urges and a pre-occupation with gambling, and two (9.5%) reported problems with both ongoing gambling and urges and preoccupation. In other words, at present 77.3% of clients who have completed the six-month follow-up report experiencing no problems with gambling or urges and preoccupation. The number of clients reporting problems with either gambling or urges and preoccupation is presented in Table 47. There were no differences between treatment conditions of these variables.

Table 47: Self-reported problems with gambling at six-month follow-up

	Total n = 22*	**CTG n = 10**	**IDCTG n = 6**	**ID n = 6**
Ongoing gambling	2 (7.3)	0 (00)	1 (16.7)	1 (16.7)
Urges/Preoccupation	1 (12.2)	1 (10.0)	0 (0.0)	0 (0.0)
Both problems	2 (12.2)	1 (10.0)	0 (0.0)	1 (16.7)
Total experiencing problems	5 (22.7)	2 (20.0)	1 (16.7)	2 (33.3)

*Note: 2 clients missing data. Both clients coded as uncontrolled. If these clients are included as having ongoing problems the percentage of clients reporting problems increases to 31.8% and the percentage of clients who reported no ongoing problems decreases to 68.2%.

These figures reflect the client's own beliefs about gambling as a cause of ongoing problems. It is interesting to note that there are differences between the number of clients reporting problems and the number of clients rated as continuing "uncontrolled" gambling in Table 45. This discrepancy arises for several reasons. In some cases the client's gambling behaviour had not changed greatly but external factors prevented problems from arising. For example, analysis of actual gambling behaviour indicated markers of loss of control (e.g., chasing, inability to resist urge, relief gambling) but lack of access to funds reduced the potential for problems. As a consequence when comparing their current gambling to pre-treatment levels the client perceived no ongoing problems, but clinically displayed an uncontrolled behaviour pattern. Such an individual would be highly vulnerable to relapse should the external situation change. Alternatively, the client may be hiding their ongoing gambling from their partner and as a result consider that they are experiencing no problems – it is only when their partner finds out that they perceive the problems as commencing.

7.34 Clinical rating

Overall, 83.4% of clients completing the six-month follow-up were rated as showing either moderate or great improvement in their gambling compared to pre-treatment levels. It was noted that 16.6% of clients were rated as showing no change in gambling compared to pre-treatment. The data for each category for each treatment group is presented in Table 48. Of the five clients not assessed at six months, two were rated as unchanged, two were rated as greatly improved and one was rated as showing moderate improvement at one month.

Table 48: Clinical rating and six-month follow-up by treatment group

Outcome 6 month	Total n = 24 n (%)	CTG n = 12 n (%)	IDCTG n = 6 n (%)	IID n = 6 n (%)
Great improvement	13 (54.2)	7 (58.3)	4 (66.7)	2 (33.3)
Moderate improvement	7 (29.2)	3 (25.0)	2 (33.3)	2 (33.3)
No change	4 (16.6)	2 (16.7)	0 (0.0)	2 (33.3)

Table 49 presents the comparison of one-month and six-month clinical ratings. Overall, 66.7% of clients were rated at the same level of improvement at one and six months while 12.5% showed improvement in their gambling behaviour and 20.8% showed a decline gambling behaviour.

Table 49: Comparison of one and six-month clinical rating

	One month gambling		
	No Change	Moderate improvement n(%)	Great improvement n(%)
Six month gambling			
No Change		2 (8.3)	1 (4.2)
Moderate improvement		6 (25.0)	2 (8.3)
Great improvement		3 (12.5)	10 (41.7)

Note: Percentages expressed as percentage of all clients who completed the 6-month follow-up (n = 24)

7.35 Review of six month findings

As noted previously, no firm conclusions about treatment outcome can be drawn from the data collected to date as only half the clients who finished treatment have completed the six-month follow-up. Nonetheless several trends are emerging in the data. As was found in Taber, McCormick and Ramirez (1987), telephone interviews were necessary to increase follow-up participation. Reported reasons for failure to arrange and attend six follow-up interviews varied – the most commonly reported reason was "it slipped my mind". Clients were willing to comply with telephone follow-up interviews if contacted directly.

There was no overall pattern in the findings. Clients who reported one to two uncontrolled sessions at one month tended to be doing worse at six months. This suggests that one to two uncontrolled sessions soon after treatment is a predictor for poor long-term outcome and that these clients should be encouraged to attend further treatment session to enhance their skills. This conclusion may seem self-evident, however it is interesting to note that many of these clients indicated in their one-month self-report data that they did not consider they were experiencing any ongoing problems from gambling.

7.36 Twelve-month outcome

7.37 Follow-up completion rates

To date 12-month follow-up data has been collected from 11 (23.9%) of clients who completed treatment (see Table 50). Data collection is continuing. As the majority of clients have yet to complete the 12-month follow-up, the following section provides only a brief overview of the gambling behaviour and clinical ratings of completed clients. As yet there is insufficient data to draw conclusions about treatment effectiveness.

Table 50: Twelve-month follow-up completion rates by treatment condition

	Total n = 46 n (%)	CTG n = 20 n (%)	IDCTG n =14 n (%)	ID n = 12 n (%)
Interview completed	11 (23.9)	6 (30.0)	4 (28.6)	1 (8.3)

7.38 Gambling behaviour

Half the clients who have completed the 12-month follow up were abstinent or participating in controlled gambling episodes during the month prior to the assessment while 27.3 % reported uncontrolled gambling, and the remaining 27.3% reported one to two gambling episodes that displayed at least one feature of uncontrolled gambling. Table 51 presents 12-month follow-up gambling behaviour data for each treatment group. Numbers are too small to compare treatment groups.

Table 51: Gambling behaviour at twelve-month follow-up

	Total n = 11 n (%)	CTG n = 6 n (%)	IDCTG n = 4 n (%)	ID n = 1 n (%)
Abstinent	4 (36.4)	3 (50.0)	1 (25.0)	0 (0.0)
Controlled	1 (9.1)	1 (16.7)	0 (0.0)	0 (0.0)
One to two sessions	3 (27.3)	1 (16.7)	2 (50.0)	0 (0.0)
Uncontrolled	3 (27.3)	1 (16.7)	1 (25.0)	1 (100.0)

Comparison between gambling behaviour at six-and 12-month follow up is presented in Table 52. In all, 72.7 % of clients reported no change in their gambling behaviour from the one-month to six-month follow-up. Half of the clients who reported one to two uncontrolled sessions at six-month have completed the twelve-month follow-up. Of these 83.3% reported ongoing uncontrolled gambling during the month prior to six-month assessment. No client who reported abstinence or controlled gambling at six-month and who completed the twelve-month follow-up reported an uncontrolled gambling episode at twelve-months. No client reporting one to two sessions or repeated uncontrolled gambling at six-month who has been followed up has achieved abstinence or controlled gambling.

Table 52: Comparison of six month and 12 month gambling behaviour

	Six month gambling			
	Abstinent n(%)	Controlled n(%)	1-2 session n(%)	Uncontrolled n(%)
12 month gambling				
Abstinent	3 (27.3)			1 (9.1)
Controlled		1 (9.1)		
One to two sessions	2 (18.2)		1 (9.1)	
Uncontrolled				3 (27.3)

7.39 Twelve-month clinical rating

Table 53 presents the 12-month clinical ratings. As this table shows, 18.2 percent of clients who have completed the 12-month follow-up were rated as showing no change in their gambling behaviour 12 months after completing treatment. The remaining 81.8% showed moderate or great improvement.

Table 53: Clinical rating and 12-month follow-up by treatment group

	Total n = 11 n (%)	CTG n = 6 n (%)	IDCTG n = 4 n (%)	IID n = 1 n (%)
Outcome 12 month				
Great improvement	6 (54.5)	4 (66.7)	2 (50.0)	0 (0.0)
Moderate improvement	3 (27.3)	1 (16.7)	1 (25.0)	1 (100.0)
No change	2 (18.2)	1 (16.7)	1 (25.0)	0 (0.0)

Table 54 presents the comparison of six month to 12-month clinical outcomes. The majority of clients (90.9%) who completed the 12-month follow-up interview were given the same clinical rating at the six and 12-month interview.

Table 54: Comparison of six- and 12-month clinical rating

	Six month gambling		
	No Change	Moderate improvement	Great improvement
12 month gambling			
No Change	1 (9.1)	1 (9.1)	
Moderate improvement		3 (27.3)	
Great improvement			6 (54.5)

7.40 Changes in emotional and psychosocial functioning

This project aimed to evaluate the efficacy of cognitive and behavioural treatments for problem gambling. In presenting the results and assessing treatment efficacy, we focused on evaluating post-treatment gambling behaviour, urge, pre-occupation and self-control. In the next section we explore changes in psychosocial functioning associated with changes in gambling behaviour.

These changes are in themselves not an indication of therapeutic efficacy as they were not targeted by treatment and individuals may experience continued problems unrelated to gambling. However, examination of changes in emotional and psychosocial functioning allows examination of a number of practical and theoretically important issues. This includes an exploration of whether depression and anxiety are primary or secondary to gambling, and consequently whether treatment approaches should routinely include components that address specific areas of functioning, such as mood management and relationship issues.

During the one-month follow-up assessment clients were asked to rate their relationship, financial status and mood compared to pre-treatment on a 5-point scale (great improvement to significant decline). Table 55 presents ratings on each variable for the three treatment conditions. The majority of clients reported some improvement in their relationship (66.7%), financial status (71.8%) and mood (74.4%) over the pre-treatment to one month follow-up time period. Chi-square analysis revealed no significant differences in responding across treatment conditions.

Table 55: Self-reported changes in relationship, finances and mood at one month follow-up by group

	Total n = 41 n (%)	CTG n = 20 n (%)	IDCTG n = 11 n (%)	ID n = 10 n (%)
Relationship status				
Great improvement	11 (36.7)	3 (21.4)	4 (44.4)	4 (57.1)
Moderate improvement	9 (30.0)	5 (35.7)	2 (22.2)	2 (28.6)
No change	6 (20.0)	2 (14.3)	3 (33.3)	1 (14.3)
Moderate decline	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Great decline	4 (13.3)	4 (28.6)	0 (0.0)	0 (0.0)
Total	30	14	9	7
(Not applicable)	11	6	2	3
Finances				
Great improvement	18 (46.2)	9 (47.4)	5 (45.5)	4 (44.4)
Moderate improvement	10 (25.6)	3 (15.8)	4 (36.4)	3 (33.3)
No change	7 (17.9)	3 (15.8)	2 (18.2)	2 (22.2)
Moderate decline	1 (2.6)	1 (5.3)	0 (0.0)	0 (0.0)
Great decline	3 (7.7)	3 (15.8)	0 (0.0)	0 (0.0)
Total	39	19	11	9
Mood				
Great improvement	15 (38.5)	8 (40.0)	4 (36.4)	3 (33.3)
Moderate improvement	14 (35.9)	5 (25.0)	4 (36.4)	5 (55.6)
No change	7 (17.9)	3 (15.0)	3 (27.3)	1 (11.1)
Moderate decline	2 (5.1)	2 (10.0)	0 (0.0)	0 (0.0)
Great decline	1 (2.6)	1 (5.0)	0 (0.0)	0 (0.0)
Total	39	20	11	9

Table 56 presents ratings on each variable for each level of clinical improvement. There was a significant correlation between one-month outcome clinical ratings and change in financial situation ($r(39) = .56$, $p < .001$) and mood ($r(39) = .41$, $p < .01$). There was also a significant correlation between changes in mood and financial situation ($r(39) = .58$, $p < .001$). As can be seen in Table 56 greater improvement in gambling behaviour was associated with greater improvement in finances and mood. Changes in the client's relationship were not significantly correlated with treatment outcome at the one-month follow-up.

Table 56: Self-reported changes in relationship, finances and mood at one month follow-up according by clinical ratings

	Total	No change	Moderate Improvement	Great Improvement
Relationship status				
Great improvement	11 (36.7)	1 (25.0)	2 (16.7)	8 (57.1)
Moderate improvement	9 (30.0)	0 (0.0)	6 (50.0)	3 (21.4)
No change	6 (20.0)	2 (50.0)	2 (16.7)	2 (14.3)
Moderate decline	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Great decline	4 (13.3)	1 (25.0)	2 (16.7)	1 (7.1)
Total	30	4	12	14
(Not applicable)	9	2	2	5
Finances				
Great improvement	18 (46.2)	0 (0.0)	4 (28.6)	14 (73.7)
Moderate improvement	10 (25.6)	1 (16.7)	6 (42.9)	3 (15.8)
No change	7 (17.9)	4 (66.7)	1 (7.1)	2 (10.5)
Moderate decline	1 (2.6)	0 (0.0)	1 (7.1)	0 (0.0)
Great decline	3 (7.7)	1 (16.7)	2 (14.3)	0 (0.0)
Total	39	6	14	19
Mood				
Great improvement	15 (38.5)	1 (16.7)	3 (21.4)	11 (57.9)
Moderate improvement	14 (35.9)	2 (33.3)	5 (35.7)	7 (36.8)
No change	7 (17.9)	3 (50.0)	3 (21.4)	1 (5.3)
Moderate decline	2 (5.1)	0 (0.0)	2 (14.3)	0 (0.0)
Great decline	1 (2.6)	0 (0.0)	1 (7.1)	0 (0.0)
Total	39	6	14	19

In addition to providing global ratings of changes in mood, clients also completed standardised measures of depression (BDI) and anxiety (STAY-I) at the one-month follow-up interview. Table 57 presents mean scores on these measures for each treatment group. One-way analyses of variance revealed no pre-treatment group differences on these measures.

Repeated measures analyses of variance were carried out on this data. Overall, there was a significant decrease in BDI scores from pre-treatment ($M = 13.7$, $SD = 9.1$) to one month follow-up ($M = 8.7$, $SD = 9.5$; $F(1,33) = 28.2$, $p < .001$) and a significant decrease in state and trait anxiety scores from pre-treatment ($M = 63.9$ $SD = 30.8$; $M = 77.2$, $SD = 22.7$) to one month follow-up ($M = 47.4$, $SD = 34.0$; $M = 59.3$, $SD = 30.6$; $F(1,33) = 12.2$ $p < .002$; $F(1,33) = 17.5$, $p < .001$), respectively. There were

not significant interaction effects. However, there is significant variation in the data. This most likely reflects the fact that means are averaged across the different levels of improvement. Data on these variables according to level of clinical outcome are discussed in the next Chapter.

Table 57: Mean pre and one month scores on the BDI and STAI-Y

	Total n = 36 n (%)	CTG n = 18 n (%)	IDCTG n = 9 n (%)	ID n = 9 n (%)
BDI				
Pre	13.7 (9.1)	13.0 (8.6)	13.4 (7.7)	15.3 (12.0)
1 month	8.7 (9.5)	9.2 (10.2)	6.0 (7.1)	10.3 (10.7)
STAI-Y State				
Pre	63.9 (30.8)	64.6 (30.3)	60.7 (33.4)	65.8 (32.9)
1 month	47.4 (34.0)	48.4 (35.2)	44.8 (37.6)	48.1 (31.7)
STAI-Y Trait				
Pre	77.2 (22.7)	78.1 (22.1)	72.9 (21.4)	79.9 (27.1)
1 month	59.3 (30.6)	61.1 (28.5)	54.3 (37.9)	60.9 (30.2)

7.41 Review of psycho-social changes

These data show that the majority of clients reported experiencing improvements in their significant relationship, financial situation and mood following treatment. There was no significant difference between treatment groups on these variables. As may be expected there was a positive correlation between changes in mood and finances and clinical outcome. However, not all clients reported improvement in these areas. The majority of clients who reported a decline in finances indicated that this decline was due to the arrival of bills since the commencement of treatment.

Relationship status was not related to one-month clinical outcome. There are several explanations for this finding. In some cases clients reported that their relationship had ended since commencing treatment. However, it is also likely that significant relationships will take longer to improve following treatment than the individual's mood or financial status. In other cases it may be that relationship problems are independent of the clients gambling behaviour.

In a proportion of cases, the client's financial situation improved due to the assistance of a financial counsellor and the use of such professionals is recommended where indicated. Overall however these findings indicate that in a

majority of cases clients may not need specific strategies aimed at treating depression. Our CT program did include a brief psycho-educational component about depression but no specific strategies were taught. Current findings indicate that for only a minority of clients attending our clinic depression does not change with treatment. Analysis of the impact of depression on treatment outcome is discussed in the next chapter.

8 IDENTIFICATION OF PSYCHOLOGICAL PREDICTORS OF TREATMENT OUTCOME. (PERFORMANCE INDICATOR 4)

8.1 Introduction

Analysis revealed no significant differences in treatment response across treatment conditions at the one-month follow-up. However, not all clients benefited equally from treatment. In this section we explore the relationship between pre-treatment variables and treatment outcome to identify predictors of good or poor response to treatment.

Several previous studies have attempted to identify predictors of treatment success among gamblers. Based on clinical observation, Seager (1970) concluded that stability in occupational and marital/family life were predictive of a positive outcome. Koller observed that '*those who did best appeared to develop an antipathy to playing the machine during the earliest treatment sessions*' (p. 744), a similar conclusion reached by Echeburua, Baez and Fernandez-Montalvo (1996). Ladouceur, Boisvert and Dumont (1994) postulated that the high motivation of the clients and the provision of regular feedback and reinforcement that may have increased the gambler's perception of self-efficacy and been associated with treatment success for four male adolescents treated with cognitive therapy.

There have been relatively few systematic investigations of treatment outcome predictors. Russo, Taber, McCormick and Ramirez (1984) found that continued care, such as attendance at self-help groups and professional follow-up therapy was an important determinant of successful outcome. Seventy two percent (26 of 36) who received professional aftercare and/or attended two or more GA meetings remained abstinent in comparison to only 38% (9 of 24) who had none. Taber, McCormick and Ramirez (1987) found a similar association between participation in aftercare, specifically attendance at GA, and continued abstinence. In the month before follow-up, 74% of abstainees had attended at least three GA meetings, compared to 42% of those who had returned to gambling. At the six-month follow-up, both severity of gambling prior to treatment and attribution style made significant contributions to the prediction of gambling severity (McCormick & Taber, 1988). In this study clients were followed-up again after 12 months, at which time, 25 clients had been totally abstinent (McCormick & Taber, 1988). Intelligence as measured by two WAIS scales, the Digit Symbol and Block Design, and severity of pre-treatment gambling behaviour were predictive of outcome at six months.

Blackman, Simone and Thoms (1989) determined that treatment success was associated with a number of measures of social and family involvement. Lesieur and Blume (1992) used socio-demographic characteristics, motivational factors and the Addiction Severity Index, (ASI) as predictor variables in a multiple regression analysis. Results revealed that client motivation as measured by attendance at GA

meetings, counsellor's prediction of future abstinence and counsellor's assessments of gambler's resistance to treatment were the only variables that predicted treatment outcome.

Differences between treatment completers, treatment dropouts and treatment non-attenders in the current sample were discussed earlier. On average there was a trend towards treatment dropouts and non-attenders being younger in age than treatment completers, and males were more likely to dropout of treatment than females. No differences were found between the three groups on variables reflecting gambling severity. These findings provide some indication of which individuals may be likely to dropout of treatment. However, these factors are not necessarily predictors of treatment outcome; follow-up interviews indicated that people who dropout of treatment did not necessarily continue gambling.

In the following section the relationship between pre-treatment variables and treatment outcome as defined by the therapist's clinical ratings is explored. As six-month and 12-month follow-up interviews are ongoing, the focus is on outcome at one month. Identifying predictors of poor outcome at one month will allow for early identification of clients who may require additional support and assistance in overcoming their gambling problems. Also, gaining an understanding of such predictor variables would be of significant use in adapting and matching treatment interventions with individual characteristics so as to maximise response to treatment.

8.2 Demographic characteristics

Data on the sex and mean age of clients completing treatment was presented in Table 28 and Table 29, respectively. Chi-square analysis indicated no significant difference in the response to treatment of males and females. Analysis of variance revealed no significant differences in mean age between clinical outcome levels. These findings suggest that while age and sex may have impacted on likelihood of completing treatment they were not related to outcome for those individuals who completed the program.

8.3 Gambling severity and treatment outcome

In order to determine whether gambling severity impacted on degree of improvement a series of one-way analyses of variance were conducted on variables reflecting pre-treatment severity of gambling behaviour. These variables included the SOGS, self-reported pre-occupation with gambling, urge to gamble and level or perceived self-control over gambling, years recognition of problem, and weekly expenditure on gambling. Mean values for each variable are presented in Table 58. Analyses indicated no significant differences on these pre-treatment indicators of gambling severity between clients who showed great improvement, moderate improvement or no change at one month. Table 58 also presents mean and median pre-treatment

gambling related debts. Analysis of this data is hindered by the large variation in figures. Although mean figures suggest higher debts are associated with poorer outcome, median debt suggests the opposite. Correlational analysis indicated no significant relationship between debt size and treatment outcome. These findings suggest that gambling severity, as measured in this study, had little impact on treatment outcome.

Table 58: Pre-treatment indicators of gambling severity and outcome

	Total n = 43 n (%)	Great Improvement n = 20 n (%)	Moderate improvement n = 14 n (%)	No Change n = 9 n (%)
SOGS	12.3 (2.1)	11.9 (2.1)	12.1 (1.9)	11.8 (1.8)
Pre-occupation	7.5 (1.9)	7.4 (1.6)	7.2 (2.0)	8.8 (2.4)
Urge	7.9 (1.9)	7.6 (1.8)	7.9 (2.4)	8.8 (2.4)
Self control	2.7 (1.6)	3.2 (1.5)	2.1 (1.3)	2.6 (2.3)
Years problem recognised	4.6 (5.1)	4.5 (5.6)	4.1 (5.5)	5.4 (3.6)
Weekly Expenditure	$118 (210) [60]	$111 (218) [60]	$82 (81) [58]	$200 (331) [60]
Gambling debts	$9586.7 (20699.6) [1500]	$4561.5 (7571.4) [1600]	$9721.4 (12734.5) [1574.5]	$20544.4 (40639.6 [200]

Note: Median values appear in square brackets

8.4 Financial control

Lack of access to money reduces the individual's opportunities to gamble and may be associated with improved treatment outcome. Stimulus control procedures such as restricting access to money were not included as a separated and explicit component of treatment. Although the issues of high-risk situations and carrying excess cash were addressed in CTG and IDCTG using the questioning techniques of cognitive therapy (*Cognitive Therapy for Problem Gambling: Group Program. Therapist Manual*; Blaszczynski, & Maccallum, 2000 and *Imaginal Desensitisation*

and Cognitive Therapy for Problem Gambling: Group Program. Therapist Manual; Blaszczynski, & Maccallum, 2000), clients were not given direct stimulus control instructions to restrict their financial access. Clients referred by G-line reported receiving advice to restrict financial access, and a number of clients reported that their spouses had taken over control of their finances.

At the month follow-up clients were asked about their access to finances. Responses were coded as:

- "Unrestricted" access (no deliberate efforts to decrease access to money),
- "Self-restricted" access (conscious effort to leave cards at home, not carry money or self initiated change to bank access but could access money if wanted to), or
- "Other" restricted access (control of finances given to another person with no direct access to own sources of money).

Table 59 presents number and percentages of clients in each category according to treatment outcome.

Approximately one third of clients had their finances controlled by another person. However, the largest percentage (43.6%) of clients reported unrestricted access to their finances. Chi-square analysis indicated no significant differences in percentages of clients in each category of financial control across treatment outcome. That is, overall, level of improvement was not related to freedom of access to money. However, it is possible that for particular individuals, restricting access to money was a significant factor in improvement.

Table 59: Financial access by treatment outcome

	Total	**Great Improvement**	**Moderate improvement**	**No Change**
	n = 39	**n = 19**	**n = 14**	**n = 6**
	n (%)	**n (%)**	**n (%)**	**n (%)**
Financial control				
Unrestricted	17 (43.6)	10 (52.6)	5 (35.7)	2 (33.3)
Self-restricted	8 (20.5)	4 (21.1)	4 (28.6)	0 (0.0)
Other restricted	14 (35.9)	5 (26.3)	5 (35.7)	4 (66.7)

8.5 Depression and outcome

As previously outlined, one of the most consistent findings in the gambling literature has been the association between pathological gambling and depression (Becona et al, 1996; Blaszczynski & McConaghy, 1988; Linden, Pope & Jonas, 1986; McCormick & Taber, 1988). However, it is often difficult to determine the direction of causality between gambling and depression. In light of the emotional stresses generated by excessive gambling the finding of high levels of depression among this population is not surprising. While for others pre-existing depression serves as trigger for excessive gambling. In the previous chapter self-report data indicated that the majority of clients felt their mood had improved following treatment suggesting that for these clients depression was secondary to gambling. Nonetheless depression is associated with a range of changes in motivation and cognitive functioning. Accordingly, irrespective of the direction of causality an important question to address is the impact of depression on treatment outcome.

In the current study depression was assessed using two standardised measures, the BDI and the CIDI-auto (see Chapter 1 for detailed description of these measures). Table 60 presents the mean pre-treatment BDI by clinical outcome rating. A one-way analysis of variance indicated a significant difference in mean pre-treatment BDI scores across levels of improvement ($\underline{F}(2,41) = 5.1$ $\underline{p} < .012$). Post hoc testing indicate that on average clients who showed a great improvement evidenced significantly fewer symptoms of depression at pre-treatment than other clients. The mean BDI score for great improvers ($\underline{M} = 10.0$; $\underline{SD} = 7.8$) fell just above the normal or asymptomatic range of 0-9. The mean score for the moderate improvement group ($\underline{M} = 18.2$; $\underline{SD} = 8.8$) was at the high end of the mild-moderate range (10-18) while the no-change group ($\underline{M} = 19.1$; $\underline{SD} = 7.6$) fell within the moderate to severe range for depression (19-29).

Table 60 also presents the proportion of clients in each level of improvement who met a CIDI depression diagnosis for the 12 months prior to treatment. The small number of clients meeting criteria prevents firm conclusions about the relationship between DSM-IV depression diagnosis and outcome. Nonetheless, it is interesting to note that all but one client who met criteria for severe depression during the 12 months prior to assessment were rated as showing a great improvement in gambling. These results are somewhat at variance with the findings reported for the BDI. However, the BDI is a measure of depressive symptomatology over the previous week. Only one client reported symptoms consistent with severe depression that continued into this time frame. It may be that clients who have experienced severe depression in the past put more effort into treatment and thus have a better outcome. Together these results suggest that a while previous diagnosis of depression did not effect treatment outcome, the presence of depressive symptomatology, as measured by the BDI, at the beginning of treatment was related to outcome.

As a corollary to the impact of depression on outcome we examined the relationship between SSRI medication and outcome. The current understanding of the

relationship between SSRI medication and pathological gambling was outlined in Chapter 3. The proportion of clients prescribed SSRI medication at the time of assessment is presented in Table 60. Chi-square analysis indicated that clients currently prescribed SSRI medication did not consistently improve to a greater or less degree than clients not prescribed SSRI medication. However, caution must be observed before concluding that medication does not impact on treatment outcome.

The relationship between depression, medication, and outcome is likely to be a complex one and further systematic research is needed. Issues that need to be addressed include medication dosage and compliance, length of time on medication, and the causal nature of the relationship between gambling and depression.

Table 60: Pre-treatment indices of depression and outcome

	Total n = 43	Great Improvement n = 20	Moderate Improvement n = 14	No Change n = 9
Mean BDI scores	14.2 (9.0)	10.0 (7.8)	8.2 (8.8)	19.1 (7.6)
CIDI depression diagnosis (n %)				
Mild	8 (21.1)	2 (11.8)	4 (30.8)	2 (25.0)
Moderate	1 (2.6)	0 (0.0)	1 (7.7)	0 (0.0)
Severe	7 (18.4)	6 (35.3)	1 (7.7)	0 (0.0)
SSRI medication (n %)	10 (23.2)	6 (30.0)	2 (14.3)	2 (22.2)

These findings suggest that assessment include a screen for depressive symptomatology. Clients exhibiting moderate to high levels of depressive symptomatology at assessment could benefit from a more intensive or extended treatment program targeting depression as well as gambling.

8.6 Anxiety and outcome

As outlined previously, little is known about the relationship between anxiety disorders and problem gambling. Anxiety was assessed in the current study using the CIDI and the STAI-Y (see Chapter 1 for detailed description of these measures). The proportion of clients meeting criteria for each diagnosis is presented in Table 61. This table also presents mean pre-treatment percentile scores on the state and trait scales of the STAI-Y according to treatment outcome.

Overall, 34% of clients who completed treatment met criteria on the CIDI for an anxiety disorder. Chi-squared analysis indicated no relationship between the presence of an anxiety disorder and level of improvement. However, as noted previously the relevance of particular anxiety disorders to pathological gambling is questionable at it seems unlikely that treatment outcome would be affected by the presence of such disorders.

Table 61: Mean percentile scores on the state and trait scales of the STAI-Y

	Total n = 38	Great Improvement n = 17	Moderate Improvement n = 13	No Change n = 8
CIDI anxiety diagnosis				
Clients with a diagnosis	13* (34.2)	8 (47.1)	3 (23.1)	2 (15.4)
Specific phobias				
Animal	1 (2.6)	1 (5.6)		
Environment	1 (2.6)	1 (5.6)		
Blood/injury	2 (5.1)	1 (5.6)	1 (7.7)	
Social phobia	4 (10.3)	3 (16.7)	1 (7.7)	
Panic with agoraphobia	1 (2.6)	1 (5.6)		
Panic without agoraphobia	0 (0.0)			
Generalised anxiety	8 (20.5)	6 (33.3)	1 (7.7)	1 (12.5)
Obsessive Compulsive	2 (5.1)	1 (12.5)		1 (12.5)
Post Traumatic Stress	1 (2.6)	1 (5.6)		
STAI-Y				
Mean state percentile	65.0 (31.6)	55.0 (30.7)	79.7 (26.5)	66.0 (34.9)
Mean trait percentile	80.2 (22.2)	71.6 (27.6)	85.7 (14.2)	91.2 (7.8)

*Note clients can meet criteria for more than one diagnosis.

High levels of anxiety were evident in this sample at pre-treatment assessment. Clients who completed treatment scored within the highest 35.0% and 20.0% of adults on levels of state and trait anxiety, respectively. A multivariate analysis of

variance conducted on the data indicated a significant linear trend on trait scores ($F(2,39) = 3.6$, $p < .05$). Higher levels of improvement were associated with lower levels of pre-treatment trait anxiety. In other words, clients showing a poor response to treatment had higher levels of pre-treatment trait anxiety than clients who responded well to the treatment. The same trend was evident in state data, but this did not reach significance ($p < .09$).

8.7 Substance use and outcome

Within gambling sessions, alcohol is known to impair rational judgement and control and increase risk-taking among gamblers (Daghestani, Elenz & Crayton, 1996). Baron and Dickerson (1999) found that the ingestion of alcohol prior to gambling reduced resistance to begin and end a session of gambling while Kyngdon and Dickerson (1999) demonstrated that even in regular uses, a small amount of alcohol during a session prolonged the duration and intensity of gambling. These findings suggest that substance using pathological gamblers may be at greater risk for relapse.

In addition it is well established that depression is a correlate of pathological gambling (Blaszczynski & McConaghy, 1988; Linden, Pope & Jonas, 1986). Impaired control over a session of gambling may evoke a sense of despair and depression in the substance abuser suffering a co-morbid gambling disorder that in turn precipitates the resumption of substance use in an attempt to self-medicate against gambling-induced affective disturbances. Alternatively alcohol use may precipitate a gambling lapse in a pathological gambler by impairing judgement, increasing risk taking and self-confidence in their ability to control their gambling.

In the current study we assessed substance use during pre-treatment assessment using two standardised measures, the AUDIT and CIDI-auto (see chapter 1 for detailed description of these measures), and client self-report of substance use behaviour. Mean AUDIT scores, substance use CIDI diagnoses and self-report data are presented in Table 62. A one-way analysis of variance carried out on mean pre treatment AUDIT scored indicated significant difference across levels of improvement on this measure ($F(2,41) = 3.7$, $p < .04$). Post hoc contrasts indicated that the mean AUDIT score was higher in the moderate improvement than either the no change or greatly improved condition.

Approximately 15% of clients meet criteria on the CIDI for a diagnosis of alcohol abuse according to DSM-IV (APA) while 10.5 % of the sample (who were a subset of those who met criteria for alcohol abuse) also met criteria for alcohol dependence. The small number of clients meeting diagnosis precludes analysis of this data. However the results show a similar trend to that for the AUDIT.

Participants were also asked whether they drank alcohol immediately prior to or during a gambling session. The majority of clients who completed treatment reported that they did not drink alcohol at these times. Chi-square analysis indicated

a near significant trend such that clients who were categorised as showing a moderate improvement were more likely to admit to alcohol intake prior or during a gambling episode than clients rated as showing no change in gambling or a great improvement (X^2 (2) = 5.5 $p < .07$).

Together, these findings suggest that poor gambling prognosis is not necessarily associated with harmful levels of alcohol use, as evidenced by the relatively low levels of harmful use found amongst clients showing "no change". However, alcohol use may impact on the degree of improvement among clients who show some response to treatment (i.e., the moderate improvement group). It is recommended that assessment of alcohol use is included as a standard component of assessment of problem gamblers and where identified as relevant strategies to reduce harmful drinking should be included in treatment programs.

Seven clients admitted to illicit drug use (predominantly marijuana, also amphetamines and ecstasy). There was no consistent distribution of drug use across treatment outcome levels. The small number of clients admitting to use prevents the drawing of any firm conclusions.

Table 62: Substance use and treatment outcome

	Total	Great Improvement	Moderate improvement	No Change
Mean AUDIT score	5.3 (4.6)	4.3 (3.2)	8.0 (6.0)	3.6 (3.6)
CIDI diagnoses*				
Alcohol abuse	6 [15.4]	1 [5.6]	4 [30.8]	1[12.5]
Alcohol dependence	4 [10.5]	0 [0.0]	4 [30.8]	0 [0.0]
Alcohol prior to or during gambling	17 [39.5]	5 [25.0]	9 [64.3]	3 [33.3]
Self reported drug use	7 [16.3]	3 [15.0]	3 [21.4]	1 [11.1]

Note: Standard deviations appear in parentheses. Percentages appear in brackets.
* CIDI data was not available for four clients – three clients (two in the "no change" and one in the "great improvement" condition) scored two or less on the AUDIT suggesting they would not have met criteria for an alcohol disorder diagnosis. The remaining client who was categorised in the "great improvement" condition scored 12 on the AUDIT and may have reached criteria for an alcohol disorder diagnosis.

8.8 Impulsivity and outcome

A growing body of evidence has supported the hypothesis that pathological gambling is associated with high levels of trait impulsivity (Joukhador, Blaszczynski, Maccallum & Beattie, 1999; Steel & Blaszczynski, 1996; Blaszczynski, Steel & McConaghy, 1997). We assessed impulsivity using the Self-Description Inventory (Dickman, 1990) (see chapter 1 for a detailed description of this measure). Table 63 presents the means functional and dysfunctional impulsivity scores each outcome level. Analyses of variance conducted on this data found no differences between mean functional impulsivity scores across outcome levels. However, there was a significant difference on dysfunctional impulsivity ($F(2,41) = 4.1$, $p < .026$). Follow-up tests indicated that clients who showed a great improvement had a lower mean dysfunctional impulsivity score than clients in the no-change condition.

Table 63: Mean functional and dysfunctional impulsivity scores

	Total	Great Improvement	Moderate improvement	No Change
Functional	6.2 (3.0)	5.6 (2.9)	5.8 (3.0)	8.3 (2.9)
Dysfunctional	5.0 (2.9)	3.8 (2.9)	5.9 (2.5)	6.4 (2.9)

8.9 Multiple regression analysis

Significant differences were found between treatment outcome levels on a range of pre-treatment scores, including BDI, impulsivity, anxiety, and alcohol use. To examine the extent to which these variables were useful in predicting treatment outcome a multiple regression analysis was undertaken.

Pre-treatment measures of gambling severity (SOGS) depression (BDI), anxiety (STAI-Y), impulsivity functional and dysfunctional (SDI), alcohol intake (AUDIT) were entered into a multiple regression analysis. A forward method of variable entry was used. That is, the variable that best predicts outcome is entered in the first step, the next best variable in entered in the second step and so on. Only those variables that improve prediction are included in the analysis. Variables that did not account for independent variance are not included.

The regression analysis produced an equation that included dysfunctional impulsivity, functional impulsivity and pre BDI as significant predictors of clinical outcome ($(3,36) = 8.1$, $p < .001$: $R = .64$, $R^2 = .40$, (Adjusted $R^2 = .353$)). Regression

coefficients are presented in Table 64. These figures indicate that higher scores on these measures were associated with poorer clinical outcome. The equation predicts 40% of variance in sample.

Table 64: Regression coefficients for impulsivity and BDI scores

	Standardised Beta	R^2 Change	t	Significance
Constant			14.6	.000
Dysfunctional impulsivity	-.35	.174	-2.7	.011
Functional impulsivity	-.39	.134	-3.1	.004
Pre BDI	-0.34	.094	-2.6	.014

8.10 Summary

The relationship between pre-treatment variables and treatment outcome at one-month was explored in detail. Data collection for six and twelve month follow-up is continuing and the findings of this component of the study will provide more robust information regarding predictor variables that will ultimately permit better matching between treatment interventions and client characteristics.

Currently, the indications are that a number of variables do not appear to be predictive of treatment response, that is, whether or not a client will show compliance with instructions or a beneficial response to cognitive therapy or a behavioural intervention.

The variables that do not predict outcome are sex and indices reflecting gambling severity: SOGS scores, self-reported preoccupation, urge or perceived self-control over gambling, and years of problem gambling. Levels of debt, gambling expenditure or continued access to finances likewise do not appear to predict outcome.

While these variables do not predict outcome, certain psychological states reflecting level of distress and personality factors associated with impulsivity appear predictive. The relationship between depression and outcome is complex with suggestions that high scores on the Beck Depression Inventory indicating the presence of point-in-time symptoms, are associated with a poor response to

treatment. A past history of psychiatric episodes of depression is not related to outcome.

These findings argue for the need for counsellors to screen all clients for current depression and those exhibiting such symptoms should be offered additional interventions aimed at overcoming depression.

Treatment of depression with medication may not be the recommended strategy for treatment given that there was no evidence that clients treated with the anti-depressant class of selective serotonin re-uptake inhibitors improved more than depressed clients not receiving such medication. Given the small sample size, these findings are not conclusive and further research is required before a definitive statement can be offered.

As with depression, high levels of anxiety appeared to be associated with a poorer response to treatment.

Interestingly, there was no strong relationship between level of harmful alcohol use and outcome. This finding is contrary to expectations and claims that comorbid substance use acts as a barrier to treatment and a relapse factor for problem gambling. However, given the short follow-up timeframe, this finding can only be offered as a tentative conclusion until the long-term data is analysed and the study replicated.

As shown by Blaszczynski, Steel and McConaghy (1997) and Steel and Blaszczynski (1996), impulsivity is an important variable that is associated with severity of problem gambling and treatment outcome. Clients showing high levels of impulsivity do show a poorer response to treatment and other characteristics that conceptually argue for an underlying biological basis to their impaired control (Blaszczynski, 1999).

In conclusion, problem gambling is a treatable condition with cognitive therapy and imaginal desensitisation showing comparable successful outcome rates of around 70% of treated clients. Given the similarity of outcomes, imaginal desensitisation represents the best cost-effective approach to treatment. Further research is needed to investigate the mechanism of therapeutic change. Gamblers displaying high levels of anxiety, depression and impulsivity at pre-treatment tend to respond less to treatment suggesting that clients should be routinely screened for these factors and additional interventions targeting these symptoms offered.

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