2008

Strategic contingency management to enhance treatment outcomes for problem gamblers

West, Beverly L.

Lethbridge, Alta. : University of Lethbridge, School of Health Sciences, 2008

STRATEGIC CONTINGENCY MANAGEMENT

TO ENHANCE TREATMENT OUTCOMES

FOR PROBLEM GAMBLERS

BEVERLY WEST
B.H.Sc., University of Lethbridge, 2004

A Thesis
Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfillment of the
Requirements for the Degree

MASTER OF SCIENCE

School of Health Sciences
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

DEDICATION

With love and respect, I dedicate this work to my heroes:

my daughter Heather, my sons Jonathan and Michael, and my son-in-law John.

ABSTRACT

Problem gambling is best understood from a biopsychosocial perspective, whereby multifaceted biological, psychological, and socio-environmental factors interact in ways that may lead to individual risk. Reinforcement contingencies and operant conditioning appear to play particularly important etiological roles. Theoretically, operant conditioning approaches should therefore comprise particularly effective treatment strategies. While operant conditioning in the form of contingency management is known to be an effective treatment for alcohol and substance abuse, it has never been applied by clinical practitioners in community-based treatment for problem gambling.

The present pilot study explored the utility of adding concrete reward contingencies to community outpatient treatment, from the perspectives of clinical effectiveness and client/counsellor experiences. At 3-month follow-up, clinical outcomes compared well to typical treatment outcomes, and treatment retention appeared to be superior. Participating clients perceived concrete rewards to be moderately effective in the change process, while active therapist acceptance of this technique appeared to be limited.

ACKNOWLEDGEMENTS

It is my privilege to acknowledge the unending support and invaluable guidance given to me by family, friends, fellow students, advisors, and teachers during my time in graduate school. Their collective gift was to listen, encourage, counsel, reflect, and encourage again, a gift for which I am extremely grateful.

Sincere thanks go to thesis supervisor Dr. Robert Williams. He provided a compass for the journey, ensuring that the destination remained visible and reachable, and sharing valuable time and expert knowledge. Committee members Dr. Gary Nixon and Dr. Robert Wood were equally supportive. Challenges became steps rather than hurdles, thanks to their guidance. I also wish to recognize the support and influence of other colleagues in the School of Health Sciences and in the Office of Graduate Studies at the University of Lethbridge. Their enthusiasm for scholarly inquiry embodies a research culture that is admirable.

Financial support for the project was gratefully received from the government-funded Alberta Gaming Research Institute. The Institute is to be commended for its strong support of graduate research funded through the Small Research Grant program. My sincere thanks go to the Board of Directors, and to Executive Director Vickii Williams and staff for their dedicated assistance throughout.

Additional funding was received from the Health Quality Council of Alberta, the Government of Alberta, and the University of Lethbridge. The studentship, scholarship, teaching assistantship, and research assistantship awards were truly appreciated, and contributed greatly to achievement of academic and personal goals.

A heartfelt thank you goes to the people who participated in this research. Their sharing of treatment experiences in hopes of advancing knowledge and helping others was both courageous and selfless. To AADAC supervisors, counsellors and staff: you simply were the life of the project, every step of the way. Thank you. Ongoing support provided by AADAC Research Services staff was greatly appreciated, and their prompt assistance and cooperation throughout facilitated a smooth collaboration.

My family and friends may not realize the crucial roles they played during the past years. They were there without fail to offer love, encouragement, and support. I will be ever grateful. Special thanks go to my children who are my blessings and my inspiration, and to my parents who have stood by me always.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AADAC	Alberta Alcohol and Drug Abuse Commission
CBT	Cognitive Behavioural Therapy
CM	Contingency Management
CRA	Community Reinforcement Approach
DSM	Diagnostic and Statistical Manual of Mental Disorders
EGM	Electronic Gambling Machine
GA	Gamblers Anonymous
MI	Motivational Interviewing
SOGS	South Oaks Gambling Screen
VLT	Video Lottery Terminal

CHAPTER 1: INTRODUCTION

Legal gambling has been an important and growing industry in Canada for almost forty years, driven by the legalization of lotteries in 1969, and by the 1985 amendment to the *Criminal Code of Canada* that legalized electronic gambling machines (EGMs) and transferred primary control of gambling to provincial governments (Campbell & Smith, 2003). Most forms of gambling are now widely available throughout the country. In Alberta as of April 2008, adults could gamble at almost 3,461 venues: on table games in 23 casinos; on 11,853 slot machines located in casinos and at three 'racing entertainment centres' located at horserace tracks; on almost 6,000 video lottery terminals (VLTs) located primarily in 1,049 bars and lounges; on lotteries, instant win tickets, and sports lottery tickets purchased from 2,345 ticket lottery centres; on horse racing at five tracks; on commercial or charitable bingo at 41 licensed halls; and on other forms of charitable gambling such as hospital lotteries, raffles, and pull-tab tickets (Alberta Gaming and Liquor Commission, 2008).

Government involvement in gambling is more extensive in Canada than in most other countries. Here, provincial governments not only serve as regulators; they are also directly or indirectly involved in the actual ownership and operation of most forms of gambling and are the main recipients of gambling revenue (Azmier, 2005). In 2006, revenues (wagers minus prizes and winnings) from legalized gambling conducted and managed by governments totaled $13.3 billion, an increase of $10.6 billion over 1992 revenues (Statistics Canada, 2007). In 2006, adult Albertans contributed a per capita average of $750 to the province's government-run gambling revenues (lotteries, casino slot machine gambling, and VLTs), the highest of any Canadian province (Statistics Canada, 2007). Government gambling revenue is spent on a wide range of public programs and services, and governments vary according to the transparency and detail with which spending allocations are disclosed (Azmier, 2005). For example, a large portion of net gambling revenue in Manitoba and Quebec is allocated to general revenue funds where specific spending destinations are largely unknown. In Alberta, the spending destination of every gambling profit dollar is publicly identified (Ministry of Gaming, 2006).

About 76% to 82% of the Canadian adult population has participated in some form of gambling activity within the past year (Canadian Partnership for Responsible Gambling, 2008). Of that percentage, approximately 75% gamble recreationally and non-problematically (Statistics Canada, 2004). This situation

is not true for approximately 3.5% of the Canadian adult population who are problem gamblers (Canadian Partnership for Responsible Gambling, 2008). A 2001 study of North American adults estimated the past year prevalence rate for problem or pathological gambling at 4.0% (Shaffer & Hall, 2001). Worldwide prevalence studies conducted since 2005 have found past year adult problem gambling rates of 0.6% to 5.4%, depending on the country (Alberta Gaming Research Institute, 2008). In Alberta, the most recent prevalence data indicates that 5.2% of the adult populace gambles problematically: 1.3% at severe problem levels, and 3.9% at moderate problem levels (Smith & Wynne, 2002). The Alberta rate appears to be higher than in other regions of Canada (Azmier, 2005). Observed differences among jurisdictional prevalence rates may be a function of differences in societal values and cultural norms, psychological characteristics, the availability of gambling, or measurement-related differences.

Various terms have been used over the years to describe disordered gambling. 'Compulsive gambling' is a phrase utilized most commonly by Gamblers Anonymous (GA), and is intended to denote the uncontrollable nature of the phenomenon. 'Pathological gambling' is the term most commonly used by the medical community and is the formal clinical term used in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision,* or DSM (American Psychiatric Association, 2000). Most recently, the term 'problem gambling' has gained considerable support because of its more etiologically neutral implications. Although various definitions of 'problem gambling' have been proposed, the definition of problem gambling put forward by Neal, Delfabbro, and O'Neil (2005) captures the essential elements of this phenomenon that are common to almost all definitions: "problem gambling is characterized by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community" (p. i). For present purposes, a similar definition will be utilized. This definition recognizes two important dimensions to problem gambling: impaired control and resultant negative consequences. The measurement instruments most commonly used to assess problem gambling are the Canadian Problem Gambling Index or CPGI (Ferris & Wynne, 2001), the South Oaks Gambling Screen or SOGS (Lesieur & Blume, 1987), and the DSM criteria.

The negative consequences associated with problem gambling are wide ranging. Individuals often experience severe psychological and emotional distress (including suicidal ideation), relationship/family problems such as divorce, financial impacts from unemployment, debt and bankruptcy, and legal problems

from commission of crimes such as theft and fraud (National Council of Welfare, 1996; National Gambling Impact Study Commission, 1999). Concurrent and ongoing harm to families, communities, and society in general is also significant (Korn, 2000). Such consequences are not only damaging in terms of human suffering; they are also costly. Societal costs in Canada have been estimated at $20,000 for every affected individual (Korn & Shaffer, 1999). This amount may be conservative, given other estimates ranging up to $US 52,000 (Productivity Commission, 1999). It is important to remember that while financial costs associated with problem gambling are significant, many of the negative impacts are mainly non-monetary in nature (Stevens & Williams, 2004; Williams & Stevens, 2006).

Specialized treatment for problem gambling is a relatively recent phenomenon in Canada, coincident with the expansion of legal gambling. The first programs were developed in New Brunswick and Alberta in 1993, following completion of government-commissioned reports on gambling behaviours and problem gambling (Korn, 2000). The Alberta Alcohol and Drug Abuse Commission (AADAC) and addictions-related AADAC-funded community agencies are responsible to formulate and deliver government-funded problem gambling treatment in Alberta. Services include outpatient counselling for individuals and groups, day program therapy, short-term inpatient/residential treatment, access to transition home/halfway house residency, and aftercare where available. Service delivery began in 1994, when AADAC's existing addiction treatment mandate was expanded to include problem gambling treatment, research and education (AADAC, 2006a). Current AADAC gambling policy is attached as Appendix A (AADAC, 2006b). Funding for AADAC services is provided by Alberta Health and Wellness via the Alberta Lottery Fund (the primary depository for net gambling revenues). Lottery Fund allotments for 2005/2006 included a direct distribution of $62.9 million to AADAC, one of several transfers to Health and Wellness (Ministry of Gaming, 2006). While all provinces fund problem gambling programs, average spending is less than 1% of net gambling revenues (Azmier, 2005). The Government of Alberta spent 0.79% of provincial gambling revenue on problem gambling prevention, treatment, and research in 2005 (AADAC & Alberta Gaming and Liquor Commission, 2005).

Problem gambling treatment is known to be effective. Findings of outcome studies conducted in program-based clinical settings (e.g., O'Connor, Ashenden, Raven, & Allsop, n.d.; Shaffer, LaBrie, LaPlante, Kidman, & Donato, 2005; Stinchfield & Winters, 2001) and under experimental conditions

(Pallesen, Mitsem, Kvale, Johnsen, & Molde, 2005; Toneatto & Ladouceur, 2003) indicate substantial improvement in gambling-related outcomes in both short and longer terms. Treatment has also been shown to concurrently improve psycho-social functioning (McCown & Howatt, 2007). However, while problem gambling treatment is effective, there is definitely room for improvement.

First, the rate of treatment-seeking is too low. It is estimated that only 3% to 12% of all problem gamblers access formal treatment services (Cunningham, 2005; National Gambling Impact Study Commission, 1999; Slutske, 2006). In Alberta, Smith and Wynne (2002) estimate that there are 120,000 adult problem gamblers, yet only 9.1% of AADAC's 24,796 adult clients sought treatment for gambling-related problems in 2005-2006 (or 1.9% of the total estimated adult problem gambling population) (AADAC, 2007a). It must be recognized that formal treatment is not a prerequisite for change. Many people with gambling problems appear to successfully recover, never having accessed formal services (Hodgins & el-Guebaly, 2000). That being said, there could only be benefits to larger numbers of problem gamblers availing themselves of clinically effective information and services.

Second, treatment drop-out rates are too high. Research has shown that outcomes are significantly better for people who stay in addictions treatment longer (McCusker, Stoddard, Frost, & Zorn, 1996; Simpson, Joe, Rowan-Szal, & Greener, 1997). Unfortunately, it is estimated that 40% to 80% of problem gamblers who access treatment drop-out prior to treatment completion (Grant, Kim, & Kuskowski, 2004)). Low retention rates are a problem found in addiction treatment as well as treatment for mental health problems, with most drop-outs occurring very early on in treatment (Baekeland & Lundwall, 1975; King & Canada, 2004; McCown & Howatt, 2007; Phillips, 1985; Stark, 1992).

Third, although treatment is effective for most people, a significant percentage of people fail to benefit. Program outcome evidence indicates that only 51% of treated individuals abstain from gambling during treatment (Stinchfield & Winters, 2001), while abstinence rates after treatment range from 42% to 66% (O'Connor et al., n.d.). Research-based findings indicate treatment effect sizes ranging from 0.01 to 3.94, where an effect size of 0.2 is considered small and 0.8 is considered large (Pallesen et al., 2005). Other research shows that treatment gains are not seen in 14% (Sylvain, Ladouceur, & Boisvert, 1997) to 59.4% (Hollander et al., 2000) of help-seeking individuals. A better understanding of what causes treatment failure is needed, with a goal of improving overall treatment effectiveness.

The primary focus of the present thesis is examination of a new treatment approach with a potential to improve treatment retention and overall effectiveness. 'Contingency management' (CM) is a form of behavioural therapy known to be robustly successful in the treatment of alcohol and drug abuse (Griffith, Rowan-Szal, Roark, & Simpson, 2000; Lussier, Heil, Mongeon, Badger, & Higgins, 2006; Prendergast, Podus, Finney, Greenwell, & Roll, 2006), but CM has rarely been applied to problem gambling. Essentially, the technique involves providing concrete reinforcement to the client (e.g., vouchers; prizes; access to methadone), contingent on him/her achieving positive behavioural change (Petry, 2000a).

In many ways, behavioural principles provide a compelling explanation of why people gamble in the first place. Most forms of gambling embody classic principles of operant and classical conditioning, as evidenced by the presence of clear rewards, variable reinforcement schedules, and salient conditionable stimuli (Blaszczynski & Nower, 2007; Petry, 2005b). Given that contingency management treatment techniques are known to be clinically effective in the treatment of addictions, and given the potential central role of reinforcement processes in gambling behaviour, it is logical to examine the effectiveness of CM in the treatment of problem gambling.

In collaboration with AADAC, the purpose of this pilot study was two-fold: to investigate the clinical effectiveness and utility of adding a contingency management treatment component to regular outpatient treatment for adult problem gamblers, and to explore the experiences of those who received and administered contingency management treatment. On the broadest level, the investigation was intended to add to the body of research on optimal treatment practices for problem gambling. The study stands as an approved AADAC Third Party Research Project, funded by the Alberta Gaming Research Institute and supported by the Health Quality Council of Alberta.

The foregoing introduction provides an overview of the context and rationale for this research. Subsequent chapters provide a more in-depth examination of the issues. Chapter 2 is a comprehensive review of the etiology of problem gambling. Chapter 3 examines treatment for problem gambling. Chapter 4 documents the utility of contingency management as an effective treatment strategy for alcohol and substance abuse, and provides a rationale for the strategy's theoretical and practical applicability to problem gambling treatment. A detailed overview of the contingency management pilot study research

method comprises Chapter 5. Results and discussion are presented in Chapters 6 and 7 respectively. Conclusions deriving from this theoretical, empirical, and explorative analysis are made in Chapter 8.

CHAPTER 2: PROBLEM GAMBLING ETIOLOGY

Factors associated with the development of problem gambling appear to be many and varied, and are influenced by biological, environmental, and socio-cultural determinants. Theories to explain the development of problem gambling are also many and varied, and support for each has seemed to ebb and flow. Ideologically, some theories stand alone. The medical model proposes that problem gambling results from biological/psychological predispositions and genetic determinants, and should be diagnosed and treated as would any other disease (Aasved, 2002). The term 'pathological gambling', as used by the American Psychiatric Association (2000), means 'disease-like'. Cognitive-based psychological theories implicate errors in thinking and faulty beliefs as primary causal and working agents (Ladouceur & Walker, 1996). Behavioural psychology emphasizes the roles played by social learning, reward reinforcement, conditioned response, and drive-reduction in the creation and perpetuation of gambling problems (Petry, 2005b). Other theories are categorized according to socio-cultural or economic perspectives, with problem gambling viewed primarily as a construct of the environment (Aasved, 2003). The following discussion summarizes what is known about the biological, psychological, social, and operant learning contributions to the development of problem gambling.

Biological Determinants

Predisposing biological determinants are conceptualized as fundamental differences in brain and central nervous system function between problem and non-problem gamblers. Contributing factors consist of genetic inheritance and neurophysiological function.

Genetics

Problem gambling runs in families. Pathological gamblers in treatment are up to 3 times more likely to report that immediate family members also have gambling problems (Gambino, Fitzgerald, Shaffer, Renner, & Courtnage, 1993). A study of male pathological gamblers undergoing treatment in a substance abuse hospital for veterans found that 49% reported having family members with gambling problems (Daghestani, Elenz, & Crayton, 1996). Winters, Bengsten, Dorr, and Stinchfield (1998) examined problem gambling among college students, finding that family history was a principal risk factor. A study of 458 substance abusers found that 39% of those meeting DSM-III criteria for pathological gambling (n = 41) reported that their fathers were compulsive gamblers (Lesieur, Blume, & Zoppa, 1986). Parental

problem gambling was reported by 52.4% of severe problem gamblers (n = 21) in another study (Ohtsuka, Burton, DeLuca, & Borg, 1997). However, one study showed very little familial association, at least for immediate family members of problem gamblers who attend GA meetings (Linden, Pope, & Jonas, 1986). These authors neither studied nor speculated upon potentially mediating psycho-social influences of self-help group membership.

Of course, familial association does not distinguish between a genetic or environmental contribution. Twin studies comparing the concordance rate between identical monozygotic twins (sharing 100% of the same genes) and non-identical dizygotic twins (sharing only 50% of the same genes) is a better method for disentangling these factors, as the environmental experiences are fairly similar with both types of twins. A small twin study examined genetic factors in gambling patterns for 155 pairs of adult twins (male and female), both monozygotic (MZ) (n = 75) and dizygotic (DZ) (n = 80) (Winters & Rich, 1998). For any type of gambling, a higher degree of concordance was found for MZ twins (86%) than for DZ twins (81%). For the trait of gambling prior to age 18, concordance rates were 35% for MZ twins and 31% for DZ twins. The effect of zygosity was more pronounced relative to 'high action gambling' (defined as lottery, scratch tickets, EGMs, and casino card games), where correlations were .56 for MZ and .25 for DZ, $p < .01$, with significantly larger zygosity effects in male versus female high action gamblers (.58 MZ and .18 DZ, $p < .01$ for males; .50 MZ and .43 DZ for females). Because of the small sample size, problem gambling rates were too low to allow for examination. A much larger investigation of 3,359 male twin pairs from the U. S. Vietnam Era Twin Registry (a data set of MZ and DZ twins who served in Vietnam) found that 62% of the variance in the diagnosis of pathological gambling was explained by factors derived from a "complex genetic modeling" (Eisen et al., 1998, p. 1377). Thirty-five percent of the variance was explained by familial factors when no diagnostic symptoms were present. Concordance rates by number of diagnostic symptoms (e.g., gambling more than intended/loss of control; preoccupation; chasing losses) were found to be 26.3% MZ and 22.8% DZ for no symptoms, and 14.3% MZ and 8.7% DZ for 4+ symptoms (pathological gambling). Collectively, inherited and shared environmental factors were seen to explain from 46% to 55% of the variance in diagnostic symptoms. However, one important limitation of this study is that problem gamblers made up a very small proportion of the sample (1.4%). Evidence for cross-over genetic effects among problem gambling and alcohol addiction was established by Slutske et al. (2000)

using the same data from the Vietnam Era Twin Registry. Findings revealed that vulnerability to alcohol abuse in men accounts for up to 20% of the genetic risk for pathological gambling. This evidence argues for a pattern of heritable susceptibility to addictive behaviours in general.

While twin studies point to an unambiguous genetic contribution to gambling and problem gambling, the magnitude of the contribution is the subject of some discussion. A meta-analytical review of 19 studies published between 1970 and 2000 included the 2 twin studies described above, and 17 comparison-group studies investigating familial gambling patterns (Walters, 2001). The overall influence of genetic factors was estimated at an unweighted effect size (expressed as a phi correlation coefficient) of .13, indicating a small effect. Particular analysis was conducted on the Eisen et al. (1998) twin study. By manipulating a reported statistic from that report (doubling the phi coefficient), Walters estimated that heritable factors account for about 16% of the variance in problem gambling development, leaving about 84% accounted for by non-genetic factors. He recognized the difficulty of establishing hard estimates that are neither over-inflated nor under-inflated (e.g., it is impossible to isolate the relative effects of environmental influences, or to assume equal environmental experiences for twins), and then ultimately stated that "the heritability of pathological gambling – calculated using results from the Eisen et al. (1998) study – is probably higher than 16% but lower than 46%" (Walters, 2001, p. 269).

Specific genes involved in problem gambling have not been conclusively identified. However, research has shown that the A1 allele for the dopamine D2 receptor gene is present in 50.9% of Caucasian pathological gamblers (n = 171) compared to 25.9% of Caucasian controls (n = 714) (Comings et al., 1996), and the 4-repeat allele of the monoamine oxidase gene (implicated in both dopamine and serotonin systems), appears to be present significantly more often in male problem gamblers (Ibanez, Perez de Castro, Fernandez-Piqueras, Blanco, & Saiz-Ruiz, 2000). More recently, genotyping of selected polymorphisms was carried out on 70 male pathological gamblers and full male and/or female siblings (Sabbatini da Silva Lobo et al., 2007). Findings indicated a significant association (p <. 05) between pathological gambling and the dopamine receptor gene DRD1, thought to be associated with Attention Deficit Hyperactivity Disorder. Limited research findings appear to imply a functional genetic link, but evidence is not conclusive. Ibanez, Blanco, Perez de Castro, Fernandez-Piqueras, and Saiz-Ruis (2003)

suggest that mediators of gene expression and allele variants rather than structural genetic makeup may be the 'modus operandi' of observed associations. Clearly, further research is needed.

Neurophysiology

Inherited genes for problem gambling manifest their effects through the creation of neural pathways and/or neurotransmitters that are in some way abnormal, poorly regulated, or insufficient, leading to behavioural patterns of impulsivity, increased sensitivity to the reinforcing effect of gambling, altered levels of arousal, and/or mood disorders (e.g., Griffiths & Delfabbro, 2002; Ibanez, Blanco, & Saiz-Ruiz, 2002; Potenza, 2001; Sharpe, 2002).

Dopamine, a chemical closely involved in the reward systems of the brain, has been a main neurotransmitter of interest. Evidence shows that decreased dopamine activity in the activation of reward pathways is associated with problem gambling and other addictive behaviours (Grant, 2005; Ibanez et al., 2002; Kolb & Wishaw, 2001). Reuter et al. (2005) utilized magnetic resonance imaging to examine the ventral striatum area of the brain during gambling, an area related to reward responses. Reduced ventral striatum activation was seen in severe problem gamblers compared to control group participants. The study was limited by its laboratory setting and one-time gambling task (guessing card color before turning over one card), but such functional evidence is nonetheless intriguing and may warrant further investigation. There is some thought that problem gamblers engage in gambling so as to unconsciously increase endogenous levels of dopamine (Ladouceur, Sylvain, Boutin, & Doucet, 2002). Indeed, research has shown that overall dopamine levels are higher in problem gamblers during gambling compared to non-problem gamblers (Bergh, Eklund, Sodersten, & Nordin, 1997). Further support for the role of dopamine comes from clinical evidence indicating that administration of dopamine agonists such as those used to treat Parkinson's disease may directly lead to excessive and/or problem gambling (Dodd et al., 2005; Driver-Dunckley, Samanta, & Stacy, 2003). Problem and pathological gambling prevalence rates appear to be higher in Parkinson's disease sufferers who take dopamine agonists, compared to general population prevalence rates (Crockford et al., 2008, pre-print; Voon et al., 2006).

Serotonin levels may also be lower in the brains of problem gamblers. Evidence shows decreased activity in monoamine oxidase B platelets that are linked to serotonin function (Blanco, Oresanz-Munez, Blanco-Jerez, & Saiz-Ruiz, 1996), and lower levels of serotonin metabolites compared to non-problem

gamblers (Nordin & Eklundh, 1999). The serotonin theory is also supported by study findings that fluvoxamine (a selective serotonin reuptake inhibitor or SSRI) is superior to placebo in the treatment of problem gambling (Hollander et al., 2000).

Noradrenalin and endorphins may also play a role. Noradrenergic neurotransmitter pathways appear to activate at higher levels in active problem gamblers (Roy et al., 1988), resulting in greater evidence of arousal as evidenced by increased heart rate (Leary & Dickerson, 1985). It has been suggested that chronic emotional conditions of hyper-arousal or hypo-arousal may contribute to gambling dependence as a means of bringing arousal into a tolerable or comfortable range (Rugle, 1993). Pleasure-inducing beta-endorphins also appear to be implicated in the development of problem gambling. The association between elevated levels of endorphins and problem gambling was inferred from evidence that naltrexone, a drug used to control drinking urges in treatment for alcohol abuse, demonstrates a pleasure-reducing effect in active problem gamblers, with endorphins the supposed affective agent (Grant, 2005).

Neurobiological research on problem gambling is in early stages: "what we now know from brain scans and from studies of the neurotransmitters is that something is different, and while that may be obvious we have some clues about *what* may be different" (Grant, 2005, p. 5). Goudriaan, Oosterlaan, de Beurs, and Van den Brink (2004) note that while research is limited, study findings appear to support an etiological connection rooted in biological brain dysregulation. Broader neurological processes common to all addictive behaviours also seem plausible. Nestler (2005) explores the idea of addiction as behaviour determined by 'common molecular pathways' and mechanisms of reward discernible as distinct neurological patterns centred in dopamine pathways of the brain. Shaffer, LaPlante, LaBrie, Kidman, Donato and Stanton (2004) also view addiction as one developmental syndrome caused by similar neurological processes, regardless of manifestation.

Behavioural and Psychological Determinants

This etiological area investigates whether certain personality traits, cognitive processes, and co-morbid psychiatric disorders are present more often in individuals with gambling problems compared to others, whether they are common to problem gamblers generally, and whether they can be identified as causes rather than effects of problem gambling. It should be noted that all psychological and behavioural traits necessarily have neurological concomitants, thus the distinction between biological and

behavioural/psychological factors is somewhat artificial. Nonetheless, identification of behavioural and psychological traits may be more meaningful and explanatory relative to their neurological substrate.

Impulsivity

Substantial evidence exists indicating that problem gamblers tend to show elevated scores on measures of impulsivity (e.g., Alessi & Petry, 2003; Blaszczynski, Steel, & McConaghy, 1997; Langhinrichsen-Rohling, Rohde, Seeley, & Rohling, 2004; Skitch & Hodgins, 2004; Steel & Blaszczynski, 1998). In a longitudinal study of gambling, Vitaro, Arsenault, and Tremblay (1997; 1999) and Vitaro, Brendegan, Ladouceur and Tremblay (2001) found that impulsivity in early adolescent males (ages 13-14) predicted both delinquency and problem gambling among late adolescent males (ages 16-17).

A relationship between problem gambling and impulsivity has not always been found, however (Allcock & Grace, 1988; Langewisch & Frisch, 1998). One study found this relationship for men, but not for women (Lightsey & Hulsey, 2002). A study comparing problem gamblers to substance abusers found no differences in impulsivity, leading to speculation that higher levels of impulsivity may exist in both populations (Petry, 2000b). Stoltenbert, Batien and Birgenheir (2008) investigated 197 college-aged men and women, finding no significantly higher risk for gambling problems based on impulsivity, although men were found to be generally more at risk for gambling than women. Fewer studies have investigated the relationship between impulsivity and gambling in *nonproblem* gamblers, but obtained findings tend toward a significant relationship between gambling involvement and impulsivity (Barnes, Welte, Hoffman, & Dintcheff, 1999; McDaniel & Zuckerman, 2003; Williams, 2002). This was also the case in the Vitaro et al. (1999) longitudinal study, where degree of impulsivity was found to be related to the subsequent degree of gambling involvement.

In general, impulsivity appears to be the characteristic demonstrating the strongest evidence-based link to problematic gambling (el-Guebaly & Hodgins, 2000). Indeed, the *DSM-IV-TR* (American Psychiatric Association, 2000) classifies pathological gambling as an Impulse Control Disorder, where impulsivity is defined as “the failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or to others” (p. 663). Nower and Blaszczynski (2006) note that the phrase ‘failure to resist’ is too broad to convey full conceptual meaning (i.e., whether failure to resist might result from lack

of personal capacity, or from unwillingness or lack of forethought; whether impulsivity has one or many measurable components; whether there are different types of impulsivity).

Sensation Seeking

There is some evidence that problem gamblers have elevated scores on measures of sensation-seeking (e.g., Breen & Zuckerman, 1999; Castellani & Rugle, 1995; Coventry & Norman, 1997; Powell, Hardoon, Derevensky, & Gupta, 1999). Results of a study comparing 42 pathological gamblers and 72 non-pathological gamblers utilizing the Zuckerman's Sensation Seeking Scale indicated significantly higher scores in the former group (Parke, Griffiths, & Irwing, 2004).

Here again, some research findings indicate no significant association (e.g., Allcock & Grace, 1988; Blaszczynski, Wilson, & McConaghy, 1986; Langewisch & Frisch, 1998). It is possible that sensation seeking is associated with recreational gambling and the onset of problem gambling, but not to persistent gambling, which may not be a varied and novel activity.

Risk-taking

Few studies have examined risk-taking behaviour, but there is evidence that problem gamblers tend to have elevated scores on risk-taking measures (e.g., Powell et al., 1999). Martins, Tavares, da Silva Lobo, Galetti, and Gentil (2004) found elevated scores for males, but not for females. This relationship has also been observed in nonproblem gamblers (Kassinove, 1999; Williams, 2002). The significantly higher rates of gambling and problem gambling in males and younger adults (Cunningham-Williams et al., 2005; Petry, 2005b; Raylu & Oei, 2002) may be attributable to the risk-taking propensities of both groups.

Dissociation

Feelings of being a different person while gambling, or being in a trance-like state, or being outside the self, or not remembering an episode of gambling have been defined by Jacobs (1988) as dissociation, a trait that is seen in problem gamblers more frequently than in recreational gamblers. In describing his 'General Theory of Addiction', Jacobs (1993) ascribes particular importance to evidence of dissociative states experienced by problem gamblers while gambling. Under this theory, dissociation is utilized to disengage from reality, to reduce self-criticism, and to enhance self-image. Indeed, research has shown that ego-strength, particularly related to self-esteem, appears to be low in active problem gamblers (Taber, Russo, Adkins, & McCormick, 1986).

In research utilizing his four-component model, Jacobs (1988) found significant differences in the number of dissociative experiences reported by pathological gamblers compared to non-problem gamblers; for example, 81% of 27 GA members said they had experienced trance-like states while gambling, compared to 17% of 31 social gamblers. More recent research tends to confirm these findings. A small sample of 12 pathological gamblers playing a demonstration video lottery terminal in a short laboratory session displayed narrowed attention (responded more slowly to external light stimulation), and reported more dissociative experiences (based on Jacob's four questions plus a fifth question about losing track of time) than 11 occasional gamblers (Diskin & Hodgins, 1999). Of the five questions, only feelings of taking on a different identity and losing track of time while gambling reached levels of significance. An additional measure of dissociation was administered, the 28-item 'Dissociative Experiences Scale' (DES), with results indicating higher scores among the pathological gambling group. In another study utilizing the DES, scores of 30 adult pathological gamblers seeking treatment with medication were not found to differ significantly from scores of normal controls (Grant & Kim, 2003). A recent review of the evidence concludes that dissociative states are experienced by some problem gamblers (Allcock et al., 2006).

Antisocial Personality

Problem gamblers are consistently found to have higher scores on measures of antisocial traits and behaviours such as those measured by Eysenck's Psychoticism, an assessment of psychopathy (e.g., Blaszczynski & McConaghy, 1994; Blaszczynski & Silove, 1996; Meyer & Fabian, 1992). In a factor analysis of delinquent behaviour among Scottish adolescents, gambling was seen to load on a factor labeled 'antisocial', a factor comprised mostly of physically violent behaviour (Charles & Egan, 2005). A significant genetic association was found in a study of problem gambling and antisocial behavior in male twins, utilizing data from the Vietnam Era Twin Registry (Slutske et al., 2001), indicating pre-morbid presence of antisocial traits. In a review of psychiatric comorbidities for problem gambling, Crockford and el-Guebaly (1998) confirmed that antisocial personality is a common comorbidity for a subset of pathological gamblers.

Psychiatric Disorders and Addictions

Certain psychological/psychiatric disorders have consistently high rates of co-occurrence with problem gambling (Westphal & Johnson, 2007). Petry, Stinson and Grant (2005) analyzed data from

43,093 adult Americans surveyed in the *National Epidemiologic Survey on Alcohol and Related Conditions* in 2001-2002, finding high rates of DSM-diagnosed co-occurring disorders in lifetime pathological gamblers (n = 195), where "associations between pathological gambling and substance use, mood, anxiety and personality disorders were overwhelmingly positive and significant ($p < .05$), even after controlling for sociodemographic and socioeconomic characteristics" (p. 564). Rates of lifetime disorders seen in the pathological gambling sub-sample were: alcohol use disorder, 73.2%; nicotine dependence, 60.4%; personality disorder (avoidant; dependent; obsessive-compulsive; paranoid; schizoid; histrionic; antisocial), 60.8%; mood disorder (major depressive episode; dysthymic episode; manic episode), 49.6%; anxiety disorder (panic disorder with/without agoraphobia; social phobia; specific phobia; generalized anxiety), 41.3%; and other drug use disorder, 38.1%. Similarly, data gathered in the *Canadian Community Health Survey* conducted by Statistics Canada in 2001, revealed that the presence of substance dependence or harmful alcohol use (n = 14,934) increased the risk of past-year moderate-to-high severity problem gambling by 2.9 times, and the presence of a mood or anxiety disorder increased the risk by 1.7 times (el-Guebaly et al., 2006). A study examining the prevalence of lifetime pathological gambling (2.3%) in a sample of psychiatric outpatients (n = 1,709) found that rates of bipolar disorder, social phobia, panic disorder with agoraphobia, alcohol use disorder, and other impulse control disorders were significantly higher in pathological gamblers (Zimmerman, Chelminski, & Young, 2006).

Many smaller studies have found similar results. An investigation of 74 individuals receiving alcohol or substance abuse treatment found that 29.7% met SOGS criteria for problem/probable pathological gambling or pathological gambling; 10.8% for the former, and 18.9% for the latter (Boas de Carvalho, Collakis, Tavares de Oliveira, & da Silveira, 2005). A positive and significant correlation between the number of personality disorders suffered by 82 pathological gamblers and scores on the SOGS has been found (Blaszczynski & Steel, 1998). An additional finding was that pathological gamblers also diagnosed with antisocial personality disorder or narcissistic personality disorder had greater problem severity. Further evidence indicates that individuals diagnosed with mood or anxiety disorders *and* substance dependence or harmful alcohol use are 5 times more at risk for past-year moderate-to-high severity problem gambling (el-Guebaly et al., 2006). Zimmerman et al. (2006) found that psychiatric

outpatients who met criteria for pathological gambling had a significantly greater number of diagnosed psychiatric disorders over their lifetime than other psychiatric outpatients.

The causal connection between problem gambling and psychiatric disorders is unclear. For many problem gamblers, it appears that mood disorders occur prior to the onset of problem gambling and may play an etiological role as relief from dysphoric moods is sought (Mood Disorders Society of Canada, 2004). The relationship is a complex one, however. Evidence also clearly indicates that depression is a reliable consequence of problem gambling (McCormick, Russo, Ramirez, & Taber, 1984). It is quite likely that people have a common vulnerability to addictive behaviour in general, including problem gambling.

Co-occurring mental health and gambling problems may present particular challenges for people in treatment, given that each disorder may potentiate the other, bringing a multiplied level of negative effects on quality of life and psycho-social functioning. Westphal and Johnson (2007) posit that dually-diagnosed individuals in treatment are likely to experience higher rates of treatment failure, cycle in and out of treatment, make more frequent attempts at treatment, or require more time in treatment. Comorbid substance use/abuse (licit or illicit) has not been found it to impede treatment outcome. A study of 169 people receiving outpatient treatment for problem gambling found higher rates of drug and/or medication usage compared to general populations, but no evidence that a history of substance use negatively impacted treatment outcome, which was operationalized as gambling abstinence/non-abstinence, days abstinent, client satisfaction with treatment, and treatment adherence (Toneatto, Skinner, & Dragonetti, 2002).

Gambling Fallacies

Considering the negative mathematical expectations of most forms of gambling, persistent or heavy gambling can be construed by some as inherently irrational behaviour (Walker, 1992). In support of this construct, there is considerable literature attesting to the fact that erroneous beliefs about gambling are held by many gamblers (Gaboury & Ladouceur, 1989; Ladouceur & Walker, 1996). Faulty cognitions include illusion of control over gambling, misunderstanding of the concept of event randomness, belief that personal skill can influence outcome, superstitious beliefs, belief in personal luckiness, and over-estimation of the likelihood of winning (Ladouceur & Walker, 1996; Walker, 1992; Wohl & Enzle, 2003).

While much of the gambling cognitions research has sampled student populations and non-problem gamblers (el-Guebaly & Hodgins, 2000), evidence from problem gambling populations points to

the existence and persistence of erroneous beliefs as significant correlates for problem gambling. A study comparing superstitious beliefs of 56 problem gamblers in treatment compared against 55 volunteer non-problem gamblers found that problem gamblers exhibited more superstitious beliefs, and that such beliefs were correlated with intensity of gambling (Joukhador, Blaszczynski, & Maccallum, 2004). The authors speculate that gamblers' superstitious beliefs may be grounded in social constructs such as culture and religion (e.g., praying for luck). Toneatto, Blitz-Miller, Calderwood, Dragonetti, and Tsanos (1997) interviewed 38 regular gamblers, finding significant associations between problem levels of gambling and more cognitive distortions, higher wagers on any one bet, and a family history of gambling. Small sample size and the possibility of error in retrospective recall limit the generalizability of results to regular gamblers with similar characteristics (older males, not married, with some post-secondary education).

The centrality of gambling fallacies in problem gambling is reflected in the fact that a primary focus of many treatment models is correction of erroneous cognitions (Ladouceur et al., 2001; Sylvain et al., 1997). Furthermore, as discussed in Chapter 3, successful treatment of problem gambling typically involves significant reductions in these cognitive errors. Cognitive errors appear to be an integral part of problem gambling, but their role differentiation as cause or effect is less clear. Even so, it seems reasonable to conclude that problem gambling would neither begin nor continue without some measure of cognitive influence. The following passage is a useful summary of the manner in which erroneous cognitive processes are likely to interact in the development and maintenance of problem gambling.

> Potentially heavy gamblers...maintain and increase their involvement in gambling by engaging in irrational thinking. The irrational thinking is characterized by three well-known social psychological processes: (1) the illusion of control – that there is more skill in the game than is objectively the case; (2) biased evaluation of outcomes – the wins are evidence of ability whereas the losses are discounted as evidence of failure; and, (3) entrapment – an escalating commitment to a decision strategy that has already failed (Walker, 1992, p. 147).

Psychological Needs

For some individuals, gambling likely serves a psychological need such as a need for excitement or a need to escape unpleasant mood states (as discussed above). In other people, gambling may be a way of gaining recognition and importance (Nixon & Solowoniuk, 2008; Nixon, Solowoniuk, & McGowan,

2006). Many problem gamblers have lower levels of self-esteem (Gupta & Derevensky, 1997; Volberg, Reitzes, & Boles, 1997). Psychoanalytic viewpoints have long held that gambling is essentially the manifestation of deep-rooted feelings of inferiority and inadequacy (Aasved, 2002; Rosenthal, 1993). Nixon et al. (2006) draw attention to the fact that 'high rollers' and 'winners' are glorified in many cultures, and some people engage in gambling primarily to impress others and to improve their self-image.

Other Factors

Other psychological factors have been studied, although research evidence is limited (el-Guebaly & Hodgins, 2000; Goudriaan et al., 2004). Additional traits exhibited by problem gamblers include deficits in decision-making (Cavedini, Riboldi, Keller, D'Annucci, & Bellodi, 2002), attentional deficits (Rugle & Melamed, 1993), and the discounting of rewards that are delayed in time (Petry, 2001).

Socio-environmental Determinants

Social factors have been implicated as potential risks for the development of problem gambling. Etiological determinants originating in the socio-environmental sphere include parental influences, peer influences, cultural influences, and gambling availability.

Upbringing

Parental modeling and negative childhood experiences have been implicated as factors that may contribute to the development of problem gambling. Rosenthal (1993) posits that poor parenting (constant criticism; rejection; emotional unavailability), overemphasis on family status or money while growing up, and fathers who place undue emphasis on competition and winning are important developmental factors. Shaw, Forbush, Schlinder, Rosenman and Black (2007) describe an intergenerational pattern of chaos in a pathological gambler's family, including: "mental health or addictive disorders…separation and divorce…parental abuse and neglect…emotional and physical turmoil…[and children] at risk for developing pathological gambling" (p. 620). Another study found that pathological gamblers reported low levels of parental bonding, and corresponding high levels of parental neglect (Grant & Kim, 2002). Significant associations have been demonstrated between childhood abuse and lower age of onset/increasing severity of gambling problems in treatment-seeking adults (Petry & Steinberg, 2005). Researchers investigating the incidence of past trauma in pathological gamblers receiving treatment (n = 111; 91.9% male) found that 64% reported a history of emotional trauma, 40.5% reported physical trauma,

and 24.3% reported sexual trauma, and that most of the trauma occurred in childhood (Kausch, Rugle, & Rowland, 2006).

Peers

Higher rates of susceptibility to peer pressure have been demonstrated among high school students who meet SOGS (adolescent version) criteria for probable pathological gambling (Langhinrichsen-Rohling et al., 2004). Youth who meet criteria for probable pathological gambling and at-risk gambling are significantly more likely than non-gamblers or social gamblers to have peers who are problem gamblers (Dickson, Derevensky, & Gupta, n.d.). Male high school students who gamble do so with peers more frequently than with family members, while the opposite is true for females (Gupta & Derevensky, 1998). Gupta and Derevensky (1998) explain peer influences as a function of social learning theory, whereby "individuals are more likely to imitate and model those individuals they value, such as parents, siblings, peers, and those perceived as 'significant others', especially if the individuals are rewarded for their actions" (p. 340). These authors also report that rates of gambling alone tend to increase with age.

Culture

Certain cultural groups such as Asian and Aboriginal peoples consistently show higher rates of gambling and problem gambling than other groups (Cunningham-Williams et al., 2005; Petry, 2005b; Raylu & Oei, 2002; Wardman, el-Guebaly, & Hodgins, 2005), and gambling has historically played a central role in such cultures (Raylu & Oei, 2004). For example, traditional Aboriginal cultural values include a perspective of gambling as part of myth, legend, and spiritual significance (i.e., that skill and divine assistance will help a heroic person to overcome an evil gambler) (Gabriel, 1996). Traditional Chinese cultural norms include beliefs that luck can be influenced by good deeds, (i.e., that fate is predetermined but reversals of fortune can occur, that destinies may be revealed or foretold through numbers in dice games and card games, and that gambling as a form of religious offering will bring favour from the gods) (Papineau, 2005). In a thorough review of gambling among Chinese people, Loo, Raylu and Oei (2008) note that gaps in knowledge exist, and that it is important to continue investigating culturally-determined characteristics that may positively impact prevention and treatment efforts.

Gambling Availability

A strong within-country association exists between the availability of gambling and the prevalence of problem/pathological gambling (Lester, 1994; National Gambling Impact Study Commission, 1999; Productivity Commission, 1999; Rush, Veldhuizen, Adlaf, Corea, & Vincent, 2006; Shaffer, LaBrie, & LaPlante, 2004; Welte, Wieczorek, Barnes, Tidwell, & Hoffman, 2004; Williams, West, & Simpson, 2007a). Moreover, the expansion of legalized gambling in the 1980s and 1990s was followed by significant increases in participation in gambling activities (Jacques, Ladouceur, & Ferland, 2000; Marshall, 2005; Smith & Wynne, 2002) as well as rates of problem/pathological gambling (Cox, Yu, Afifi, & Ladouceur, 2005; National Research Council, 1999; Shaffer, Hall, & Vanderbilt, 1997; Welte et al., 2004). However, it seems clear that a) there are many other important factors that also influence the problem/pathological gambling prevalence rate, and b) the relationship between gambling availability and problem/pathological gambling is not a linear one; jurisdictions may show increased rates of problem/pathological gambling initially, followed by stable or decreased rates over time (Hodgins & Peden, 2005; LaPlante & Shaffer, 2007; Shaffer, LaBrie et al., 2004).

Volberg (2004) postulates that availability of prevention and treatment services may have a moderating effect on the observed relationship between availability of legal gambling and increased problem gambling prevalence. Research has shown that problem gamblers who live close to a gambling venue are more likely to seek treatment when services are geographically nearby (Rush et al., 2006).

Operant and Classical Conditioning

Operant conditioning is “a learning process in which the frequency or probability of a particular behavior reoccurring is influenced by the consequences that follow the behavior” (Whelan, Steenbergh, & Meyers, 2007, p. 22). Such consequences are reinforcing, and act to modify or shape ensuing behaviour. Reinforcement comprises either reward (where positive reinforcement is presented or negative reinforcement is withdrawn), or punishment (where negative reinforcement is presented or positive reinforcement is withdrawn). When desired responses increase, or undesired responses decrease upon presentation of a reward following an exhibited behavioural contingency/event, reinforcement is considered to be positive (Morse, 1966).

As opposed to classical conditioning, where responses to external stimuli are seen to occur on an innate, involuntary, or reflexive level, operant conditioning presumes a level of volition (Cohen, 1969). Following an initial behavioural response, a learning process akin to the historically and scientifically relevant 'Law of Effect' (Thorndike, 1965 re-print of 1911 ed.) begins:

> Of the several responses made to the same situation, those which are accompanied or closely followed by satisfaction to the animal, other things being equal, will be more firmly connected with the situation, so that when it recurs, they will be more likely to recur; those which are accompanied or closely followed by discomfort to the animal will, other things being equal, have their connection with that situation weakened, so that, when it recurs, they will be less likely to recur. The greater the satisfaction or discomfort, the greater the strengthening or weakening of the bond (p. 244).

Gambling behaviour was viewed by Skinner (1953) as a particularly fitting example of operant learning. He considered gambling to be "a system of economic control in which the individual is induced to pay money in return for a reinforcement the value of which is too small to lead to exchange under other schedules" (p. 397). The theory of operant conditioning provides a compelling explanation for persistent gambling behaviour, given that "the contingencies of reinforcement that prevail in a gaming establishment are pervasive and complex" (Porter & Ghezzi, 2006, p. 33). Reward contingencies include money/potential wealth, and surroundings/activities that are entertaining and exciting (Delfabbro & LeCouteur, 2003).

In addition to operant learning processes, classical (associative) conditioning is theorized to act on gambling behaviour secondarily and interactively. For example, "gambling devices [slot machines] make an effective use of conditioned reinforcers which are set up by pairing certain stimuli with the economic reinforcers which occasionally appear" (Skinner, 1953, p. 397). Also, a gambling win paired with a random event such as holding a particular item or wearing a certain shirt might encourage continued superstitious behaviour (Petry, 2005b). The physical gambling environment may also contain behavioural cues/stimuli such as colors, lights and sounds, eliciting emotional responses (excitement; arousal) that secondarily reinforce gambling behaviour (Blaszczynski & Nower, 2007).

A substantial body of historical research has demonstrated the powerful behavioural effects of reinforcement. Laboratory experiments of rats learning to press levers and pigeons pecking at disks for

rewards of food or water are well-recognized examples of operant reinforcement. Experimental research findings have shown that intermittent, variable-ratio reinforcement schedules result in a high response frequency *maintained over time* (Cohen, 1969; Ferster & Skinner, 1957; Morse, 1966; Skinner, 1953). When reinforcement occurs based on a predetermined average number of random responses (e.g., after the 2nd, 9th, 17th, 18th, and 25th response, where every 5th response, on average, is reinforced), the response rate is higher than in any other type of reinforcement schedule: fixed-ratio, where responses are reinforced periodically and non-randomly (e.g., every 5th response); fixed-interval, where reinforcement occurs after a set time interval such as every 2 minutes; or variable-interval, where responses are reinforced after random time intervals (e.g., minutes 1, 2, 4, 6, 9, where every 2nd response, on average, is reinforced). Cohen (1969) notes that "the maximum rate under variable-ratio is faster than discharge of bullets by a machine gun; indeed, the pigeon's total energy expenditure is greater than the energy provided by the food reinforcements – and he suffers continuous weight loss" (p. 25). Such operant learning occurs because reinforcement has been applied during high rates of response (Skinner, 1969).

Addictive behaviour is generally well predicted by principles of operant and classical conditioning (Williams, West, & Simpson, 2007b). For substance abuse, the intrinsically rewarding nature of a substance (i.e., ability to directly produce pleasure) is a strong determinant of the addictive propensity of that substance (e.g., the high addictive propensity of opiates and stimulants relative to the low addictive propensity of hallucinogens). Frequency of drug administration ('reinforcement') is an even stronger predictor of the strength of the addiction than the intrinsically reinforcing power of the substance, as evidenced by the fact that nicotine users experience higher rates of dependency than users of other psychoactive drugs, including heroin and cocaine (Woody, Cottler, & Cacciola, 1993)[1]. Finally, cravings are a common concomitant of addictive behaviour and are reliably elicited by the presence of stimuli associated with the reinforcing substance.

Clearly, principles of learning can be readily applied to gambling behaviour. The nature of gambling is to provide clear, concrete rewards contingent on a person's behaviour. Furthermore, forms of gambling with the highest frequency of reinforcement (EGMs, casino table games) are associated with the highest rates of problem gambling (EGMs in western countries (Abbott, 2006), and casino table games in

[1] Animals will work to avoid nicotine administration (Goldberg, Spealman, Risner, & Henningfield, 1983).

Asia (Fong & Ozorio, 2005)). Of all adults who sought treatment at AADAC in 2005-2006, concern about past-year EGM use was reported more frequently than concern about any other type of gambling (VLT use followed by slot machine use) (AADAC, 2007a). Retrospective accounts of treatment-seeking problem gamblers (n = 180) reveal a faster onset of problem gambling when the primary form of gambling is EGMs (Breen, 2004). In Canada, problem gambling rates are highest in provinces with the greatest per capita numbers of EGMs and casinos (Cox et al., 2005).

What differentiates gambling from substance abuse, however, is the additional presence of variable-ratio reinforcement schedules, an especially potent mechanism to perpetuate behaviour; "the efficacy of such schedules in generating high rates [of response] has long been known to proprietors of gambling establishments" (Skinner, 1953, p. 104). Automated gambling devices that operate according to such schedules will tend to generate particularly persistent behavioural patterns (Ferster & Skinner, 1957).

Along with frequency of reinforcement, other reinforcement parameters influence operant learning while gambling (Petry & Roll, 2001). These parameters include 1) response cost and magnitude of reinforcement: if gamblers perceive that potential rewards outweigh the dollar cost of gambling, they will be more likely to continue gambling, 2) priming: perks such as free meals or coupons are provided to regular customers in order to reinforce established gambling patterns, and 3) immediacy of reinforcement: a reinforcer administered immediately after a response is more effective than delayed reinforcement. Research has shown that problem gamblers are more likely than recreational gamblers to have experienced an early big win (Turner, Zangeneh, & Littman-Sharp, 2006). Additionally, pathological gamblers discount hypothetical rewards that are delayed in time (choosing smaller immediate rewards over larger, delayed rewards), and discounting occurs at much higher rates than in non-pathological gamblers (Petry, 2001).

A number of research studies have investigated reinforcement parameters specific to various EGM features, including win size and rate, speed of play, near misses, and number of lines played (see Appendix B for a review of research findings). Findings discussed in Appendix B demonstrate that several types of machine alterations have some potential to influence behavioural responses. These parameters include decreasing the frequency of near misses, slowing the speed of play, reducing maximum win size to eliminate early big wins, and decreasing the number of betting lines available for play (Williams et al., 2007b). It must be recognized that the research base is still limited, and most research has been conducted

with participants who have had previous exposure to machine gambling. Nonetheless, it seems fairly evident that EGM reinforcement parameters are an important determinant of EGM gambling behaviour.

Critiques of Learning Theory

A Skinnerian view proposes that contingencies of reinforcement are the primary (if not the only) cause of gambling behaviour. We now know that such a view is limiting, given the multiplicity of etiological factors seen in the literature since that time. For example, not everyone who gambles on EGMs will exhibit persistent gambling: "while pigeons pecking keys for food under a variable ratio schedule will all develop very persistent behaviour, only a minority of people who ever play EGMs find them appealing and continue playing them" (Williams et al., 2007b, p. 34).

Another criticism concerns the following question: If reinforcement (positive and negative) causes gambling and problem gambling to develop, then why doesn't punishment (in effect, the response cost associated with continued involvement) extinguish the behaviour? (Blaszczynski & Nower, 2007; Dickerson & O'Connor, 2006). This question does not take into account the cumulative effects of positive reinforcement and negative reinforcement acting together. Herscovitch (1999) describes the cycle of problem gambling as beginning with positive reinforcement in the form of pleasurable, exciting and euphoric feelings, augmented by occasional wins. As problems begin and negative consequences escalate, gambling is increased to relieve the resultant emotional discomfort associated with stress and guilt (negative reinforcement). In other words, the negative reinforcement of temporary escape overrides the response cost.

In sum, the above evidence makes the case that principles of operant and classical conditioning are fundamentally important etiological considerations in the development of gambling and problem gambling, but they do not, on their own, offer a comprehensive explanation of how and why these behaviours develop.

Biopsychosocial Etiological Model

Based on the range of etiological research described above, strong argument may be made for a multifaceted theoretical approach. Attribution of problem gambling causation to one stand-alone theory or another is neither desirable nor feasible. Indeed, it seems counterintuitive to think that a one-dimensional etiological model could adequately explain a multidimensional behaviour such as problem gambling. While

complexity is not always superior to simplicity, multi-causal developmental theory appears to be the most comprehensive and sensible etiological model to explain putative interactions between multiple factors that may result in maladaptive gambling behaviours. Such factors are theorized to combine in ways that incorporate implicated elements from genetic and biological functioning, psychological makeup, and sociologically constructed environments (Griffiths & Delfabbro, 2002; Sharpe, 2002). The main premise of biopsychosocial theory is that individuals may be more or less influenced by interacting biological, psychological, and social factors that generate vulnerability to, or protection from, the development of gambling-related harm.

A biopsychosocial etiological model has been developed that integrates evidence from the literature into a more unified global perspective. Here, a multifaceted set of biological, psychological, experiential, and social factors are thought to interact either sequentially or in concert to contribute to, or provide protection from the development of problem gambling (Griffiths & Delfabbro, 2002; Sharpe, 2002). As described by Williams, West, and Simpson (2007b, pp. 4-5) and seen in Figure 1 below, the biopsychosocial model follows a general sequence of events:

1. Genetically-based determinants result in a brain and nervous system that functions to either increase or decrease individual susceptibility to gambling participation; traits of susceptibility include impulsivity, vulnerability to stress and disorders of mood, risk-seeking, cognitive deficits, and predisposing central nervous system responses (e.g., an unusually strong response to an addicting process or substance). A person with the opposite attributes has inherited some protection from engaging in gambling and/or developing problem/pathological gambling.
2. The likelihood of initial experimentation with gambling is influenced by biological propensities, combined with parental, peer group, and societal modelling of the behaviour, and the actual physical availability of gambling.
3. Continued involvement in gambling is additionally influenced by the person's psychology and learning experience. Two aspects of the person's psychology play a particularly important role. The first aspect is whether the person holds erroneous beliefs (gambling fallacies) about how gambling works (i.e., failure to understand the independence of random events, illusion

of control, belief in 'luck', etc.). The second aspect concerns whether gambling serves any psychological need for the individual (e.g., escape; excitement; recognition/importance). With respect to learning experience, the rewarding or non-rewarding consequences of the person's early betting/gambling experiences is a potent determinant of gambling continuation or discontinuation.

4. Once gambling is regularly engaged in, operant and classical conditioning play a central role in beginning to increase the frequency and strength of the behaviour and the physiological processes underlying it, making it progressively more difficult to willfully resist. At a psychological level, the person begins to become preoccupied with thoughts of gambling. At a behavioural level, the person starts playing more often and longer than intended, and spends more than their planned limit. Someone with this pattern of play is known as an 'at risk gambler'. In light of the negative consequences that begin to occur, the psychological needs filled by gambling and the person's beliefs about how gambling works are important factors that influence whether the behaviour continues (i.e., an erroneous belief that one is 'due for a win' or that 'skillful play' can recoup losses provides the intellectual justification for continuation).
5. Gambling behaviour that progresses unabated typically leads to negative consequences in a range of areas (financial, psychological, social, legal, health, employment/school). These negative consequences combined with impaired control over gambling behaviour constitute 'problem gambling**',** with severe forms of problem gambling known as 'pathological gambling'. In many people, the same biological and environmental risk factors that lead to problem/pathological gambling independently lead to problems in other areas (i.e., substance abuse, mental health problems, interpersonal problems, poor health practices, school/work problems, antisocial behaviour). These associated comorbidities reinforce each other, hampering recovery from each.

Figure 1 provides an illustration of the biopsychosocial etiological model. The pattern of risk factors is often different for different people, and the age at which problems develop is variable. But the pattern of risk factors within an individual is not totally random. Evidence suggests two main subtypes or

routes to addiction: the impulsive/antisocial pattern that is often seen in males and the emotionally vulnerable pattern often seen in females (e.g., Blaszczynski & Nower, 2002; Windle & Scheidt, 2004).

In summary, a wide range of factors influences the development of addictive behaviour, including problem gambling. The relative importance of each causal role, and the degree to which any or all factors contribute to individual problem severity, are yet to be definitively determined. Continuing research is needed to replicate study findings, to create or verify regionally or culturally sensitive data, to ensure identification of all factors that may determine whether problem gambling is more likely to develop in some people compared to others, and to establish the particular influence of such factors on treatment-seeking individuals. 'Big picture' knowledge is necessary to inform harm reduction efforts. But consideration of individual determinants such as pivotally important behavioural causal elements may be just as important from a treatment standpoint. As will be seen in the next two chapters, treatment research is often (and necessarily) grounded theoretically in etiological parts rather than the whole. Only then can the effectiveness of targeted strategic interventions be determined.

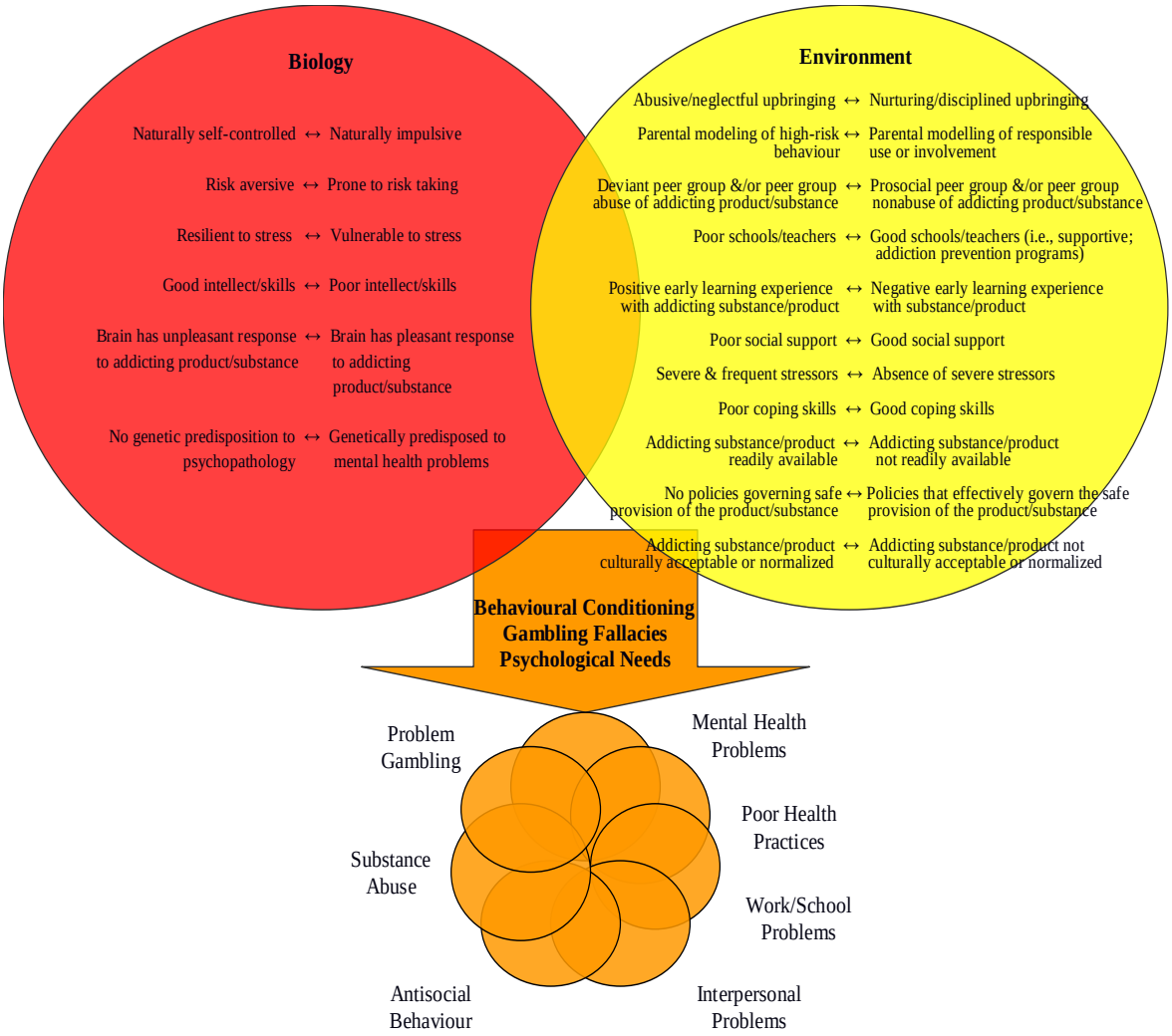


Figure 1. <u>Biopsychosocial Model of Addictive Behaviour</u>

From "Prevention of problem gambling: A comprehensive review of the evidence", by R. Williams, B. West, and R. Simpson, 2007, published research paper. Reprinted with permission.

CHAPTER 3: TREATMENT FOR PROBLEM GAMBLING

The previous chapter made the case that the etiology of problem gambling is complex and multifaceted, but principles of operant and classical conditioning likely play a fundamental role. To contextualize the contingency management approach used in this thesis project, the present chapter reviews the types of treatment typically provided to problem gamblers. Selected treatment effectiveness research is also summarized.

Therapeutic Modalities

Treatment for problem gambling comprises a range of theoretical approaches. The National Research Council (1999) references an individual psychoanalytic case study conducted by Lindner in 1950 as the earliest example of recent problem gambling treatment literature. Knowledge has grown since then, although the body of research is still quite small (Eber & Shaffer, 2000).

Therapy is usually delivered in one or more forms. Treatment types include psychodynamic (to create change through self-recognition of maladaptive psychological processes), cognitive (to restructure faulty thinking about gambling), behavioural (to modify behaviours through techniques such as desensitization to gambling cues, relaxation/other skill training, and reinforcement of adaptive behaviours), multimodal (e.g., simultaneous individual and group treatment, social skills training, and relapse prevention), minimal intervention (e.g., a single counselling session; telephone contact only), pharmacotherapy to stabilize moods or control gambling urges, and 12-step group attendance (Lopez Viets & Miller, 1997; National Research Council, 1999; Potenza, 2002).

Psychodynamic Treatment

Psychodynamic treatment aims to first bring into conscious understanding, and then to resolve, hidden psychological forces and internal conflicts thought to motivate maladaptive gambling behaviour. Psychoanalysis is one such therapy, traditionally requiring deep psychic exploration through long-term application of techniques such as free association, analysis of resistance, and interpretation of transference (Corey, 2001). Early psychoanalytic research on pathological gambling comprised case study descriptions (Rosenthal, 1987), with Bergler's (1958) work perhaps the most well-known example. Bergler's conception of gambling was one of unconscious aggression against parental teachings of reality/rationality (the 'harsh truth' of which gamblers have not accepted in adulthood, instead clinging to the child's 'fiction of

omnipotence'), teachings which are proven false by the very nature of gambling. But guilt prevents overt hostility toward parents, and so unconscious aggression is expressed as *self*-punishment: the 'unconscious wish to lose' achieved only by compulsive gambling. Psychoanalytic theory has been further elaborated by Rosenthal (1986), who sees gambling as a defense against helplessness and lack of power/control. Rosenthal and Rugle (1994) posit that illusions of omnipotence must be confronted and brought into consciousness during treatment.

Although formalized psychoanalysis is infrequently utilized in problem gambling therapy (Rosenthal & Rugle, 1994), it is not uncommon for psychodynamic techniques to be used by therapists as part of an overall treatment strategy that considers the importance of developmental and generational influences (e.g., examination of childhood experiences to identify stage-related developmental gaps that negatively influence adult functioning; discovery of past psychic trauma; facilitation of client insight into the origins of change-blocking defense mechanisms such as denial and rationalization). Dynamic psychotherapy may comprise an existential approach, to help people make meaning of life experiences, gain self-awareness, and act purposefully to live authentically in the present moment (Corey, 2001). Transpersonal developmental approaches facilitate client reframing of the past and acceptance of the present, as new or different life meanings are embraced (see Nixon and Solowoniuk (2008) for a theoretical overview and phenomenological case study exploration of transpersonal developmental therapy).

The reliance of psychodynamic therapy on high-level verbal interaction as well as psychological insight may be an impediment to wide-scale application of this technique for all problem gamblers. The longer-term nature of the treatment is another factor that limits its use (Nixon & Solowoniuk, 2008). Studies investigating the effectiveness of psychodynamic treatments are fairly uncommon. Lack of standardized therapies and gambling-specific application guidelines may preclude suitability for comparative effectiveness research, as evidenced by the fact that psychodynamic techniques have not been studied under the gold standard of randomized, controlled experimental conditions (Hodgins & Holub, 2007; Rosenthal, 2008, in press). But this situation does not imply ineffectiveness. A paucity of research may only mean that variability within treatment delivery and lack of construct definition to inform outcome measures comprise methodological challenges that have not yet been resolved.

Gamblers Anonymous

Gamblers Anonymous was formed in 1957 and is modeled after Alcoholics Anonymous. It consists of groups of recovering or recovered problem gamblers that meet regularly to support each other in achieving and/or maintaining abstinence. In some cases, GA comprises the primary form of treatment as individuals work through a 12-step program of peer-mentored self-help recovery. In other cases, it accompanies or follows other types of treatment to serve as a form of relapse prevention. In January, 2008, there were 48 GA meetings operating in Alberta (Gamblers Anonymous, 2008).

Gamblers Anonymous is one of the most common interventions (Petry, 2005a), yet evidence-based GA research is limited. Examples include Stewart and Brown (1988) who found repeat attendance to be low and relapse rates to be high, and Stinchfield and Winters (1996), whose findings indicated that GA attendance concurrent with formal treatment was not associated with better treatment outcomes. More recently, Petry (2003) reported that attendance at GA meetings while receiving formal treatment predicted increased engagement in therapy, increased treatment attendance, and reduced relapse rates. Hodgins, Peden, and Cassidy (2005) found that for pathological gamblers who had recently quit gambling, those who attended GA as part of recovery had better outcomes than those who did not. This evidence provides support for counsellors who suggest GA attendance to clients as part of a multi-pronged treatment effort. Therapist recommendations are not always followed, however. In one study, only 3 of 9 participants who were encouraged to attend GA as a form of aftercare did so (Wulfert, Blanchard, Freidenberg, & Martell, 2006). Reasons for non-attendance were not reported. It is possible that the spiritual orientation of GA (even though non-denominational) may be a deterrent or impediment for some people.

Cognitive Restructuring

Cognitive restructuring (also known as cognitive-behavioural treatment/cognitive behaviour therapy or CBT) is postulated to work through the application of techniques aimed at identifying and then correcting and/or re-framing maladaptive thoughts that underlie problem gambling behaviours, as reviewed in Chapter 2. The counsellor's goal is to assist as invalid cognitions and beliefs are first recognized, then challenged, and ultimately changed (Ladouceur et al., 2002). It is thought that individuals may become unable to persist in problematic gambling once the truth of rational gambling cognitions is accepted and internalized, resulting in behavioural change. Therapeutic focus is directed in particular toward the concept

of random chance, and beliefs about personal ability to influence gambling outcomes. Cognitive restructuring is a common form of treatment either as a primary modality, or more typically as part of a broader treatment approach (e.g, challenging erroneous cognitions about the nature of gambling, social skills training, problem-solving training and so on) (Petry, 2005b). Meta-analytic review confirms the effectiveness of cognitive-behavioural therapy when delivered individually or in group format, and also its preponderance among outcome studies (Pallesen et al., 2005).

Medication

The use of medication to treat mental health problems and addictions (including problem gambling) has increased significantly over the past 20 years. The theoretical basis for pharmacological approaches is that all disordered behaviour has a neurophysiological substrate (and vice versa) that can be treated at either the behavioural/psychological level or at the neurophysiological level. In some cases the medication is intended to treat comorbidities often associated with problem gambling (e.g., mood disorders). In other cases, medication is prescribed to reduce cravings for gambling or the intensity of pleasure derived from gambling.

For the past 25 years, researchers have studied the use of pharmaceuticals as stand-alone treatments for problem gambling (Lowengrub, Iancu, Aizer, Kotler, & Dannon, 2006), and infrequently, combined with psychotherapy (Grant et al., 2004; Ravindran & Telner, 2002). A wide range of drug classes and types have been studied: 1) mood stabilizers, antipsychotics, antiepileptics, and anticonvulsants to regulate mood, 2) opioid antagonists to decrease or stop pleasurable feelings associated with gambling, and most commonly, 3) selective serotonin reuptake inhibitors, atypical antidepressants, and dual-action SSRI-serotonin type 2 receptor antagonists to reduce urges and interrupt obsessive-compulsive behaviour (Grant, Williams, & Kim, 2006; Hodgins & Holub, 2007; Lowengrub et al., 2006).

Research findings, while not unequivocal, seem to indicate that drug therapy may effectively reduce problem gambling behaviour, lessen urges to gamble, and improve related disorders of mood or obsessive-compulsive behaviour (Hodgins & Holub, 2007). A meta-analytic review of 16 pre-experimental or controlled studies conducted between January 1966 and July 2006 found an overall post-treatment effect

size (weighted by sample size) of $d = 0.78$[2], $p < .01$ (range 0.11-2.48) (95% CI0.64-0.92) (Pallesen et al., 2007). Although Pallesen et al. (2007) found no difference in effect sizes by class of drug, others posit that the selective serotonin reuptake inhibitor class of anti-depressant drugs appear to be effective in larger doses, even for those without comorbidity (Grant et al., 2006). A study of combined drug treatment and psychotherapy (paroxetine alone, CBT and placebo, and CBT with paroxetine) found that all three treatments resulted in reduced gambling behaviour and related symptoms such as urges and perceptions of control, but combined CBT and paroxetine treatment was most effective (Ravindran & Telner, 2002).

Most people do not experience serious medication side effects, although the potentiality exists. In one study of the opioid agonist naltrexone, 38 of 83 participants (46%) were terminated early due to serious kidney dysfunction manifesting as dosage was gradually increased (Kim, Grant, Adson, & Shin, 2001). The marketing of Nefazodone is now prohibited in North America for reasons of liver toxicity (Hodgins & Holub, 2007). Serotonin syndrome is a potentially lethal side effect of SSRI use in high doses or in combination with other drugs, and serotonin withdrawal syndrome can occur for up to 4 weeks after use is discontinued (Julien, 2001).

Whether or not pharmacotherapy ever becomes integrated into mainstream formalized treatment will depend on future verification of equal efficacy and safety compared to psychotherapy. Evidence indicates that psychological treatment for problem gambling appears to be more effective than pharmacological treatment, particularly in the longer term (Pallesen et al., 2005). Few studies of drug treatment for problem gambling incorporate follow-up assessment (Pallesen et al., 2007), but long term effectiveness of psychotherapy for mental health problems is known to be significantly greater than pharmacological treatment (Bovasso, Eaton, & Armenian, 1999).

Behavioural Treatment

Behavioural therapies for problem gambling have been studied in various forms over the years, alone or in combination. Indeed, "behavioural studies have provided some of the most extensive and encouraging treatment literature…" (Lopez Viets, 1998, p. 263). The focus of behavioural therapy is to directly change the maladaptive behaviour or develop new behavioural skills. As discussed in Chapter 2,

[2] 'Standardized mean difference' (*d*) effect size calculations consist of "subtracting the mean of the control group from the mean of the treatment group at post-treatment or follow-up and dividing by the pooled SD [standard deviation] of the two groups" (Pallesen et al., 2007, p. 359). A value of 0.2 reflects a small effect, 0.5 a medium effect, and 0.8 a large effect.

behavioural precursors of problem gambling appear to be largely grounded in learned processes of reinforcement where antecedent, co-occurring, or consequential environmental contingencies act to generate and maintain the behaviour. The therapeutic goal of behavioural treatment is to induce and reinforce new learning through processes designed to change such contingencies, thereby reducing or eliminating gambling and gambling-related behaviours. Improvements are expected in other areas of life negatively affected by problem gambling.

Treatments include aversion therapy such as administration of electric shocks while gambling or reading about gambling/viewing gambling-related pictures; systematic desensitization to progressively eliminate gambling-cued responses; imaginal desensitization; sensitization through in-vivo exposure; exposure to gambling/gambling cues followed by response prevention; imaginal relaxation and other stress reduction techniques; social skills training; behavioural analysis of gambling (including pre-and post-gambling experiences); behavioural monitoring; and contingency management (Hodgins & Holub, 2007; Lopez Viets & Miller, 1997; Petry, 2002; Porter & Ghezzi, 2006). While aversive techniques involve punishment for engaging in the behaviour, the other treatment types attempt to control gambling motivators, cues and/or stimuli to prevent problematic behaviour. Behavioural treatments demonstrating the highest effect sizes are those that apply relaxation techniques or involve exposure to gambling cues, while the least effective approaches tend to involve aversive techniques (Pallesen et al., 2005).

Present-day clinicians employ a variety of behavioural strategies, although in-vivo exposure does not appear to be commonly practised. No evidence of its use was found in Alberta, but recent evidence from the Australian state of Victoria indicates that of 43 counsellors working at government-funded 'BreakEven' community treatment agencies who completed a survey of the most common cognitive and/or behavioural therapeutic techniques, 11 utilized in-vivo exposure and 7 utilized imaginal desensitization (Jackson et al., 2000).

Relapse Prevention

Preventing relapse involves providing in-treatment and/or post-treatment (aftercare) therapy intended to maintain treatment gains. Therapeutic techniques are similar to those utilized in alcohol and substance abuse treatment. Strategies include relapse-avoidance skill development such as identifying potential cues, triggers, and high risk situations, exploring problem-solving around these issues, and

supporting continued lifestyle change and family/peer involvement (Dimeff & Marlatt, 1995). Relapse is viewed as a prime opportunity to enhance further education and training, while addressing the accompanying shame and guilt. Recovering problem gamblers in treatment are encouraged to view lapses or slips as a valuable learning process within an overall treatment progression (AADAC, 2008).

Multimodal Treatment

Multimodal treatment comprises an eclectic mix of therapies, an approach often seen in formal treatment agencies (e.g., AADAC, n.d., Jackson et al., 2000). A broad range of strategies may be utilized that integrate some or all of the treatment types described above, as well as general counselling and/or financial or marital/family therapy. Counsellors employ the approaches judged most likely to be effective for a particular client, and change or augment the mix according to client needs as treatment progresses.

Length and Modality of Treatment

Most formal treatment entails several sessions. However, in recognition of the high drop-out rates from treatment and the low utilization of treatment, shorter therapeutic interventions have been developed. 'Brief treatment' for problem gambling is considered to be an approach that utilizes "…less professional resources or time than usual face-to-face interventions" (Hodgins & Holub, 2007, p. 383). Effectiveness has been demonstrated under randomized, controlled research conditions (Hodgins, Currie, & el-Guebaly, 2001; Petry, Weinstock, Ledgerwood, & Morasco, 2008). Potential advantages of brief therapy include implementation if/when limitations to therapist time or availability exist (very real possibilities), or when individuals are unlikely to seek out or attend formalized counselling. Minimal treatment strategies include a single counselling session, telephone contact with a therapist, self-help workbooks, and online counselling. Contact with therapists often involves the application of strategic motivational interviewing (MI) techniques to identify and enhance stage of change through empathy and empowerment. Workbooks are designed to reflect evidence-based cognitive and behavioural approaches. One example is a workbook published and utilized by AADAC, titled *Becoming a Winner: Defeating Problem Gambling* (Hodgins & Makarchuk, 2002). A clear advantage of this learning tool is its suitability for clients and non-clients alike. Those attending formal counselling may solidify learning or make progress in recovery while working through the book at home, while individuals who reach out by telephone or email but may not yet be ready to access in-person counselling (or feel no need), may still be helped as they receive resources by mail.

Very recently, web-based counselling services have begun to appear. The United Kingdom's GamCare treatment organization website encourages users to "talk live online to one of our trained Advisors who can offer counselling support, information and advice" (GamCare, 2007, home page). The service began in late 2007. The San Diego Center for Pathological Gambling in California offers real-time 'e-therapy' (San Diego Center for Pathological Gambling, 2007). Additionally, online counselling is also available for problem gamblers willing to pay for professional services (e.g., http://www.thecounselors.com/). An important foundational element of online counselling is assurance of confidentiality and protection of anonymity, factors that may attract individuals who are unlikely to seek out formal treatment due to feeling stigmatized. Other putative benefits include wide-ranging availability of use, convenience of access, and provision of additional support for those in formal treatment, while drawbacks include a lack of 'best practice' treatment delivery standards, and the potential for misuse (e.g., personal online misrepresentation). Preliminary usage statistics from a government-funded pilot project in New Zealand indicate that in the first 3 months of operation, 4000 visitors accessed the 24-hour online service, and 220 real-time text interface counselling sessions took place, more than half of which occurred outside of usual daytime business hours (Swan, 2006).

Treatment Effectiveness

Historically, studies designed to evaluate the effectiveness of problem gambling treatment have been methodologically inconsistent in outcome definition, measurement, and reporting (Hodgins & Holub, 2007). And the research practice of combining different treatment types in one study has made it difficult to effectively determine which treatment or treatment component is the effective mediator of change (Lopez Viets & Miller, 1997; Pallesen et al., 2005). Such wide-ranging variability presents challenges to researchers desiring to synthesize the body of literature for the purpose of comparing the effectiveness of different therapeutic approaches, or of estimating treatment effectiveness in general. Authors reviewing the evidence are careful to highlight methodological issues that may impact comparability of findings (e.g., low sample sizes; differences in participant characteristics, variability in defining treatment success or failure, differences in outcome measures, and inconsistency of follow-up intervals) (Oakley-Browne, Adams, & Mobberley, 2004; Toneatto & Ladouceur, 2003). To address the problem of methodological inconsistency, a group of prominent researchers recently released a set of outcome evaluation guidelines known as the

Banff Consensus (Walker et al., 2006). Researchers who now choose to incorporate these recommendations will ensure that, in future, outcome comparability across studies and treatment modalities is greatly improved.

Limitations of treatment research notwithstanding, a number of literature reviews have been conducted (Blaszczynski & Silove, 1995; Knapp & Lech, 1987; Lopez Viets & Miller, 1997; Murray, 1993; National Research Council, 1999; Oakley-Browne et al., 2004; Petry, 2002; Toneatto & Ladouceur, 2003; Toneatto & Millar, 2004; Walker, 1992). Oakley-Browne et al. (2004) and Toneatto and Ladouceur (2003) take the important further step of identifying what they consider to be the best controlled efficacy studies. The identified studies are comprehensively summarized in the following section.

Controlled Treatment Efficacy Studies

Randomized controlled trials are the 'gold standard' of experimental treatment research, but rarely achieved at the level of excellence. While studies of problem gambling treatment have often relied on convenience sampling (e.g., people already in treatment; people who volunteer to participate in advertised research), such purposive sampling may result in participant groups that do not represent all problem gamblers in the general population. For example, it is possible that fundamental differences exist between treatment-seeking and non-treatment seeking individuals, or between people who volunteer to participate in research and those who do not. Alternatively, random sampling and randomized assignment of subjects to experimental and control groups are more likely to ensure the ability to generalize findings to the general population, one of the primary requirements of such research (Cresswell, 2003).

In Oakley-Browne et al.'s (2004) systematic review and meta-analysis of randomized controlled trials for pathological gambling treatment, evaluated according to gold standard criteria set by the Cochrane Collaboration (for background information on the Collaboration, see http://www.cochrane.org/reviews/clibintro.htm), 4 studies were selected for inclusion out of 17 identified studies[3]. In Toneatto and Ladouceur's (2003) critical review of the literature, 11 randomized controlled trials were selected for inclusion (the same 4 studies selected by Oakley-Browne et al. (2004), and 7 others). A summary of methods and results for the 11 studies is presented in Table 1.

[3] The last minor update of the review was carried out on February 25, 2005; conclusions remained unchanged. The review was subsequently withdrawn from the Cochrane Database pending a substantive update, and remains withdrawn as of January 2008.

Table 1. Controlled Treatment Outcome Studies: Methods and Results

Study	*Design*	*Treatment*	*Assessment*	*Results*
1 **Dickerson et al. (1990) (Australia)**	2-group pre-experimental Random allocation (RA), method unspecified Grp 1 n=13 Grp 2 n=16 Grp 2: RA to 1 of 2 psychologists	Minimal intervention Grp 1 ('manual only'): cognitive-behavioural, 12-week self-help manual, mailed with assessment questionnaires; follow-up questionnaires mailed Grp 2 ('manual & interview'): same self-help manual distributed in-person during 1½-2 hr interview; follow-up questionnaires mailed	Gambling involvement: frequency, time, $ spent per week/per session, by type of gambling Grp 1: Baseline: gambling involvement, treatment (tx) goal-setting, demographics Grp 2: Baseline: gambling involvement, demographics, reasons for seeking help, behavioural analysis of gambling, life consequences, rating scales of positive and negative effects, personality questionnaires Psychologists reviewed data, sent summary letter within 5 days Follow-up, both groups, 3 and 6 mos.: previous week gambling involvement, strategies to reach goal, negative/positive life effects	Dropout rate: 55% (65 enrolled; 29 participated) Follow-up rate = 74% at 3 and 6 mos. (n=21; group membership not specified) Grp 2 reported higher levels of baseline problem gambling Both groups reduced frequency and length of gambling sessions, and money spent/wk from pre-treatment to 3 mo follow-up; Grp 2 improved faster than Grp 1 in first 3 mos., but made no progress thereafter Grp 1 showed continued improvement to 6 mos.; both groups increased money spent per session between 3 and 6 mos.; no change in other areas of life At 3 mo follow-up, % reductions in past-month frequency of gambling: Grp 1: 43.3% Grp 2: 60.5% In money spent (estimated from graphical data): Grp 1: 63.6% Grp 2: 71.8%
2 ***+** **Echeburua et al. (1996) (Spain)**	Multi-group experimental 3 treatment (tx) groups and a control RA, method unspecified n=16 per group	Behavioural and cognitive tx Grp 1: weekly individualized tx over 6 weeks; stimulus control and exposure with	DSM-III-R and SOGS for inclusion Gambling dependency: SOGS at pretest, Gambling Dependent Variables Questionnaire (GDVQ): frequency, $ and time spent; subjective indicators (self-perceptions of severity, frequency of thoughts)	Dropout rate: 21.9% Follow-up rate: 90.5% Intent-to-treat analysis Tx groups all abstinent post-treatment (continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
	Pilot study lead-in, n=8	response prevention Grp 2: weekly group cognitive restructuring for 6 weeks Grp 3: combined tx as delivered to Grp 1 and 2, twice per week for 6 weeks Grp 4: 6 mo. waitlist control	Psychopathological variables: Beck Depression Inventory, State-Trait Anxiety Inventory, Adaptation Scale Assessment schedule: baseline, 3rd week (GDVQ), posttreatment, 1, 3, 6, and 12 mos Control group assessed at pretreatment and 6 mos Family members assessed using a family version of the GDVQ	% success rates (abstinent, or 1-2 episodes in 12 mos, and total $ spent ≤ 1 week's total prior to tx), at 6 mo/12 mo follow-up: Grp 1=75%/68.8% Grp 2=62.5%/37.5% Grp 3= 37.5%/37.5% Grp 4=25%/na At 6 mo follow-up, % reductions in past-week frequency of gambling (p<.001): Grp 1: 97.5% Grp 2: 96.8% Grp 3: 92.2% Time spent: Grp 1: 98.8% (p<.01) Grp 2: 95.1% (p<.001) Grp 3: 89.5% (p<.01) Money spent (p<.01): Grp 1: 95.7% Grp 2: 92.6% Grp 3: 84.8% Grp 4 (control): improved time and money spent but not frequency Relapse rate: n=15 (46.6% within 1 month, more frequent in combined than individual tx)
3 *				
Echeburua et al. (2000) (Spain)	2-part experimental Part 1: one tx group, n=69 Part 2: two tx groups and a control RA, method unspecified n=23 per group	Behavioural and cognitive tx Part 1: individualized tx: stimulus control and exposure with response prevention Part 2: relapse prevention:	DSM-IV and SOGS for inclusion; 45 minute interview at first assessment Assessments and tx by 2nd author; three 1-hr pretreatment assessments and one posttreatment for Part 1; independent, blind assessor for Part 2 posttreatment, and at 1, 3, 6, and 12 mos follow-up	100% abstinence Part 1; all included in Part 2 Follow-up rates at 6/12 mos: Grp 1=87%/83% Grp 2=87%/78% Grp 3=57%/52% Dropout rate: 14.5%, mainly within 3 months of follow-up, mainly among control group (mean anxiety level greater for dropouts)

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
		Grp 1: individual tx (length not specified) Grp 2: group tx, 2 hr sessions Grp 3: control group	Dependency on gambling: SOGS, frequency, $ and time spent; subjective indicators (self-perceptions of severity, frequency of thoughts); Beck Depression Inventory; State-Trait Anxiety Inventory; Inadaptation Scale Family member assessment of dependency on gambling variables	% success rate at 3/6/12 mos. (abstinence or 1-2 gambling episodes): Grp 1: 91.3/87/82.6% Grp 2: 91.3/87/78.3% Grp 3: 60.9/56.5/52.2% Relapse rate: 47.8% for controls, 17.4% for Grp 1, 22.7% for Grp 2
4 *** Hodgins et al. (2001) (Canada)**	3-group experimental 2 tx groups and a 1-month wait-list control RA, method unspecified Grp 1 n=35 Grp 2 n=32 Grp 3 n=35 Collateral n=67 (55% spouses; interviewer blind to subject's report)	Minimal intervention Grp 1: self-help workbook mailed after 10 min. phone interview by research asst. Grp 2: 20-45 min. telephone motivational enhancement interview conducted by 1st or 2nd author, mailed workbook Grp 3: 1-mo wait list control (brief phone interview, workbook mailed after follow-up phone call at 4 weeks)	Gambling involvement (days gambled/mo, $ lost/mo, mean $ lost/gambling day) Initial and follow-up interviews conducted by research asst., not blind Initial assessment: SOGS, gambling history, timeline gambling history for past 2 mos., self-perception of motivation, confidence in meeting goal in 6 mos. and in 12 mos, goal selection (stop or cut back) Assessment at 1, 3, 6, 12 mos: timeline follow back for gambling involvement, present goal, workbook usage, level of satisfaction At 3 mos.: asked to provide name of collateral At 12 mos.: SOGS re-administered	No group differences Follow-up rate: 91% at 1 mo, 82% at 3 mos., 80% at 6 mos., 83% at 12 mos. (data for missed follow-ups collected retrospectively) Intent-to-treat analysis Over 1 yr follow-up, significantly reduced gambling in 84% (≥50% reduction in $ lost) Grp 1: not significantly different than control at 1 mo Grp 2: advantage at 1 and 3 mos; at 1 mo., almost twice as many abstinent compared with controls (32% vs 18%) At 1 mo follow-up, % improved or abstinent: Grp 1: 61% Grp 2: 74%

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
				At 1 mo follow-up, % reductions in past-month frequency of gambling: Grp 1: 50.5% Grp 2: 57.8% Money spent: Grp 1: 49.2% Grp 2: 72.2% At 3 mos., significantly reduced gambling maintained for Grp 2 23 participants sought tx during the study (had more severe problems) Control significantly reduced gambling at 1 mo Overall collateral agreement: 84%
5 **Hollander et al. (2000) (USA)**	1-week single-blind placebo lead-in (n=15), followed by 16-week, 2-group double-blind crossover trial RA, method unspecified Grp 1 n=7 Grp 2 n=6	Phase 2 pharmacolog-ical treatment Grp 1: Fluvoxamine for first 8 weeks (phase 1), placebo for last 8 weeks (phase 2); dosage gradually increased and then reduced by 50 mg/day leading into placebo phase) Grp 2: placebo for first 8 weeks, fluvoxamine for last 8 weeks	Structured Clinical Interview for DSM-III-R Personality Disorders, DSM-IV, SOGS, Pathological Gambling-Yale-Brown-Obsessive-Compulsive Scale (PG-YBOCS) and Pathological Gambling-Clinical Global Impression (PG-CGI) administered at baseline For each 8-wk treatment phase, weekly assessment during first 4 weeks and biweekly for final 4 weeks; gambling urge and behaviour on PG-YBOCS and PG-CGI improvement scales at each visit; no follow-up reported Inter-relater reliability high; scale correlations high	Dropouts: 67% (2 in lead-in, 3 before wk 4 in Grp 1) 10 completers (received at least 12 weeks tx); more completers in Grp 2 10 had mild side effects from fluvoxamine 75% of subjects responded to pharmacological treatment Non-significant PG-YBOCS improvement for fluvoxamine (33.4%) compared to placebo (28%) Significant PG-CGI improvement for fluvoxamine (40.6%) over placebo (16.6%) Significant drug x phase interaction

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
		No psychosocial or supportive treatment during study		Both groups responded in phase 1; placebo response disappeared in phase 2 while drug response was sustained
6 **Kim et al. (2001) (USA)**	2-phase study: 1-week single-blind placebo lead-in (n=83) followed by 11-week, 2-group double-blind trial RA, method unspecified Grp 1 n=20 Grp 2 n=25	Phase 2 pharmacological treatment Grp 1: Naltrexone (dosage gradually increased from 25 mg/day to 250 mg/day) Grp 2: Placebo in same capsule form as drug	First visit: psychiatric interview and physical exam followed by DSM-IV Structured Clinical Interview (SCID), SOGS, Gambling Symptom Assessment Scale (G-SAS; developed by the authors for this study), Hamilton Depression Rating Scale (HRDS), Hamilton Anxiety Scale (HARS), blood count (CDC), liver function test (LFT), urine drug screen, pregnancy test for women 12 weekly visits: PG-CGI (both patient- and clinician-rated), G-SAS, HDRS, and HARS weekly, LFT biweekly, adverse effects at baseline and weekly	38 of 83 subjects terminated in Phase 2 due to abnormal hepatic transaminase levels Dropouts: Grp 1 n=6 Grp 2 n=3 Intent-to-treat analysis Grp 1 showed significant improvement over Grp 2 on all gambling measures; behaviour/urges: 75% vs 24% Significant placebo effect: only 36% of Grp 2 showed no change on assessment measures No results reported on HRDS or HARS Side effects more common in Grp 1 than Grp 2; increased transaminase levels unexpected
7 *** Ladouceur et al. (2001) (Canada)**	2-group experimental, treatment condition and 3-mos wait-list control RA, method unspecified Grp 1 n=35 Grp 2 n=29	Brief motivational therapy to establish goals, then 2-component cognitive treatment (individual cognitive correction + relapse prevention)	Dependent variables: DSM-IV, self-efficacy perception (0-10 scale), perception of control (0-100), desire to gamble (0-10), SOGS, frequency of gambling (# of sessions, # of hours, $ spent during previous week) Initial phone contact: SOGS and socio-demographic questionnaire given by	Grp differences seen; frequency of gambling analyzed separately Dropout n=31 (47%), data not included (66 subjects started treatment, initial sample n=88) Follow-up=89% at 6 mos, 80% at 12 mos

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
		Max. 20 1-hr weekly sessions Mean hrs of therapy=11.03 No blinding Tx integrity checked No other tx during study Tx manual available	psychologist or masters student Grp 1: assessments on all variables at pretest, posttest, 6 mos and 12 mos (no SOGS at posttest) Grp 2: pretest, posttest at 3 mos	Significantly reduced gambling behaviour, improved self-perceptions, and less desire to gamble at posttest; 86% no longer met DSM-IV criteria at 1 yr follow-up All treated subjects showed some clinical improvement, control showed none; effects were maintained at 6 and 12 mos for DSM criteria, perception of control, self-efficacy, and desire to gamble At 6 mo follow-up, % reductions in past-week frequency of gambling: 72.2%; in money spent: 78.2% At post-test, % reduction in past week time spent: 67.4%
8 McConaghy et al. (1983) (Australia)	2-group pre-experimental RA, method unspecified Grp 1 n=10 Grp 2 n=10	Behavioural tx Grp 1: electric aversion-relief (AR); 504 shocks given on reading exciting gambling phrases Grp 2: imaginal desensitization (ID); gambling scenes presented, relaxation elicited	Conducted by 2nd author blind to treatments, pre-tx and at 1 mo and 1 year follow-ups Outcomes: gambling urges and behaviour Prior to tx: Eysenck Personality Questionnaire (EPQ), Spielberger State-Trait Anxiety Inventory (STAI, Forms X-1 and X-2) At 1 mo follow-up: STAI Form X-1 At 1 year follow-up: STAI Forms X-1 and X-2 (interviews either by phone or in person)	100% tx completion and follow-up No significant differences between groups on baseline EPQ and STAI scores Grp 2 (ID) showed significantly greater reduction than Grp 1 (AR)in STAI state anxiety at 1 mo and 1 year, trait anxiety at 1 year, and urges at 1 yr Gambling behaviour at 1 mo: 40% abstinent, 40% improved (AR and ID) At 1 year: 0% abstinent, 30% improved (AR); 20% abstinent, 70% improved (ID) (significant at p=.02)

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
		Fourteen 15-minute sessions given over 5 days in psychiatric hospital	Collateral interviews Independent interviews by 1st author at pretreatment, 1 mo post-treatment, and at 2-3 mo. intervals over follow-up period	Several participants received additional treatment prior to 1 yr follow-up (AR for 2 who had received ID, and ID for 2 who had received AR) 5 collaterals confirmed positive response to ID, and 3 confirmed for AR
9 + McConaghy et al. (1988) (Australia)	2-group pre-experimental RA, method unspecified Grp 1 n=10 Grp 2 n=10	Behavioural therapy to reduce arousal Grp 1: imaginal desensitization Grp 2: imaginal relaxation (IR) (visualization of self-described relaxing scenes verbalized by the therapist, scenes not gambling related) Both treatments delivered in 14 sessions over a 1 week admission to a psychiatric hospital	By 2nd author blind to treatments, pre-tx and at 1 mo and 1 year follow-ups Outcomes: gambling urges and behaviour Prior to tx: Spielberger State-Trait Anxiety Inventory (STAI, Forms X-1 and X-2) Percentage scale measures of subjects' perceived reduction in urge and tension at 1st, 8th, and final treatment sessions (not done in 1983 study) 1 mo follow-up: STAI Form X-1 and percentage scale measures 1 year follow-up: STAI Form X-2 and percentage scale measure Follow-up data gathered either by phone or in person Collateral follow-up not done due to low response in 1983 study	100% tx completion 95% at 1 mo follow-up 100% at 1 yr follow-up Gambling behaviour at 1 mo: 60% abstinent, 30% improved (ID), 40% abstinent, 40% improved (IR) At 1 year: 10% abstinent, 50% improved (ID); 10% abstinent, 70% improved (IR) Significant correlations between assessed and self-reported measures Significant reductions in anxiety for both groups; urges improved more for ID 3 subjects requested and received aversive therapy prior to 1 year follow-up; responses to initial treatment only were analyzed

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
10 **+** **McConaghy et al. (1991) (Australia)**	Long term follow-up study (1983) Average years to follow-up: 5.5 RA, method unspecified Grp 1 n=60 Grp 2 n=20 Grp 3 n=20 Grp 4 n=10 Grp 5 n=10	Behavioural tx Grp 1: ID Grp 2: AR Grp 3: IR Grp 4: brief in vivo exposure (subjects accompanied to regular gambling setting; 20 min observation period) Grp 5: prolonged in vivo exposure (60 min, once per day) All treatments delivered during 1-week admission to a psychiatric hospital	Prior to treatment: Eysenck Personality Questionnaire (EPQ), Spielberger State-Trait Anxiety Inventory, Symptoms Checklist-90 At 2-9 year follow-up: as above plus Beck Depression Inventory	100% tx completion for all modalities Overall follow-up rate=53% (highest for IR at 70%, lowest for AR at 30%) At follow-up, 10 ID participants (n=33) abstinent and 16 controlled, compared to 0 abstinent and 2 controlled for AR,(n=6); 6 abstinent and 2 controlled for IR (n=14), 1 abstinent and 3 controlled for brief in vivo (n=6), and 1 abstinent and 1 controlled for prolonged in vivo (n=4) Overall, 79% abstinent or controlled (ID) compared to 53% abstinent or controlled for the other 4 treatments (significant at p<.05) Authors suggest that AR, IR, and in vivo may be placebos; abstinence or control equally satisfactory
11 ***+ Sylvain et al. (1997) (Canada)**	2-group experimental, tx and 4-mo max. wait-list control RA, method unspecified Grp 1 n=14 Grp 2 n=15	Individualized 4-component cognitive-behavioural tx (cognitive correction, relapse prevention) 60-90 min sessions 1-2 x per week to max of 30 hrs Mean length of tx=16.7 hrs	Outcome measures: DSM-III-R, self-efficacy perception (0-10 scale), perception of control (0-10), desire to gamble (0-10), SOGS, frequency of gambling (# of sessions, # of hours, $ spent during previous week) Full assessments pre-test, post-test, post-waitlist, and 6 mos DSM through phone contact or brief interview at 12 mos	No significant group differences except on frequency of gambling (not distributed normally and analyzed separately) Dropout n=11 (27.5%), 8 from Grp 1, 3 from Grp 2, data not included At post-test, Grp 1 showed improvement on all key dependent variables and gambling behaviour (57.1% vs. 7% in Grp 2); 86% no longer met criteria for pathological gambling

(continued)

Study	*Design*	*Treatment*	*Assessment*	*Results*
		Sessions recorded and rated by independent evaluator to ensure tx fidelity No other treatment during the study Manual available	Subjects on waitlist contacted by phone once a month	At post-test, % reductions in past-week frequency of gambling: 75% in time spent: 35.7% in money spent: 63.2% At 6 mos, improvements were maintained for 80% of the 10 participants followed up At 12 mos, gains were maintained for 8 of 9 participants followed up Cognitive change, problem-solving ability, and social skill levels were not evaluated

* Studies identified as the best of 11 controlled studies included in Toneatto and Ladouceur's (2003) critical review of the literature.
+ Studies included in Oakley-Browne et al.'s (2004) review of randomized, controlled trials.

The findings summarized in Table 1 indicate that treatments based on behavioural, cognitive-behavioural, multi-modal, and pharmacological treatment approaches effectively improve gambling behaviour from pre-treatment to post-treatment and follow-up. End-of-treatment results showed significantly improved rates of gambling (abstinence or reduced gambling) in 40.6% (Hollander et al., 2000) and 75% (Kim et al., 2001) of those treated, while 57% (Sylvain et al., 1997) demonstrated global improvements such as perceptions of control and self-efficacy, and reduced urges to gamble. At one month follow-up, 74% (Hodgins et al., 2001) and 90% (McConaghy, Armstrong, Blaszczynski, & Allcock, 1988) of participants receiving the most efficacious intervention were improved or abstinent. In Hodgins et al. (2001), improvements were maintained at 3 month follow-up. Another multi-group study reported a highest 3 month success rate of 91.3% (Echeburua, Baez, & Fernandez-Montalvo, 1996). Rates of improved gambling at 6 month follow-up were variously found to be 75% (Echeburua et al., 1996), 80% (Sylvain et al., 1997), and 87% (Echeburua, Fernandez-Montalvo, & Baez, 2000). Hodgins et al. (2001) found that over a 1 year period, significantly reduced gambling was seen in 84% of treated participants. Other findings at 12 month follow-up indicated improved gambling rates of 68.8% (Echeburua et al., 1996), 82.6%

(Echeburua et al., 2000), and 90% (McConaghy, Armstrong, Blaszczynski, & Allcock, 1983; McConaghy et al., 1988). Eighty-six percent of treated individuals evaluated at 1 year follow-up no longer met DSM criteria for pathological gambling (Ladouceur et al., 2001). One study followed participants over an average of 5.5 years (range 2-9 years) and reported improved gambling in 79% of cases. Drop-out rates ranged from 14.5% (Echeburua et al., 2000) to 67% (Hollander et al., 2000) overall, and from 14.5% to 47% in studies most closely resembling community-based treatment (Echeburua et al., 1996; Echeburua et al., 2000; Ladouceur et al., 2001; Sylvain et al., 1997).

Mean measures of gambling behavior (amount of money lost; frequency and duration of gambling episodes at baseline and post-treatment or follow-up) were reported in five studies. Percentage reductions in money spent were 63.2% at post-test (Sylvain et al., 1997), 72.2% at 1 month follow-up (Hodgins et al., 2001), 24.2% at 3 month follow-up (Dickerson et al., 1990), 78.2% at 6 month follow-up (Ladouceur et al., 2001), and 95.7% at 6 month follow-up (Echeburua et al., 1996). Reductions in frequency of gambling were found to be 75% at post-test (Sylvain et al., 1997), 57.8% at 1 month (Hodgins et al., 2001), 60.5% at 3 months (Dickerson et al., 1990), 72.2% at 6 months (Ladouceur et al., 2001) and 97.5% at 6 months (Echeburua et al., 1996). Time spent gambling was reportedly reduced by 35.7% at post-treatment (Sylvain et al., 1997), 67.4% at post-treatment (Ladouceur et al., 2001), and 98.8% at 6 month follow-up (Echeburua et al., 1996).

Oakley-Browne et al. (2004) estimated treatment effect size according to relative risk calculations[4] carried out on the four included studies. Fixed effects[5] relative risk at shorter-term follow-up (1 month or less) was estimated to be 0.44 (95% CI 0.24-0.81), and random effects relative risk was estimated at 0.45 (95% CI 0.25-0.81). At longer-term follow-up (6 months or more), fixed/random effects relative risk was estimated at 0.56 (95% CI 0.33-0.95) and 0.61 (95% CI 0.25-1.47) respectively. Estimated relative risk sizes indicate 'modest to moderate' treatment effects for behavioural or cognitive-behavioural interventions, compared to control conditions.

[4] Experimental group outcomes divided by control group outcomes.
[5] Fixed effect models assume no population variance, and effect sizes are weighted by the inverse of their variances. Random effect models assume population variance, and effect sizes are weighted by an estimated variance component added to the variance (Prendergast, Podus, Finney, Greenwell, & Roll, 2006).

Effectiveness of psychological treatment for problem gambling has been further validated in a recent meta-analysis of 22 outcome studies conducted between 1966 and 2004 (Pallesen et al., 2005). Included studies were any that targeted pathological gambling and reported gambling-related outcomes. Effect sizes were calculated for 16 studies and 29 treatment conditions (24 within-subjects and 6 between-subjects). A total of 24 individual effect sizes were included in the overall mean effect size calculation. Two individual effect sizes were excluded because they were calculated according to intention to treat analysis. Where drop-out rates were explicitly reported in studies (n = 12), the researchers calculated intention to treat effects for comparative purposes, however, only non-intention to treat effect sizes were included in the overall effect size calculation. Reasons for excluding four additional effect sizes were not identified. As calculated according to Cohen's d mean difference formula, post-treatment effect sizes weighted by sample size were found to range from 0.01 to 3.94. Overall estimated effect size at the end of treatment was 2.01, $p < 0.01$ (95% CI 1.90-2.13), indicating that average outcome measure scores were about 2 standard deviations higher for individuals who received treatment, either compared to their own pre-treatment scores, or compared to control group scores. At an average 17-month follow-up (range 6-66) the overall weighted mean effect size based on 29 individual within-subjects comparisons was 1.59, $p < 0.01$ (95% CI 1.48-1.69) indicating significant long term beneficial effects of treatment.

Pallesen et al. (2005) note that contrary to their expectations, randomized controlled trials showed larger post-treatment effect sizes than other studies (where normally the latter would show larger effect sizes due to less scientific rigour), and speculate that the former studies may have included more sensitive outcome variables. Post-treatment effect sizes were also found to be larger for within-group outcome analyses than between-group analyses, lower in studies where participants met diagnostic criteria for pathological gambling, and higher where treatments were of longer duration. Moderators of effect size were not found for outcomes at follow-up. The Pallesen et al. (2005) study recently met quality criteria for inclusion in the *Database of Abstracts of Reviews of Effects, Centre for Reviews and Dissemination* (see http://www.york.ac.uk/inst/crd/aboutcrd.htm for background information on the Centre).

Program Outcome Evidence

From a clinical standpoint, community-based psychosocial treatment for problem gambling is also known to improve problem gambling behavior. O'Connor et al. (n.d.) found that in nine Australian

community agencies, 42-66% of treated clients remained abstinent at follow-up periods ranging from post-treatment to 12 months, and 67-91% maintained improved behaviour over follow-up periods averaging 6 to 12 months. Stinchfield and Winters (2001) evaluated 592 clients treated at four state-funded programs in Minnesota. On treatment completion, 51% reported abstinence during treatment, 28% were still abstinent at 6 month follow-up, and 18% were abstinent at 12 month follow-up. For those still gambling, frequency of gambling decreased substantially for 48% of study participants. Clients also showed statistically significant improvements in psychosocial and financial functioning. In Nevada, Bernhard, Crossman, and Cross (2007) surveyed 75 clients who had completed or partially completed state-funded problem gambling treatment programs in 2006-2007. An original evaluation tool was created to incorporate best-practice processes recommended in the *Banff Consensus* (Walker et al., 2006). Outcome findings showed that 66% of survey participants reported currently abstaining from gambling, with 80% reporting abstinence for at least the past month. Overall, 95% of clients reported reduced frequency of gambling after treatment, as well as improved psychosocial and financial functioning. Average time to follow-up was not reported.

The foregoing summary of treatment effectiveness evidence is intended to serve as a general benchmark to which findings of the present pilot study will be compared in Chapter 6. Discussion now turns to contingency management treatment theory and efficacy.

CHAPTER 4: CONTINGENCY MANAGEMENT TREATMENT

The present research is theoretically situated within the broad range of developmental factors and therapeutic methods reviewed in Chapters 2 and 3. Discussion will now focus on specific contextualization of contingency management as an effective and viable behavioural treatment based on operant learning theory. Topics include a theoretical overview of contingency management approaches to addiction treatment, historical framing to situate CM addictions research chronologically, and a review of effectiveness evidence from the body of treatment literature. Argument will be made for the applicability and adaptability of contingency management techniques to problem gambling treatment.

Theoretical Foundation

Contingency management is defined as a "behavior modification technique in which the stimuli and reinforcers that control a given behavior are manipulated to increase the likelihood of occurrence of the desired behavior" (Ovid Websearch Gateway, 2007). The goal of CM treatment is to create new learning through positive reinforcement of improved behaviours (Budney, Sigmon, & Higgins, 2003; Higgins, 1999; Petry, 2000a) according to optimal schedules of reinforcement and reinforcer magnitude (Petry & Roll, 2001). Theoretical origins are grounded in experiential processes of operant conditioning and contingencies of reinforcement described in Chapter 2. It was Skinner (1953) who first established the validity of such theory through animal modeling, and then proposed to apply it to human behaviour in real world settings (Skinner, 1954). Operant behaviour theory evolved from foundational principles of conditioning and learning established in laboratory studies (both animal and human) (Bandura, 1969; Krasner, 1971), and also from intuitive 'real-world' observations that rewards and punishments appear to direct and modify individual behaviours in society (Levis, 1982). Central to operant learning theory is the idea that behaviour can be changed through environmental modification of behavioural consequences, resulting in a synergistic blend of learning and personal development (Kratochwill & Bijou, 1987).

Contingency management techniques involve provision of incentives to individuals who provide objective evidence of having achieved a targeted element of behavioural change. A number of researchers have provided succinct summaries of how best to implement CM protocol clinically, based on evidence from the literature (Budney et al., 2003; Petry, 2000a). The basic therapeutic structure is:

> First, the clinician arranges the environment such that target behaviors (e.g., drug abstinence, clinic attendance, medication compliance, other behaviors) are readily detected. Second, tangible reinforcers are provided when the target behavior is demonstrated, and third, incentives are withheld when the target behavior does not occur. (Petry, 2000, p. 9).

Once a behaviour has been targeted, a protocol must be put in place to allow for objective verification of each and every occurrence of the behavior. Biological testing (urinalysis; breathalyzers) is appropriate to verify for drug abstinence, while compliance with treatment plans or medication ingestion may rely on first-hand evidence (e.g., visual confirmation) or secondary proof of activity completion (e.g., submission of receipts or attendance validation).

Next, decisions must be made on the type of reinforcement to utilize (e.g., vouchers to exchange for goods; prizes; cash payments; clinic privileges; methadone doses; treatment fee rebates), and the schedule of reinforcement to implement. Contingent reinforcement is most effective when delivered as soon as possible after the target behavior has occurred, and when delivered more frequently (i.e., 3 times per week instead of once).

Incentive values must be substantial enough to not only be perceived as rewarding, but to provide competition for significant levels of reinforcement derived from drug use (or other targeted behaviours). Reinforcements that escalate in value are recommended, as are bonuses (e.g., an additional $10 voucher after submission of three negative urine samples). Such parameters best facilitate optimal adherence to principles of operant conditioning and behavioural learning. As new behaviours are established, voucher parameters may be adjusted downward or optimized to a level that predicts maintenance of the new behaviour. Lastly, behavioural contracts are recommended, so that the CM program and voucher eligibility may be clearly explained to treated individuals, and to ensure therapist adherence to the protocol.

In summary, the theoretical premise behind contingency management treatment is that learned, conditioned processes strongly influence the development and maintenance of substance abuse, and similar, but competing processes can exert equally strong influences on stopping the behaviour. However, such processes are rarely viewed as the only mechanism of therapeutic change. Present-day perspectives posit that contingent reinforcement of adaptive behaviours can effectively mediate addictive behaviour regardless of etiological complexity (Bigelow & Silverman, 1999) or concurrent diagnoses (Sigmon &

Higgins, 2006; Weinstock, Alessi, & Petry, 2007). A growing body of effectiveness research seems to support this view.

History of Contingency Management

Early applications of contingency management were directed primarily toward changing so-called 'deviant' conduct seen in institutional settings such as psychiatric hospitals, schools, prisons, and rehabilitation facilities (Krasner, 1971). Applications typically included reinforcement of learning; modification of behavioural problems such as 'acting out' associated with mental health or emotional disorders, organic brain injury, or other adverse developmental circumstances; strategies to improve medication compliance; and behaviour modification to ameliorate personal problems such as poor grooming, bed-wetting or stuttering.

Receiving reward and punishment contingent on behaviour has been a routine part of institutional life for hundreds of years. However, what changed with the formal application of contingency management in the 1960s and 1970s was the explicitness of contingent applications, the recognition that rewarding desirable behaviour was generally more efficacious than punishing undesirable behaviour, and a greater focus on gradual 'shaping' of the desired behaviour, often through the use of 'token economies' in which tangible conditioned reinforcers in the form of 'earned' tokens were exchangeable for goods and services within the system (Kazdin, 1988). As these types of explicit and formalized behavioural programs began expanding to community-based settings, and as the types of rewards became more diversified, the more generic phrase 'contingency management' began supplanting the term 'token economies'.

The popularity of behaviourism waned in the late 1970s in favour of more cognitively-oriented approaches. As evidence, a PsycINFO bibliographic database title search for the period 1971 – 1976 found 123 studies utilizing the term 'token economy' and another 58 utilizing 'contingency management'. By comparison, in the period 2001 to mid-September 2007 there were only 22 studies using the term 'token economy' and 85 studies utilizing 'contingency management'. The degree of focal change is even more striking when considered as a proportion of all publications, since there has been a significant increase in the overall number of publications over the past 20 years. As shown in Table 2, a recent resurgence in contingency management research has been seen, primarily due to interest in its applicability to the treatment of addictions.

Table 2. Investigative Focus of CM Research*, 1965-2007

Years	*# of Publications*	*# ATOD-related*	*% ATOD-related*
2007 (mid-Sept)	29	23	79.3%
2001-2006	56	52	92.9%
1995-2000	28	20	71.4%
1989-1994	14	1	7.1%
1983-1988	31	3	9.7%
1977-1982	35	5	14.3%
1971-1976	58	4	6.9%
1965-1970	5	0	0.0%
Total, all years:	256	108	42.2%
Total, 1965-1994:	143	13	9.1%
Total, 1995-2007:	113	95	84.1%

* Identified in the PsycINFO bibliographic database using the title search term 'contingency management'
ATOD = alcohol, tobacco and other drugs

A previous body of research provided the theoretical foundation for this expanded view of contingency management utility. Laboratory-based studies had established that drug reinforcement effectively produces drug-seeking and self-administration behaviour in animals (e.g., Aigner & Balster, 1978; Pickens & Thompson, 1968; Thompson & Schuster, 1964; Weeks & Collins, 1964). Findings were unequivocal: "perhaps most striking was that positive reinforcement was capable of generating in normal laboratory animals the dangerous extremes in drug consumption characteristic of human substance abuse disorders" (Higgins, Heil, & Lussier, 2004, p. 432). Similar processes were posited to significantly impact the human development of substance abuse, and researchers began to investigate the effects of reinforcement on alcohol and drug using behaviour (Sobell, Sobell, Ersner-Hershfield, & Nirenberg, 1982). In 1980, particular attention was drawn to a behavioural conceptualization of illicit drug-taking as a form of operant learning reinforced by conditioned processes within the person (i.e., physical and psychological drug effects), as a function of the surrounding environment and drug-using lifestyle (Griffiths, Bigelow, &

Henningfield, 1980). In keeping with the observation that etiological theories drive treatment, and based on early evidence from outcome research, contingency management began to be seen as a potential therapeutic 'counter-operant' to learned processes acting to maintain maladaptive activities (Sigmon, Dunn, & Higgins, 2007).

The earliest reference to contingency management in addictions treatment was a study utilizing 'covert operants' and reinforcement of non-smoking behaviour, with minimal success (Gardner, 1971). An early study on CM treatment for alcohol abuse compiled results of an American court-administered program, where 141 individuals charged with habitual public intoxication could choose one year of disulfirum ('Antabuse') treatment (a medication producing severe physical symptoms of nausea, vomiting, and headache if drinking occurs), probation, or jail time (Haynes, 1973). Of the 138 individuals who chose Antabuse, 47.8% were still receiving Antabuse after 1 year, and numbers of arrests had decreased from 3-8 in the previous year to 0-3 while in treatment. Another early study first suggested that CM techniques might be suitable for application with opiate-dependent individuals attending methadone maintenance clinics (Stitzer & Bigelow, 1978). Fifty-three clients were asked to rank actual or potential clinic privileges according to perceived desirability. The top two picks were medication 'take-home' privileges, followed by $30 per week, while the least-preferred privileges were playing pool and having a monthly party at the clinic.

Contingency management research is historically situated within a theoretical progression that begins with explanations of operant conditioning and contingencies of reinforcement, and continues within contexts of conditioned learning through reinforcement of adaptive behaviours. The focus now moves to a review of CM treatment effectiveness.

Effectiveness Research

This section comprises an overview of substance abuse treatment outcome studies utilizing contingency management approaches. A range of substance dependencies have been investigated in CM research, primarily stimulants, opiates, marijuana, and nicotine. Contingent reinforcement most often consists of monetary-based vouchers exchangeable for material goods and/or services on achievement of pre-determined treatment goals, usually abstinence verified through biochemical testing (Higgins, Alessi, & Dantona, 2002). Prize-based contingency reinforcement consists of vouchers administered in the form of

draws from a 'fish bowl', where about half of the draws are prizes varying in value from $1 (over 85% of winning draws) to one draw of larger value (e.g., $100); the remaining draws consist of non-tangible reinforcement such as slips of paper with the words 'good job' written on them[6] (Petry, Martin, Cooney, & Kranzler, 2000). Other abstinence-contingent types of reinforcement include methadone take-home doses and methadone dosage increases or decreases in opiate or polydrug abuse treatment (Griffith et al., 2000), and less frequently, other types of clinic privileges such as treatment fee reductions, graduation to the next phase of treatment, reduced clinic responsibilities, and discharge from treatment (Prendergast et al., 2006). Studies utilizing cash rewards have typically targeted nicotine dependence (Prendergast et al., 2006).

Representative literature is reviewed from the following outcome perspectives: levels of substance use, retention in treatment, and effects on other behaviours where biological verification may or may not be possible (e.g., medication compliance; treatment goal-related activity compliance). A comprehensive summary of findings from four published meta-analyses concludes the section.

Substance Use Outcomes

Given that voucher-based CM was utilized in this pilot study, a detailed review of three seminal research studies is included here. Voucher-based CM therapy first occurred in a study of cocaine dependent individuals seeking outpatient treatment at a university research clinic (Higgins et al., 1991). Thirteen individuals were consecutively offered therapy in the form of CM plus psychosocial counselling delivered according to a community reinforcement approach (CRA) (Smith & Meyers, 1995) targeting lifestyle change (employment; relationships; recreation) for a period of 12 weeks, and all agreed to participate. The next 15 treatment-seekers were offered 12-step treatment, and 12 people agreed to participate. Abstinence compliance was determined through urinalysis conducted four times a week for all participants. The non-contingent group received $5 per urine sample, and the CM group received points redeemable for vouchers (where items were approved and purchased by counsellors): $1.50 for the first negative urinalysis increasing to a maximum of $1,028 over 12 weeks, including a bonus of $10 for every four consecutive negative tests. Voucher values were reset to $1.50 on evidence of cocaine use (positive urinalysis). Treatment completion reached 84.6% in the CM condition, compared to 41.7% in the control, and 10 CM participants (76.9%) achieved 4 consecutive weeks of cocaine abstinence compared to 3 participants in the

[6] Prize-based reinforcement is not suitable in contingency management treatment for problem gambling, given its similarity to gambling.

12-step group (25%). Eight weeks into treatment, 46.2% of the CM group had achieved continuous abstinence, compared to none in the 12-step group.

Importantly, equally robust findings were reported in subsequent research applying the same two therapies (CRA-CM and 12-step/disease model counselling), but utilizing randomization for group assignment and reducing urine sampling to three times per week (Higgins et al., 1993). Six month treatment programs were completed by 58% of the CRA-CM group (n = 19) and by 11% of the 12-step counselling group (n = 19); 84% in the contingency group attended for 12 weeks, compared to 26% in the 12-step group. Continuous cocaine abstinence for eight or more weeks was achieved by 68% of participants who received the CM contingencies, and by 11% of participants in the 12-step group. Mean voucher values were not reported in either study, but the first author later reported that average earnings in clinic-based voucher studies were about half of the maximum available amount (Higgins et al., 2002).

A third investigative iteration isolated the effects of voucher reinforcement in a randomized clinical trial (Higgins et al., 1994). Forty cocaine abusing outpatients were evenly assigned to two treatment groups, community reinforcement counselling with voucher-based CM, or CRA without CM. Treatment extended over a period of 24 weeks, but CM was only delivered in weeks 1 through 12. Thereafter, all participants received CRA only. The experimental treatment (CRA plus escalating voucher reinforcement up to $1,000 on continuing thrice weekly submission of negative urinalysis) resulted in significantly improved treatment completion rates compared to CRA alone (75% versus 40%; p = .03), and greater rates of continuous cocaine abstinence (11.7 weeks +/-2 weeks, versus 6.0 weeks +/- 1.5 weeks respectively). Over 50% of the CRA-CM group achieved at least 12 weeks of continuous abstinence compared to about 20% of the control group, and abstinence levels in the experimental group were not seen to drop substantially when voucher reinforcement was discontinued in the thirteenth week of treatment. Importantly, measures of psychosocial functioning were administered in this study. Results indicated that participants receiving vouchers evidenced significantly improved scores on a measure of drug abuse severity (the 'Addiction Severity Index', or ASI), and only those in the experimental group demonstrated improved scores on the psychiatric component of the ASI.

The three seminal studies described above provided a foundational basis for subsequent voucher-based contingency management research. Since then, the effectiveness evidence base has continued to

expand (Lussier et al., 2006). Very recently, a retention rate almost double that seen in standard care was observed in a study comparing treatment outcomes for 28 cocaine dependent individuals randomized to standard care (non-contingent urinalysis; psycho-education and psychosocial counselling delivered in self-help therapy groups), and 15 individuals randomized to a combined CRA approach (individual and group delivery) and vouchers contingent on negative urine tests (Secades-Villa, Garcia-Rodriguez, Higgins, Fernandez-Hermida, & Carballo, 2008). The CM condition yielded a significantly improved treatment completion rate over 24 weeks compared to the rate in standard care (73% versus 42% respectively), and a 40% rate of continuous treatment compared to 21% for standard care. This study is noteworthy in that it occurred outside the United States (indicating that support for contingency management approaches is spreading internationally), it occurred in a community outpatient treatment setting (one of few such studies worldwide) and it demonstrated that CM is effective and applicable within a range of socio-cultural environments.

Several investigations of CM for cocaine addiction have taken place in methadone maintenance clinics rather than drug-free clinic settings, since multiple substances may be abused concurrently (Stitzer & Petry, 2006). In the first such study, 37 participants were randomly assigned to either a voucher-contingent group or a non-contingent group who received vouchers regardless of urinalysis results. After 12 weeks, abstinence levels were found to be significantly higher among the voucher-contingent group (Silverman, Higgins et al., 1996). A subsequent trial found similarly robust effects (Silverman et al., 1998). In a 52-week study, the number of cocaine-negative urine samples was consistently significantly higher in clients who received take-home methadone plus vouchers, and 42% were continuously cocaine abstinent for six months or more compared to 8% of those who received take-home methadone only, and 0% of those who received regular methadone care (Silverman, Robles, Mudric, Bigelow, & Stitzer, 2004).

Improved treatment outcomes for other substances have been found in voucher-based CM studies conducted in methadone maintenance settings. Significantly increased abstinence rates have been found in treatment for opiate dependence (Silverman, Wong et al., 1996), opiate detoxification (Robles, Stitzer, Strain, Bigelow, & Silverman, 2002), and concurrent opiate and cocaine abuse (Dallery, Silverman, Chutuape, Bigelow, & Stitzer, 2001). Voucher reinforcement for multiple drug abuse has also been evaluated and shown to be effective (Downey, Helmus, & Schuster, 2000; Piotrowski et al., 1999),

although outcome improvements are less strong than when single drug use is targeted for extinction (Griffith et al., 2000; Lussier et al., 2006). Voucher-based contingency management has also effectively targeted nicotine abuse in opiate dependent individuals (Shoptaw et al., 2002).

Very recently, voucher incentives were utilized in a randomized control of smoking cessation for pregnant women (Heil et al., 2008). The end of pregnancy abstinence rate for participants who received vouchers for negative CO tests during pregnancy and afterward for 12 weeks (n = 40) was significantly higher than for participants in the control group (n = 42) (41% compared to 10% respectively). Importantly, positive effects on estimated fetal growth were found. Increases to estimated fetal weight, femur length, and abdominal circumference from 30 to 34 weeks gestation were found to be significantly greater in the contingent group, as determined by an ultrasound technician blind to group membership. Moderating factors such as maternal age, weight, drug exposure, and infant gender were controlled in the analysis. At birth, mean infant weight was not significantly different (p = .06), although trends toward better outcomes for participants in the voucher contingent group were seen on all infant measures.

Controlled studies have demonstrated the effectiveness of CM for pregnant women abusing cocaine (Elk, Mangus, Rhoades, Andres, & Grabowski, 1998), and cocaine and opiates (Jones, Haug, Stitzer, & Svikis, 2000). Although lifetime personal and societal benefits accruing from improved infant health at birth cannot be quantified, these findings are noteworthy. Higgins et al. (2004) note that incentive programs for pregnant women are particularly important, given the consequences to babies: “the fact that reinforcement theory can offer a conceptual framework for understanding a perplexing phenomenon like substance abuse by pregnant women along with a practical intervention for treating the problem is a strong testimonial to the utility of the theory” (p. 454).

Research has shown that voucher-based reinforcement can be utilized to improve continuous abstinence rates in treatment for cannabis dependence, when delivered along with cognitive-behavioural treatment or as a stand-alone protocol (Budney, Moore, Rocha, & Higgins, 2006). A combined CBT-voucher protocol did not demonstrate higher abstinence rates during 14 weeks of treatment, but during 12 month follow-up the addition of CBT appeared to sustain the effects of CM. Verification of cannabis abstinence presents challenges because positive urine tests can occur weeks after the last use, and so discrepancies between participant reports and urinalysis results are expected in early treatment. Other

studies confirm the superior effectiveness of voucher reinforcement alone during cannabis dependency treatment, as well as the additive effects of supplemental psychosocial counselling in the form of motivational enhancement therapy and cognitive-behavioural treatment seen over 1 year follow-up (Kadden, Litt, Kabela-Cormier, & Petry, 2007).

Evidence of maintained effects in voucher-based CM treatment, while limited, has been demonstrated. Seventy cocaine dependent outpatients receiving psychosocial counselling were randomized to two treatment groups, CRA plus vouchers or CRA plus non-contingent vouchers (Higgins, Wong, Badger, Haug Ogden, & Dantona, 2000). Vouchers were only available to both groups in the first 12 weeks. After 24 weeks of treatment, rates of continuous abstinence in the voucher-contingent condition were significantly higher at 12 weeks than in the control condition ($p = .05$), and were consistently higher at follow-up urinalysis testing conducted during the following year (9, 12, 15, and 18 months after entering treatment). These findings are important in demonstrating that contingent reinforcement improves substance use outcomes in short and longer terms. An earlier study found that treatment effectiveness was maintained for 6 months or more after incentives were discontinued (Higgins et al., 1995).

A less costly alternative to voucher-based reinforcement is prize-based contingency management, shown to yield effectiveness levels comparable to voucher-based reinforcement (Petry, Alessi, Marx, Austin, & Tardif, 2005). The first prize-based CM application was developed by Petry et al. (2000) in a study of 42 alcohol abusing individuals (the majority of whom were drug dependent as well). Eighty-four percent of those who received standard care plus prize-based reinforcement for negative breathalyzer tests and for completing goal-related activities remained in treatment after 8 weeks, compared to 22% of those in standard care; 69% of the CM group were abstinent at post-treatment compared to 39% of the non-contingent group. In another study ($n = 415$), stimulant abusers who received prize-based CM in outpatient substance abuse treatment showed significantly improved retention and abstinence rates (Petry, Peirce et al., 2005). Substantially increased rates of post-treatment abstinence and continuous abstinence during treatment were demonstrated in another study of stimulant abusers in community methadone maintenance clinics, although counselling attendance was not improved compared to standard methadone care (Peirce et al., 2006). Group therapy combined with prize reinforcement for cocaine abusers receiving methadone

resulted in increased attendance rates and longer periods of abstinence during treatment compared to standard treatment (Petry, Bonnie, & Simcic Jr., 2005).

Cash payments or reimbursements have been used as contingent reinforcers. When cost reimbursement of stop smoking aids (nicotine replacement; counselling; bupropion) was offered to 632 non-treatment seeking smokers but not to a control group of 634 non-treatment seeking smokers, more than twice as many in the intervention group used smoking cessation aids (10.8% versus 4.1% of controls), and more than twice as many were abstinent at 6 month follow-up (5.5% versus 2.8%) (Kaper, Wagena, Willemsen, & van Schayck, 2005). Cash for quitting (contingent upon negative carbon monoxide breath samples) was also effective in encouraging smoking abstinence among individuals not intending to stop smoking (Stitzer & Bigelow, 1982). A study of cash incentives for treatment-seeking smokers found significantly increased treatment attendance and abstinence rates at 1 month post-treatment, compared to non-reinforced controls (Volpp et al., 2006). In another study, monetary payments to reinforce carbon monoxide-negative breath samples did not reduce smoking rates in methadone maintained individuals, although payments were low (maximum $10 per week) and breath analysis was infrequent (once per week) (Schmitz, Rhoades, & Grabowski, 1995).

Research has shown that access to methadone take-home doses can act as an effective reinforcer in CM treatment for opiate or polydrug dependent individuals (e.g., Chutuape, Silverman, & Stitzer, 1998; Saxon, Calsyn, Kivlahan, & Roszell, 1993; Stitzer, Iguchi, & Felch, 1992). Methadone take-home reinforcers are less effective in reducing drug use than other types of reinforcement (Epstein & Preston, 2008), although take-homes and dosage increases are more effective than dosage decreases (Griffith et al., 2000).

Treatment Retention

Drug abstinence comprises the primary treatment outcome indicator in the majority of contingency management studies. While treatment retention outcomes are often evaluated as well, attendance is less frequently targeted as the behavioural contingency upon which reinforcement depends. When attendance is the targeted contingent behaviour, outcomes are seen to vary by type of reinforcement. For example, when vouchers contingent on attendance were provided to non-methadone maintained pregnant women, treatment retention after 30 days was only 28.9%, compared to a retention rate of 86.4% for methadone

maintained pregnant women who also received vouchers (Svikis, Lee, Haug, & Stitzer, 1997). In the first week, those in the methadone group were seen to attend an average of 5.2 days of full treatment compared to 2.8 days ($p < .001$) in the non-methadone group. This finding indicates the powerful effect of methadone reinforcement, since participants in the methadone group attended more treatment and were retained longer whether they received vouchers or not. A follow-up study found similar results, leading the authors to suggest that "direct reinforcement of attendance is not the only way to achieve the goal of better retention" (Jones et al., 2000, p. 266). However, when reinforcement consists of methadone itself, the opposite appears to be true. Counselling attendance was seen to improve in a study utilizing negative reinforcement in the form of inconvenient methadone dosing schedules and dosage reductions to the point of program discharge (Brooner et al., 2004). In this study, maintained methadone dosing and scheduling was also contingent on drug-negative urine samples.

Other research has utilized combined contingency protocols. Group counselling attendance rates were investigated in a study of 20 dually-diagnosed individuals attending treatment at a mental health centre (Helmus, Schoener, Saules, & Roll, 2003). After a 4 week baseline phase, a CM condition was initiated involving breath alcohol test administration before every session, with negative tests earning a retail gift certificate in the amount of $2.50 (non-escalating). Vouchers were discontinued after 4 weeks, followed by a 4 week non-CM counselling phase ('return to baseline'). Treatment attendance rates were found to significantly increase during the active CM phase compared to baseline (65.2% versus 45.0%; $p < .01$), and the effect was maintained during the return to baseline phase.

More recently, a study utilizing prizes instead of vouchers found a significant improvement in the number of twice-weekly group counselling sessions attended by 102 individuals receiving methadone maintenance therapy at a hospital research clinic (Sigmon & Stitzer, 2005). The prize-based protocol was developed according to Petry et al.'s (2000) fishbowl design. After the incentive program was implemented, attendance increased from 52% to 76% over 12 weeks. Some participants joined the study mid-way through the counselling period. Participants were also reinforced with daily methadone contingent upon submission of negative urine samples 3 times per week during the period of research (although methadone delivery was not contingent upon counselling attendance). This study is interesting in that positive results were seen when counselling attendance was an overt contingency target, and when a

combined variable ratio-fixed ratio schedule of reinforcement was applied (different from the fixed ratio schedule seen in voucher-based contingency management, where every contingent response is reinforced). Another study demonstrated that prize incentive programs combined with group therapy resulted in longer periods of continuous abstinence, but treatment attendance was not substantially improved even though prizes were contingent on attendance as well as abstinence (Alessi, Hanson, Wieners, & Petry, 2007).

Other Contingent Behaviours

Several other applications of CM have been seen in the literature. Voucher-based contingency management appears to effectively enhance pharmacological (naltrexone) treatment of opiate dependency, whether maximum voucher values are low ($561) or high ($1,152) (Carroll, Sinha, Nich, Babuscio, & Rounsaville, 2002). Adherence to naltrexone schedules in opiate dependent persons is improved (Preston et al., 1999), and HIV-medication compliance among affected methadone maintenance patients is shown to increase during the voucher intervention (Sorensen et al., 2007). Of particular importance to the present study are findings indicating that compliance with goal-related activities can also function effectively as a behavioural contingency. Iguchi, Belding, Morral, Lamb, and Husband (1997) randomly assigned 103 individuals receiving methadone maintenance therapy to either standard treatment (n = 35), voucher reinforcement of $5 for each negative urine test (n = 27), or voucher reinforcement to a maximum cash value of $180 ($n$ = 41) for objectively verified completion of tasks related to a treatment plan (e.g., vocational training; being on time for counselling). After 12 weeks, task-based reinforcement was found to be more effective in reducing levels of drug use than reinforcement for negative urine tests, although treatment attendance was similar between both groups receiving vouchers. Other studies have combined activity compliance and abstinence contingencies to good effect (Petry et al., 2000).

Synthesis of Findings

Four meta-analyses of contingency management outcome research have been published to date, each targeting particular foci of the literature. In one instance, researchers limited their analysis to studies utilizing voucher-based reinforcement therapy, or VBRT (Lussier et al., 2006). Other meta-analysts focused on contingency management research in general (Prendergast et al., 2006), CM delivered in outpatient methadone treatment settings (Griffith et al., 2000), and CM utilized in a day treatment program for homeless persons addicted to crack cocaine (Schumacher et al., 2007).

Lussier et al.'s (2006) meta-analysis of outcome literature on voucher-based reinforcement therapy for substance abuse treatment included 40 of 63 identified studies conducted between 1991 and 2004. Primary inclusion criteria were utilization of a control group or experimental comparison condition, and methodology permitting isolation of treatment effects. Reasons for study exclusion were sample sizes less than 10, inadequate data reporting, interventions targeting non-treatment seeking individuals, or research design precluding attribution of effects to the intervention. Studies were systematically reviewed according to quality criteria specified in Cochrane Collaboration guidelines, and analyzable data was extracted (contingent outcome target and type of drug, e.g., abstinence from cocaine use; sample size; treatment setting; research design; voucher program duration; daily voucher amounts; mode of voucher delivery, e.g., immediate or delayed). Twenty-two studies comprised designs comparing a contingent voucher group to a group receiving no vouchers, 9 studies compared a contingent voucher group to a group receiving non-contingent vouchers, and 9 studies compared a contingent voucher group to a no voucher group utilizing within subject comparison. Overall, 77.5% of studies comprised between-subject comparisons, and 22.5% were within-subject.

Studies were then categorized according to three contingent outcome target behaviours: abstinence, treatment attendance, and medication compliance. Thirty studies assigned to the first category comprised single drug investigations of cocaine, opiates, marijuana, alcohol, and nicotine (n = 19), evaluations of cocaine and opiates (n = 5), and evaluations of multiple drugs (n = 6). Effect sizes were measured as Pearson's product-moment correlation coefficients (computed with test statistics if reported, or descriptive statistics if not reported), and examined for outcome improvements attributable to VBRT. Meta-analytic software was also utilized to analyze effects of potential moderating variables. For purposes of meta-analysis, per-condition effect sizes in studies where more than one condition could have contributed to effect size (n = 9) were averaged so as to result in a single effect size per study. Effect sizes of 0.10, 0.30 and .050 were considered to reflect small, medium, and large effects respectively, indicating between-group percentage differences of 55%-45% (small effect), 65%-35% (medium effect), and 75%-25% (large effect).

Overall, a medium end-of-treatment estimated effect size of r = 0.32, p < 0.0001 (95% CI 0.26-0.38) was found. Multivariate analysis found that effect sizes were larger in studies utilizing immediate incentive delivery (i.e., same day as verification of the behavioural contingency), and where maximum

daily voucher values were higher. The largest effect size (0.68; 95% CI 0.37-0.85) was seen in a study offering the second highest daily voucher value at $29.71 (Dallery et al., 2001). The lowest effect size (0.08, 95% CI -0.32-0.46) was found in a study where maximum voucher value reached $2.14 per day (Iguchi et al., 1997), one of the lowest daily maximum values of any studies included in the meta-analysis. Of the 30 studies targeting abstinence, 16 evidenced small effects, 8 demonstrated medium effects, and 6 fell into the large effects range. Studies targeting a single drug demonstrated higher effect sizes (generally in the medium range) than when polydrug use was targeted.

Six studies were assigned to the second contingent category. In these studies, the primary therapeutic target was treatment attendance rather than drug abstinence. Estimated effect sizes ranged from 0.00 to 0.28, contributing to a small overall estimated effect size of 0.15 (95% CI 0.02-0.28). The third contingent category, medication compliance, included four studies producing an average effect size of 0.32 (95% CI 0.15-0.47). Moderating variables were not identified for studies where voucher delivery was dependent (or partially dependent) on treatment attendance or medication compliance. Overall, the estimated effect size for studies targeting outcomes other than abstinence was 0.21 (95% CI 0.02-0.47).

Researchers conducting a second meta-analysis of contingency management treatment reviewed literature published from 1970 to 2002 (Prendergast et al., 2006). Forty-seven of 203 identified studies were included in the analysis, 26 of which utilized voucher reinforcement. Reinforcers provided in non-voucher studies were methadone access, access to take-home methadone, methadone dosage adjustments, and rarely, cash or program privileges such as discharge or fee reduction. Primary inclusion criteria were utilization of CM treatment group-no CM control group designs, and adequate reporting of data. Effect sizes were calculated according to a 'standardized mean difference' calculation (*d*) where means and standard deviations were reported; otherwise, reported test statistics were used to estimate effect sizes. Effect was estimated for studies where the outcome variable was level of drug use/abstinence (since other outcomes were rarely targeted), weighted according to fixed effect and random effect methods, using end-of-treatment measures.

Calculations resulted in an overall fixed effects weighted mean effect size of $d = 0.42$ (95% CI 0.35-0.50) during treatment ($n = 16$) or at the end of treatment ($n = 31$). The magnitude of this effect translates to an equivalent success rate of 61% for treatment groups and 39% for control groups, indicating

that “CM is able to establish and maintain abstinence for many clients during treatment, thereby permitting clients to engage more productively in treatment services that promote the broader psychosocial aspects of recovery” (Prendergast et al., 2006, p. 1556). A slightly higher random effects mean effect size of $d = 0.49$ (95% CI 0.38-0.59) was found. The estimated fixed effects mean effect size was higher ($d = 0.48$, 95% CI 0.39-0.56) when analysis was limited to biologically verified outcomes (40 of 47 cases, or 85.1%). Mean effect sizes were not significantly different for during-treatment or end-of-treatment measures.

Potential moderators were examined, and results indicated that studies conducted in earlier decades (the 1970s and 1980s) had greater effect sizes (0.64) than those published in the 1990s (0.35). Prendergast et al. (2006) postulate that improved scientific rigour (e.g., intent to treat analysis) accounts for the difference, rather than some element of decline in the effectiveness of CM techniques over time. Larger effect sizes were seen in studies of cocaine or opiate abuse (0.65 and 0.66 respectively) than in studies targeting tobacco use (0.31) or polydrug use (0.42). Smaller effect sizes were found when treatment duration was longer (0.58 in studies of 1 to 11 weeks duration compared to 0.34 for treatment studies lasting 26 weeks or more), prompting the authors to draw attention to the potential for relapse regardless of treatment type, and the difficulties involved in maintaining long-term abstinence.

A third meta-analysis focused on outcomes in outpatient methadone contingency management treatment research (Griffith et al., 2000). The literature search timeframe was not specified, but publication dates of the thirty included studies ranged from 1979 to 1997 (median year: 1988). Particulars about excluded studies were not provided. All contingent reinforcement was dependent on drug use abstinence corroborated through urinalysis conducted $\leq$3 times per week. Treatment duration (reported in 28 studies) was categorized according to <12 weeks ($n = 8$), 12 to 18 weeks ($n = 13$) and >18 weeks ($n = 7$). Contingency reinforcement consisted of vouchers in 6 studies, and methadone access, take home privileges, or dosage adjustment in the remaining studies. Analytic processes similar to those utilized by Lussier et al. (2006) were employed, where effect sizes were estimated as Pearson’s correlation coefficiencies. A fixed effects model was selected because population paradigms were deemed to be limited.

Griffith et al. (2000) found a mean weighted estimated effect size of $r = 0.25$ (95% CI 0.20-0.30), indicating a post-treatment magnitude of effect approaching moderate levels. Potential moderating variables were also examined. Results similar to other meta-analytic findings were seen, where effect size

was larger when a single type of drug use was targeted, and when reinforcers were delivered immediately. Methadone increases and take-home privileges exhibited the largest effect sizes (0.55 and 0.39), and methadone decreases and combined reinforcement types yielded the lowest magnitudes of effect (0.21 and 0.19). Effect size was lower when two or fewer weekly urine samples were collected (0.16), compared to 0.38 for three sample collections per week. Meta-analytic findings were "consistent with general principles of learning. That is, in order to change behavior the reinforcement should be immediate, targeted toward a single behavior, and closely monitored" (Griffith et al, 2000, p. 63.). Given that methadone itself is a strong reinforcer from a pharmacological perspective (stronger than voucher reinforcement in this meta-analysis), these findings are not unexpected. The overall estimated effect size is slightly lower than that seen in the Lussier et al. (2006) meta-analysis of voucher-based CM outcomes described above.

Finally, a meta-analysis was recently conducted to determine abstinence prevalence based on published results (n = 5) from four contingency management trials of day treatment for crack cocaine abuse in 644 homeless individuals, comparing data extracted at 2 month and 6 month treatment periods for each 5 year 'arm' of the 15 year period of research (Schumacher et al., 2007). While treatment composition varied within each 5 year period, usual day treatment was reportedly comprised of a variable mix of phase-based (1-2 months; 3-6 months) therapies: outpatient counselling, 12-step groups, therapeutic goals management, medical services, non-contingent housing and employment referrals, HIV/AIDS education, and organized monthly social activities. Enhanced care comprised day treatment plus provision of contingent housing, or housing and work therapy and aftercare all contingent on drug urinalysis-verified drug abstinence (scheduled and random), and in one trial, the addition of vouchers on goal achievement. Contingency management treatment consisted of contingent housing and work therapy.

Data from nine distinct therapeutic 'arms' was statistically integrated using a weighted 'least squares' model fitting method. Abstinence prevalence rates were then reduced by 0.25 in a 'sensitivity analysis' utilized to address possible bias from the first treatment arm that had conducted single measures of abstinence at 2 and 6 months. At 2 months, abstinence prevalence was found to be 0.73 for CM alone, 0.71 for CM and day treatment combined, 0.52 for day treatment alone, and 0.12 for neither treatment. Abstinence prevalence rates at 6 months were 0.52 for CM only, 0.54 for CM and day treatment combined, 0.27 for neither treatment, and 0.25 for day treatment alone. While abstinence prevalence decreased

between 2 and 6 months for CM alone, effects were maintained to a greater degree than for day treatment alone (which at 6 months was reported to be lower than if neither treatment had been delivered). Although the authors did not quantify potential biases other than to note the sensitivity analysis procedure, other potential mediators could be seen in the report (e.g., complexity and variability of program delivery, an extended period of data collection (15 years), variability within and among treatment 'arms'). Additionally, the meaning of 'neither treatment' was not made clear, although it did not appear to comprise a no-treatment control condition. Neither were the relative effects of voucher incentives versus housing and work-related contingencies addressed. The most salient finding was the improvement in abstinence prevalence when provision of housing was contingent upon negative urinalysis results. In one included study, participants were randomized to one of three treatment groups, contingent housing, non-contingent housing, and no housing (Milby, Schumacher, Wallace, Freedman, & Vuchinivich, 2005). It is unfortunate that access to housing was only achieved through research participation. It is also sad to think that housing was denied to some participants as a function of such participation (or that participants could be taken from their homes after two consecutive positive urine tests). The conceptualization of access to housing as an appropriate reinforcement contingency for research purposes is a difficult one. Importantly, study findings indicated that abstinence rates were higher *in those who had a home* compared to those who didn't, and observed differences between improved abstinence prevalence in the contingent and non-contingent groups were not statistically significant.

Effectiveness evidence is substantiated through published literature review. In an excellent overview of voucher-based outcome studies conducted between 1991 and 2003, Higgins et al. (2004) note that significant improvements ($p < .05$) in voucher-contingent behaviour were reported in 85% of 55 peer-reviewed publications. Treatment duration across studies ranged from less than 1 week to 78 weeks, maximum voucher amounts ranged from $7 over 1 week to $9197 over 78 weeks, and average treatment duration and maximum voucher value was about $1000 over about 12 weeks.

The limited range of evidence discussed previously shows that when contingent behaviours other than drug use comprise the primary reinforcement target (e.g., treatment attendance), outcomes also improve compared to non-CM conditions. Overall, improved treatment outcomes appear to be best achieved when incentive values escalate over time (based on biological verification of continuous

abstinence), when reinforcers are presented immediately and are not delayed, and when incentive values are larger rather than smaller (Higgins et al., 2004; Stitzer & Petry, 2006). A study of 75 cocaine and heroin abusers undergoing pharmaceutical treatment combined with CM treatment who received vouchers escalating in value to a maximum of $US738 over 3 months found that drug-free urine samples decreased when incentive values were held constant with a maximum value of $US108 over the next three months of treatment (Kosten, Poling, & Oliveto, 2003). A mediating factor in this study may have been an increased response requirement introduced in treatment months 5 and 6, when two (and then three) drug-free specimens were consecutively required for voucher eligibility.

It is important to note that the meta-analytic findings reviewed above report lower effect sizes than those reported in Pallesen et al.'s (2005) meta-analysis of psychological treatments for problem gambling (d = 2.01 at end of treatment; d = 1.59 at follow-up averaging 17 months). The end-of-treatment effect size of 2.01 is also higher than effect sizes reported in other meta-analyses of substance abuse treatment outcome research, where estimated overall mean end-of-treatment effect sizes are d = 0.34 (Prendergast, Podus, Chang, & Urada, 2002) and d = .45 (Dutra et al., 2008). Notably, studies included in Prendergast et al. and Dutra et al. were limited to treatment group-control group investigations. As noted in Chapter 3, the majority of individual effect sizes calculated by Pallesen et al. (2005) comprised single group pre-post comparisons. Effect sizes of psychotherapy outcomes in general are also lower than those reported by Pallesen et al. (2005). A review of 302 meta-analyses of psychological, educational, and behavioural treatment outcome studies found an overall mean effect size of d = 0.50 (Lipsey & Wilson, 1993).

Pallesen et al. (2005) did not interpret their estimated effect size in terms of percentage differences between comparison outcomes, likely because of the preponderance of pre-post comparisons. Other meta-analytic researchers have done so, however (e.g., Prendergast et al., 2006; Prendergast et al., 2002). Based on evidence that percentage differences between treatment group and control group outcomes are typically about one-half of d (Prendergast et al., 2006), Pallesen et al.'s (2005) estimated effect size of 2.01 would translate to a 100% difference in outcomes for treated individuals. While this assumption presumes that a 'one-half of d' estimate would hold for pre-post comparisons, Pallesen et al.'s (2005) results indicate that treatment for problem gambling could be up to three times more successful than treatment for substance abuse, which seems unlikely based on evidence from the literature. Also, clinical wisdom suggests

otherwise. For example, problem gambling is strongly viewed by Gamblers Anonymous as a chronic disorder, and formalized treatment agencies place equal emphasis on the importance of relapse prevention and aftercare in recovery from problem gambling.

Pallesen at al. (2005) recognize the apparent difference between their estimated effect size of 2.01 and the fixed effects relative risk effect size of 0.44 calculated by Oakley-Browne et al. (2004), attributing the difference primarily to the exclusion of pre-post studies by Oakley-Browne et al. (2004). Also, Oakley-Browne et al. (2004) calculated between-subjects effect sizes for studies where control conditions consisted of a treated group, while Pallesen et al. (2005) did not. Further, Pallesen et al. (2005) drew attention to the extreme variability in outcome measures across included studies (three types of gambling outcomes (gambling behavior, diagnostic criteria, and self-perceptions) comprising 15 distinct measures, averaged to determine a single per-study effect size), noting that some measures were inadequate or poorly described. This uneven quality of included studies may speak to the fact that the effect sizes reported by Pallesen et al. (2005) are quite large relative to treatment research in other areas.

As discussed in Chapter 3, attention has been drawn to methodological shortcomings in problem gambling treatment outcome research, and recommendations for improvements have been made (Walker et al., 2006). Westphal (2006) identifies similar methodological shortcomings, including non-randomized study design, methodological differences that make outcome comparisons difficult, and improper analysis of data relative to group attrition. In the latter circumstance, over-estimated effects may result when data is analyzed only for participants who complete treatment. Attrition rates for all types of treatment can be significant. In compiling summary statistics based on a synthesis of 24 problem gambling treatment outcome studies where drop-out was reported, Westphal (2006) found attrition rates as follows: 1) for short term pharmacotherapy (eight included studies, 8-16 weeks in length), from 11.3% to 40%; weighted average: 23.5%, 2) for psychosocial treatments (six included studies), from 32% to 55.4%; weighted average: 42%, 2) for long term pharmacotherapy (two included studies, 6 month duration), from 48.3% to 59.4%; weighted average: 50.4%, 4) for GA (three included studies), from 50% to 69.4%; weighted average: 67.5%, and 5) for community multimodal treatments (five included studies), from 29% to 83%; weighted average: 75%. While this summary is based on limited evidence that cannot be generalized, it

nonetheless underscores the potential issue of high attrition in research-based and community-based treatment.

These methodological limitations may indicate a possibility that Pallesen et al.'s (2005) estimated effect size of 2.01 may be somewhat inflated overall. Arguably, meta-analysis of contingency management outcomes might reflect a higher degree of accuracy and validity than meta-analyses of psychological treatment outcomes, given that outcome measures are more consistent across studies (i.e., biologically verified abstinence of drug use). Still, the possibility exists that problem gambling is more treatable than substance abuse.

In summary, a growing body of research evidence has demonstrated that administration of positive reinforcement in the form of immediate, incremental material incentives effectively and consistently improves usual treatment outcomes (substance use; treatment attendance; psychosocial functioning). Retention in treatment appears to improve most significantly in studies where abstinence is the targeted behavioural contingency. Most importantly, a recent meta-analysis of psychosocial treatment for substance abuse (randomized controlled clinical trial outcomes) found that the estimated mean effect size at post-treatment was higher for contingency management treatments (n = 14) than for other treatments (CBT; relapse prevention; CBT + CM) (n = 20) (Dutra et al., 2008). The estimated mean effect size for CM was moderate to high at d = 0.58 (95% CI 0.25-0.90), compared to a moderate overall mean effect size of d = .45 (95% CI 0.27-0.63). Dutra et al. also found that the mean CM treatment drop-out rate (29.4%) was lower than the overall drop-out rate of 35.4%, and the lowest of all types of psychosocial treatment.

Applicability to Problem Gambling Treatment

A comprehensive database search utilizing the title search terms: 'contingency management' [and] 'gambling' (EBM Reviews; PsycINFO; Medline; Academic Search Complete; Addiction Abstracts; Web of Science; Science Direct; Psychology and Behavioral Sciences; Google Scholar), found only one reference, a study of prize-based CM administered to stimulant users seeking treatment at outpatient substance abuse or methadone clinics (Petry, Kolodner et al., 2006). The study was conducted in response to outside criticisms that rewards administered in the form of chances to win prizes might lead to increased gambling behaviour among substance abusers. Findings indicated that gambling behaviour was not

increased over a 6 month follow-up period in any of the participants (n = 803) whether or not they were receiving CM along with standard group counselling (about half of the sample).

Support for CM's suitability as a problem gambling intervention was first expressed a number of years ago (Petry & Roll, 2001), but research has not been undertaken until very recently. A treatment outcome study currently ongoing at the University of Connecticut Health Center's research-based addictions treatment clinic (Weinstock, 2007) is the only known study of CM for problem gambling outside of the present investigation. The researchers intend to compare participant outcomes after delivering eight sessions of cognitive-behavioural treatment plus voucher-based reinforcement of activity compliance, to outcomes after eight sessions of CBT alone. Several hundred pathological gambling individuals are to be evaluated 6 times over a 2 year follow-up period. Recruitment is nearing completion (personal communication, J. Weinstock, January 22, 2008), and results are highly anticipated.

Rationale for the present voucher-based study is grounded in the robust body of research demonstrating that contingency management treatment results in significantly improved outcomes compared to non-CM treatment or no treatment. The superior effectiveness of CM over regular substance abuse treatment warrants an investigation into CM for problem gambling. It is possible that the effect of contingency management might be stronger for problem gamblers because CM is more like gambling than substance use (material rewards being central to both CM and gambling). Furthermore, CM programs have been effectively implemented by community practitioners in the United States (Kellogg et al., 2005; Peirce et al., 2006; Petry, Peirce et al., 2005) and in Spain (Secades-Villa et al., 2008). Voucher-based motivational incentive programs have been adopted in about 340 American substance abuse treatment centres (Ducharme, Knudsen, Roman, & Johnson, 2007). It is reasonable to think that CM could work equally well as a therapeutic technique in community-based treatment for problem gambling. Important considerations in making this theoretical argument are: 1) problem gambling is particularly suited to the application of a behavioural treatment component such as CM, given the influence of behavioural mechanisms in its development and maintenance; and 2) what may be seen as 'classic' application of CM in substance abuse treatment (strategic manipulation of environmental contingencies) may be feasibly applied to problem gambling treatment.

Recent contingency management research has focused on addictive behaviours for which physiological tests exist to verify usage or non-usage in a timely manner (e.g. urinalysis). Of course, no such test exists for states of non-problem gambling or abstinence from gambling. Admittedly, this difference contravenes an accepted testing standard on which research-based determination of CM effectiveness has traditionally depended. But such a difference is neither unique nor inviolable. The idea that treatment-related goal achievement can serve as an effective reinforcement contingency is not new. Reinforcement of activity compliance has been shown to contribute to improved treatment outcomes when added to contingency management studies utilizing urinalysis or breathalyzer test results as primary contingencies (Bickel, Amass, Higgins, Badger, & Esch, 1997; Petry et al., 2000). Although contingent reinforcement of abstinence demonstrates greater improvement in treatment outcomes than reinforcement of goal-based activities, both contingency conditions outperform standard treatment alone (Petry, Alessi et al., 2006). Research has also shown that voucher reinforcement of activity compliance can reduce drug use in and of itself (Iguchi et al., 1997).

In discussing the theory behind effective treatments for substance abuse (including motivational interviewing, motivational enhancement therapy, cognitive-behavioural treatment, and contingency management), Moos (2007) states that "…the probable active ingredients that underlie effective psychosocial treatments for substance use disorders are conceptually comparable to the social processes that protect individuals from developing substance use problems" (p. 110). Active change precipitants are thought to include supportive environments, directed goal-setting, self-efficacy and coping skills, broader ranges of life choices, and deriving reward from other activities and lifestyles (Moos, 2007; Oetting & Donnermeyer, 1998). All of these activities can be seen as pertinent to contingent reinforcement of activity completion.

A broadened view of what constitutes an effective reinforcement contingency is founded on the idea that concurrent involvement in social, recreational, or vocational activities facilitates treatment progress (Smith & Meyers, 1995), and that each small step taken toward reduced drug use is important (Morral, Iguchi, & Belding, 1999; Petry, Tedford, & Martin, 2001). And while research has shown that contingency management treatment achieves superior outcomes, it still remains that some study participants do not respond optimally to an abstinence-based contingency reinforcement protocol.

Therefore, “an alternate, or synergistic, approach to reinforcing drug abstinence directly is to reinforce development of behaviors that may compete with drug use and thereby facilitate abstinence” (Petry et al., 2001, p. 34). Activity compliance contingencies may be the most practical and cost-effective of any CM strategy intended for application in community treatment settings (Epstein & Preston, 2008).

Evidence also exists to support the idea that strategies to verify activity compliance exist. First, early outcome research on CM and smoking found evidence of reduced tobacco use based solely on self-reported data (Paxton, 1980; Winett, 1973). Later studies utilized biological verification in the form of carbon monoxide breath tests (Rand, Stitzer, Bigelow, & Mead, 1989; Stitzer & Bigelow, 1985), and findings corroborated earlier self-reported evidence. Second, the only other researchers in the process of investigating CM treatment for problem gambling argue that methods to verify self-reported activity compliance exist, and suggest that treatment deliverers follow a strict verification protocol requiring the submission of hard evidence (Weinstock, 2007). Evidence might take the form of a receipt from a business, organization or recreational facility, or a signed note confirming attendance at Gamblers Anonymous, and so on. Even under such protocol, verification may still be subjective (for example, a client could claim any generic receipt as their own). While limitations to the validity of self-reported addictive behaviour exist (Del Boca & Noll, 2000; Harrison, 1995), a general concordance between self-reported gambling behaviour and corroboration by a third party has been demonstrated (Hodgins & Makarchuk, 2003). These findings are noteworthy, and of primary importance when considering the suitability of CM as a strategy to treat problem gambling. Verification protocol is a unique aspect of CM treatment for problem gambling that will benefit from further research (especially relative to clinical studies such as the present investigation where collateral participation is not likely, and where verification procedures are subscribed by organizational parameters).

Historically, treatment protocols for alcohol and substance use addictions have been developed according to evidence-based best practices. Contingency management effectiveness is well-substantiated, and researchers continue to call for communities to actively support contingency management applied in formal treatment settings (Higgins et al., 2002; McLellan, 2001; Petry et al., 2000). However, contingency management treatment programs cost money. Early on, researchers acknowledged that availability of reinforcement incentives might limit the application of CM in community treatment (Stitzer & Bigelow,

1978). Program costs remain a concern today (Higgins & Silverman, 2008). Even so, cost concerns can be addressed. Weinstock (2007) suggests that rewards don't necessarily have to consist of vouchers, and may include items such as clinic privileges (e.g., a prime parking spot, so as to reduce external deterrents to treatment attendance). He further suggests that donations from community agencies are entirely feasible (e.g., local chambers of commerce), given the wide-ranging circle of societal harm caused by problem gambling.

Addictions treatment research has shown that contingency management effectively improves treatment outcomes (rates of abstinence and continuous abstinence; treatment attendance and completion; psychosocial functioning) when combined with psychosocial counselling in various forms: community reinforcement approaches (Higgins et al., 1994; Higgins, Sigmon et al., 2000), cognitive-behavioural therapy (Epstein, Hawkins, Covi, Umbricht, & Preston, 2003; Morgan, 2003) and multimodal treatment programs (Prendergast et al., 2006). Qualitative findings indicate that client perceptions of self-esteem, success and accomplishment are increased as a result of receiving rewards (Kellogg et al., 2005). Perceived quality of life is seen to significantly increase over time in those who receive intensive outpatient treatment plus contingency management, while quality of life perceptions of those in standard treatment remain constant (Petry, Alessi, & Hanson, 2007). The superior potential of CM to enhance retention may be especially important as clients experience early successes, thereby building hope and confidence in continued treatment. Ultimately, rates of treatment-seeking could increase as positive results accrue and become more generally known.

We know from the addictions literature that drop-out rates can be significant. Reported reasons for drop-out include low levels of client motivation, dissatisfaction with the therapy or the therapist, external or logistical difficulties in treatment attendance, or client determination that further treatment is not needed (Stark, 1992). We also know that few problem gamblers seek help at formalized treatment agencies. Self-reported reasons for treatment-seeking reticence include wanting to handle the problem alone; feeling stigmatized, embarrassed, or prideful; not recognizing that a problem exists or feeling that help isn't needed; inability to talk about and share problems; and being unaware of treatment or whether it is available (Hodgins & el-Guebaly, 2000). Notably, a study of former and currently active problem gamblers found that those experiencing more severe problems were more likely to have received significant

treatment of five or more exposures to self-help or targeted formal treatment (Hodgins & el-Guebaly, 2000).

Historically, a paucity of research exists regarding strategies to increase treatment seeking and reduce drop-out (Agosti, 1995; Substance Abuse & Mental Health Services Administration, 1995; Vaillant, 1995), despite the fact that treatment attendance and completion are associated with the best outcomes (Grant et al., 2004; Simpson, Joe, Broome et al., 1997; Simpson, Joe, Rowan-Szal, & Greener, 1995; Williams & Chang, 2000). This apparent disconnect persists today. An American initiative to enhance treatment access and retention, known as *The Network for the Improvement of Addiction Treatment*, brings attention to this important issue (McCarty et al., 2007). Very recently, a study of treatment-seeking substance abusers was conducted to evaluate the effects of interventions posited to improve linkage with treatment (Rapp et al., 2008). Results showed that a 1 hour MI session (n = 226) had no greater effect on whether clients entered treatment than a usual 'standard of care' condition delivered during clients' first visits to centralized treatment intake units (n = 230). A 'strengths-based case management' condition (n = 222) continued over one to five sessions, and demonstrated a significantly higher rate of treatment linkage compared to usual care. Even though such findings are promising, case management strategies may not be feasible to implement in community-based outpatient treatment agencies. But MI is already commonly practised. If MI alone is not enough to improve treatment linkage, then MI accompanied by an evidence-based motivational enhancement program (i.e., contingency management) may be indicated.

Rationale for the present argument comes down to a series of logical statements. Traditional problem gambling treatment approaches are known to be effective, but few people seek treatment, drop out rates are high, and some people fail to respond. Contingency management is known to increase the effectiveness of substance abuse treatment outcomes and facilitate client retention. Problem gambling behaviour is likely to be at least as sensitive to CM treatment effects, given the etiological influence of operant conditioning that is particularly relevant to gambling behaviour, and the compositional similarity between CM and the activity of gambling. Therefore, contingency management added to regular treatment for problem gambling is likely to improve outcomes and retention rates for a greater number of treatment seekers.

Based on this rationale, the pilot study was designed and carried out in a research spirit patterned after researchers who were pioneers in voucher-based contingency management treatment. In responding to perceptions that incentive reinforcement is contrived or artificial, they stated:

> In our opinion, the incentives were no more contrived than the cocaine with which they were designed to compete. The rationale behind the use of material incentives is to arrange conditions that encourage initial abstinence and retain individuals in treatment, thereby providing more time for the difficult task of getting them involved with more naturalistic contingencies of reinforcement for abstinence (Higgins et al., 1991, p. 1223).

A similar line of reasoning is offered here. Gift card incentives are no more contrived than mechanisms of operant conditioning built into the activity of gambling itself, mechanisms that contribute to the development and persistence of problem gambling behaviour and are targeted for change as part of a comprehensive, evidence-based, biopsychosocial approach to treatment. While negative beliefs about behavioural therapy exist (e.g., it fails to recognize or honour the individualized nature of the human spirit; it is morally suspect and controlling) (Kratochwill & Bijou, 1987), it still remains that the present goal of helping suffering individuals arises from an ethical perspective that is, above all else, person-centred and humanistic.

CHAPTER 5: RESEARCH METHODOLOGY

A detailed procedural view of the contingency management pilot study is presented in this chapter. Discussion comprises two categories: research design and research process. Topics include project background, research objectives, mixed methods approach, study design, and research procedures.

Background

The study was conceived primarily as a result of the principal investigator's prior association with staff and clients at AADAC. A four-month internship while completing an undergraduate Addictions Counselling degree at the University of Lethbridge provided a well-mentored and much-valued complement to an ongoing keen interest in problem gambling treatment from perspectives of pragmatism and broad applicability. While in the process of determining a thesis topic and choosing a suitable research design, the idea of a new collaboration was born. An opportunity to re-connect through research was one that could not have been more fortuitous, given AADAC's announcement in 2004 to include enhancement of problem gambling services in its business plan through 2007 (AADAC, 2004). The Commission's problem gambling treatment framework seemed a natural fit for the present research study, in view of its mandate to provide a broad range of best practice treatment options based on demonstrated research efficacy. Supported by AADAC supervisors and the University of Lethbridge Thesis Committee Supervisor, a decision was made to submit an AADAC Third Party Research Application.

Planning and preparation for the study took place from November 2004 through February 2005. First, it was necessary to ensure that the client base was large enough to support an adequate sample over a 9 month period. Between April 1, 2002 and March 31, 2003, 314 clients of the proposed treatment site reported concern over past-year gambling participation, and 247 completed the SOGS (personal communications, area supervisor, November 16, 2004). During the month of February, 2004, 41 individuals who were assessed for service indicated concern about gambling use in the last 12 months (a 64% increase over the same month in 2003). Open/active files for problem gambling clients numbered 32 as of February 4, 2004. When extrapolating to a 9 month timeframe based on 2002-2003 service statistics, a sample of 20 participants would equate to: 1) about 8.5% of all clients concerned about past-year gambling, or 2) about 11% of those who completed the SOGS. Based on these statistics, and on evidence demonstrating extremely low rates of client refusal in contingency management treatment studies (less than

5%) (Petry, 2000a), an intake rate totaling 20 individuals over a 9 month period (or about 2 clients per month) was considered theoretically achievable. Planning discussions with the supervisor indicated that staff would be available and ready to participate in the research. The logistical details of on-site research were finalized.

An application to conduct AADAC Third Party Research was submitted to AADAC Research Services on November 30, 2004, and notification of approval was received December 13, 2004. To secure funding for the project, a Small Research Grant application was submitted to the Alberta Gaming Research Institute on January 5, 2005. An Application for Ethical Review of Human Subject Research was approved by the University of Lethbridge Human Subject Research Committee on February 15, 2005. On April 12, 2005, the project was approved by the Alberta Gaming Research Institute for the research period May 15, 2005 to May 15, 2006, and the period of research began. The end-of-research date was subsequently extended to August 15, 2006 to allow for completion of follow-up evaluations and full dispensation of the research budget.

Mixed Methods Research Approach

When choosing a research design, factors to be considered include philosophical assumptions that will drive formulation of knowledge about the object of study (House, 1994), as well as the intended audience and the research environment (Cresswell, 2003). A methodological approach is selected that is best suited to answer specific research questions and facilitate valid conclusions. Intervention outcome studies often comprise research framed within a positivist, or scientific philosophical approach. This quantitative paradigm implies that objective 'truth' about human interactions exists, can be validly operationalized, reliably measured, and statistically analyzed to explore causal relationships, and results may be generalizable to a population-wide level if well-supported by adequate statistical power (Cresswell, 2003; Monette, Sullivan, & DeJong, 2002). Alternatively, a qualitative, post-positivist research perspective proposes that it is important and necessary to subjectively understand individual experiences and ascribe meaning to human interactions when studying socially constructed phenomena (Lincoln & Guba, 1985; Patton, 2003), given that factors such as individual behaviour, attitudes and beliefs, environmental/external impacts, and socio-cultural dynamics determine the expression of social phenomena (Crossan, 2003). This axiological standpoint presumes that social science is value-laden, and that qualitative exploration allows

the researcher to gain in-depth understanding of human experiences and behaviour through the eyes of study participants. Depending on the research purpose, qualitative findings supported by credible data collection and rigourous analysis may also be tentatively transferable to wider populations (Fossey, Harvey, McDermott, & Davidson, 2002).

Quantitative research is useful for many applications: testing theory; replicating research; analyzing the effects of interventions; measuring behavioural or attitudinal change; assessing needs; evaluating programs. Indeed, a usual precursor of clinical or organizational change is establishing the efficacy of new treatments or procedures. Qualitative research is similarly useful and can address many of the same research applications, but through subjective interpretation rather than objective observation. The field of health sciences is comprised of individual life experiences bound by socio-cultural interactions (House, 1994). We can perceive, define, and measure aspects of socially constructed phenomena, and we can also strive to understand them. For example, outcome studies may show whether or not a given treatment is effective, while explorative interviewing may reveal the meaning of the treatment experience within the context of research participants' lives.

Quantitative and qualitative paradigms need not sit at opposite ends of the research spectrum. Proponents of integrated research design have been advocating for and practising mixed methods for almost 40 years (Datta, 1994). Denzin (1978) stated 30 years ago that

> No *single* method ever adequately solves the problem of rival causal factors… Because each method reveals different aspects of empirical reality, multiple methods of observations must be employed. This is termed triangulation. I now offer as a final methodological rule the principle that multiple methods should be used in every investigation… (p. 28).

The 'final methodological rule' stated above is debatable. Mixed methods research designs may be neither feasible (e.g., within budgetary constraints; within research parameters), nor advisable (e.g., best suited to answer a specific research question). Further, investigators who conduct research exclusively within one paradigm or the other typically do not suggest that their findings are absolutely conclusive. Nor is such a claim likely to be made by investigators who combine research methods to study a given phenomenon. A primary driving factor behind the application of mixed methods design appears to be an effort to broaden and deepen the range of data available for analysis (Patton, 2003). Additionally, triangulated data analysis

may reveal content similarities, highlight differences, or expose contradictions that might remain unexplored under singular paradigms (Jick, 1979). In other words, a more comprehensive analysis of data is possible.

Mixed methods design was chosen for the present pilot study because of dual researcher interest in CM treatment effectiveness (the phenomenon measured) as well as participant treatment experiences relative to processes of behavioural change (the phenomenon understood). Additionally, the subject matter and research environment were well-suited to a multiple measures approach. Combined research methods and triangulated data analysis were necessary to answer research questions arising from positivist and post-positivist paradigms.

Research Objectives

This thesis had two main research goals. The primary purpose was to investigate the effectiveness and utility of providing contingency management within the treatment regime of individuals receiving outpatient therapy for problem gambling at AADAC. A secondary aim was to investigate client experiences of receiving contingency management and counsellor experiences of administering contingency management.

The specific research questions were:

1. Does regular treatment plus contingency management produce higher treatment retention relative to regular treatment?
2. Does regular treatment plus contingency management produce superior clinical outcomes relative to regular treatment?
3. How do clients view and experience contingency management as a therapeutic tool?
4. How do therapists view and experience contingency management as a therapeutic tool?
5. In light of the empirical evidence as well as counsellor and client experiences and perceptions, what recommendations arise from this research investigation concerning the application of CM to clinical treatment for problem gambling?

Research Design

The empirical part of this study was originally intended to be a statistical comparison of clinical outcomes in two different groups. The Intervention Group would consist of 20 problem gamblers receiving

regular outpatient treatment plus CM in one AADAC area office. The Control Group would consist of 20 problem gamblers receiving regular outpatient treatment without CM from AADAC counsellors in another AADAC area office. The clinical outcomes of comparison would be a) treatment retention between the two groups (number of sessions attended; percentage that completed treatment); and b) clinical outcomes 3-4 months after participants' last session (past month frequency of gambling; past month time spent gambling; past month money spent gambling; and past month 'life functioning'). However, an inability to recruit a sufficient number of participants for either the Intervention Group or the Control Group changed the design to a more descriptive comparison of a) treatment retention in the Intervention Group relative to treatment retention documented for AADAC outpatient services generally; and b) pre-post gambling and life functioning changes in the Intervention Group relative to clinical outcomes established in the problem gambling treatment literature.

Qualitative investigation consisted of follow-up interviews with participants. Semi-structured interviews were conducted with problem gamblers who received the contingency management treatment protocol, and with therapists who administered the CM treatment component.

Research Procedure

The research process consisted of counsellor training, client recruitment, baseline evaluation, treatment application, and follow-up evaluation. Each research component is described below.

Counsellor Training

On June 6, 2005, the principal investigator conducted a group training session for six therapists (two administrative staff members also attended). The 1.5 hour presentation took place during a regularly-scheduled staff meeting, and consisted of an overview of contingency management theory, evidence-based effectiveness research, and techniques of therapeutic application selected from the treatment literature. To provide therapeutic structure and to ensure adherence to contingency management techniques, a treatment protocol manual was distributed and explained in detail (attached as Appendix C). A question and answer period followed, consisting of logistical questions to do with the practicalities of treatment delivery. Counsellors were encouraged to contact the principal investigator with any follow-up questions. Two counsellors were not in attendance at the training session. Extra protocol manuals were left at the AADAC

office for their use, and follow-up telephone calls were made to ensure clarity regarding the research method and counsellor roles.

A new counsellor was hired late in 2005 (a circumstance discovered by the investigator when a participant was recruited by the counsellor in early January, 2006). Immediate contact was established (via telephone and then in-person) to review research protocol and ensure comfort with all aspects of the study. Also, a counsellor who had been on leave resumed work in early 2006 (also discovered after the counsellor had recruited a client). Contact was similarly established. Both counsellors participated in recruitment for 2 to 3 months, as opposed to 9 months for the other counsellors.

Client Recruitment

The recruitment period began on June 7, 2005 and ended on March 7, 2006. All new adult clients seeking treatment for problem gambling were consecutively eligible for study inclusion. Individuals with co-occurring alcohol and/or drug problems were not excluded. Client eligibility was determined by counsellors based on results of a formal assessment procedure to determine whether or not outpatient treatment was indicated. Assessment included the client self-administered lifetime and past-year SOGS, utilized by AADAC since 1994. Research has shown the SOGS to be a valid, reliable, and commonly-used instrument with which to determine problem gambling study eligibility (Echeburua et al., 2000; Hollander et al., 2000; Kim et al., 2001). Once deemed eligible, clients were asked to join the study, explained in very general terms (e.g., 'the research will evaluate treatment results for problem gamblers receiving regular outpatient treatment, compared to results for those receiving regular treatment plus contingency management through positive reinforcement'). To encourage participation, counsellors were asked to recognize the positive nature of the study (participants to receive enhanced treatment with gift card rewards up to $250 for recognition of hard work in achieving treatment goals; long-term benefits such as help for other individuals with gambling problems and contribution to the treatment knowledge base; an additional $50 gift card for participating in the follow-up interview). Clients who agreed to participate were asked to sign a consent letter explaining the study purpose, informing them of eligibility for receipt of gift cards, and assuring anonymity and confidentiality (see Appendix D).

Baseline Evaluation

Baseline evaluation on intake consisted of administration of AADAC's usual assessment tools: the client self-administered SOGS (and alcohol and/or drug screens if applicable), 2) the self-administered Treatment Client Information Form, 3) the self-administered Alcohol, Drug Use & Gambling Information Form, 3) and the counsellor-administered Adult Screening Assessment Interview Form. Instrumentation is included, with permission, as Appendix E. Usual intake procedure included gathering detailed information on gambling behaviour severity and other addictive behaviours if applicable, per Section A1 of the Adult Screening Assessment Interview Form. Research protocol required counsellors to ensure that highly specific and contextualized behavioural indicators were included: past month frequency of gambling (number of visits to gambling venues/number of gambling occasions), time in hours spent gambling in the past month, and money spent on gambling in the past month (net of losses and wins). Additionally, counsellors were asked to administer a scale measure of past month life functioning in four specific areas of life identified within question A4 of the Adult Screening Assessment Interview Form (areas deemed likely to be most negatively affected): Family, Relationships/Social Life, Financial, and Emotional/Psychological. For each area, counsellors were directed to ask: '*On a scale of 1 to 5, with 1 being low and 5 being high, how would you rate the quality of your functioning in the area of*_____*?*'.

Prior to the start of recruitment, the area supervisor and administrative staff were asked to consider revising the Adult Interview Form for the period of research. After discussion, it was agreed that hard copy descriptors would be typed into sections A1 and A4 of the form, to facilitate the accurate and complete recording of participants' past month gambling behaviour and life functioning. Research protocol also required that counsellors gather and confirm the accuracy of all required demographic information at baseline (client age, gender, ethnicity, marital status, employment status, mailing address and phone number), and to ensure that the other assessment forms had been completed in full by participants.

Baseline evaluation procedures were designed to follow existing AADAC assessment procedures closely, in order to minimize counsellor time and effort and reduce data gathering complexity as much as possible, thereby maximizing likelihood of counsellor acceptance of/participation in the research. The augmentations described above were considered necessary to ensure an adequate and standardized level of data capture for purposes of treatment outcome comparisons.

Regular Treatment Regime

As is the case in most formal treatment agencies, regular treatment comprises an eclectic mix of theory and application, largely adapted from evidence-based therapies with demonstrated effectiveness in the treatment of alcohol and substance addictions (AADAC, n.d.; Tavares, Zilberman, & el-Guebaly, 2003). Multi-modal approaches take "… a practical stance in favour of abstinence and emphasizing support and self-help" (AADAC, n.d., p. 4.3). As listed in *Treatment Tools: A Resource for Counsellors Treating Problem Gambling* (AADAC, n.d.), accepted approaches to counselling for problem gambling are: referral to GA, group psychotherapy, marital/family therapy, psychoanalysis, behaviour modification, cognitive therapy, brief interventions, and harm reduction strategies. Efforts to increase the community support network are also made (e.g., referrals to debt counselling or other social service agencies). In addition to stopping or reducing gambling, a goal of treatment is to help suffering individuals who invariably feel hopeless, worthless, and helpless, so that they may become hopeful and self-empowered, gain self-acceptance, and achieve a sense of self-efficacy with the confidence and skills to change behaviours.

Usual individualized treatment is tailored to the client's specific stage of change, as adapted from Prochaska, Norcross, and Diclemente (1994). Counsellor tasks for each change stage are:

> Precontemplation: To raise doubts; increase the client's perception of the risks and problems with current behaviours.
>
> Contemplation: Tip the decisional balance: evoke reasons to change, risks of not changing. Strengthen the client's self-efficacy for change of current behaviour.
>
> Preparation: Help the client determine the best course of action to take in seeking change.
>
> Action: Help the client take steps towards change.
>
> Maintenance: Help the client identify and use strategies to prevent relapse. (AADAC, n.d., p. 4.13)

Treatment planning is based on treatment matching (AADAC, n.d.), where tailoring the type and intensity of treatment to each client's needs and self-identified treatment goals is of critical importance. Further,

> As with most other addiction problems, the principle of least intrusive therapy also applies to problem gambling. This means applying a sufficient level of treatment to meet the treatment goals – not too much and not too little. One approach may be appropriate for a mild problem. Severe

problems may require multi-dimensional approaches, such as intensive individual counseling combined with support groups and Gamblers Anonymous attendance. (p. 4.3)

Motivational interviewing is also strategically applied throughout the counselling process. The tenets of person-centred MI, as identified by Miller and Rollnick (1991), are to express empathy, develop discrepancy, avoid argumentation, roll with resistance, and support self-efficacy.

Contingency Management Treatment Component

The research protocol consisted of regular treatment as described above, plus the application of a structured, 10-minute contingency management treatment component in each session, to a maximum of eight sessions. Eight sessions was identified as a minimum treatment duration considered necessary to capture measurable levels of change in participant behaviours; in other words, to allow enough time for an intervention to demonstrate clinical effectiveness. Also, most CM studies are of 8-12 weeks duration (Petry, 2000a). In the present study, treatment length was chosen after also giving pragmatic attention to the timeframe necessary to allow for 1-year completion schedules under AADAC Third Party Research and Alberta Gaming Research Institute Small Grant research parameters. For similar reasons, participants were considered dropped from the study after a 1 month absence from treatment (in which case counsellors were informed of the participant's involuntary withdrawal; if the participant returned to treatment thereafter, counsellors were responsible to inform them that participation in the study was ended). Participants were not informed of this parameter prior to or during the research, in order to isolate the effect of the CM condition on treatment attendance. Counsellors were not blind to this condition. AADAC treatment guidelines do not specify an optimal length of outpatient treatment, but anecdotal evidence provided by the area supervisor indicates that an optimal outpatient treatment program at AADAC would not be expected to exceed 12 weeks. Planned treatment duration of eight sessions in the present study was therefore considered acceptable under usual clinical standards.

In order to adhere as closely as possible to therapeutic structure seen in the literature, the CM treatment component required counsellors to facilitate a goal-centred process whereby participants would set a goal to be completed between that session and the next. Counsellors were instructed to ensure that participants' selected goals were within reasonable reach, based on an overall assessment of client characteristics, extent of problems/problem severity, and life circumstances. It was important that goal-

setting in early sessions target short-term, easily achievable goals so that operant reinforcement of adaptive behaviours could begin immediately, consistent with the principle of 'successive approximations' (Petry et al., 2000). Any behaviour that counsellors judged as having the potential to reduce gambling behaviour and improve life functioning was eligible as a goal, even if not related directly to gambling behaviour (although gambling behaviour was the primary target). Gradual shifts toward abstinence or improved gambling behaviour were to be reinforced as new behavioural patterns emerged. Counsellors were expected to encourage participation of significant others to support client efforts, per usual therapeutic practice.

After each goal-setting session, counsellors were responsible to judge whether or not the goal had been reached, utilizing all available strategies to improve the validity of client self-reporting (including collateral verification where possible). Collaborative research parameters did not require that counsellors gather overt proof of goal achievement (e.g., asking to see a receipt; asking for a signed note from a significant other). Counsellors subjectively determined client success in goal achievement, and then recorded details of the goal-setting process in client case notes.

Therapists were also asked to facilitate client self-reward: the reinforcement of non-gambling behaviour, reduced gambling behaviour, and improved life functioning through participant identification of natural environmental and social rewards accessible from participants' personal resources. Participants were to be guided in the identification of goal behaviours that would likely be significantly reinforcing and rewarding enough to compete with self-defeating behaviours. This strategy was intended to engender a persistent habit of goal-setting (both short and long term) and self-reward that would transfer from the counselling setting to the wider experiential world. As an added benefit, it was theorized that the CM goal-setting treatment component would provide a prime therapeutic opportunity for clients to explore recovery processes (e.g., if the goal was met, how was it achieved?; what were the client strengths and choices that led to goal achievement?; or conversely, what factors were operating against goal achievement?; how could these challenges be addressed?), and to review client progress with self-reward and reinforcement outside of treatment.

The principal investigator was responsible to administer the gift card incentives. The program consisted of an incremental reward system starting with a $30 gift card awarded on achievement of the first goal, and escalating to a cumulative total value of $250 in gift cards (all awarded by mail). Voucher values

were selected based on previously noted evidence that significant and escalating values act as effective operant reinforcers in contingency management. Voucher eligibility progressed according to number of goals achieved, and values were not reset when goals were not achieved. On recruitment, participants were asked to select which of three retailer gift cards they would like to receive on goal achievement: Wal-Mart; the Movie Mill theatre; or McDonald's. Evidence indicates that retail vouchers are effective reinforcers in CM treatment (Lussier et al., 2006). A choice of three gift cards was offered in order to provide an appealing and diverse range of incentive reinforcers.

In order to accurately track goal achievement in a timely manner, the principal investigator diarized all participant client appointments (kept; cancelled; rescheduled). Attendance and case note records were provided for review during 15 scheduled meetings with the area supervisor during the period of research; attendance was also tracked on an ad hoc basis through frequent telephone contact with counsellors and administrative staff. As the study progressed, tracking became more efficient, and developing into the following system: if the previous week's review of client case notes indicated that an appointment was due on a particular day, wherever possible a telephone call would be placed that day to see whether the participant had attended, cancelled, or re-scheduled; if the client had attended, the counsellor would immediately inform the investigator as to whether or not the participant had met their goal. If the counsellor was unavailable, administrative staff would check the client record to see if a case note had been entered; if the case note had been entered, the administrative staff member would confirm whether or not the goal had been met. If the goal had been met, the principal investigator would immediately mail out the gift card reward. The time interval between session attendance and gift card mail out was variable, given that the tracking system could not always work in an optimal fashion. It varied according to scheduling of the principal investigator's in-person visits to the AADAC office for purposes of case note review, logistical challenges, and timing of case note entry by counsellors (normally very prompt). Table 3 shows the optimal schedule under which gift cards were to be administered.

Table 3. Contingency Management Incentive Schedule

Treatment Session	*Gift Card Amounts*	*Cumulative Total*
Week 1	Goal-setting only	N/A
Week 2	$30 (for Goal 1)	$30
Week 3	$30 (for Goal 2)	$60
Week 4	$35 (for Goal 3)	$95
Week 5	$35 (for Goal 4)	$130
Week 6	$35 (for Goal 5)	$165
Week 7	$40 (for Goal 6)	$205
Week 8	$45 (for Goal 7)	$250

Follow-up Evaluation of Empirical Component

Assessment instruments administered at baseline were re-administered to participating clients by the researcher during face-to-face interviews at 3-4 months post-treatment. At the end of the interview, participants were given a $50 Wal-Mart gift card as an honorarium for their time and effort. Evidence indicates that provision of significant incentives improves follow-up retention in longitudinal research (Collins, Ellickson, Hays, & McCaffrey, 2000), and increases willingness to participate (Bentley & Thacker, 2004). Given the necessary research completion timeframe, it was decided not to include the SOGS in post-treatment assessment, as 3 months would not have comprised an adequate period of time to reflect a change in problem gambling status pursuant to the SOGS 'past 12 months' context. Echeburua et al. (1996) postulate that the SOGS should be administered at baseline only, as "it is not a test sensitive to therapeutic change." (p. 55). Other researchers have re-administered the SOGS as part of follow-up assessment, but only at 6 and 12+ months post-treatment (e.g., Hodgins et al., 2001; Stinchfield & Winters, 2001).

Past month gambling behaviour and life function measures were administered at follow-up, even though it became apparent early in the research that baseline measures had not been consistently or

completely gathered by counsellors. Despite efforts to maximize the quality of data gathering as the study progressed, baseline gambling behaviour data could not be standardized. Number of hours spent gambling was documented only once, while frequency of gambling and amount spent data was gathered for 5 clients (55.6%). It was not universally clear that numbers referred to total amounts or 'per occasion' amounts, or that documented gambling behavior was framed as past-month behavior. It appeared that a perspective of 'a time when gambling behavior was the most problematic' could have been taken (likely to have been the month prior to treatment seeking, but not certain). In one instance, treatment case notes included a historical notation of daily gambling spend, but the data was not gathered at baseline and a timeframe was not specified (e.g., past month or past year). Life functioning data was not gathered at all.

There are several possible reasons for incompleteness of the baseline data. First, this data gathering requirement was a departure from usual intake interview procedures. Gambling severity and life functioning are normally assessed by counsellors during intake assessments, but not to the level of detail or in the past-month time-frame specified by the research design. Second, adaptation of the Adult Assessment Interview Form was not carried out as planned (past month gambling behaviour questions and life function scale questions were to have been typed into sections A1 and A4 of the form prior to the start of recruitment). Had the form been revised, it might have provided a visual reminder of the study's data gathering requirements. Lack of revision to the form appeared to result from a pre-existing environment of high workload and lack of time on the part of administrative staff. Third, there is evidence that active counsellor acceptance of the project (discussed in Chapters 6 and 7) may have been impacted in part by concerns about extra work requirements in a high caseload environment.

To address the baseline data problem, follow-up evaluation procedures conducted by the principal investigator were modified to include retrospective reports of baseline behaviour. At that time, each participant was asked to first think back to gambling behaviour and life functioning in the month immediately prior to seeking help at AADAC. To assist with recall, they were reminded of the baseline assessment date, framed as part of larger events where possible (e.g., 'around Thanksgiving time'; 'about two months before Christmas'; 'just after New Year's'). Follow-up measures were established by asking participants to think back over the immediate past month.

Follow-up Evaluation of Participant Experiences

Client experiences of receiving contingency management were explored in the follow-up interview, immediately after completion of empirical data gathering. A semi-structured interview process was utilized, where "the interview remains fairly conversational; the interviewer is free to probe, rephrase questions, or take the questions in whatever order best fits that particular interview" (Monette et al., 2002, p. 176). Narratives were tape-recorded[7].

Follow-up telephone interviews with participating counsellors were conducted after the active treatment phase, as recommended by the area supervisor. It was decided to conduct interviews by telephone in order to minimize time disruptions for counsellors while still allowing for full exploration of research experiences. A semi-structured interview process was utilized as counsellor experiences of the research were explored and study parameters were discussed from a perspective of what 'worked' and what did not. Notes were taken manually during the telephone conversations. An in-person meeting was held with the area supervisor, for similar purposes.

Data Analysis

Primary outcome indicators consisted of treatment retention and duration (number of sessions attended; treatment completed/not completed), and gambling behaviour (number of gambling sessions; time in hours spent gambling; amount in dollars spent gambling). Clinical significance was determined through descriptive comparison of reported outcomes to benchmark evidence-based effectiveness findings. Additionally, repeated measures analyses were conducted to determine levels of significant pre-post changes in gambling behaviour and levels of psychosocial functioning (family, relationships/social life, financial, and emotional/psychological). Client perceptions of contingency management effectiveness were explored descriptively.

Given the nature of this thesis as a pilot study investigating specific research questions relative to targeted process and outcome phenomena within a collaborative framework (AADAC Third Party Research), the qualitative analytical goal was considered best achieved within a methodological approach known as qualitative description (Sandelowski, 2000). In essence,

[7] A revised consent form (to allow for longer tape-recorded interviews) was required and approved by the University of Lethbridge Human Subject Research Committee. Each client signed a revised consent form at the start of the follow-up interview (see Appendix D).

> Qualitative descriptive studies offer a comprehensive summary of an event in the everyday terms of those events. Researchers conducting such studies seek descriptive validity, or an accurate accounting of events that most people (including researchers and participants) observing the same event would agree is accurate, and interpretive validity, or an accurate accounting of the meanings participants would agree is accurate. (Sandelowski, 2000, p. 336).

Qualitative description aims to record human experiences in a fundamental manner (i.e., what were the experiences and how do we understand them?). Data is analyzed according to content, coded systematically, and then presented in an organized manner that best reflects the data and how it is to be used (Sandelowski, 2000; Wolcott, 1994). This configuration was employed to explore the targeted human phenomena reported by those exposed to the present collaborative study, with a view toward multiple end uses of data. Reflective explication of personal narratives utilizing immediacy of description, highlighted analysis, and fundamental interpretation are intended to present an account of participant experiences of the CM treatment component, while attending to the importance of subjective meaning.

Researchers undertaking phenomenological inquiry employ various methods, including descriptive phenomenology to understand participant accounts of concrete experiences from a more 'scientific' perspective (Todres & Holloway, 2004); existential ('descriptive interpretive') phenomenology that compares experiential method to empirical analysis (Osborne, 1990); and hermeneutical phenomenology that insightfully uncovers deep interpretations of participant descriptions with less emphasis on research structure (Hein & Austin, 2001). Sandelowski (2000) suggests that qualitative research methodology does not necessarily need to adhere strictly to one singular approach, but may effectively borrow from other theoretical stances. She supports the use of methods that are "variously textured, toned, and hued" (Sandelowski, 2000, p. 337). The qualitative element of the present pilot study takes on a similar hue while undertaking to ascribe thematic meanings to described experiential processes.

From a purely philosophical perspective, phenomenology has been defined as "the science that studies truth…and the limitations of truth" (Sokolowski, 2000, p. 185). It is beyond the intent of this writing to provide a historical discourse on the developmental foundations and manifestations of phenomenological inquiry, but it is nonetheless important to acknowledge the roles of philosophers Husserl (the father of the descriptive phenomenological approach) and Heidegger (who modified Husserl's theory

and formulated the interpretive or hermeneutical phenomenological approach) (Lopez & Willis, 2004; Sokolowski, 2000; Spiegelberg, 1969). The qualitative description method used in the present research resembles the descriptive phenomenology tradition in its structured approach to data analysis, but is also guided by the hermeneutic views of van Manen (1990). Van Manen (1990) sees phenomenology as the study of lived human experiences for the purpose of formulating a possible (but never certain) textual interpretation of the nature of such experiences. He adopts a pragmatic approach to human science research (a term used interchangeably with phenomenology in his book entitled *Researching Lived Experience: Human Science for an Action Sensitive Pedagogy*). Grounded in an educational worldview and practice, van Manen (1990) states "the practical nature of the pedagogic lifeworld demands that this form of education inquiry does not convert into armchair philosophizing or abstract theorizing" (p. ix). Frequent repetition of the words 'practical' and 'practicality' seem to be an intentional effort to 'free' qualitative research from possible perceptions of idea-bound passivity and move it to method-bound action. The research goal is to understand the lived experiences of research participants as 'intentional objects', thematic meanings identified through descriptive and interpretive context analysis. The concept of intentionality is fundamental to the practice of phenomenological inquiry. Intentionality refers to the act of *always* being conscious in and part of the world of being human, though only becoming conscious of our lived experiences as objects (rather than as unconscious awareness) when intentionally reflecting on them (van Manen, 1990; Sokolowski, 2000).

Phenomenological researchers are necessarily implicated in the intentional process, bearing sole responsibility for choosing which data to include, describe, analyze, and interpret (Patton, 2003; van Manen, 1990; Wolcott, 1994). Synthesis of descriptive accounts requires researcher immediacy and presence. While 'bracketing' (the suspension of one's own beliefs, preconceived ideas about the phenomenon under investigation, or the theoretical world surrounding the phenomenon) is thought to be a necessary practice for researchers who study social phenomena from a descriptive tradition (Lopez & Willis, 2004), personal biases may still come into play (given that we are human). Indeed, "no researcher can be completely neutral and detached from the social phenomena that he or she studies" (Wood, 2001). Van Manen (1990) suggests that, rather than expecting assumptions and biases to disappear, we 'come to terms' with them through recognition and reflection.

About 10 years ago, for a period of several years I personally witnessed and experienced the devastating impact of negative consequences resulting from another person's problem gambling behaviour. Healing from trauma came slowly but steadily, greatly advanced by a decision to become a trained addictions counsellor. An underlying motivation was to help problem gamblers stop gambling so that others like me might be helped. My educational/personal journey has been one of hurt and anger gradually transforming to empathic understanding and an ongoing process of forgiveness toward self and others. Given this personal connection to the phenomenon under study, it was necessary to recognize personal biases as potential roadblocks to understanding, but sometimes to honour them as roadmaps to enhanced connection with participants' lived experiences. At all times, the goal was to conduct qualitative interviews from an open, non-judgmental, reflexive position, with participants as teachers and research collaborators.

Participant groups (clients; counsellors) were each asked the same set of follow-up questions in the present study, approaching similarity to a qualitative descriptive method known as the 'Rashomon Effect' (Wolcott, 1994). This presentational format, named for a movie directed by Kurawasa in 1950, refers to the observation that individuals viewing or experiencing the same event are apt to report different accounts or versions of that event. Thus, "any descriptive account can be related through the eyes of different participants, seemingly freeing the researcher from having to disclose his or her own view – except for the authorial hand that has guided each viewer's recounting" (Wolcott, 1994, p. 22). This is not to suggest that the investigator's personal worldview is (or should be) absent, or that contingency management treatment was experienced identically by participants. Utilization of a Rashomon Effect approach is simply intended to minimize the potential for incorrect data interpretation. The intentional object (the experience of receiving and delivering contingency management treatment and what it meant to participants) remained the foundational focus during each interview.

The present chapter provided a comprehensive description of the research methodology. Quantitative and qualitative research findings are presented next.

CHAPTER 6: RESULTS

Pilot study results are presented below. Findings encompass client characteristics, incentive program particulars, empirical results, and qualitative description of client and counsellor experiences.

Participating Clients

Two clients joined the study within the first 5 weeks. By 3 months, 4 individuals had been recruited. At recruitment mid-point (the latter part of October, 2005), the sample comprised 5 participants. By the end of recruitment on March 7, 2006, a total of 9 clients had joined the study[8].

Data gathered during intake assessments included a range of demographic information. Of the 9 participants, 4 (44 %) were female and 5 (56%) were male. This ratio is slightly different from the gender breakdown among other AADAC clients who received treatment for problem gambling between April 2005 and March 2006, where 38% were female and 62% were male (AADAC, 2007b). Participant ages ranged from 29 to 67, with a mean age of 47.8 years (*SD* = 12.6). Five individuals (55%) were between the age of 25 and 54, and 4 clients (44%) were 55 or older. The percentage of participants 55 and older exceeded that of all adult problem gambling clients in Alberta in 2005-06, where 12% were over the age of 55 (8% were between the ages of 18 and 24, and 78% were aged 25 to 54). With regard to marital status, 32% of the participants were single (never married), 42% were married/common-law/partnered, 11% were separated, 13% were divorced, and 2% were widowed. A Grade 12 or better education was reported by 67% of participants; 65% were employed full-time of part-time, or were self-employed, and the two most frequently reported occupations were 22% in sales and service and 16% in construction. Other reported occupations were management, clerical/office work, professional occupations, and no usual occupation. One participant identified themselves as Aboriginal; and 5 people self-identified as ‘other’ or ‘I do not identify with any group’. Three participants left this question blank.

At baseline evaluation, 7 participants indicated that problem gambling was the primary reason for seeking treatment. One of these individuals reported tobacco use as a secondary problem. Two people reported that alcohol was the primary problem and that gambling problems were secondary. Interestingly, counsellor ratings of addiction severity indicated that gambling problem severity was the greatest indicator of a need for outpatient treatment in all cases (even where participants had reported alcohol as their primary

[8] A similar poor rate of recruitment (*n* = 8) occurred for what would have been the Control Group.

concern). Counsellors recommended a secondary need for alcohol abuse treatment in two cases, and for drug abuse counselling in one case. Abstinence was documented as the treatment goal for 4 participants. Treatment goals were not documented at baseline for the other participants, but as treatment progressed, case note documentation inferred goals of abstinence for all.

The mean baseline past-year SOGS score was 11.2 (*SD* = 3.1). Scores ranged from 6 to 15, where scores greater than 5 indicate 'probable pathological gambling' according to scoring criteria. These scores equate to severe levels of problem gambling experienced by all participants in the year prior to seeking treatment. Problematic past-year electronic machine gambling was reported by all participants: VLTs (9 participants used and were concerned about use), and slots (6 used and were concerned about use). Five participants indicated having 'Bet in casinos' over the past 12 months, and all reported concern. One person participated in Internet gambling and was concerned about it. Other types of past year gambling participation were reported as bingo (*n* = 8), scratch/instant win tickets (*n* = 2), lottery tickets (*n* = 4), cards/board games (*n* = 1), sporting events (*n* = 2), and horse race betting (*n* = 1). None of the participants reported concern about any of these types of gambling. Seven participants reported on the SOGS that the largest amount ever gambled on a single day in the past year was 'more than $100 up to $1000', while 2 participants reported 'more than $1000 up to $10,000'. Of 7 participants responding to the SOGS question '*Check which of the following people in your life has (or had) a gambling problem*', 3 reported a friend or someone else of importance, and the remaining 4 separately indicated sibling, spouse/partner, their child/children, and another relative. Two participants disclosed past treatment for addictions at the intake interview.

Baseline measures of gambling behaviour reported to the researcher at follow-up indicated that in the month prior to treatment-seeking, the mean frequency of gambling was 8.7 sessions (*SD* = 9.1); mean number of hours gambled was 20.8 (*Mdn* = 12.0); and mean amount of money spent gambling was $1538.89 (*Mdn* = $1050.00). Case-by-case data was compared to available baseline data gathered by counsellors during the intake assessment. For frequency of gambling, data gathered by counsellors at intake (*n* = 5) was identical to baseline data gathered at follow-up in two cases, and higher in three cases. For time spent gambling (*n* = 1), counsellor-gathered data was identical to data gathered at follow-up. For money

spent gambling (n = 5), counsellor-gathered data was lower than data gathered at follow-up in two cases, and higher in three cases.

All participants reported alcohol use in the past 12 months, with 2 people reporting concern about its use. Eight of 9 participants (88.9%) smoked cigarettes, and 4 were concerned about use. One participant reported using marijuana, opiates, and tranquillizer use, but was not concerned about levels of use. One participant reported cocaine use and was not concerned about use. One participant reported anti-depressant use of no concern. One participant reported other drug use ('prescriptions'), as well as concern about use.

AADAC intake forms do not include a question about current or past year psychological comorbidity, although the counsellor-administered Adult Screening Assessment Interview form includes a section on whether clients have ever experienced serious depression, anxiety, suicidal thoughts, abuse, or trouble controlling violent behaviour. Counsellors completed this section for 6 participants, the majority of whom reported that they had experienced one or more indicators (most commonly, depression and anxiety). Two participants reported previous suicide attempts, 3 reported previous suicidal thoughts, 3 reported past abuse, and 1 reported violent behaviour. Also included in this section of the form is a question on whether clients have ever seen a doctor or received counselling due to such problems. None of the participants were noted to have done so. Counsellor documentation at intake indicated a range of psychological/emotional functioning from a continuum-based score of 1 (where 0 or 1 means '*no real problem: treatment not indicated*'), to 6 (where 6 or 7 indicates '*considerable problem: treatment necessary*'). Negative consequences in areas of life functioning were noted by counsellors as conflict with family, divorce, loss of employment, poor job performance, withdrawal from educational pursuits, significant debt, legal issues/charges laid, physical health problems (e.g., high blood pressure), anger, low self-esteem, stress, anxiety, guilt, depression, grief, and less frequent participation in leisure activities. During the period of research, a participant revealed a schizoaffective personality disorder diagnosis (disclosed to the counsellor during treatment and to the investigator during the follow-up interview). Another counsellor noted at intake that 1 participant exhibited symptoms of post-traumatic stress disorder.

Four participants received other treatment during the period of research. One participant reported attendance at several GA meetings during treatment, and 3 participants reported attending from 2-5 (M = 3.3) evening gambling support group meetings during the research. This weekly group program was held at

the AADAC area office, organized and facilitated by an addictions counsellor from a local AADAC-funded treatment agency.

In-person follow-up interviews took place an average of 3.5 months (range 2-6.2) after each client's last treatment session as a study participant. The interview period extended from January through June 2006. The follow-up rate was 100%. Interviews were conducted at participants' homes (n = 5), in the researcher's home (n = 2), and in the researcher's office (n = 2). Logistics and feasibility did not allow for interviews to take place at the AADAC office, as originally intended. Interviews lasted about an hour on average. In an effort to check validity and establish trustworthiness of the data, participants were asked if they would review the transcripts (when ready) for accuracy of content. Two participants agreed, and hard-copy transcriptions were subsequently hand-delivered to their homes. To date, no revisions have been suggested.

Participating Counsellors

Seven of 8 therapists who received treatment orientation training and were eligible to take part within organizational parameters participated in the research (87.5%). Of this group, 6 counsellors successfully recruited clients. One counsellor recruited 4 participants (44.4%), and 5 counsellors each recruited 1 participant. For all clients, the recruiting counsellor also delivered the CM treatment protocol.

Five of the 6 counsellors who recruited participants were interviewed by telephone in June and July 2006, in conversations lasting 15-20 minutes. Several attempts were made to follow-up with the sixth counsellor, but organizational changes and scheduling difficulties prevented the interview from taking place. An interview was also conducted with the counsellor who participated in recruitment but did not recruit any clients for the study.

Gift Card Incentive Program

Contingent-dependent goals set by participants during the period of research were seen to appropriately support overall treatment goals and facilitate progress in treatment, thereby conforming to evidence-based guidelines for contingent reinforcement of treatment-related activities (Iguchi et al., 1997; Lewis & Petry, 2005; Petry, Peirce et al., 2005). Goals were usually, but not always, recorded by counsellors in case notes. In these instances and wherever possible, the principal investigator would follow-up with counsellors by telephone and ask for specific details. Identified contingency goals included: save

money for a holiday with a family member, shop for a family member/buy groceries, abstain from gambling, reduce the frequency of attendance at usual gambling venues, take time for self (crafts; organize belongings), spend quality time with spouse/partner, work on communication skills with spouse/partner, resume a favorite hobby, exercise, complete a problem gambling self-help book, make concrete plans to fill spare time, be kinder and more positive to self, plan leisure activities, take part in community/church activity, practise daily devotions, access other community supports, write a personal journal, listen to smoking cessation motivational tapes, assist an aging parent. Some participants appeared to set a new goal by continuing from, or building on the previous week's goal. Based on a review of case note entries, counsellors appeared to facilitate this cumulative process of increasing achievement. The majority of participants were judged by counsellors to have met treatment goals. In total, 27 gift card rewards (M = 3.2) valued at $895.00 ($M$ = $99.44) were distributed during the active treatment period (26 Wal-Mart, 1 Movie Mill, 0 McDonald's), as seen in Table 4.

Table 4. Contingency Management Incentive Distribution

Participant	*Incentives Distributed*	*Sessions Attended*
1	2 x $30 (Wal-Mart)	3
2	1 x $30 (Wal-Mart)	4*
3	2 x $30, 3 x $35, 1 x $40 (Wal-Mart)	8*
4	2 x $30, 1 x $35 (Wal-Mart)	4
5	1 x $30 (Wal-Mart), 1 x $30 (Movie Mill), 1 x $35 (Wal-Mart)	4
6	0	2
7	2 x $30, 2 x $35 (Wal-Mart)	7*
8	2 x $30, 3 x $35, 1 x $40, 1 x $45 (Wal-Mart)	8
9	1 x $30 (Wal-Mart)	3

* Goal-setting began in the second session.

One participant did not receive any gift cards. In this instance the initial goal was to abstain from gambling between the first and second counselling sessions. The goal was not reached. Notably, this participant was attending outpatient counselling while waiting to enter residential treatment. Another participant successfully met only the second of two goals. And another participant did not meet the fourth of five goals. The remaining participants were judged to have successfully met all of their stated goals throughout the period of research, and received gift cards accordingly. The fact that several goals were judged by counsellors to be unmet may give an indication of accurate self-reporting relative to goal achievement.

Treatment Outcomes

Information provided by the area supervisor indicates that adult outpatient clients received an average of 3.3 individual counselling hours in 2002-2003, including the intake assessment (personal communication, area supervisor, February 4, 2004). Given that individual counselling sessions are usually scheduled to last 1 hour, it seems reasonable to equate 3.3 hours of counselling with 3.3 counselling sessions. This conclusion is substantiated by recent attendance statistics showing that clients in general who entered treatment on or after April 1, 2006 and ended treatment on or before March 31, 2007 (n = 374) attended an average of 3.2 appointments (range, 1-47) (AADAC, 2007c). Of the same demographic, 19.5 % attended 2 appointments, 49.5% attended ≥2 appointments; 29.9% attended ≥3 appointments, and 22.1% attended ≥4 appointments. Clients attending eight sessions comprised 1.3% of the sample. Overall statistics gain wider substantiation based on a recent review of substance abuse program data in the United States from 1996 to 1999 (client record sample n = 4,945), where counsellor contact per outpatient client was found to average 2.81 hours (Woodward, Raskin, & Blacklow, 2008).

By comparison, participants in the present study attended an average of *4.8 counselling sessions* (range: 2-8), 1.6 sessions more than the average number of sessions usually attended by outpatient clients at the area office (an increase of 50%). All clients receiving CM in addition to usual treatment attended the second session (almost 5 times the rate of second session attendance for usual treatment clients), 100% attended ≥2 sessions, 77.8% attended ≥3 sessions, and 66.7% attended ≥4 sessions. Two participants (22.2%) attended eight sessions. Retention rates were higher at all comparison points, demonstrating an enduring trend.

When retention findings are viewed from the perspective of actual versus optimal length of treatment (duration), the effect of CM therapy is less apparent. Only 2 participants reached the maximum eight sessions under study parameters. As noted in Chapter 5, participants were necessarily blind to this design element. Non-attendance for 1 month resulted in an involuntary end to study participation, a condition also blind to clients (involuntary discontinuance did not preclude continuance in usual treatment).

Treatment factors were seen to play a role in voluntary discontinuation for 5 of 7 participants who attended fewer than eight sessions. At follow-up, 4 participants reported that they left treatment because their gambling-related problems had improved to the point where no further treatment was necessary (one of whom reported that the decision to end treatment after four sessions had been reached in consultation with, and with the support of the counsellor). In the fifth instance, the person reported ending treatment after four sessions because of perceptions that there would be no benefit from continued attendance. Mitigating external factors played a role in the remaining two cases of voluntary discontinuation. One person entered residential treatment very soon after joining the study, and therefore attended only two outpatient sessions. Another person gained full-time employment after attending three treatment sessions, and was unable to secure time off for further outpatient/daytime treatment.

One participant attended seven sessions, and then did not attend for a period of 1 month (two appointments were cancelled and re-scheduled by the participant during this timeframe). Study participation thus ended involuntary, although two sessions were subsequently attended (as recalled at follow-up).

A treatment *completion rate of 22.2%* is notable in that less than 2% of regular AADAC clients attend eight sessions (AADAC, 2007c). One of the two completers attended eight sessions in 8 consecutive weeks, and then attended several additional sessions after study participation ended (the exact number of sessions is unknown and was not recalled at follow-up; under terms of AADAC Third Party Research, the principal investigator's access to client tracking data at the area office was limited to the duration of active research).

Measures of baseline and follow-up gambling behaviour consisted of past-month frequency of gambling (number of times gambled), time spent gambling (number of hours gambled), and money spent gambling (net dollars lost). Mean results by form of gambling are displayed in Table 5, where percentage

reductions from baseline to follow-up are also shown. Aggregated results include standard deviation and/or median values.

Table 5. Past-month Gambling Behaviour: Means and % Reductions, Baseline to Follow-up

	VLTs (n = 8)	*Slots (n = 4)*	*Internet (n = 1)*	*Tables (n = 2)*	*All types of gambling (n = 9)*
Frequency Pre	5.8	5.8	1.0	4.0	8.7 (*SD* = 9.1; *Mdn* = 8.0)
Frequency Post	1.7	2.5	0	1.0	2.9 (*SD* = 3.9; *Mdn* = 1.0)
% Reduction	*69.5%*	*56.5%*	*100%*	*75%*	*66.7%*
Time Pre	14.8	13.0	1.5	8.0	20.8 (*SD* = 22.3; *Mdn* = 12.0)
Time Post	2.4	8.9	0	2.0	7.4 (*SD* = 13.0; *Mdn* = 2.5)
% Reduction	*83.4%*	*31.7%*	*100%*	*75%*	*64.5%*
Money Pre	$1407.50	$485.00	$50.00	$300.00	$1538.89 (*Mdn* = $1050.00)
Money Post	$188.75	$170.00	0	$100.00	$265.56 (*Mdn* = $300.00)
% Reduction	*86.6%*	*64.9%*	*100%*	*66.7%*	*82.7%*

For all types of problematic gambling in the present study, the *66.7% reduction in frequency, 64.5% reduction in time, and 82.7% reduction in money spent* gambling at 3.5 months post-treatment compares well to benchmark evidence-based results reported earlier in Table 1. Research-based findings indicate a 72.2% reduction in frequency, 67.4% reduction in time, and 72.2% reduction in money spent gambling. These percentage reductions comprise median values extracted from aggregated post-treatment and follow-up data: frequency (*n* = 5; range 57.8%-97.5%); time (*n* = 3; range 35.7%-98.8%); money spent (*n* = 5, range 63.2%-95.7%). To the extent that gambling is considered significantly improved if percentage reductions exceed 50% (Hodgins et al., 2001), present findings are strong.

Clinical significance was further demonstrated in terms of abstinent or improved outcomes. Three participants reported past-month abstinence from VLT gambling at follow-up. One participant reported

unchanged slot machine gambling and increased VLT gambling; 1 participant reported reduced slot machine gambling, 1 participant reported reduced VLT gambling and abstinence from Internet gambling and table game gambling, 1 participant reported unchanged VLT gambling and reduced slot machine gambling, 1 participant reported increased VLT gambling frequency but decreased time and money spent, and 1 participant reported increased VLT gambling and increased table game gambling.

Overall, 33.3% of participants reported abstinence from gambling in the month prior to follow-up. Another 44.4% were improved compared to pre-treatment past-month gambling behaviour. In total, *77.7% of participants reported abstinence or reduced/improved gambling behaviour* at follow-up. This finding compares well with various findings of clinical effectiveness seen in the literature: 1) two-thirds abstinent or controlled at 6 and 12 month follow-up (Lopez Viets & Miller, 1997); 2) as seen in Table 1, 40.6% at post-treatment (Hollander et al., 2000), 80.6% at 3 month follow-up (Hodgins et al., 2001); and 3) 75% abstinent or reduced at 6 month follow-up (Echeburua et al., 1996). Program evaluation findings variously indicate 1) 42% to 66% abstinent and 67% to 91% improved 6 to 12 months after treatment (O'Connor et al., n.d.); 2) 28% abstinent and 48% improved at 6 month follow-up (Stinchfield & Winters, 2001); and 3) 66% abstinent at unknown follow-up intervals (Bernhard et al., 2007). When Table 1 data (post-treatment to 6 month follow-up) is aggregated and the median value is extracted (n = 8, range 40.6%-91.3%), research evidence indicates that 75% of those treated reported abstinence or reduced/improved gambling behaviour at follow-up.

Gambling behaviour was also analyzed statistically, to determine whether gambling frequency, time and money spent on VLTs, slot machines, and all types of gambling decreased significantly from baseline to follow-up. Since distributions were not normal and the sample size was small, nonparametric Wilcoxon tests were conducted. No significant differences were found, which may well be attributable to the very low statistical power.

Pre-post past month measures of quality of life functioning were gathered at follow-up, in the areas of family functioning, relationships/social life, financial functioning, and emotional/psychological health. Numbered response options were labelled for analytical purposes as 1. '*low quality of life functioning*'; 2. '*moderately low quality of life functioning*'; 3. '*moderate quality of life functioning*'; 4. '*moderately high quality of life functioning*'; and 5. '*high quality of life functioning*'. Wilcoxon tests were

conducted to determine whether reported quality of life functioning increased from baseline to 3 month follow-up in any of the four identified areas. Results are reported in Table 6.

Table 6. Past-month Psychosocial Functioning: Baseline to Follow-up

Area of Life	*Baseline*		*Follow-up*		*z*
	M	*SD*	*M*	*SD*	
Family	2.6	1.0	4.0	.9	-2.57**
Relationships/social life	2.9	1.3	3.8	1.2	-2.13*
Financial	1.8	1.3	3.3	1.4	-2.20*
Emotional/psychological	2.0	1.1	3.7	1.0	-2.39*

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

In the present study, *statistically significant increases in quality of life functioning* were found on all measures. Baseline responses ranged from 1 (*low*) to 4 (*moderately high*), while follow-up responses ranged up to 5 (*high*). Family functioning showed the most significant change. Scores ranged from 1 (*low*) to 5 (*high*) at baseline, and from 3 (*moderate*) to 5 (*high*) at follow-up.

The majority of participants reported improved perceptions of psychosocial functioning in all four areas. Unchanged or decreased functioning was reported as follows: 1 participant reported no change in relationships/social life and family functioning (rated 'moderately high' at both baseline and follow-up); 1 participant reported unchanged financial functioning ('low') and emotional/psychological functioning ('moderately low') at both time periods; 1 participant reported unchanged emotional/psychological functioning ('moderate') and decreased financial functioning ('moderately high' to 'moderate') at follow-up; 1 participant reported decreased quality of functioning in the area of relationships/social life ('moderate' to 'moderately low').

Evaluation tools administered in research-based outcome studies are often highly specific and relate to particular mental health constructs or indicators (e.g., depression; anxiety; obsessive-compulsiveness; personality questionnaires; 'urge' and 'self-efficacy' scales). It is therefore challenging to compare evidence-based results to present findings, where measures were designed to closely follow existing AADAC assessment procedures. Benchmark effectiveness research indicates statistically

significant psychosocial improvements in treatment groups compared to control groups at 6 month or 1 year follow-up: depression and 'inadaptation' to daily life (Echeburua et al., 1996); anxiety and depression (Echeburua et al., 2000); urge to gamble (Kim et al., 2001); gambling urges, perceptions of control over gambling problems, and perceptions of self-efficacy (Ladouceur et al., 2001); anxiety (McConaghy et al., 1983, 1988; McConaghy, Blaszczynski, & Frankova, 1991).

Program outcome study findings may comprise a more appropriate benchmark for comparison purposes. Stinchfield and Winters (2001) reported statistically significant reductions at 6 and 12 months in number of friends who gamble, number of psychosocial problems, and number of financial problems. Bernhard et al. (2007) found that 60% to 83% of those treated reported improved functioning in other areas of life (relationships, finances, improved coping skills). In summarizing program outcome findings, O'Connor et al. (n.d.) report 'generally improved' to 'broadly improved' psychosocial functioning. Statistically significant findings in the present study indicate comparability to outcomes reported in the literature.

The foregoing analysis of treatment effectiveness was conducted according to methodology judged most suitable for this small pilot study (as discussed in Chapter 5). Because follow-up data was available for 6 of 8 control group participants, outcome measures were also explored from a between-groups perspective. A Mann-Whitney U test was conducted to determine whether the number of treatment sessions attended by the experimental group (M = 4.8, SD = 2.3) differed from the number of sessions attended by the comparison group (M = 3.5; SD = 2.1). Findings were non-significant. Mann-Whitney U tests were then conducted to investigate whether gambling behaviour outcomes and psychosocial functioning indicators differed significantly between groups, and all findings were non-significant with one exception. For past month level of financial functioning at follow-up, the mean rank of the experimental group (M = 3.3, SD = 1.4) was significantly higher than the mean rank of the control group (M = 1.8, SD = .8), z = -2.14, p <.05 (2-tailed) (2 missing values not replaced). These results indicate greater improvement in self-reported ratings of financial functioning for AADAC clients who received the CM treatment component in addition to regular outpatient treatment, compared to AADAC clients who received regular treatment.

Client Experiences of Receiving Contingency Management Treatment

Participants were asked in face-to-face semi-structured follow-up interviews about their experiences of the CM treatment component and therapeutic process. A brief opening statement preceded the dialogue, phrased to ensure inclusion of the following content:

> Opening:
> The purpose of today's interview is to gather information to compare with information you provided to AADAC at your first visit (intake assessment forms), and also to talk with you to gain an understanding of your treatment experiences. I would like to ask your permission to tape record the interview to be sure that I don't miss anything or change your words in any way. Confidentiality is assured, and the tape will be destroyed along with all data. To make sure you feel safe and comfortable, you can stop the tape at any time or ask me to do so. Also, I can provide a copy of the transcript for your review when ready.

Interviews were structured around a set of open-ended interview questions designed to explore all aspects of the contingency management treatment component. The interview guide for participating clients is found in Appendix G (Table 7). Tape-recorded interviews were transcribed, systematically reviewed for thematic analysis and coded descriptively according to seven content categories inherent in the set of structured questions. Data presentation follows the same progression. Because the research comprised an intervention, descriptions of meaning relate to research process and outcome. Selected transcript excerpts are intended to demonstrate content themes and support a subjective understanding of thematic meaning. Excerpts are numbered to anonymously identify participants, and to provide a person-centred sense of continuity across topics.

Clients' Limited Conceptual Understanding of the Research

Participating clients were asked to think back to the time of recruitment, and to recall their initial impressions of the research. Narratives revealed that the term 'contingency management' was unknown, although a few people indicated familiarity with incentive programs and the concept of positive reinforcement.

> "Oh yeah, in businesses or whatever, if you do this promotion or do some sales or whatever you get some kind of incentive program." (2)

> "To me, it wasn't new. I learned a lot about behaviours and that in my psychology courses, but those were years ago." (8)

Most participants did not appear to have an understanding of the contingency management treatment component, or to recall the counsellor's explanation of the research at the intake interview. The study purpose seemed to be perceived as one-dimensional. Several interviewees expressed an appreciation

for the importance of research (to help others, add to the body of knowledge and so on), but did not necessarily associate the CM program component with treatment designed to encourage personal success.

> "All I did was I, you know, linked it with a person that needed, was doing their thesis or something else…just linked it with, that you were trying to get your thesis done… I remember signing the papers and everything else, and I remember vaguely about [counsellor] saying something about the money that you would be putting forth to have the information, but after that it just went, I just wasn't in the mind to be even thinking about it." (1)

> "Actually, to tell you the truth, you were just somebody that was doing some research, that I figured OK, if I'm helping you out, great. I didn't give it much thought that first day." (3)

> "[Counsellor] didn't mention reaching goals, just said to help you with your thesis. [Counsellor] did mention a gift card…just to talk to you about my gambling habit, addiction, I guess." (6)

> "Um, I really didn't know at first. I thought it was more or less going to be a survey on gambling." (7)

> "There were two reasons I signed that paper. I really, not to be rude, but I really didn't care about your research. But I cared about the fact that you were a student, you were *doing* research. The second was, if I can get something out of this to help me, then you know, that's hope." (8)

> "Oh, [counsellor] didn't explain. I don't know, [counsellor] told me 'you're doing the research for someone doing research at the University. 'Yeah, sure, I like those things, yeah'. And then [counsellor] explained to me, said, I don't know, 'they're going to send you $30', and then doing these things [follow-up interview]." (9)

The majority of participants did not articulate an understanding of gift card eligibility or connect it to any treatment process.

> "I know [the counsellor] said something about them, but I'd forgotten all about it until you sent me one in the mail." (1)

> "I knew there would be something coming, but I was really surprised when they kept coming and coming, so that was a nice surprise for me." (4)

One person indicated that eligibility for gift cards was a primary motivation to join the study.

> "At first I'm like, aw, I don't want to be part of a study', and then [counsellor] said 'well, there are gift cards', and I'm like 'OK, I can be part of the study', you know? [laughing]… I always thought it [receiving gift cards] was at the end. [counsellor] probably explained it to me, and who am I to listen?" (2)

The primary purpose of the gift card program seemed to be understood by most participants as a 'bonus' for research participation, not necessarily as ongoing reward for having achieved success in treatment.

> "When [counsellor] was first describing it and gave me the sheet to sign, I think that was kind of an extra bonus, like just 'I've come to get help, and I'm getting incentives' sort of thing." (5)

> "Besides getting help from the treatment, the cards were a fringe benefit, I guess... It was a nice little bonus." (7)

> "I know how valuable this [follow-up] interview is, you know. The rest, I couldn't see why that happened, but the valuable part to me was this interview." (8)

Strong Support for Goal-setting Processes

All participants recognized goal-setting as a prominent part of the research-based treatment protocol, and were strongly supportive of this targeted treatment aspect.

> "Yeah, we talked about goals, we set goals. The goal-setting was great." (1)

> "[The counsellor] was working toward these set goals. So, 'what would be your goal, what would you like to accomplish before you come back?' And we talked, and then if I did good or whatever, or if I didn't, I tell her, well I screwed up or whatever, and she'd be 'Oh, that's OK'. Then we'd talk about it, I'd set another goal. It was good." (2)

> "We would discuss something, OK? And out of the discussion [counsellor] would of course ask questions, and then say 'well, what do you think a good goal would be to reach, based on our discussion today?' And [counsellor] would get that out of me, sooner or later, and uh, I mean it was, I thought [counsellor] was very helpful on how [counsellor] prompted me, to help me realize what things I should be dealing with." (3)

> "Yeah, like even when it was the first session, just setting goals based on building myself up, or setting goals on anything like that, and just like trying to follow through on all of them. Different things, I don't know. One was starting to get more active and stuff. There was one, like every day, writing down what I had accomplished that day, stuff like that. Um, it felt good. You know, it wasn't all focused right on the gambling and stuff, it was just, it felt good just to be able to…it was more of a help, it was like staying active and stuff was a health choice. Yeah, things like that, making healthy choices. I was trying to choose a healthier lifestyle. Yeah, it definitely helped with that kind of stuff, relationship-wise." (5)

> "I thought about it [goal-setting]. Like, uh, I didn't go days and days and days without thinking about it. I think I was always conscious, conscious of the goal. 'OK, well, 2 more days to my session, and I haven't gambled'… Oh, it felt good, you know. Good for the ego. Some of [the goals] were maybe don't go to the pub as often. Instead of going every day, go every other day. The days I didn't go to the bar and went straight home, I felt good about it. I had achieved a goal." (7)

Increased self-esteem was an important by-product of goal-setting processes, particularly supported by counsellors' non-judgmental framing of outcomes. As we know, personal consequences of problem gambling include pervasive feelings of guilt and shame. The process of setting goals seemed to help in mitigating these devastating emotions. As one participant bravely stated,

> "I have very low self-esteem. And any time you can get a boost, I need it." (7)

Appreciation of Incentive Characteristics

Participants were asked to describe their treatment experiences relative to specific features of the gift card incentives (amounts; choices; timeliness; patterns of use). The majority of participants positively endorsed gift card values.

> "I thought it was very generous… I mean if you start with a $30 gift card and you know it increases…If it were weekly, after a month, $120 you'd have in your hand, for my pocket. You know, so that's a great incentive." (2)

> "I think they were substantial. It was more than I thought would ever come. Yeah, they were good actually. I didn't expect, I don't think I ever expected…just like how they seemed to increase in increments each time. That was just like 'oh'. I didn't expect that at all, and it was kind of nice to see that anyway." (5)

Only one participant felt that card values were low.

> "It could have been more. I thought it was a good idea [but] it could be doubled." (7)

While most participants chose Wal-Mart gift cards, the element of choice between Wal-Mart, the Movie Mill and McDonald's seemed to be appreciated by all. One person suggested adding a recreational option such as gym or swimming pool gift cards. Notably, McDonald's cards were never selected. Access to a wide variety of goods was cited as the primary reason for choosing Wal-Mart cards.

> "For me there was, I mean there was a choice, but I was going Wal-Mart, there was no McDonald's or … If I had to choose another one it would have been the movies, so, but yeah, you can [buy] anything, you can go to Wal-Mart and get your toilet paper and your shampoo." (2)

> "Um, most of the time, like we go to the Movie Mill anyway, so it was kind of nice having that, but even with the Wal-Mart stuff…I didn't really have a preference to this. We get stuff at Wal-Mart. You know, whatever it was, was kind of nice. Either way it was fine. It was nice having a choice actually. I think there was even two other choices." (5)

> "I could appreciate it for other people. Perhaps they would prefer the Movie Mill to Wal-Mart, having other things to do. I saw the value in the card of opening doors for people, OK, because now they've spent all their money at the VLT, and then you know, they go to a movie and really enjoy that. So maybe now in their pay check they'll save some money for that movie." (8)

One participant reported being unaware that there was a choice of cards.

> "No way. No, I didn't know. I would have gone to a movie." (9)

Perceptions varied as to length of time between a treatment session and receipt of a gift card. As noted in Chapter 5, mailing times were not consistent (primarily due to logistical challenges in tracking participant appointments).

> "Oh yeah, oh yeah, very soon after." (2)

> "Um, I think usually it was a couple of weeks, was it a couple of weeks? I can't even remember. A week or so maybe, I'm not too sure exactly." (5)

Some participants revealed that family members were carefully considered when choosing and spending gift cards, indicating a sharing of the treatment journey with those closest to them.

> "You know what, I think the reason I chose Wal-Mart is because I know [partner] likes to go there." (3)

> "Wal-Mart was perfect for me. I could spend some on me, and I could spend some on [family member] at the same time." (7)

Most participants reported that they hadn't used the cards right away, and some had allowed cards to accumulate. Participants seemed to value their practice of saving up cards for one-time use.

> "I saved them to spend at Christmas. I went out and treated myself, mostly household stuff I needed, and it helped to buy Christmas presents for [family member]." (4)

> "No, no, I saved for…I'm a planner, I like to have a plan in front of me. If this [item] is $80, I'm going to save up $80." (8)

> "I didn't spend it very quickly. No, money's too [tape inaudible]… Yeah, I went to buy a few things at Wal-Mart." (9)

Mixed Feelings about Rewards for Goal Achievement

As seen above, the incentives seemed to be greatly appreciated in the sense of a perk or bonus to research participation. Additionally, the process of treatment was seen by most to facilitate recognition of the connection between gift cards and reward for goal achievement.

> "Well, I think, you know, if you follow your goals, you will be rewarded, as opposed to if you follow your goals, it's going to be a struggle, but in the end you'll get that reward in itself, but it's just an added incentive." (2)

> "It was very helpful, it gave me more incentive…When I was spending it, it's like free money, and I got it for something that I achieved, so that made me feel better." (7)

> "I earned something, I did something good." (9)

However, one participant felt that goal-related reward value was limited.

> "That's not a strong motivator for me. Like, it was nice to receive it and acknowledge 'yeah, I did that', but for me, a bigger motivator is the things I've done for myself, and to me it was more like, 'OK, I'm kind of selling this information so maybe it'll help somebody else. That's more the way I looked at it rather than it being a reward for what I was doing." (4)

Several comments conveyed beliefs that gift cards were awarded too easily, that people had not worked hard enough to deserve them, or that dishonest reporting of goal achievement could occur.

> "One goal…[was] very simple. On the other hand, maybe it was too simple. I went in [to AADAC], I talked to you, you want me to do this, and now the next time I come and see you, 'yeah, you did that, great'… I could have told [counsellor] I [reached the goal] and never got one, you know... I need more of a watchdog kind of thing. The first thought in my mind was I could lie the whole time through and get gift cards, because there's no checking, 'did you do this, did you do that'. If I rely on the gift cards, I could agree to anything and say yes I did this, and no I didn't, and I could, because [counsellor] wasn't double-checking me, just taking my word for it." (2)

> "Well, I was expecting something, and then when I got that, 'well, that's pretty nice', and then I got, I think two more after that, like 'this is pretty easy'. You know, I didn't feel that I did that much to earn them." (4)

> "Uh, I don't accept rewards for accomplishments or anything too well. Because I've never really felt that I deserved it - tied in with my low self-esteem." (7)

Also, one participant initially felt that non-gambling related goals should not be allowed.

> "I understood (and I'm probably wrong, because I did receive a gift card with that), I would work toward becoming gambling-free, and do whatever, and then receive a gift card. The first time I got one I went, 'all I did was open my bank account?' I did not feel I really deserved it, because as far as I was concerned, I hadn't accomplished my goal, which was to not gamble… If it was less easy to attain goals, then you'd feel like you really worked for it." *(*2)

As conversation progressed, the participant clarified that they meant that short term goals should be specifically related to stopping gambling; in the longer term, other goals might be seen as contributing to the overall plan of becoming a non-gambler (e.g., by not gambling and putting the money into a bank account, a planned family vacation might be possible). The participant's perception was interesting on two fronts: 1) having very high expectations of self and potentially setting up for failure early in treatment, and 2) an 'all or nothing' way of thinking. From a counsellor's perspective, opening a bank account could be seen as a positive life step that resulted in improved relationships with family members. But the participant did not view the process or outcome as valuable in early treatment. This finding underscores the balancing act engaged in by counsellors: realistically exploring stages of recovery while establishing a working alliance and honouring client self-expectations.

On the other hand, another person saw great value in receiving concrete positive reinforcement for non-gambling related activities. The account was framed within patterns of self-denial formed in childhood.

> "They weren't necessarily for working on gambling, but spending money on myself – it was hard, because I'm just a giver and I know that. But spending that card, in itself, was a therapy, therapeutic, that I really needed, because I never knew the delight of having, for *myself*; since I was four years old, if that makes sense." (8)

Other positive spin-offs were identified relative to the relationship between achieving a goal and receiving a gift card.

> "After I got the first card, my [partner] asked what it was for and I said, I explained it. And then I thought, well before these come, after my sessions, and this is after a while of working on the relationship, that I have to be more open and honest with my [partner] and treat [partner] more as a friend, well, I started telling [partner] about the sessions and discussing it, and *what* my goals were. So then, but with the first one, I didn't talk about it until the card came. And then after that, then I started talking about it before the card came. So, that helped." (3)

> "The shopping of course opened up doors like hobbies, things to do, you know. And a couple of times [family member] and I just went uptown to [name of store] and said, 'gee, you know, this would be nice, on my next card I'm going to get this. I think in my case, I knew when I went to the [VLT] machine I didn't have any problems, everything was blocked, OK? But I had to learn

> new patterns, like the shopping, I never thought of the problem the whole time I was shopping... And so, you know, when you look at it, doing an activity would…my grandmother used to say, 'busy hands make happy hearts'. So if you're involved in activities you really aren't seeing all the sad things that are going on. To me that was gambling for the last 2 years. Now that became a habit, an addiction, and I had forgotten everything else that I enjoyed in life… So you see, the Wal-Mart card did snowball in my life... Having those Wal-Mart cards really made me feel good." (8)

Two participants felt strongly that receiving the gift cards should not be construed as being paid for going to treatment.

> "I felt…actually I felt really guilty taking them. I didn't figure I deserved them. You know, if you can't – my feeling was, if you couldn't talk to people and do whatever without money, then… It wasn't an incentive to go to counselling. I mean it wasn't even a part of my mind… Why would somebody pay me for going to counselling, you know? I had to make the decision myself. And at that time, I wasn't in any frame of mind to even think about it… I was going to a counsellor because I needed counselling. I wasn't going because somebody was paying me to go." (1)

> "[The incentives] really didn't mean that much to me, because I really didn't expect to be paid for what I was doing. That wasn't why I was there. I mean it was a nice bonus; there was no doubt about it. It was just a little reward, which was very, very nice. However, it wasn't as satisfying as meeting my goal. Yeah, self-reward - that was more important to me than getting the cards. I would have been here regardless of whether I got the cards." (3)

Several interview questions, then, appeared to be value-laden, and to evoke value-laden responses.

Frequent Use of Goal-setting Outside of Treatment

Participating clients were asked about whether they had applied goal-setting strategies on a wider scale (outside of treatment), or were doing so currently. Two people immediately responded 'no', while others answered positively.

> "I'm a big writer of lists, so I'll write down what I want to do, or I'll write down where I screw up so that I can see it, because that way it seems worse. Um, yeah, so I'll write down what I want to accomplish and how I can accomplish it, and how I could have accomplished it years ago, but what I can do to accomplish it now, and which way I'll go." (2)

> "It [contingency management treatment] opened my eyes up to where you could use [goal-setting strategies] basically for anything, and just making small goals, don't make unrealistic goals. That's one thing that I've found really helpful, is make realistic goals, ones that are achievable." (3)

This insight seems simple, yet is nonetheless profound: setting up for failure is self-defeating, and the benefits of strategic goal-setting are widely applicable. For this participant, the learning experience that occurred in conjunction with study participation seemed to be life-impacting.

Self-reward practices were also described in terms of the warmth and pleasure that come from positive reinforcement.

> "Yes. I went to get a little gift card after… I did all the bank switching, and we went and got groceries, and then we went to Chapters and I got myself three books, and I promised [family member I would read them all. I promised I would do some housework before I read these books, so I did, a put a little laundry in and started on my first book… It was nice, it was like, OK I have these books, and I felt good. OK, I screwed up again,[family member is] helping me again, [but] I feel better about it." (2)

> "Yeah, I do reward [myself], I do. I like that, you know. "Geez, I did something good, I did good today, my chili was so good, I need a reward [laughing]…I like to get a reward, 'oh, I'm proud of myself'. Yesterday we went to the park; it was beautiful, seeing the ducks, trying to climb the trees…the smell of the air, it's beautiful." (9)

Sense of Pride in Treatment and Research Participation

Overall experiences of research participation were discussed. Participants portrayed a sense of pride and accomplishment in having attended treatment and joined the study.

> "I realize that it's helping you get through your thesis, and I've always been a [supporter of] education." (1)

> "After the first couple of visits, I was looking forward to going back to seeing [counsellor], to tell that I hadn't been back to the casino, because I had a sense of accomplishment, and a bit of pride too I guess, and pulling myself out of the hole, and uh, yeah, I knew [counsellor] would be supportive, give me a slap on the back, 'good for you, way to go'. So um, like I say, after the first visit or two, and I knew I could stay away [from the casino], I was almost looking forward to seeing [counsellor] just to share that accomplishment… [Now] I'm feeling a lot better about myself because I'm not gambling, and I'm doing my exercise, I'm eating better, I'm just in a better spot. I think we're very fortunate to have resources like that available. It's always a personal decision, but if people can make that personal decision and decide 'I'm going to quit this bad activity', or 'I'm going to move to this place in my life', the resources are there to do it, and there's no excuse." (4)

> "I realized that I had to forgive myself in order to heal. And don't look back, just accept it and forgive yourself. Life goes on, and I just have to... I guess because I want to help someone else, from this. And helping you with your thesis, I'll feel a little better." (6)

> "I like to tell my story, you know, what happened to me. I like to tell people not to gamble. It destroys everything…until you lose your money you don't realize how much it will destroy. I've been there…but I do right now have a strong sense of my life… I'm doing the research, I'm talking to you. It makes me feel better now, gives me more strength. I like to do that, I like to help people, you know. Today you're talking; maybe one day I'll be sitting in your chair. I like to help people." (9)

Phenomenological research has shown that access to a supportive recovery community and reaching out to help other problem gamblers can be powerful determinants of life-meaning in latter-stage recovery (Nixon & Solowoniuk, 2005). One participant summarized their experience of the contingency management treatment process in terms of personal and societal implications.

> "It was kind of like icing on the cake, um, like I said, my main reason for going was to help myself, and when I got those, it was icing on the cake, it was a little bonus, with hope that whatever is found out moves research forward." (4)

Thoughtful Suggestions for Research Improvements

Participants were asked to recommend improvements to the study overall, or to the incentive program in particular. Two suggestions were made in the latter category.

> "I think it would be great, I think it would be a motivator, I think for those who don't really want to go to counselling, or are kind of lazy about it, I think that would be a good incentive. But I think there would have to be more checks, you'd have to make your goal, and it has to be a provable goal." (2)

> "Possibly letting counsellors give the rewards, then it would be more immediate…and I think that would tie it more to the behaviour." (4)

Although a minority of participants recommended improvements, those provided indicate that thought and attention was given to research processes. Participant identification of basic contingency management best practices perhaps highlights the common sense, pragmatic nature of this behavioural treatment approach.

Clients' Perceptions of CM Treatment Effectiveness

Two questions specific to participants' perceptions of contingency management effectiveness were asked near the end of the interview: 1) '*On a scale of 1 to 5, with 1 being low and 5 being high, how effective was this incentive-based treatment component in helping you to make changes in gambling behaviour?*', and 2) '*On a scale of 1 to 5, with 1 being low and 5 being high, how effective was this incentive-based treatment component in helping you to make changes in other areas of life?*'. Numbered response options presented during follow-up interviews were subsequently labeled for analytical purposes as 1. '*low level of effectiveness*', 2. '*moderately low level of effectiveness*', 3. '*moderate level of effectiveness*', 4. '*moderately high level of effectiveness*', and 5. '*high level of effectiveness*'. One participant did not receive any gift cards, and so was not asked the questions.

Average self-reported ratings on the first question (n = 8) were as follows: 1) M = 2.9, Mdn = 3.00, SD = 1.4, range = 4 (1-5), indicating that CM was perceived as moderately effective in helping to change gambling behaviour. Perceptions of moderate effectiveness or higher were reported by 75% of those who received gift cards. Scoring statistics for Question 2 were: M = 2.6, Mdn = 2.00, SD = 1.6, range = 4 (1-5); revealing perceptions that CM was slightly less effective in helping participants to make changes in other areas of life. Here, 37.5% of respondents reported moderate or higher levels of effectiveness.

During the closing stage of follow-up interviews, attention was given to how the process may have affected participants on psychological and emotional levels. A brief closing statement guideline was utilized to ensure that participants were afforded every opportunity to discuss and debrief the process:

> Closing:
> How are you feeling now? How has this interview process been for you? Please ensure that you call me, a support person, or a counsellor at AADAC, GA, etc. if any issues arise that are distressing or of concern to you. [If indicated, provide names and contact numbers].

No adverse feelings or indicators of potential harm were reported. While a few comments indicated that people had been a bit nervous beforehand, or had wondered whether personal disclosures might be difficult in the sense of 'bringing everything up again', post-interview perceptions were positive. Everyone expressed feelings of pride in having participated. Heartfelt thanks were extended for the time and effort expended, and participants were provided with a gift card honorarium (all chose Wal-Mart), in recognition of their invaluable contributions to the research. As required under research fund budget expenditure parameters, signatures were obtained to account for all gift cards received (during the treatment period and at follow-up).

Counsellor Experiences of Administering Contingency Management Treatment

To explore therapist approaches to regular treatment, counsellors were surveyed on September 12-13, 2005 regarding personal theoretical approaches normally used in treating problem gambling. The survey was distributed by the area supervisor during a regularly scheduled staff meeting. Seven categorical responses were included, consisting of six theoretical approaches known to be most commonly practised in community agency settings, and an open choice of '*other*' (the survey is attached as Appendix F). Of eight completed surveys, 39 'yes' responses were noted as follows: *cognitive restructuring,* 6 endorsements (75% of respondents), *motivational interviewing,* 7 endorsements (87.5% of respondents), *behavioural/contingency management,* 5 endorsements (62.5% of respondents), *psychodynamic,* 5 endorsements (62.5% of respondents), *problem solving*: 6 endorsements (75% of respondents); *family/marriage therapy,* 4 endorsements (50% of respondents); and *other,* 6 endorsements (75% of respondents). Counsellors' written explanations of '*other*' were: 'psycho-education'; 'exploration of psychic development and possible places of arrest'; 'existential theoretical, transpersonal theory'; 'strength-based, empowerment'; 'integral counselling (Wilbur's Four Quadrants)'; 'systems theory, solution-focused, client-centred, narrative'. The range of reported approaches confirmed the composition of usual, multi-

modal AADAC treatment, and also indicated a level of autonomy in choosing best practices for clinical therapy. Cognitive restructuring was the most frequently endorsed theoretical approach, and family/marriage therapy the least commonly endorsed. One counsellor reported utilizing a single theoretical approach to treatment: behavioural/contingency management. All other respondents endorsed four or more theoretical approaches.

To answer the research question that arose as the pilot study progressed ('How do therapists view and experience contingency management as a therapeutic tool?'), 6 of 7 counsellors who participated in the research were interviewed at follow-up via telephone, using the semi-structured interview guide displayed as Table 8 in Appendix G. Questions were structured to explore counsellor experiences working within project parameters, and to solicit recommendations for ways in which the collaborative study could have been improved. Notes taken manually during the telephone conversations were subsequently analyzed to determine themes. Data is presented using excerpts to illustrate thematic content, numbered to identify and link each counsellor's comments across themes.

Counsellors' Contrasting Theoretical Beliefs

Three counsellors expressed concerns about contingency management therapy based on personal treatment philosophy. Objections centred on the idea of intrinsic versus extrinsic motivation.

> "The gift cards seemed like external motivators, with no impact on internal processes. Internal motivators and impacts are more important in recovery. Contingency management doesn't recognize internal motivation; achieving the goal is intrinsically rewarding in itself. The idea of giving a gift card; as a counsellor, giving that kind of reward; it took away from what they were getting from it. That's the only thing." (1)

> "I had questions around "Is this going to work? Are they coming for gift cards, or for treatment?" I questioned their motivation. Even after your [training] presentation, I wondered whether it was a bribe for clients. This impacts the treatment end. I was worried that the gift cards might compromise or take away from their intrinsic motivation." (3)

> "The money piece (material/financial gain, even if it is a gift card), is harder to integrate into it, as money does relate to gambling. Counsellors are looking for internal, intrinsic motivation. Environmental rewards (e.g., improved relationships) are the most rewarding and motivating for clients. It could get complicated if clients become focused on material things." (5)

The idea of material rewards as external motivators appeared to be antithetical for these counsellors. Furthermore, the provision of concrete, positive reinforcement was viewed as having the potential to reduce levels of intrinsic motivation, and gift cards were perceived as potential bribes by one counsellor.

Other comments indicated a more supportive theoretical stance, but not always framed within parameters of internal versus external motivation (as were all statements indicating theoretical concerns).

> "The idea is good, similar to the 'token economy. I'm interested to see the research outcomes. I do think there are some good things about it, that it works with certain populations. The majority of treatment-seeking problem gamblers are already in the action stage of change. It works well, but is it contingency management that's operative, or just readiness to change? It would be interesting to find this out." (4)

> "I had no issues with the research from a theoretical standpoint." (6)

> "I always felt this type of reinforcement would be very useful. I am very supportive of this research protocol." (2)

> "It was helpful with identifying stages of change." (5)

Counsellors appeared to be equally split as to beliefs about the theoretical validity of contingency management (although counsellor 5 seemed to have mixed feelings). The expression of interest in study findings reflected a shared collaborative spirit, while the clear statement of support conveyed the strongest endorsement. Overall, the range of counsellor comments implied a level of comfort in disclosing beliefs about the research.

Challenges to Recruitment

Counsellors were asked to describe the process of recruitment (questions 2 through 5 of the interview guide). Five of 6 counsellors interviewed indicated that recruitment protocol had been consistently followed. A majority of those interviewed (83.3%) reported substantial levels of client refusals as well as reduced numbers of clients presenting with gambling problems during the recruitment period. Client refusals were estimated to range from 20% to 90%. Grouped responses of each counsellor are displayed below.

Counsellor 1

> A couple of people weren't interested at all. One person took the consent form to think about but decided not to participate.
> Concerns were primarily about confidentiality issues (the comfort level of clients).
> Concerns were also that someone else would then know about their problems (too much shame; couldn't face the idea of someone else knowing).
> Getting to AADAC regularly [logistical concerns].
> Sometimes people don't acknowledge the gambling problems up front; alcohol or other drugs may be the primary concern.
> Refusers appeared to have less severe financial problems.
> One client who had less severe problems participated only to advance the research (saw the importance of the research).
> Those who participated were in different stages of motivation/readiness for change than those who refused.

Counsellor 2

> Some people thought confidentiality might not be maintained ('Can I trust the researcher to protect confidentiality?'; 'I am well-known in the community').
> Others mentioned that they already had lots of other commitments ('lots on my plate right now'), or 'I don't want to/I'm not ready right now'.
> Logistical concerns about participating (e.g., living out of town).
> Stigma/shame attached to treatment seeking; shame transfers to the idea of research participation.

Counsellor 3

> I saw very few gamblers during the recruitment period.
> At least 2 refusers were concerned about confidentiality.
> The thought of meeting someone else created fear; it's hard enough as it is just to come in to see the counsellor.
> Level of problem severity/complexity; emotional issues.
> Shame (huge).
> Co-morbidity; sometimes gambling didn't come up as a concern up front; then when it did, the client was too far into counselling to join the study; clients wouldn't have even completed a SOGS if there was no indication of gambling problems at intake.
> 'No-shows' were an issue; a few said they would think about joining the study, and then never came back for a second appointment.

Counsellor 4

> I only had 2 gamblers during the recruitment period; one refused.
> The person who refused was a professional person, and shame was a significant issue ('my business is behind these closed doors [at AADAC]').

Counsellor 5

> I only had 2 gambling clients.
> I made a judgment call and used discretion by not asking one of them to participate; I was just trying to make the person return; there is already so much paperwork, and asking this client to participate may have deterred them even further; unfortunately, the client never returned.

Counsellor 6

> I was not present at the training session, and so didn't have a 'buy-in'.
> The research was never at the top of my mind, from a practitioner's standpoint.
> Also, I saw only 3 gamblers at intake; I only asked one to participate and they said they would take the information and think about it, but they never came back.
> The other 2 gamblers weren't asked; I didn't remember to ask ('not on my radar'), forgot to broach the topic with them.

Confidentiality concerns, shame/stigma, and comorbidity/problem severity were perceived by counsellors as the most common reasons for client refusal. It was reported that a few clients agreed to think about the study but never returned for further treatment. This finding speaks to the importance of retention in treatment. The observation that financial problem severity was related to research participation is an interesting one, indicating a perception that financial need motivated clients to join the study. Eligibility to

receive gift cards redeemable for goods or services may indeed be a consideration for problem gamblers. Negative financial consequences are likely to be more severe in problem gambling than is seen in alcohol or substance addictions. Given the high recruitment rates seen in studies of CM for other addictions, it seems logical to think that recruitment rates might be even higher when investigating CM for problem gambling. This is not the case in the present study, even though the baseline average of dollars spent on gambling approximated that seen in other problem gambling treatment research (Hodgins et al., 2001).

One counsellor stated that they did not experience buy-in and had not remembered to ask every eligible client to participate; this person did not successfully recruit any participants. A discretionary judgment was disclosed by another counsellor who decided to forego recruitment in one instance. Clearly, the best interest of the client took precedence and all efforts were made to minimize a potentially negative impact of paperwork overload. But a paradox is revealed here, when considering previously cited evidence that CM treatment can work to improve retention. Regardless, it remains that community counsellors have the right to employ discretionary judgments relative to research.

The low rate of recruitment was also explored in a post-research, in-person conversation with the area supervisor, during which the questions were asked: What do you perceive were possible reasons for the low rate of recruitment?, and What could have been done to improve recruitment? Notes were taken manually during the meeting, and are reproduced below.

> A shortage of resources is responsible, nothing more than that.
> People [counsellors] don't speak up; when asked 'are you interested?' they say 'yeah'. They have true good intentions to participate, but then the reality of time-overwhelm, or simply forgetting to ask clients to participate takes over.
> Client caseload has increased steadily, from 900 new intakes three years ago, to 1535 intakes in 2005; one of the highest caseloads in the province.
> Caseloads average about 100-150; the lowest caseload is about 100, the highest is 170, and 150 clients are often regularly maintained[9]; caseloads may consist of a mix of short-term counselling or slipping clients directly into groups with no active counselling, as well as long-term, high maintenance cases.
> The number of counsellors has not increased proportionally to client numbers.
> [To improve recruitment] Before the project starts, talk to each counsellor individually; try to gauge levels of support and individual commitment, and then decide whether or not to proceed with the research.
> The issue [of low recruitment] was highlighted and adequately addressed [by the researcher] throughout the period of research.

[9] These caseloads appear to be high. In Ontario in 2004-05, counsellors at community treatment agencies averaged 79 clients per full-time position/position equivalent, considered below an accepted standard of 120 clients (Sadinsky, 2005).

> Following up with clients who refused might have been useful, to allow for more direct researcher involvement[10].

Comments provided by the area supervisor reflect perceptions that constraints on resources and time were primary factors impacting recruitment results. Reduced numbers of treatment-seeking problem gamblers was not specifically mentioned during the follow-up interview, although it was cited as a reason for low participant numbers several times during the period of research[11].

Positive, Easily-administered, Treatment-compatible Goal-setting Processes

The goal-setting treatment component was reported by most counsellors to be a very constructive and easily administered part of the study, blending well with the regular treatment process.

> "I liked the idea of specific goal-setting, and the idea of a reward. We try to encourage self-reward: 'be good to yourself'. I did like setting a particular, tangible goal each time. As clients became engaged in the therapeutic process, goals evolved. At first, it was 'I will do this, this week'. Then it evolved to 'I will work on this in my marriage' (self-focus evolving to relationship focus). This reaffirmed the process of counselling. I usually began each session with the goal-setting component (usually five to ten minutes), and sometimes discussion would go from there. It determined the direction of the session. People were very up-front with truthfulness, and things they had noticed. The time was not prohibitive. I didn't do anything I wouldn't have done anyway." (1)

> "Goal-setting and goal-achieving was a positive thing and encouraged positive self-talk. Discussion around how to achieve goals was very specific, and gave opportunities to work on social skills development." (2)

> "I had no concern with the time commitments. Goal-setting is part of normal treatment. In the working relationship, the process is to evaluate ('how did the week go?), re-assess and re-design the treatment plan if necessary. The time spent on the goal-setting component was minimal, less than 10 minutes. The client was working actively on recovery and ran with it." (4)

> "The goal-setting was not time consuming, very much like a normal session would go. For one client who was at an advanced stage of recovery, it was challenging to pick one goal. 'Small, concrete and easily achievable' parameters didn't apply to [name of client]." (5)

While goal-setting was often reported to comprise a normal part of treatment, the strategic, targeted CM goal-setting process was seen to be particularly useful, and streamlined into regular treatment sessions with no problems. Time requirements were described as minimal and conforming to research design.

---

[10] Ways in which such follow-up could have been accomplished under AADAC policy and procedure were not identified.

[11] The actual number of adult clients seeking treatment for problem gambling during the recruitment period is unknown, but based on an extrapolated estimate of 100 research-eligible clients, it appears that numbers were lower compared to previous years.

Only one counsellor described a negative experience of structured goal-setting within the research process.

> "I normally wouldn't have even talked about goals, given the high level of crisis for this client. The primary focus was on critical family issues. The goal-setting took away from the focus. The client saw no options, no middle ground, it was an all or nothing goal [abstain from gambling]. How could that goal realistically be achieved in these circumstances? [The goal was not reached]. And even if the client said a goal was reached, how can you be sure?" (3)

Here, the counsellor clearly felt that the client's best interests weren't being served. This is an important perception reflecting disempowerment and lack of control. The counsellor felt constrained by obligations to fulfill the goal-setting component against better judgment, and was theoretically worried about having to make a subjective determination about the truth of client self-reporting. Such feelings may have compromised further research participation, since the counsellor did not subsequently recruit participants.

Differing Views of CM Effects on Clients

Therapists expressed varying opinions regarding observed effects of contingency management on client experiences and outcomes.

> "To me, I have seen that when there is a reward, the client makes an effort. The incentives really work. [Name of participant] talked about creating internal change and having increased self-esteem. Positive activity brought pleasure and success, which I could then reinforce. There is a difference now; the client had a relapse when not getting a gift card [since research participation ended]. It is still working, though; there have been reductions in gambling behavior." (2)

> "[Name of participant] enjoyed participating in the research, the goal-setting, and being part of a bigger project, not just the gift cards; 'This is going to help other people'." (5)

> "I found that in talking with people, the gift cards weren't a motivator in accessing services or keeping coming to treatment. People didn't come because of the cards. The treatment process for contingency management participants was no different than for other clients (an eclectic mix of theoretical approaches)." (1)

The comment 'people didn't come because of the cards' is similar to reports of several participants. Perhaps the idea that gift cards were intended to encourage treatment retention was simply not palatable on a theoretical level (i.e., counsellor beliefs that motivation to attend treatment is maintained solely from within; client beliefs that a need for external motivation denotes weakness of character). Another interesting finding was the report of client relapse after the period of research, an indication that the treatment journey remained in process. The aim of contingency management treatment is for individuals to internalize a learned system of self-reward, to progressively solidify operantly-conditioned

change processes that begin with concrete positive reinforcements. Meta-analytic review of CM research finds that "after clients are no longer subject to contingencies, the magnitude of the treatment effect begins to decline, although it appears to decay relatively slowly over time" (Prendergast et al., 2006, p. 1556). While the effect of CM cannot be isolated in the present pilot study, counsellor observations about one client's post-research journey appear to resemble processes seen in evidence-based findings.

Mixed Views of How the Research Protocol Worked

Several comments were made regarding specific aspects of the research design and process (what seemed to work; what was of concern; what could have been improved).

> "It may have helped to have more background research presented to counsellors at the training session (evidence of treatment success; the theoretical foundation). Regular in-person contact may have served to remind counsellors about the research. I never referred back to the protocol manual after first reading it over – no time. I'm not sure how recruitment could have been improved. If more aggressive, we may have lost some clients." (1)

> "There's no fund for giving incentives. It would be good to have a little something to give. It would mean a lot. The protocol manual was useful and I did refer to it. More face-to-face contact with the researcher would be useful, to discuss how things are going and facilitate the process. Lack of time is an issue. If I could get more time I could be more organized to recruit: look at the total number of [problem gambling] clients per month; develop strategies as to how to recruit more efficiently. If clients had direct access to the researcher at intake, it might allay their fears." (2)

> "Expectations of the research put added pressure on; I was worried that I might be required to give preferential time to research participants. And the weekly expectations; having to see people within a certain timeframe. I just wasn't able to see people weekly. More frontline contact [with the researcher] was needed, more face-to-face, to brainstorm around 'how's it going?; what about this or that?; how can we improve?'." (3)

> "You did an excellent job at explaining the research in the original presentation. I referred to the protocol manual for a refresher on research procedure when I had recruited a client, and it was very useful. I have no suggestions for improvement there. Low recruitment was the problem and I don't know how it could have been improved. With regard to the consent form, counsellors must use discretion, not to deter, and to do no harm. With extra paperwork - even the AADAC consent to follow-up form can be onerous and detracts from the therapeutic alliance, establishing the therapeutic relationship." (4)

> "I was comfortable working with the research. Meeting with you was not time-consuming. Time spent was sufficient and very helpful. I did review the protocol manual. It was good, brief and easy to follow. I preferred the in-person meetings though, that way, any questions I had could be answered right away." (5)

> "When I was thinking about what I would say to you in this interview, I just wanted to be totally upfront and honest. I didn't attend the training but had a copy of the protocol manual and referred to it when telling one client about the gift cards. It was awesome to have that resource – very helpful. But mostly I didn't remember to ask clients. Lack of resources is huge. There is no time. As a matter of fact, staff wellness will be pushed this year as a topic of importance. I believe that even though we are busy, we have a responsibility to research as well. In university, we're told that research should comprise one-third of our practice, including researching client outcomes.

> Awareness is a huge key. We need to talk about evidence-based research regularly, to apply to practice. This research was a great example of how, even though we know we need to support research – it helps clients, helps us as counsellors, helps agencies – it's just not on our radar. It's a good reminder. We need to go the extra mile for research." (6)

Three counsellors felt that more feedback, more face-to-face contact with the researcher would have been useful. Indeed, therapists thrive on human-centred interaction. These comments comprise clear direction for future collaborative research studies, and highlight the need for more frequent, regularly scheduled (perhaps even continuous where feasible) researcher presence. In this study, regular attendance at staff meetings might have been helpful[12]. Lack of time and resources was mentioned as a concern by three interviewees, and implied by another. In the latter case, weekly scheduling of sessions was perceived as an absolute parameter rather than as a guideline. As noted previously, weekly sessions were presented as the ideal treatment scenario, but clients would remain in the study through eight sessions provided that a period of 1 month did not go by between sessions. It wasn't until the follow-up interview that this misperception became known to the researcher. Another counsellor revealed the same misperception at follow-up.

> "The requirement for once a week sessions was a barrier; I kind of wrote it off and just didn't think I could meet the study parameters; I thought, 'It wouldn't work for my schedule'." (6)

This counsellor had missed the initial training session. The protocol manual was provided, but not discussed in person prior to the start of recruitment. Administrative staff was proactive in attempting to minimize potential counsellor overload relative to the research. On several occasions where counsellors were unavailable for discussion, front-line staff participated on behalf of counsellors if subject matter warranted. The researcher considered such contact as a useful way to maintain regular contact while remaining cognizant of counsellor time constraints. But in this case, persistence in trying to achieve immediate personal contact with this counsellor should have occurred. It is not clear why a misunderstanding over attendance parameters occurred for two counsellors and not the others. What is clear is that responsibility rests with the researcher to ensure rather than assume across-the-board awareness levels.

[12] Weekly attendance at staff meetings was not considered by either the researcher or the area supervisor during the period of research. It is not known whether such an organizational parameter could have been feasibly implemented.

In summary, the counsellor survey data revealed an eclectic approach to regular therapy, delivered in multi-modal formats. Interview data was described in terms of theoretical beliefs, recruitment processes, CM treatment delivery, perceived effects on participants, and the overall research protocol. Fifty percent of interviewees conveyed theoretical concerns about the potential for incentive reinforcement to compromise or replace intrinsic motivation. Recruitment was perceived to present challenges associated with overall high refusal rates and low numbers of problem gamblers seeking treatment. Characteristics of problem gamblers were seen to have the greatest impact on low recruitment (i.e., comorbidity; shame; fear). Paperwork and workload pressures were mentioned as therapist-based impacts. The utility and value of CM goal-setting processes was unanimously endorsed. Feelings about the effect of CM on clients were mixed, ranging from clearly positive to ambivalent (i.e., no effect). Half of the counsellors interviewed expressed approval of the research as designed and carried out, while the others perceived limitations in the areas of training/treatment orientation, extra workload, and researcher presence. Salient findings from interviews with counsellors were those highlighting underlying theoretical contradictions about contingency management treatment relative to client motivation, and those suggesting increased opportunity for direct interaction with the researcher.

Empirical and qualitative findings were presented in this chapter. Findings will now be discussed, and research implications will be highlighted.

CHAPTER 7: DISCUSSION

Summative discussion of results and implications will begin with treatment outcomes, the empirical part of the pilot study. Participant experiences of receiving or administering contingency management treatment are then discussed, followed by methodological limitations.

Treatment Outcomes

Higher retention findings of 4.8 sessions for CM clients versus 3.2 sessions for clients receiving regular treatment may be important in light of strong research evidence demonstrating that staying in treatment longer predicts better treatment outcome (Zhang, Friedmann, & Gerstein, 2003). Findings of substantially higher attendance at second and subsequent sessions is also noteworthy, given that initial sessions offer critical windows of opportunity for client engagement. A review of longitudinal outpatient drug treatment outcome studies in the United States found that retention was the strongest predictor of outcome, stronger than client characteristics such as psychological problems, criminal activity before/during treatment, unemployment, drug use during treatment, and severity of pre-treatment drug use (Nsimba, 2007).

Drop-out from substance abuse treatment is known to be at least 50% in the first month (Stark, 1992). A recent study found that drop-out from a clinic delivering cognitive-behavioural psychotherapy reached almost 45% during the assessment stage of treatment, with 28% of clients dropping out after only one session (Bados, Balaguer, & Saldana, 2007). In the present study, drop-out was estimated to be no higher than 33.3% in the first month (66.7% of participants attended at least four sessions, and early sessions were primarily scheduled one week apart).

As reported in the literature, drop out rates for psychosocial problem gambling treatment outcome studies are estimated at a weighted average of 42% (Westphal, 2006). The overall drop out rate of 77.8% in the present study is therefore higher than is usually seen in research-based investigations of treatment for problem gambling. It exceeds the highest drop-out rate of 67% reported in Table 1 (Hollander et al., 2000), but approximates the weighted average drop-out rate of 75% reported in community-based multimodal treatment programs (Westphal, 2006). Grant et al. (2004) found drop-out rates ranging from 40% to 80% in community treatment, again indicating the legitimacy of present findings. While such comparisons are useful, they cannot be considered definitive. Most importantly, weighted attrition averages are based on a

small body of literature (Westphal, 2006). And differences between research designs and methods, treatment components and modalities, and agency mandates and program delivery make it difficult to establish comparative validity. Nonetheless, low rates of retention in community treatment are of concern.

These findings are the first reported results from research utilizing contingency management treatment for problem gambling. Results are very preliminary given the pilot study status of the present research, and should be considered only suggestive of a CM effect. Retention rate findings as a percentage of attended sessions/appointments in community-based outpatient treatment are not reported in the literature, precluding a comparative view. The finding that study participants remained in treatment longer than regular AADAC clients may simply reflect some element of difference in individuals who seek treatment for problem gambling compared to all treatment seekers (e.g., problem composition and severity; demographics; characteristics). Indeed, treatment-seeking problem gamblers appear to differ from non-treatment seeking problem gamblers on five demographic variables: most are middle-aged and Caucasian, the male/female ratio is about equal, education levels are higher, and they are more likely to be employed and married (Petry, 2005b). Moreover, elements of difference may exist between the study participants and all treatment seekers. Characteristics that motivate individuals to join a research study might also motivate a greater commitment to treatment in general (e.g., a more favorable view of the benefits of treatment, or of their potential to achieve success in treatment). It is possible that participating clients might have remained in usual treatment for a similar timeframe had they not joined the study.

Overall, retention findings are mixed. The treatment completion rate is lower than comparative evidence-based results, but similar to rates commonly seen in community agencies. Importantly, length in treatment is higher at certain comparison points (second session attendance; first month retention; percentage attending a greater number of sessions) when compared to AADAC statistics. Participants receiving a CM treatment component in addition to usual treatment attended a greater number of sessions than is usually seen in formal treatment. These results approximate retention evidence from other contingency management research relative to improved treatment attendance (but not to treatment completion). Pilot study results cannot support conclusive findings, but this outcome is encouraging given the need for improved treatment retention (McCarty et al., 2007). Also encouraging is evidence showing that the concept of a minimum threshold for onset of outpatient treatment benefits may be more fluid than

static, since client outcomes can improve even when duration of treatment nears rather than reaches a predetermined optimal length (Zhang et al., 2003).

Past-month percentage reductions in frequency of gambling and time spent gambling were comparable to findings from the literature, although the reduction in money spent was about 10% greater in this study compared to evidence-based findings (82.7% and 72.2% respectively). Over one-third of clients who received CM treatment reported complete abstinence in the month prior to 3 month follow-up, and another 44% reported reduced gambling behaviour, for a total of almost 78% improved. This result is slightly higher than evidence-based findings of 75% improved. Results do not demonstrate a clear advantage of gambling behaviour outcomes in contingency management treatment over those in regular treatment, as delivered under the present research protocol. Findings of improved retention over gambling behaviour outcomes may be attributable to low statistical power.

Psychosocial functioning in the four areas deemed most likely to be negatively affected by problem gambling (family; relationships; finances; emotional/psychological) were seen to improve significantly at follow-up, indicating a substantial benefit to treated problem gamblers. These findings also compare well to reported results in the literature, although attribution of effects to regular treatment plus CM cannot be suggested. Differences in measurement instruments made it challenging to compare findings. In this pilot study, the direct and clearly stated question about perceived psychosocial functioning may have been a useful attempt to simplify a complex outcome construct (one that is widely variable in other research).

In summary, the empirical research questions are answered as follows. A positive effect was observed for retention, where duration of treatment as a function of number of sessions attended exceeded retention rates seen in usual community treatment settings. Treatment completion rates were low, although comparable to completion rates found in program outcome studies of treatment for problem gambling. Clinically significant improvements in gambling behavior (frequency, time and money spent) compared favourably to evidence from the literature. Psychosocial indicators demonstrated significant improvements at statistical and clinical levels.

Client Experiences of Receiving Contingency Management Treatment

Participant narratives reflected positive beliefs about the importance of research in general. Overall, the possibility of receiving gift cards on goal achievement did not appear to influence clients in deciding whether or not to join the study. Few details regarding research purpose or gift card eligibility were remembered, indicating limitations of retrospective recall, or the possibility that 'thin' explanations were provided at intake. Counsellors were responsible to briefly explain the purpose and importance of the research during recruitment. Guidelines were provided in the protocol manual, but may not have been adequately internalized by, or explained to, counsellors during training. As already noted, recruitment rates in other CM voucher studies are high. A greater focus on gift card eligibility (perhaps through the use of mandatory scripting rather than a suggested opening statement of research benefits) might have enhanced recruitment.

Strategic goal-setting was described as a particularly valued part of treatment. Several participant narratives revealed that self-awareness and insight developed through goal-centred therapeutic processes, and working alliances appeared to be strengthened. Goal-based elements of the treatment journey were often shared with significant others or close family members. This finding is important, since support of family members is known to be beneficial in recovery.

Contingency management application theory directs that vouchers be spent promptly, to provide the intended immediate reinforcement effect. Reported card utilization in this study did not universally conform to this important parameter, possibly resulting in a negative influence on the overall impact of the CM treatment component. On the positive side, involvement of others when redeeming the gift cards was reported to result in improved relational communication patterns, and for one person, greater enjoyment of life through reconnection with past hobbies.

Gift cards were certainly appreciated by all participants, and often viewed as a nice reward for working to achieve goals or for participating in research. But a few participants seemed to feel that receiving gift cards somehow implied weakness of character (e.g., a lack of self-efficacy or insufficient levels of internal motivation). In these instances, positive comments of gift cards as very nice bonuses were followed by statements qualifying them as unneeded external motivation. Theoretical concerns surrounding intrinsic and extrinsic motivation seem to be at work here. This issue is also reflected in counsellor attitudes

toward the theoretical idea of contingency management treatment (discussed below). Indeed, a valuable finding of the present pilot study is that some participants expressed beliefs reflecting theoretical resistance to the idea that external motivation can effectively improve treatment outcomes, particularly when asked about the influence of incentives on treatment attendance. This finding has not been reported in studies of contingency management treatment for substance abuse (most of which are quantitative in nature, and theoretical beliefs of treated individuals were not explored). But an intriguing dynamic may be at play here. As discussed in Chapter 4, meta-analytic findings indicate that voucher-based treatment effects are smaller when the therapeutic goal is treatment attendance rather than substance use abstinence (Lussier et al., 2006). It is possible that some participants in those studies viewed the goals from unique theoretical (and perhaps moral) perspectives. Abstinence may be perceived as a principled, morally sound goal that is deserving of reward based on hard work, whereas reward for attending treatment or being on time may be seen as an 'easy' or less honourable achievement. Also, participants in abstinence-based voucher studies are required to undergo physiological testing to determine voucher eligibility, a substantial personal commitment. Future investigators of CM treatment might consider a qualitative approach to compare theoretical beliefs between participants who receive vouchers for treatment attendance and those who receive them for achieving abstinence.

Value-laden attributions in the present study could also have been a function of question order, wording, or researcher presentation. Or, the treatment delivery protocol may not have included sufficient counsellor focus on the benefits of motivational incentive rewards relative to the importance of small steps in recovery. Another possibility is that theoretical concerns expressed by some counsellors at follow-up had existed throughout the period of research, and subconsciously entered the treatment milieu. On a final note, ordering of questions may have generated another impact. As reported in Chapter 6, participant perceptions of CM effectiveness were explored in follow-up interviews through administration of two closed-ended, scaled response questions. The scale questions were posed near the end of the set of open-ended questions. It is possible that such placement impacted participant responses to the scale questions, and that asking the closed questions first (as part of gambling behaviour data gathering) may have resulted in different responses. Even so, it seems reasonable to say that the theoretical validity of external motivation was not universally accepted in this study.

The highest ratings on both scaled questions were reported by the participant who received the most gift cards. Interestingly, the client who received the second highest number of gift cards reported low levels of effectiveness for both questions. Reasons for this counterintuitive finding are unknown, but could include methodological limitations to the research. Further research is indicated. The effectiveness of CM treatment for problem gambling could not be determined within the methodological parameters of this pilot study, and it may have been interesting to ask similar scaled questions relative to treatment in general. Still, the latter finding perhaps indicates slight disconnect between effectiveness evidence from CM literature and participant perceptions of CM effectiveness (particularly since psychosocial functioning demonstrated significant change from baseline to follow-up). Overall findings may simply reflect greater personal focus on the importance of reduced gambling behaviour than on improved psychosocial functioning among participants.

In summary, study volunteers were overwhelmingly supportive of research in general, a factor which likely differentiates them from AADAC clients who were recruited but refused to join (reflecting selection bias, as discussed in Chapter 6). Only 1 of 9 participants overtly indicated that the research topic motivated them to join the study. Notably, few could recall information about the incentive program provided at the time of recruitment, or whether information had been provided. During active research participation, goal-setting processes were seen as a much-valued aspect of the contingency management strategy. Gift cards were viewed very positively as a bonus of CM treatment, and were theoretically linked to goal achievement by all but one participant. Several participants expressed qualified opinions about the utility of external motivation that seemed discrepant with overall attitudes regarding the benefits of positive reinforcement. Interpretation of participant narratives appears to indicate that views of contingency management treatment utility are tied to beliefs about intrinsic and extrinsic motivation. Theoretical attitudes will be further explored in the following discussion of counsellor experiences.

Follow-up interviewing was a time of learning and growth for me, and was particularly meaningful because of past personal experiential connection to the research topic. To finally meet participating clients and explore treatment experiences together was an invaluable part of the study. Primary impressions were of courageous people continuing to move forward in life in the face of past and/or continuing adversity. As they expressed pride in themselves, I felt proud of them. A particular

connection was experienced with some participants, likely rooted in empathy, or perhaps in similarities of thought and emotion. Conscious effort was made to interview participants from an investigative, 'blank slate' point of view. The interview guide was useful in promoting similarity of approach and direction of discussion throughout. Nonetheless, an interview between two people is a unique, interactive, 'living' experience, and in that sense, the influence of personal biases cannot be ruled out. Additionally, several logistical challenges were apparent (contacting participants; scheduling convenient interview times; less than optimal interview logistics such as location or the presence of family members which resulted in distraction and interruption). Logistical challenges could have impacted interview quality and introduced an element of researcher bias. The fact that all participants were interviewed at follow-up helped to ensure that the influence of such impacts was diffused.

Counsellor Experiences of Administering Contingency Management Treatment

Therapist perceptions of the research were mixed. Positive, unanimous support was expressed for CM goal-setting processes (a perception also reported by clients), and it appeared that therapeutic partnerships were enhanced as a result. This finding is significant, given the established effect of the working alliance on treatment outcomes. Exposure to the highly structured CM goal-setting component was only achieved through study participation, although a majority of counsellors reported that they often utilized goal-setting as part of regular treatment. A topic for further investigation might be a comparison between the configuration of goal-setting processes in contingency management and those in regular community-based treatment. Recruitment presented particular challenges for some counsellors, even to the point of creating feelings of disempowerment in one instance. Clearly, the ability to exercise therapeutic discretion is paramount when circumstances warrant, in the interests of client care and well-being. Overall, the CM treatment component seemed to be viewed from a perspective similar to clients: it was nice for clients to receive incentives and to benefit from research participation.

One counsellor's suggestion to provide more evidence of CM effectiveness during training supports an implication that lack of familiarity with evidence-based findings was an issue. Selected research evidence was highlighted during the training session, but might have been reinforced if hard copy supportive documentation had been distributed as well. Improvements to the recruitment process were not suggested, and only one counsellor thought that researcher presence on-site could have improved the rate of

recruitment. No issues were reported relative to the protocol manual, which appeared to be a useful tool when accessed (although in several instances it was not). One counsellor expressed regret that a fund was not available to provide small incentives, given the potential for positive impacts. Identification of the consent form as a possible deterrent to research participation was an interesting finding. Addictions counsellors are taught that establishing rapport from the first meeting is critical. Individuals seeking treatment at AADAC are required to complete a battery of assessment forms, and counsellors are responsible to also ask them to participate in AADAC's follow-up evaluation. One more form or one more request may indeed comprise overload for some treatment seekers, and perhaps for counsellors as well. In that vein, one counsellor disclosed impressions that research participation was partly compromised by a lack of time and resources, which in turn impacted a sense of professional duty to facilitate evidence-based research. Clearly, research design must take into account organizational parameters that might constitute possible barriers to collaborative community research. But the counsellor's narrative created a wider question here. Should agency mandates include concrete directives to actively facilitate ease of counsellor participation in treatment research? This is a large and difficult question triangulated within policy and personnel parameters. Nonetheless, it draws attention to the challenges of translating organization-wide vision to local practice within treatment environments pressured by increasing client caseloads.

Most importantly, theoretical inconsistency with personal treatment philosophy (i.e., the belief that external motivation compromises internal motivation) is a salient finding. When viewed from the perspective of theoretical objections to contingency management reported by 50% of counsellors at follow-up, it seems that the construct of 'buy-in' (acceptance of, support for, and ongoing fidelity to the research) may not have been experienced uniformly by all participants. One counsellor's interpretation of incentives as potential bribes rather than as rewards for having worked hard to achieve personal goals perhaps best crystallizes the construct of theoretical opposition. This interpretation was clearly unmodified by the researcher's presentation on behavioural and contingency management theory during the training session. Theoretical concerns were not raised by counsellors during training. Given the enduring nature of these beliefs from training to follow-up, it might have been useful to meet with counsellors on an individual basis immediately after the training session, to offer an opportunity for counsellors to explore any theoretical questions, unconstrained by time or place.

Motivation is integral to behavioural change. A relationship between pre-treatment motivation levels ('readiness for treatment') and retention in drug abuse treatment programs has been demonstrated (Joe, Simpson, & Broome, 1998). This relationship is important, and addictions counsellors practise in an environment founded on motivational therapeutic principles. This will not, and should not change. But are the two domains necessarily exclusive, or can they be viewed as complementary? A meta-analytic review of 96 experimental studies found that attitudinal indicators of intrinsic motivation (levels of interest in/enjoyment of/satisfaction with tasks) are similar between study participants who have received monetary rewards for task completion and those who have not (Cameron & Pierce, 1994). The authors report that their meta-analytic findings had 'touched a nerve' following publication, and in a subsequent article argued that their statistical techniques were robust and conclusions were supported: "rewards can be used effectively to enhance or maintain an individual's intrinsic interest in activities" (Cameron & Pierce, 1996, p. 39).

Recent research also suggests that intrinsic-extrinsic arguments are, perhaps, moot. A study conducted by Ledgerwood and Petry (2006) evaluated motivational levels pursuant to the stages of change model in 115 individuals who sought treatment for cocaine or opiate dependency at a community clinic, and who had been randomized to either usual treatment or usual treatment augmented by contingency management in the form of vouchers or prizes. Individuals receiving the additional CM component were found to have significantly better treatment outcomes (defined as duration of abstinence during treatment) compared to those receiving standard treatment. Self-reported motivation levels, as measured by the University of Rhode Island Change Assessment tool, did not increase or decrease for the CM group, indicating that "CM does not differentially affect intrinsic motivation to change substance use compared with standard treatment provided without CM" (Ledgerwood & Petry, 2006, p. 70). Motivation was demonstrated to significantly decrease at 3-month post-treatment follow-up for *both* treatment groups, indicating that motivation levels decrease over time regardless of treatment type. This decreasing effect is further demonstrated by significant rates of relapse seen at follow-up in treatment outcome studies (see Table 1 in Chapter 3). Ledgerwood and Petry's (2006) study appears to support the premise that ongoing theoretical debate regarding the potential for extrinsic motivation to somehow compromise or replace intrinsic motivation may be of little practical utility. As discussed in Chapter 2, multifaceted, interactive

etiological processes best explain the development of addictive behaviors such as problem gambling. Similar complex processes are likely to operate in recovery as well. Neither area of research (intrinsic *or* extrinsic) currently fits neatly into a singular explanatory model. Contingency management outcome research strongly endorses the positive effect of concrete reinforcement therapy, suggesting a mutually interactive relationship between external and internal motivation. In the end, therapists must believe that what they do not only works, but is in the best interest of clients. If counsellors believe otherwise, resistance to trialing or utilizing new therapies may result.

The construct of therapist resistance has been explored in other contingency management treatment research. A study of CM adoption in five community methadone treatment settings found that some frontline staff members were initially resistant, much more so than was seen at administrative levels (Kellogg et al., 2005). Resistance was defined by terms such as viewing incentives as bribes, making statements indicating philosophical differences (i.e., intrinsic versus extrinsic motivation), expressing concern about increased workload, or feelings of burnout or fatigue. If, after completion of training, counsellors still felt unenthusiastic or even opposed to application of the CM protocol, they were offered the opportunity to opt out. Such program adaptability is recommended when CM is delivered by community practitioners (Petry & Bohn, 2003), to prevent negative attitudes from inadvertently or subconsciously having an impact on CM outcomes. The size, location, and design of the present pilot study did not allow for inclusion of an opt-out parameter, nor was one advised by the area supervisor.

A recent survey of therapist attitudes in 249 American substance abuse treatment agencies (outpatient; residential; detoxification; methadone programs) found that opinions toward motivational incentives were related to perceptions of professional autonomy (Fuller et al., 2007). When staff saw opportunities for program improvements and felt able to influence peers, their attitudes toward motivational incentives were significantly more supportive. Therapists working in outpatient settings, detoxification centres, and methadone programs reported the highest levels of support for the use of motivational incentives. Another American survey reported that 67% of 383 substance abuse treatment providers surveyed agreed with positive statements about CM (Kirby, Benishek, Dugosh, & Kerwin, 2006). The most commonly reported objection was that incentives fail to address underlying addictions issues, although 60% of the sample agreed that CM could be useful even if underlying issues were not addressed. An

Australian study of attitudes among experienced alcohol and drug abuse practitioners (n = 30) found that opinions about CM were primarily positive, although a few negative attitudes were expressed in terms of philosophical concerns about compromising internal motivation, or concerns about incentives as bribes (Cameron & Ritter, 2007). One counsellor used the term 'bribe' in this study, expressing concern that gift card incentives might be no more than bribes. Interestingly, practitioner attitudes toward utilization of contingency management techniques are reportedly positive when the target population is adolescent substance abusers (Henggelar et al., 2007).

The present pilot study was a purely clinical application that explored contingency management application from a 'hands-off' researcher perspective. It was conducted in a stand-alone community treatment agency, not in a research-based addictions treatment clinic located at a university, as is the case with the only other known CM problem gambling treatment research currently in progress. Telephone-based and electronic discussions were held with one of the investigators involved in that study, to explore challenges associated with CM substance abuse treatment research (personal communications, J. Weinstock, March 30, 2007; June 19, 2007; January 22, 2008). Excerpts from emails and manual notations made during the telephone conversation are reproduced below, with permission.

> I'm not sure if we would get the same results at a community clinic. The University of Connecticut study is not conducted by community agency counsellors, but by counsellors associated directly with the research. We are currently in the process of training counsellors at community-based substance abuse agencies, and encountering resistance. [Paraphrased telephone conversation]

> The resistance we run into is two-fold: (1) they object to paying people to do something they should want to do on their own [beliefs about the immutability of intrinsic motivation], and (2) it means more work for the counselors as they have to do urine testing twice a week and we have certain administration procedures they need to follow to sign out prizes and such. We address these concerns in a presentation that we do with the counselors before we initiate the study. The presentation reviews the data on CM and presents a logical rationale. We also provide plenty of examples of CM in their life (e.g., reward programs for credit cards, etc.). They get it. On the practical side, we find that it is best to acknowledge that the procedures will take some time, but that it is in the best interest of the client." [Electronic mail excerpts]

The foregoing discussion highlights the importance of addressing potential resistance early on in community-based studies of contingency management. As noted, efforts were made to ensure counsellor understanding of, and allegiance to, the research. Additionally, a potential moderator of resistance was thought to exist in this study. The principal investigator was known to some counsellors and staff, a circumstance which could have worked to establish initial trust and comfort levels (i.e., the researcher was

not a stranger). While low levels of trust and feelings of power imbalance can be experienced by practitioners involved in community research (Sullivan et al., 2001), such feelings were not overtly expressed by counsellors in the present study. It is possible that these feelings existed but were not reported. Also, counsellors were aware that research findings would be published in the form of a thesis, and that a final report would be submitted to AADAC. Perhaps some did not feel free to express other feelings. Also, demonstrated willingness to participate may not necessarily reflect trust, but openness to research and an interest in developing collaborative relationships (Lantz, Viruell-Fuentes, Israel, Softley, & Guzman, 2001). Based on the interpretation of counsellor follow-up narratives recounted herein and in Chapter 7, resistance cannot be ruled out. Concerns reported at follow-up were very similar to those seen in other CM treatment research described above. It was at follow-up that counsellors willingly expressed perceptions and concerns. As the body of contingency management treatment research grows, best practices to address counsellor resistance will continue to advance.

In community-based clinical research, attention must be paid to the effect of research on participating staff. Have their experiences been positive or negative; stressful or rewarding? Research has shown that intention to leave a job is significantly higher when job demands are perceived to have increased as a result of research participation; conversely, 'turnover intention' is significantly lower when counsellors perceive that clients and the agency itself are showing improvements directly attributed to the research (Knudsen, Ducharme, & Roman, 2007). While the majority of counsellors reported generally positive experiences and little increase in job demand in the present study, evidence of negative impacts was seen. For those so affected, theoretical opposition to personally held beliefs must have been difficult to reconcile within the research process. And the counsellor who felt disempowered as a result of a perceived 'forced' goal-setting experience must have been particularly affected. Counsellors are at the very heart of collaborative treatment research, and researchers must work to reduce the potential for alienation or harm.

A culture of work overload was observed within the agency environment, underscored by the researcher's pervasive feeling of imposing on very busy people. This feeling was perhaps self-imposed. There was a question of balance throughout the period of research: not pushing so hard that people were alienated or harmed, but hard enough to accomplish the research goals while maintaining methodological fidelity. And so contact boundaries were established. Comments made by some counsellors at follow-up

resulted in determination that these boundaries were somewhat limiting. Therefore, expanded opportunities for counsellor input and mutual debriefing would have been helpful to all partners in the research.

The opportunity to conduct follow-up interviews with participating clients and AADAC staff was highly valued. Indeed, it was the most enlightening and fulfilling aspect of the study from a personal perspective. Connections were established on a humanistic level that situated the research within lived experiences, allowing for understanding of CM treatment experiences to emerge. The research took on greater meaning and depth as a result of the honesty, courage and generosity of spirit shown by the individuals working hard to change, and by those who helped them.

Limitations

Attention will now be drawn to a number of procedural factors that weakened, or had potential to weaken the pilot study. A thorough review of recruitment challenges begins the section. Methodological considerations are then discussed from the perspectives of reliability and validity.

Small Sample Size and Lack of Control Group

From an empirical standpoint, the small sample size and lack of a control group are serious limitations precluding inferential ability to attribute results to, or isolate the effects of, the CM treatment component. Resulting statistical power (the probability of detecting a meaningful effect) was low.

From the third month into recruitment, the area supervisor was regularly consulted about the unexpectedly low participant intake. The issue was recognized, and recruitment was willingly addressed at several staff meetings. Counsellor exposure to the study was further maintained through the researcher's scheduled visits to the AADAC office. Telephone contact and ad-hoc in-person visits provided opportunities for discussion of study processes and experiences of the research.

Anecdotal evidence provided by the area supervisor and other staff indicated that very few problem gamblers had sought treatment during the first half of recruitment, a natural factor thought to be entirely responsible for low participant entry (one which could yet change). But the rate of recruitment continued to be low, and so a strategy to increase the community profile of both AADAC and the research study was established. In November 2005, an AADAC-approved recruitment information poster was placed in various gambling and social service agency locations. When recruitment ended in early March 2006, the posters were removed. Staff at each location had been asked to leave the posters in place for the

duration of study recruitment, and the request was honoured with one exception. The poster at the casino was not found when the principal investigator arrived for poster removal. Several casino staff members attempted to determine when, why, or by whom the poster had been removed, but were unsuccessful.

Recruitment remained low despite the poster campaign. By year-end 2005, 6 participants had joined the study (an average of 1 per month). Cyclical variations in numbers of individuals seeking treatment for gambling problems undoubtedly played a role here. Low participation rates could also have been a function of client characteristics, treatment agency characteristics (e.g., client overload), or intake counsellor characteristics (e.g., work overload). But there was some question as to other factors that might be at work: Were counsellors remembering to ask clients to participate? Were they choosing not to ask clients to participate or finding themselves too busy to do so?

Recruitment factors were explored during two meetings with the area supervisor. On January 20, 2006 (approximately 6 weeks before the end of recruitment), an overview of client attendance statistics was provided. About 70 individuals sought treatment for problem gambling between April 1, 2005 and December 31, 2005, and about 25 people sought treatment for gambling and alcohol problems during the same time period (the number of individuals seeking treatment for co-occurring gambling and substance abuse problems was not specified, but was estimated to be low). Based on an estimated total of about 100 eligible clients in 9 months, the final recruitment rate was about 9%. In the end, recruitment was less than 50% of that expected. This result was surprising, in that other contingency management research has shown that "voucher systems are highly accepted by clients; fewer than 5% of clients refuse participation in voucher trials" (Petry, 2000a, p. 17). If all eligible clients were asked to participate in the present study, then the acceptance rate was extremely low: less than one-tenth that seen in voucher-based studies of CM treatment for substance abuse.

On January 27, 2006, the area supervisor was consulted about the advisability of immediately surveying counsellors to identify possible reasons for low participant numbers/high refusal rates, with a view to improving recruitment success during the remaining recruitment period. Rather than conduct a survey, it was recommended to talk with each counsellor at the end of study, to better facilitate full exploration of the issue. In keeping with that directive, counsellor experiences of the research were explored in brief post-research telephone interviews (as described in Chapter 6).

Counsellors' retrospective reports bear out the finding that the number of adult problem gamblers seeking outpatient treatment at the AADAC office was lower during the recruitment period than would normally be seen. But it seems unlikely that the reduction in eligible client numbers was largely responsible for the low rate of recruitment, given the high recruitment rates seen in other CM treatment studies, irrespective of base client numbers. Additionally, some counsellors appeared to recruit less successfully than others, according to estimated refusal rates ranging from 20% to 90%. As previously stated, 1 counsellor recruited 4 clients (44.4%), while 5 counsellors each recruited 1 client. In the first instance, was the counsellor responsible to work intake more frequently or for longer periods than other counsellors? Hours spent working on intake duties was not investigated, although the researcher was aware that time spent on intake varied proportionally to agency needs or counsellor job descriptions (and as noted previously, recruitment participation time was reduced for two new/returning counsellors). Did the counsellor see more individuals with gambling problems at intake than the other counsellors? Again, such data was not investigated, nor was it accessible (although counsellor accounts provided at follow-up suggest that 2 counsellors saw the bulk of problem gambling clients and 4 counsellors saw very few problem gamblers between them).

Recruitment statistics appear to indicate varying levels of counsellor 'buy-in' to the research. Based on overall rates of counsellor participation in recruitment (87.5%, or 7 of 8 therapists available to participate), it is clear that general support for the project was demonstrated. But the overall rate of recruitment, the difference in per-counsellor recruitment numbers, and the range of estimated client refusal rates appear to indicate limited active therapist acceptance of the CM technique. A higher rate of recruitment would have reflected a more universal belief in the potential for the incentive program to enhance treatment by demonstrating a clinical advantage for clients. It seems likely that recruitment processes may have been impacted by resistance in the form of theoretical concerns and/or concerns that research implementation would require extra work in an already high-caseload environment.

Early on in the research planning stage, a decision was made to regard the area supervisor as the organizational 'gatekeeper', the single point of contact from which to seek theoretical and structural direction under AADAC Third Party Research protocol. But at the follow-up interview, the supervisor suggested that improvements might have been possible had counsellors been involved in the research

planning stage. This suggestion indicated that the researcher had narrowly interpreted gatekeeper identity. Early inclusion of counsellors may have allowed them to feel more empowered, by providing an overt element of choice in whether or not to participate. Research has shown that front-line practitioners would prefer to become involved in research projects from early planning stages (Sullivan et al., 2001).

Recruitment results may also have been impacted by the fact that the principal investigator was necessarily removed from the process as a function of AADAC employment/liability policy. Research has shown that an 82% recruitment rate can be achieved when clients seeking problem gambling treatment in the community are directly recruited by investigators (Blaszczynski & Steel, 1998). In the present study, consistency of recruitment procedures might have been better achieved by one dedicated recruiter, thereby eliminating the potential for differing counsellor approaches, fidelity levels, and success rates.

Threats to Validity

A number of additional threats to validity may have influenced study results. Validity threats are classed as either internal: factors that impact the 'truth' of any causal inferences arising out of the findings (e.g., is the intervention responsible for measurable outcome effects?), or external: factors that limit the ability to generalize causal inferences to the general population level (e.g., are observed outcome effects likely to occur among the general population?) (Monette et al., 2002).

Data gathering was structured around existing AADAC procedures in order to facilitate the research, but there was room for improvement. Follow-up evaluation could have been optimized through utilization of a time-line follow-back method, which gathers daily gambling measures using a calendar format thought to most accurately prime a person's memory (Weinstock, Whelan, & Meyers, 2004). Measures of psycho-social functioning and CM effectiveness were original to the pilot study; construct validity and overall reliability were not established.

Retrospective self-reporting is a common (and often necessary) source of data in social science research. Such data is potentially unreliable, due in large part to the influence of recall bias. Eisenhower, Mathiowetz and Morganstein (2004) note that findings can be biased as a function of four influential recall factors: 1) interference caused by a limited ability to view similar events separately from new information, even where that information may conflict; 2) the length of time that has passed since the occurrence of an

event; 3) the salience of the event; and 4) current psychological states such as mood. Collateral verification of outcome indicators was not utilized in this study.

Under-reporting of socially undesirable behaviour is known to occur (Del Boca & Noll, 2000; Harrison, 1995), as is over-estimation of alcohol and substance use. The latter finding was demonstrated in a study that asked adolescents at follow-up to retrospectively recall baseline levels of substance use behaviour (Stinchfield, 1997). Collins, Graham, Hansen, and Anderson Johnson (1985) did not find this effect, however. As noted in Chapter 5, two baseline gambling behaviour measures gathered by the principal investigator at follow-up were higher than corresponding baseline data gathered by counsellors during intake assessments; three measures were equivalent to counsellor-gathered data, and six measures were lower than data gathered by counsellors at intake. Definitive conclusions about the potential influence of retrospective over-reporting of baseline data cannot be determined here, but the data comparison between counsellor-gathered and researcher-gathered data may indicate that the revised baseline data gathering procedure did not result in over-estimated recall.

Response bias is defined as "responses to questions that are shaped by factors other than the person's true feelings, intentions, and beliefs" (Monette et al., 2002, p. 517). Such bias is related to interviewer effects/demand characteristics, where participants may report what they think the investigator wants to hear. The researcher's professional training as an addictions counsellor may have acted to minimize the potential for interviewer error. Nonetheless, the potential for reactivity existed (participants to researcher; researcher to participants).

Examples of generalized client-centred impacts to validity of findings include life events occurring outside of treatment, personal maturation, and receiving other treatment during or after the period of research. Common treatment factors such as client expectancies and the placebo effect, client characteristics, the therapeutic alliance, and therapist characteristics are also posited to influence outcomes (Asay & Lambert, 1999; Castonguay & Buetler, 2006; Martin, Garske, & Davis, 2000; Najavits, Crits-Cristoph, & Diergerger, 2000).

Other potential impacts to validity could have functioned within the CM treatment delivery protocol: variations in therapist application of the CM component (although qualitative findings did not reveal such an effect), length of time between sessions, and variability in length of time between session

attendance and mailing of gift cards. Escalating gift card amounts were set based on funding parameters as well as evidence from the body of CM literature, but might have benefited from adjustment (i.e., delivery of a bonus incentive at week 4). Also, the goal-setting process began in the second session for 3 participants, indicating that CM effects may have been experienced differently in these cases. Interestingly, the number of gift cards received among this group averaged 3.7, slightly higher than the overall average of 3.2 cards. The 6 participants who began goal-setting in the first session received an average of 2.7 gift cards. Small pilot study status precludes any determination of causal effects here, but these observations indicate that further exploration of voucher scheduling might be useful.

It is important to consider the fact that counsellors were necessarily distanced from the gift card reward program and delivery of incentives. They were not able to immediately experience the positive effects on clients, an important determinant of practitioner perceptions of contingency management treatment utility. In one study of CM adoption at the community agency level, staff reported post-treatment improvements in two domains: 1) increased client motivation, improved treatment progress, and greater goal achievement, and 2) improved staff attitudes and morale, enhanced quality of therapeutic relationships, and better relationships among staff (Kellogg et al., 2005).

Given that reductions in problem gambling behaviour cannot be objectively verified, it would have been useful to require hard proof of goal-achievement. During the design phase of the present study, the principal investigator and area supervisor discussed this option. It was decided to streamline the CM treatment component as much as possible, in order to reduce demands on counsellor time and increase counsellor acceptance of the research. The principal investigator was aware of the time pressures and heavy caseloads experienced by counsellors. But as noted previously, perceptions of work overload may have received an over-focus in the research process.

The foregoing discussion of treatment outcomes and methodological challenges clearly indicates that while preliminary pilot study outcome findings are somewhat positive (particularly as a function of client retention), they are subject to a number of limitations (particularly as a function of the low recruitment rate). Conclusions arising from this empirical and qualitative investigation are presented in the next chapter.

CHAPTER 8: CONCLUSION

As the study progressed, it was seen to evolve from an investigative attitude of idealistic theory to one of realistic action tempered by the challenges of clinical research. New perspective was required on a regular basis, often preceded by invaluable opportunities to adapt and learn. A common thread throughout was the collaborative research spirit centred on the health and well-being of people seeking help to change problem gambling behaviours.

The thesis was theoretically grounded by a comprehensive review of problem gambling etiology. Behavioural processes were seen to play an important role within complex and multi-faceted interactions among biological, psychological, and socio-environmental developmental factors. Necessary theoretical context was also provided by a review of treatment theory and effectiveness evidence, and an overview of contingency management theory and literature. Based on strong evidence that contingency management treatment is superior to regular treatment for substance abuse, it was proposed that CM could feasibly demonstrate increased effectiveness when added to regular treatment for problem gambling. It was suggested that CM might be especially suitable as a strategic treatment approach for problem gambling, given the demonstrated role of operant conditioning mechanisms in its development and maintenance. Theoretical analyses presented in Chapters 2, 3 and 4 provided a foundation for the pilot study investigation described in Chapters 5 through 7: design and application of the research, empirical and descriptive qualitative results, and summative discussion.

Empirical research questions were answered, revealing mixed findings. As delivered in the present pilot study, regular treatment plus strategic contingency management did not result in a clear clinical outcome advantage. Reported outcomes compared well to those seen in the literature: clinically significant reductions in gambling behaviour and statistically significant improvements in psychosocial functioning. Although problem gambling behaviours improved for the 9 participating clients, the small sample size, lack of an adequate control condition, and other methodological limitations precluded any statistical inference about the influence of contingency management treatment. It may be concluded that under the current research protocol delivered in local community outpatient treatment for problem gambling, reinforcement of activity compliance (even where treatment goals were deemed by counsellors to support overall goals of

gambling abstinence), did not replicate the significantly higher effectiveness levels demonstrated in studies of CM treatment for substance abuse.

Positive effects on treatment retention were seen, however. The average length in treatment for clients who received CM in addition to regular treatment exceeded that of other AADAC outpatient clients. Predictors of retention have not been consistently demonstrated in addictions treatment literature (Stotts et al., 2007), and so the preliminary finding of a possible effect on treatment attendance may be important. We know that drop-out rates are high in community treatment programs. Also clear is that longer duration of treatment is known to result in better treatment outcomes. Therefore, a 50% increase in the number of sessions attended is notable. From this tentative perspective, it appears that contingent reinforcement of treatment-related activities may have the potential to increase attendance rates for individuals seeking community outpatient treatment for problem gambling.

The benefits of longer treatment duration are well-established, but another advantage may be seen. Given the positive personal opinions about goal-based incentives expressed by participants during follow-up interviews, it seems that contingency management in the form of incentives for goal achievement is unlikely to result in significant deterrent effects. It has been noted that "we have begun to develop and evaluate treatments that may be more attractive to pathological gamblers and therefore may result in greater numbers of treatment seekers" (Hodgins & Holub, 2007, p. 391). An increase in positive treatment experiences may gradually translate to improved public perceptions of treatment advantages and ultimately, greater willingness to seek formalized treatment.

Qualitative research questions were answered through descriptive exploration of participant experiences. An encouraging finding was that clients perceived the added contingency management component to be moderately helpful to the process of changing gambling behaviour. Through explorative follow-up interviews, deeper understanding of client treatment experiences was gained, and meanings related to value and belief systems were revealed that may be unique to CM treatment for problem gambling (i.e., "I didn't work hard enough to deserve a gift card"). Follow-up interviews with counsellors were equally valuable. The strategic goal-setting component was viewed by all participants as a very productive and useful part of treatment. Previous evidence demonstrating the potential for theoretical disconnect between effectiveness evidence and beliefs about the acceptability and utility of CM was

confirmed in this study. Contingency management effectiveness is well-established in the literature, yet therapist support is variable. Contingency management therapy is designed to enhance motivation for recovery, yet some practitioners view it in an opposite light. This paradox of theoretical contradictions merits further investigative attention.

The present pilot study has shown that conceptually sound, universally applicable, and clinically feasible strategic contingency management can be added to community outpatient treatment for problem gambling. Based on the positive views of contingent goal-setting expressed by all participants, and the encouraging but preliminary findings of an increased retention effect, further research is recommended under controlled conditions utilizing larger sample sizes. The goal of CM is to achieve maintained transfer of learning after rewards are withdrawn, and so incorporation of long term follow-up would also be useful from a clinical perspective. A more overt framing of future CM research as motivational enhancement therapy is also suggested.

In any future research, goal completion should be verified objectively (e.g., verification of participation in social, recreational or healing-based activities: a movie ticket stub; restaurant bill; recreation facility receipt; signed GA attendance slip), so as to further minimize a potential for interpretations of theoretical ambiguity by those who receive and deliver CM treatment. Based on present evidence of value-laden interpretations, contingencies should be broadened to consistently incorporate overt goals of abstinence or reduced gambling. A two-part interactive incentive program might therefore be advisable, where abstinence is reinforced under one incentive schedule and goal-related activity completion is reinforced under a second incentive schedule (e.g., a higher incentive would be given if both goals were achieved, but activity compliance alone would still be reinforced as an important part of success in treatment).

Active therapist acceptance of future CM treatment research may be increased by a longer and more intensive period of counsellor training to minimize any potential for overt or covert resistance to impact recruitment, and to provide unlimited opportunities for counsellor input. As possible within the research environment, regular researcher presence is recommended in order to optimize the recruitment environment, ensure that all counsellors feel humanistically supported at all levels, and allow for immediate incentive delivery to clients. Qualitative exploration of participant experiences is also recommended, given

the valuable insights provided by participants in this investigation, and the dearth of such research in the CM treatment literature.

These recommendations for future research are exacting. While future research-based CM treatment might be suitable for application by researcher therapists (as is presently occurring in the ongoing University of Connecticut study described in Chapters 4 and 7), continued investigation of the practicalities of CM application by frontline community practitioners would be useful.

Potential benefits resulting from higher rates of treatment attendance must be balanced by the costs of implementing a treatment innovation such as contingency management. It is concluded here that the cost of CM treatment would be money well-spent, if decision makers

> …develop consensus threshold values for policy relevant treatment outcomes… We acknowledge that such threshold values will be challenging, inasmuch as such an endeavor would require (i) identifying and quantifying the links between a given treatment outcome (e.g., an additional week of [abstinence]) and the associated benefits to patients and society… and ii) monetizing the estimated benefits." (Olmstead, Sindelar, Easton, & Carroll, 2007, p. 1451).

Realistically, the costs to implement and maintain a contingency management incentive program are of concern. Yet opportunities to minimize costs exist. For example, a recent CM study was financed solely by companies and businesses in the community who saw value in donating vouchers that could be exchanged for their own particular goods and services (Secades-Villa et al., 2008). Furthermore, it seems reasonable to think that government funding could be sourced (perhaps a very small increase to current funding of AADAC programs, funding which consists primarily of gambling revenues).

The practical logistics of implementing a CM treatment component must also be considered. Since 2002, the National Institute on Drug Abuse (2002) has progressively promoted the field of addictions knowledge transfer in the United States. The Institute's National Drug Abuse Treatment Clinical Trials Network facilitates research on the application of evidence-based treatments in clinical settings. Two Clinical Trials Network outcome studies of community-based CM implementation have been published to date (Peirce et al., 2006; Petry, Peirce et al., 2005). Via Addiction Technology Transfer Centers centrally coordinated by the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment, affiliated researchers provide training and support for community practitioners to

implement scientifically validated therapies on a trial basis (Ducharme et al., 2007). Evidence from New England suggests that such efforts are highly successful. Of 28 substance abuse agencies voluntarily participating in an Addiction Technology Transfer Center program operated by 'technology transfer specialists', 26 agencies successfully implemented and subsequently adopted a CM treatment component (Squires, Gumbley, & Storti, 2008). Similarly configured knowledge transfer partnerships are not known to operate in Canada.

Research capacity building was facilitated through the present collaborative investigation. Opportunities for partnered research can be realized among treatment agencies, universities, funding agencies, and the wider community. If future CM research continues to consistently demonstrate increased rates of treatment retention, an important implication may be that all treatment-seekers, regardless of demographics, life circumstances, or addiction severity, may benefit equally from a therapeutic program that includes goal-directed incentive reinforcement. Behavioural modification techniques such as contingency management are increasingly being seen as having strong potential to improve the effectiveness of addictions therapy in future (Murphy, Correia, & Barnett, 2007; Raccioppo, 2005; Stitzer, 2006).

Lastly, the opportunity is being taken here to suggest that treatment outcome evaluation conducted by community agencies could benefit from improved data collection methods. A standardized measurement tool is suggested, developed according to *Banff Consensus* (Walker et al., 2006) guidelines, framed in a Canadian perspective, and practically constructed to facilitate acceptance and ease of use at all levels (clients; clinicians and agency administrators; policy-makers; researchers). Bernhard et al. (2007) were guided by the *Banff Consensus* when developing a measurement instrument soon to be used in community agencies across several American states. This represents an important step forward in the field of evaluation research, in that those who determine and implement best practices are engaging firsthand in efforts to ensure that complete, up-to-date, and valid effectiveness data is consistently available.

Individual human behaviour is highly complex, infinitely variable, often unpredictable, and always absorbing. The mechanisms by which we change behaviour are similarly intriguing. The human face of problem gambling is reflected in the evidence, with each research finding best viewed as a particular 'time and place' snapshot of individual and collective life experiences. It is hoped that this

empirical and explorative pilot study contributed to the knowledge base about problem gambling treatment and how it is experienced.

REFERENCES

AADAC. (2004). *Business plan 2004-2005 to 2006-2007*. Retrieved November 4, 2005, from http://www.aadac.com/documents/business_plan_04-05_06-07.pdf

AADAC. (2006a). *AADAC history*. Retrieved April 17, 2006, from http://corp.aadac.com/content/corporate/about_aadac/aadac_history/

AADAC. (2006b). *Policy on gambling*. Retrieved April 18, 2006, from http://corp.aadac.com/content/corporate/about_aadac/policy_gambling.pdf

AADAC. (2007a). *AADAC adult clients: April 2005 to March 2006*. Retrieved April 25, 2007, from http://corp.aadac.com/content/corporate/research/profile_adult_clients.pdf

AADAC. (2007b). *AADAC clients who received treatment for gambling: April 2005 to March 2006*. Retrieved April 25, 2007, from http://corp.aadac.com/content/corporate/research/profile_clients_who_received_treatment_for_gambling.pdf

AADAC. (2007c). *ASIST Data Mart appointment view April1, 2006 - March 31, 2007*. Edmonton, AB: Author.

AADAC. (2008). *Relapse prevention: Planning for success*. Retrieved August 23, 2008, from http://www.aadac.com/87_141.asp

AADAC. (n.d.). *Treatment tools: A resource for counsellors treating problem gambling*. Edmonton, AB: Author.

AADAC, & Alberta Gaming and Liquor Commission. (2005). *Problem and responsible gambling strategy: Proposal for enhancement to address increasing problem gambling needs in Alberta, 2005-2006*. Retrieved July 6, 2006, from http://corp.aadac.com/content/corporate/about_aadac/problem_and_responsible_gambling_strategy.pdf

Aasved, M. (2002). *The psychodynamics and psychology of gambling: The gambler's mind*. Springfield, IL: Charles C. Thomas.

Aasved, M. (2003). *The sociology of gambling*. Springfield, IL: Charles C. Thomas.

Abbott, M. (2006). Do EGMs and problem gambling go together like a horse and carriage? *Gambling Research: Journal of the National Association for Gambling Studies (Australia), 18*(1), 7-38.

Agosti, V. (1995). The efficacy of treatments in reducing alcohol consumption: A meta-analysis. *The International Journal of the Addictions, 30*, 1067-1077.

Aigner, T. G., & Balster, R. L. (1978). Choice behavior in rhesus monkeys: Cocaine vs. food. *Science, 201*, 534-535.

Alberta Gaming and Liquor Commission. (2008). *Quick facts: Gaming*. Retrieved May 10, 2008, from http://www.aglc.gov.ab.ca/pdf/quickfacts/quickfacts_gaming.pdf

Alberta Gaming Research Institute. (2008). *Reference sources: Prevalence - international*. Retrieved February 18, 2008, from http://www.abgaminginstitute.ualberta.ca/prevalence_international.cfm

Alessi, S. M., Hanson, T., Wieners, M., & Petry, N. M. (2007). Low-cost contingency management in community clinics: Delivering incentives partially in group therapy. *Experimental and Clinical Psychopharmacology, 15*(3), 293-300.

Alessi, S. M., & Petry, N. M. (2003). Pathological gambling severity is associated with impulsivity in a delay discounting procedure. *Behavioural Processes, 64*(3), 345-354.

Allcock, C., Delfabbro, P., Garcia, A., Griffiths, M., Wood, R., Parke, J., et al. (2006). *Current issues related to dissociation*. Melbourne: Australian Gaming Council.

Allcock, C. C., & Grace, D. M. (1988). Pathological gamblers are neither impulsive nor sensation-seekers. *Australian and New Zealand Journal of Psychiatry, 22*, 307-311.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). (Text rev.). Washington, DC: Author.

Asay, T. P., & Lambert, M. J. (1999). The empirical case for the common factors in therapy: Quantitative findings. In M. A. Hubble, B. L. Duncan & S. D. Miller (Eds.), *The heart and soul of change: What works in therapy* (pp. 23-55). Washington, DC: American Psychological Association.

Azmier, J. J. (2005). *Gambling in Canada 2005: Statistics and context*. Calgary, AB: Canada West Foundation.

Bados, A., Balaguer, G., & Saldana, C. (2007). The efficacy of cognitive-behavioral therapy and the problem of drop-out. *Journal of Clinical Psychology, 63*(6), 585-592.

Baekeland, F., & Lundwall, L. (1975). Dropping out of treatment: A critical review. *Psychological Bulletin, 82*, 738-783.

Bandura, A. (1969). *Principles of behavior modification*. New York: Holt, Rinehart and Winston.

Barnes, G. M., Welte, J. W., Hoffman, J. H., & Dintcheff, B. A. (1999). Gambling and alcohol use among youth: Influences of demographic, socialization, and individual factors. *Addictive Behaviors, 24*, 749-767.

Bentley, J. P., & Thacker, P. G. (2004). The influence of risk and monetary payment on the research participation decision making process. *Journal of Medical Ethics, 30*(3), 293-298.

Bergh, C., Eklund, T., Sodersten, P., & Nordin, C. (1997). Altered dopamine function in pathological gambling. *Psychological Medicine, 27*, 473-475.

Bergler, E. (1958). *The psychology of gambling*. New York: International Universities Press.

Bernhard, B. J., Crossman, E. W., & Cross, C. (2007). *Evaluation of state-funded problem gambling treatment programs in Nevada*. Las Vegas, NV: Nevada Center for Environmental and Health Surveillance, University of Nevada. Available at http://dhhs.nv.gov/.

Bickel, W. K., Amass, L., Higgins, S. T., Badger, G. J., & Esch, R. (1997). Behavioral treatment improves outcomes during opioid detoxification with buprenorphine. *Journal of Consulting and Clinical Psychology, 65*, 803-810.

Bigelow, G. E., & Silverman, K. (1999). Theoretical and empirical foundations of contingency management treatments for drug abuse. In S. T. Higgins & K. Silverman (Eds.), *Motivating behavior change among illicit drug abusers: Research on contingency management interventions* (pp. 15-31). Washington, DC: American Psychological Association.

Blanco, C., Oresanz-Munez, L., Blanco-Jerez, C., & Saiz-Ruiz, J. (1996). Pathological gambling and platelet MAO activity: A psychobiological study. *American Journal of Psychiatry, 153*, 119-121.

Blaszczynski, A., & McConaghy, N. (1994). Antisocial personality disorder and pathological gambling. *Journal of Gambling Studies, 10*, 129-145.

Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction, 97*, 487-499.

Blaszczynski, A., & Nower, L. (2007). Research and measurement issues in gambling studies: Etiological models. In G. J. Smith, D. C. Hodgins & R. J. Williams (Eds.), *Research and measurement issues in gambling studies* (pp. 323-344). New York: Elsevier.

Blaszczynski, A., Sharpe, L., & Walker, M. (2001). *Final report: The assessment of the impact of the reconfiguration on electronic gaming machines as harm minimisation strategies for problem gambling*. Retrieved August 10, 2006, from http://www.psych.usyd.edu.au/gambling/GIO_report.pdf

Blaszczynski, A., & Silove, D. (1995). Cognitive and behavioral therapies for pathological gambling. *Journal of Gambling Studies, 11*(2), 195-220.

Blaszczynski, A., & Silove, D. (1996). Pathological gambling: Forensic issues. *Australian and New Zealand Journal of Psychiatry, 30*, 358-369.

Blaszczynski, A., & Steel, Z. (1998). Personality disorders among pathological gamblers. *Journal of Gambling Studies, 14*(1), 51-71.

Blaszczynski, A., Steel, Z., & McConaghy, N. (1997). Impulsivity in pathological gambling: The antisocial impulsivist. *Addiction, 92*(1), 75-87.

Blaszczynski, A., Wilson, A. C., & McConaghy, N. (1986). Sensation seeking and pathological gambling. *British Journal of Addiction, 81*, 113-117.

Boas de Carvalho, S. V., Collakis, S. T., Tavares de Oliveira, P. M., & da Silveira, D. X. (2005). Frequency of pathological gambling among substance abusers under treatment. *Rev Saude Publica, 39*(2), 1-6.

Bovasso, G. B., Eaton, W. W., & Armenian, H. K. (1999). The long-term outcomes of mental health treatment in a population-based study. *Journal of Consulting and Clinical Psychology, 67*(4), 529-538.

Breen, R. B. (2004). Rapid onset of pathological gambling in machine gamblers: A replication. *International Journal of Mental Health and Addiction, 2*(1), 44-49.

Breen, R. B., & Zuckerman, M. (1999). 'Chasing' in gambling behaviour: Personality and cognitive determinants. *Personality and Individual Differences, 27*, 1097-1111.

Brooner, R. K., Kidorf, M. S., King, V. L., Stoller, K. B., Peirce, J. M., Bigelow, G. E., et al. (2004). Behavioral contingencies improve counseling attendance in an adaptive treatment model. *Journal of Substance Abuse Treatment, 27*, 223-232.

Budney, A. J., Moore, B. A., Rocha, H. L., & Higgins, S. T. (2006). Clinical trial of abstinence-based vouchers and cognitive-behavioral therapy for cannabis dependence. *Journal of Consulting and Clinical Psychology, 74*(2), 307-316.

Budney, A. J., Sigmon, S. C., & Higgins, S. T. (2003). Contingency management in the substance abuse treatment clinic. In F. Rotgers, J. Morgenstern & S. T. Walter (Eds.), *Treating substance abuse: Theory and technique* (2nd ed., pp. 248-278). New York: Guilford Press.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research, 64*(3), 363-423.

Cameron, J., & Pierce, W. D. (1996). The debate about rewards and intrinsic motivation: Protests and accusations do not alter the results. *Review of Educational Research, 66*(1), 39-51.

Cameron, J., & Ritter, A. (2007). Contingency management: Perspectives of Australian service providers. *Drug and Alcohol Review, 26*, 183-189.

Campbell, C. S., & Smith, G. J. (2003). Gambling in Canada-from vice to disease to responsibility: A negotiated history. *Canadian Bulletin of Medical History, 20*(1), 121-149.

Canadian Partnership for Responsible Gambling. (2008). *Canadian gambling digest: 2006-2007*. Retrieved April 17, 2008, from http://www.cprg.ca/articles/Canadian_Gambling_Digest_2006-07.pdf

Caraniche Pty Ltd. (2005). *Evaluation of electronic gaming machine harm minimisation measures in Victoria*. Final Report prepared for the former Victorian Gambling Research Panel. Retrieved July 28, 2006, from http://www.justice.vic.gov.au/wps/wcm/connect/DOJ+Internet/Home/Gambling+and+Racing/Research+and+Statistics/JUSTICE+-+Evaluation+of+Electronic+Gaming+Machine+Harm+Minimisation+Measures+in+Victoria+(PDF)

Carroll, K. M., Sinha, R., Nich, C., Babuscio, T., & Rounsaville, B. J. (2002). Contingency management to enhance naltrexone treatment of opioid dependence: A randomized clinical trial of reinforcement magnitude. *Experimental and Clinical Psychopharmacology, 10*(1), 54-63.

Castellani, B., & Rugle, L. (1995). A comparison of pathological gamblers to alcoholics and cocaine misusers on impulsivity, sensation seeking and craving. *International Journal of the Addictions, 30*, 275-289.

Castonguay, L. G., & Buetler, L. E. (2006). Common and unique principles of therapeutic change: What do we know and what do we need to know? In L. G. Castonguay & L. E. Buetler (Eds.), *Principles of therapeutic change that work* (pp. 353-369). New York: Oxford University Press.

Cavedini, P., Riboldi, G., Keller, R., D'Annucci, A., & Bellodi, L. (2002). Frontal lobe dysfunction in pathological gambling patients. *Biological Psychiatry, 51*, 334-341.

Charles, K. E., & Egan, V. (2005). Mating effort correlates with self-reported delinquency in a normal adolescent sample. *Personality and Individual Differences, 28*, 1035-1045.

Chutuape, M. A., Silverman, K., & Stitzer, M. L. (1998). Survey assessment of methadone treatment services as reinforcers. *American Journal of Drug and Alcohol Abuse, 24*(1), 1-16.

Cohen, J. (1969). *Operant behavior and operant conditioning*. Chicago: Rand McNally & Company.

Collins, L. M., Graham, J. W., Hansen, W. B., & Anderson Johnson, C. (1985). Agreement between retrospective accounts of substance use and earlier reported substance use. *Applied Psychological Measurement, 9*(3), 301-309.

Collins, R. L., Ellickson, P. L., Hays, R. D., & McCaffrey, D. F. (2000). Effects of incentive size and timing on response rates to a follow-up wave of a longitudinal mailed survey. *Evaluation Review, 24*(4), 347-363.

Comings, D. E., Rosenthal, R. J., Lesieur, H. R., Rugle, L. J., Muhleman, D., Chiu, C., et al. (1996). A study of the dopamine D2 receptor gene in pathological gambling. *Pharmacogenetics, 6*(3), 223-234.

Corey, G. (2001). *Theory and practice of counseling and psychotherapy* (6th ed.). Belmont, CA: Wadsworth.

Corporate Research Associates. (2006). *Nova Scotia video lottery program changes: Impact analysis*. Available at http://www.gamingcorp.ns.ca.

Cote, D., Caron, A., Aubert, J., Desrochers, V., & Ladouceur, R. (2003). Near wins prolong gambling on a video lottery terminal. *Journal of Gambling Studies, 19*, 433-438.

Coventry, K., & Norman, A. (1997). Arousal, sensation seeking and frequency of gambling in off-course horse racing bettors. *British Journal of Psychology, 88*, 671-681.

Cox, B. J., Yu, N., Afifi, T. O., & Ladouceur, R. (2005). A national survey of gambling problems in Canada. *Canadian Journal of Psychiatry, 50*(4), 213-217.

Cresswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Crockford, D., Quickfall, J., Currie, S., Furtade, S., Suchowersky, O., & el-Guebaly, N. (2008, pre-print). Prevalence of problem and pathological gambling in Parkinson's Disease. *Journal of Gambling Studies*.

Crockford, D. N., & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: A critical review. *Canadian Journal of Psychiatry, 43*(1), 43-50.

Crossan, F. (2003). Research philosophy: Toward an understanding. *Nurse Researcher, 11*(1), 46-55.

Cunningham-Williams, R. M., Crucza, R. A., Cottler, L. B., Womack, S. B., Books, S. J., Przybeck, T. R., et al. (2005). Prevalence and predictors of pathological gambling: Results from the St. Louis personality, health and lifestyle (SLPHL) study. *Journal of Psychiatric Research, 39*, 377-390.

Cunningham, J. A. (2005). Little use of treatment among problem gamblers. *Psychiatric Services, 56*, 1024-1025.

Daghestani, A. N., Elenz, E., & Crayton, J. W. (1996). Pathological gambling in hospitalized substance abusing veterans. *Journal of Clinical Psychiatry, 57*(8), 360-363.

Dallery, J., Silverman, K., Chutuape, M. A., Bigelow, G. E., & Stitzer, M. L. (2001). Voucher-based reinforcement of opiate plus cocaine abstinence in treatment-resistant methadone patients: Effects of reinforcer magnitude. *Experimental and Clinical Psychology, 9*(3), 317-325.

Datta, L.-E. (1994). Paradigm wars: A basis for peaceful coexistence and beyond. In C. S. Reichart & S. F. Rallis (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 53-70). San Francisco, CA: Jossey-Bass Publishers.

Del Boca, F. K., & Noll, J. A. (2000). Truth or consequences: The validity of self-report data in health services research on addictions. *Addiction, 95*(Supplement 3), 347-360.

Delfabbro, P., Falzon, K., & Ingram, T. (2005). The effects of parameter variations in electronic gambling simulations: Results of a laboratory-based pilot investigation. *Gambling Research, 17*(1), 7-25.

Delfabbro, P., & LeCouteur, A. (2003). *A decade of gambling research in Australia and New Zealand (1992-2002): Implications for policy, regulation and harm minimisation*: Report prepared for the Independent Gambling Authority of South Australia, Adelaide.

Delfabbro, P., & Winefield, A. H. (1999). Poker-machine gambling: A analysis of within session characteristics. *British Journal of Psychology, 90*, 425-439.

Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods* (2nd ed.). New York: McGraw-Hill.

Dickerson, M., & O'Connor, J. (2006). *Gambling as an addictive behaviour: Impaired control, harm minimisation, treatment and prevention*. New York: Cambridge University Press.

Dickerson, M. G. (1993). Internal and external determinants of persistent gambling: Problems in generalizing from one form of gambling to another. *Journal of Gambling Studies, 9*(3), 225-245.

Dickerson, M. G., Hinchy, J., England, S. L., Fabre, J., & Cunningham, R. (1992). On the determinants of persistent gambling behaviour: I: High-frequency poker machine players. *British Journal of Psychology, 83*, 237-248.

Dickson, L., Derevensky, J., & Gupta, R. (n.d.). *Youth gambling problems: The identification of risk and protective factors* (Report to the Ontario Problem Gambling Research Centre). Montreal, QC: R & J Child Development Consultants, Inc.

Dimeff, L. A., & Marlatt, G. A. (1995). Relapse prevention. In R. K. Hester & W. R. Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (2nd ed., pp. 176-194). Boston: Allyn & Bacon.

Diskin, K., & Hodgins, D. (1999). Narrowing of attention and dissociation in pathological video lottery gamblers. *Journal of Gambling Studies, 15*(1), 17-28.

Dixon, M. R., & Schreiber, J. B. (2002). Utilizing a computerized video poker simulation for the collection of data on gambling behaviour. *Psychological Record, 52*, 417-428.

Dodd, M. L., Klos, K. J., Bower, J. H., Geda, Y. E., Josephs, K. A., & Ahlskog, J. E. (2005). Pathological gambling caused by drugs used to treat Parkinson disease. *Archives of Neurology, 62*, 1377-1381.

Downey, K. K., Helmus, T. C., & Schuster, C. R. (2000). Treatment of heroin-dependent poly-drug abusers with contingency management and buprenorphine maintenance. *Experimental and Clinical Psychopharmacology, 8*, 176-184.

Driver-Dunckley, D., Samanta, J., & Stacy, M. (2003). Pathological gambling associated with dopamine agonist therapy in Parkinson's disease. *Neurology, 61*, 422-423.

Ducharme, L. J., Knudsen, H. K., Roman, P. M., & Johnson, J. A. (2007). Innovation adoption in substance abuse treatment: Exposure, trialibility, and the Clinical Trials Network. *Journal of Substance Abuse Treatment, 32*(4), 321-329.

Dutra, L., Stathopoulou, G., Basden, S. L., Leyro, T. M., Powers, M. B., & Otto, M. W. (2008). A meta-analytic review of psychosocial interventions for substance use disorders. *The American Journal of Psychiatry, 165*(2), 179-187.

Eber, G. B., & Shaffer, H. J. (2000). Trends in bio-behavioral gambling studies research: Quantifying citations. *Journal of Gambling Studies, 16*, 461-467.

Echeburua, E., Baez, C., & Fernandez-Montalvo, J. (1996). Comparative effectiveness of three therapeutic modalities in the psychological treatment of pathological gambling: Long-term outcome. *Behavioural and Cognitive Psychotherapy, 24*, 51-72.

Echeburua, E., Fernandez-Montalvo, J., & Baez, C. (2000). Relapse prevention in the treatment of slot-machine pathological gambling: Long-term outcome. *Behavior Therapy, 31*, 351-364.

Eisen, S. A., Lin, N., Lyons, M., Scherrer, J. F., Griffith, K., True, W. R., et al. (1998). Familial influences on gambling behavior: An analysis of 3359 twin pairs. *Addiction, 93*(9), 1375-1384.

Eisenhower, D., Mathiowetz, N. A., & Morganstein, D. (2004). Recall error: Sources and bias reduction techniques. In P. P. Biemer, R. M. Groves, L. E. Lybert, N. A. Mathiowetz & S. Sudman (Eds.), *Measurement errors in surveys* (pp. 127-144). New York: John Wiley & Sons.

el-Guebaly, N., & Hodgins, D. (2000). *Pathological gambling: The biopsychological variables and their management: A review of the literature*. Edmonton, AB: Alberta Gaming Research Institute.

el-Guebaly, N., Patten, S. B., Currie, S., Williams, J. V. A., Beck, C. A., Maxwell, C. J., et al. (2006). Epidemiological associations between gambling behavior, substance use & mood and anxiety disorders. *Journal of Gambling Studies, 22*, 275-287.

Elk, R., Mangus, L., Rhoades, H., Andres, R., & Grabowski, J. (1998). Cessation of cocaine use during pregnancy: Effects of contingency management interventions on maintaining abstinence and complying with prenatal care. *Addictive Behaviors, 23*, 57-64.

Epstein, D. H., Hawkins, W. E., Covi, L., Umbricht, A., & Preston, K. L. (2003). Cognitive-behavioral therapy plus contingency management for cocaine use: Findings during treatment and across 12-month follow-up. *Psychology of Addictive Behaviors, 17*(1), 73-82.

Epstein, D. H., & Preston, K. L. (2008). Opioids. In S. T. Higgins, K. Silverman & S. H. Heil (Eds.), *Contingency management in substance abuse treatment* (pp. 42-60). New York: Guilford.

Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index final report*. Ottawa, Ontario: Canadian Centre on Substance Abuse.

Ferster, C. B., & Skinner, B. F. (1957). *Schedules of reinforcement*. New York: Appleton-Century-Crofts.

Fong, D. K., & Ozorio, B. (2005). Gambling participation and prevalence estimates of pathological gambling in a Far-East gambling city: Macao. *UNLV Gaming Research and Review Journal, 9*(2), 15-28.

Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research [Electronic Version]. *Australian and New Zealand Journal of Psychiatry, 36*, 717-732.

Fuller, B. E., Rieckmann, T., Nunes, E. V., Miller, M., Arfken, C., Edmundson, E., et al. (2007). Organizational readiness for change and opinions toward treatment innovations. *Journal of Substance Abuse Treatment, 33*, 183-192.

Gaboury, A., & Ladouceur, R. (1989). Erroneous perceptions and gambling. *Journal of Social Behavior and Personality, 4*, 411-420.

Gabriel, K. (1996). *Gambler way: Indian gaming in mythology, history and archaeology in North America*. Boulder, CO: Johnson Books.

Gambino, B., Fitzgerald, R., Shaffer, H. J., Renner, J., & Courtnage, P. (1993). Perceived family history of problem gambling and scores on SOGS. *Journal of Gambling Studies, 9*, 169-184.

Gamblers Anonymous. (2008). *Gamblers Anonymous international directory*. Retrieved January 12, 2008, from http://www.gamblersanonymous.org/mtgdirCAN.html#CANal

GamCare. (2007). *Online support/phone support/counselling support*. Retrieved November 12, 2007, from http://www.gamcare.org.uk/

Gardner, R. M. (1971). A test of coverant control therapy to reduce cigarette smoking: A comparative effectiveness of two different strategies with a direct test of the effectiveness of contingency management. *Dissertation Abstracts International, 32*(5-B), 3001-B.

Goldberg, S. R., Spealman, R. D., Risner, M. E., & Henningfield, J. E. (1983). Control of behavior by intravenous nicotine injections in laboratory animals. *Pharmacology Biochemistry & Behavior, 19*, 1011-1020.

Goudriaan, A. E., Oosterlaan, J., de Beurs, E., & Van den Brink, W. (2004). Pathological gambling: A comprehensive review of biobehavioral findings. *Neuroscience and Biobehavioral Reviews, 28*, 123-141.

Grant, J. (2005). The neurobiology of pathological gambling [Electronic Version]. *Journal of Gambling Issues, 15*, 1-7. Retrieved January 5, 2006 from http://www.camh.net/egambling/issue15/jgi_15_grant.html.

Grant, J. E., & Kim, S. W. (2002). Parental bonding in pathological gambling disorder. *Psychiatric Quarterly, 73*, 239-247.

Grant, J. E., & Kim, S. W. (2003). Dissociative symptoms in pathological gambling. *Psychopathology, 36*, 200-203.

Grant, J. E., Kim, S. W., & Kuskowski, M. (2004). Retrospective review of treatment retention in pathological gambling. *Comprehensive Psychiatry, 45*(2), 83-87.

Grant, J. E., Williams, K. A., & Kim, S. W. (2006). Update on pathological gambling. *Current Psychiatry Reports, 8*, 53-58.

Griffith, J. D., Rowan-Szal, G. A., Roark, R. R., & Simpson, D. D. (2000). Contingency management in outpatient methadone treatment: A meta-analysis. *Drug and Alcohol Dependence, 58*, 55-66.

Griffiths, M., & Delfabbro, P. (2002). The biopsychosocial approach to gambling: Contextual factors in research and clinical interventions. [Electronic Version]. *eGambling: The Electronic Journal of Gambling Issues.* Retrieved March 29, 2005 from http://www.camh.net/egambling/issue5/feature/index.html.

Griffiths, R. R., Bigelow, G. E., & Henningfield, J. E. (1980). Similarities in animal and human drug taking behavior. In M. K. Mello (Ed.), *Advances in substance abuse: Behavioral and biological research* (pp. 1-90). Greenwich, CT: JAI Press.

Gupta, R., & Derevensky, J. (1997). Familial and social influences on juvenile gambling behavior. *Journal of Gambling Studies, 13*, 179-192.

Gupta, R., & Derevensky, J. L. (1998). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with problem gambling. *Journal of Gambling Studies, 14*(4), 319-345.

Harrigan, K. A. (2007). Slot machine structural characteristics: Creating near misses using high award symbol ratios [Electronic Version]. *International Journal of Mental Health and Addiction*. Retrieved August 12, 2007, SpringerLink.

Harrison, L. D. (1995). The validity of self-reported data on drug use. *Journal of Drug Issues, 25*(1), 1-15.

Haynes, S. N. (1973). Contingency management in a municipally-administered antabuse program for alcoholics. *Journal of Behavior Therapy & Experimental Psychiatry, 4*(1), 31-32.

Heil, S. H., Higgins, S. T., Bernstein, I. M., Solomon, L. J., Rogers, R. E., Thomas, C. S., et al. (2008). Effects of voucher-based incentives on abstinence from cigarette smoking and fetal growth among pregnant women. *Addiction, 103*, 1009-1018.

Hein, S. F., & Austin, W. J. (2001). Empirical and hermeneutic approaches to phenomenological research in psychology: A comparison. *Psychological Methods, 6*(1), 3-17.

Helmus, T. C., Schoener, E. P., Saules, K. K., & Roll, J. M. (2003). Reinforcement of counseling attendance and alcohol abstinence in a community-based dual-diagnosis treatment program: A feasibility study. *Psychology of Addictive Behaviors, 17*(3), 249-251.

Henggelar, S. W., Chapman, J. E., Rowland, M. D., Halliday-Boykins, C. A., Randall, J., Shackelford, J., et al. (2007). If you build it, they will come: Statewide practitioner interest in contingency management for youths. *Journal of Substance Abuse Treatment, 32*, 121-131.

Herscovitch, A. G. (1999). *Alcoholism and pathological gambling: Similarities and differences*. Holmes Beach, FL: Learning Publications.

Higgins, S. T. (1999). Introduction. In S. T. Higgins & K. Silverman (Eds.), *Motivating behaviour change among illicit-drug abusers: Research on contingency management interventions* (pp. 3-13). Washington, D C: American Psychological Association.

Higgins, S. T., Alessi, S. M., & Dantona, R. L. (2002). Voucher-based incentives: A substance abuse treatment innovation [Electronic version]. *Addictive Behaviors, 27*(6), 887-910.

Higgins, S. T., Budney, A. J., Bickel, W. K., Badger, G. J., Foerg, F. E., & Ogden, D. (1995). Outpatient behavioral treatment for cocaine dependence: One-year outcome. *Experimental and Clinical Psychopharmacology, 3*, 205-212.

Higgins, S. T., Budney, A. J., Bickel, W. K., Foerg, F. E., Donham, R., & Badger, G. (1994). Incentives improve outcome in outpatient behavioral treatment of cocaine dependence. *Archives of General Psychiatry, 51*(7), 568-576.

Higgins, S. T., Budney, A. J., Bickel, W. K., Hughes, J. R., Foerg, F., & Badger, G. (1993). Achieving cocaine abstinence with a behavioral approach. *American Journal of Psychiatry, 150*(5), 763-769.

Higgins, S. T., Delaney, D. D., Budney, A. J., Bickel, W. K., Hughes, J. R., Foerg, F., et al. (1991). A behavioral approach to achieving initial cocaine abstinence. *American Journal of Psychiatry, 148*(9), 1218-1224.

Higgins, S. T., Heil, S. H., & Lussier, J. P. (2004). Clinical implications of reinforcement as a determinant of substance abuse disorders. *Annual Review of Psychology, 55*, 431-461.

Higgins, S. T., Sigmon, S. C., Wong, C. J., Heil, S. H., Badger, G. J., Donham, R., et al. (2000). Community reinforcement therapy for cocaine-dependent outpatients. *Archives of General Psychiatry, 60*, 1043-1052.

Higgins, S. T., & Silverman, K. (2008). Introduction. In S. T. Higgins, K. Silverman & S. H. Heil (Eds.), *Contingency management in substance abuse treatment* (pp. 1-18). New York: The Guilford Press.

Higgins, S. T., Wong, C. M., Badger, G. J., Haug Ogden, D. E., & Dantona, R. L. (2000). Contingent reinforcement increases cocaine abstinence during outpatient treatment and 1 year of follow-up. *Journal of Consulting and Clinical Psychology, 68*(1), 64-72.

Hodgins, D. C., Currie, S. R., & el-Guebaly, N. (2001). Motivational enhancement and self-help treatments for problem gambling. *Journal of Consulting and Clinical Psychology*, *69*(1), 50-57.

Hodgins, D. C., & el-Guebaly, N. (2000). Natural and treatment-assisted recovery from gambling problems: A comparison of resolved and active gamblers. *Addiction, 95*(5), 777-789.

Hodgins, D. C., & Holub, A. (2007). Treatment of problem gambling. In G. J. Smith, D. C. Hodgins & R. J. Williams (Eds.), *Research and measurement issues in gambling studies* (pp. 371-397). New York: Elsevier.

Hodgins, D. C., & Makarchuk, K. (2002). *Becoming a winner: Defeating problem gambling*. Edmonton, AB: Alberta Alcohol and Drug Abuse Commission.

Hodgins, D. C., & Makarchuk, K. (2003). Trusting problem gamblers: Reliability and validity of self-reported gambling behavior. *Psychology of Addictive Behaviors, 17*(3), 244-248.

Hodgins, D. C., & Peden, N. (2005). Natural course of gambling disorders: Forty-month follow-up [Electronic Version]. *Journal of Gambling Issues*, *14*. Retrieved July 3, 2006 from http://www.camh.net/egambling/issue14/jgi_14_hodgins.html.

Hodgins, D. C., Peden, N., & Cassidy, E. (2005). The association between comorbidity and outcome in pathological gambling: A prospective follow-up of recent quitters. *Journal of Gambling Studies, 21*, 255-271.

Hollander, E., DeCaria, C. M., Finkell, J. N., Begaz, T., Wong, C. M., & Cartwright, C. (2000). A randomized double-blind fluvoxamine/placebo crossover trial in pathologic gambling. *Biological Psychiatry, 9*(1), 813-817.

House, E. R. (1994). Integrating the quantitative and qualitative. In C. S. Reichardt & S. F. Rallis (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 13-22). San Francisco, CA: Jossey-Bass Publishers.

Ibanez, A., Blanco, C., Perez de Castro, I., Fernandez-Piqueras, J., & Saiz-Ruiz, J. (2003). Genetics of pathological gambling. *Journal of Gambling Studies, 19*(1), 11-22.

Ibanez, A., Blanco, C., & Saiz-Ruiz, J. (2002). Neurobiology and genetics of pathological gambling. *Psychiatric Annals, 32*(3), 181-185.

Ibanez, A., Perez de Castro, I., Fernandez-Piqueras, J., Blanco, C., & Saiz-Ruiz, J. (2000). Genetic association study between pathological gambling and DNA polymorphic markers at MAO-A and MAO-B genes. *Molecular Psychiatry, 20*, 105-109.

Iguchi, M. Y., Belding, M. A., Morral, A. R., Lamb, R. J., & Husband, S. D. (1997). Reinforcing operants other than abstinence in drug abuse treatment: An effective alternative for reducing drug use. *Journal of Consulting and Clinical Psychology, 65*(3), 421-428.

Jackson, A. C., Thomas, S. A., Thomason, N., Borrell, J., Crisp, B. R., Enderby, K., et al. (2000). *Longitudinal evaluation of the effectiveness of problem gambling counselling services, community education strategies and information products: Service design and access* (Vol. 1). Melbourne, AU: Victorian Department of Human Services.

Jacobs, D. F. (1988). Evidence for a common dissociative-like reaction among addicts. *Journal of Gambling Behavior, 4*, 27-37.

Jacobs, D. F. (1993). Evidence supporting a general theory of addiction. In W. R. Eadington & J. A. Cornelius (Eds.), *Gambling behavior and problem gambling* (pp. 287-294). Reno, NV: University of Reno.

Jacques, C., Ladouceur, R., & Ferland, F. (2000). Impact of availability on gambling: A longitudinal study [Electronic version]. *Canadian Journal of Psychiatry, 45*, 810-815.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly, 24*, 602-611.

Joe, G. W., Simpson, D. D., & Broome, K. M. (1998). Effects of readiness for drug abuse treatment on client retention and assessment of process. *Addiction, 93*(8), 1177-1190.

Jones, H. E., Haug, N. A., Stitzer, M. L., & Svikis, D. S. (2000). Improving treatment outcomes for pregnant drug dependent women using low-magnitude voucher incentives. *Addictive Behaviors, 25*(2), 263-267.

Joukhador, J., Blaszczynski, A., & Maccallum, F. (2004). Superstitious beliefs in gambling among problem and non-problem gamblers: Preliminary data. *Journal of Gambling Studies, 20*(2), 171-180.

Julien, R. M. (2001). *A primer of drug action: A concise, nontechnical guide to the actions, uses, and side effects of psychoactive drugs*. New York: W. H. Freeman and Company.

Kadden, R., Litt, M. D., Kabela-Cormier, E., & Petry, N. M. (2007). Abstinence rates following behavioral treatments for marijuana dependence. *Addictive Behaviors, 32*, 1220-1236.

Kaper, J., Wagena, E. J., Willemsen, M. C., & van Schayck, C. P. (2005). Reimbursement for smoking cessation treatment may double the abstinence rate: Results of a randomized trial. *Addiction, 100*, 1012-1020.

Kassinove, J. (1999). Development of the gambling attitudes scales: Preliminary findings. *Journal of Clinical Psychology, 54*, 763-771.

Kassinove, J. I., & Schare, M. L. (2001). Effects of the "near miss" and the "big win" on persistence at slot machine gambling. *Psychology of Addictive Behaviors, 15*(2), 155-158.

Kausch, O., Rugle, L., & Rowland, D. Y. (2006). Lifetime histories of trauma among pathological gamblers. *The American Journal on Addictions, 15*, 35-43.

Kazdin, A. E. (1988). The token economy: A decade later. In G. Davey & C. Cullen (Eds.), *Human Operant Conditioning and Behavior Modification*. New York: John Wiley and Sons.

Kellogg, S. H., Burns, M., Coleman, P., Stitzer, M. L., Wale, J. B., & Kreek, M. J. (2005). Something of value: The introduction of contingency management interventions into the New York City Health and Hospital Addiction Treatment Service. *Journal of Substance Abuse Treatment, 28*, 57-65.

Kim, S. W., Grant, J. E., Adson, D. E., & Shin, Y. C. (2001). Double-blind naltrexone and placebo comparison study in the treatment of pathological gambling. *Biological Psychiatry, 49*(11), 914-921.

King, A. C., & Canada, S. A. (2004). Client-related predictors of early treatment drop-out in a substance abuse clinic exclusively employing individual therapy [Electronic version]. *Journal of Substance Abuse Treatment, 26*, 189-195.

Kirby, K. C., Benishek, L. A., Dugosh, K. L., & Kerwin, M. E. (2006). Substance abuse treatment providers' beliefs and objections regarding contingency management: Implications for dissemination. *Drug and Alcohol Dependence, 85*, 19-27.

Knapp, T. J., & Lech, B. C. (1987). Pathological gambling: A review with recommendations. *Advances in Behaviour Research and Therapy, 9*(21-49).

Knudsen, H. K., Ducharme, L. J., & Roman, P. M. (2007). Research participation and turnover intention: An exploratory analysis of substance abuse counselors. *Journal of Substance Abuse Treatment, 33*, 211-217.

Kolb, B., & Wishaw, I. Q. (2001). *An introduction to brain and behavior*. New York: Worth Publishers.

Korn, D. (2000). Expansion of gambling in Canada: Implications for health and social policy [Electronic version]. *Canadian Medical Association Journal, 163*(1), 61-64.

Korn, D., & Shaffer, H. J. (1999). Gambling and the health of the public: Adopting a public health perspective. *Journal of Gambling Studies, 15*(4), 289-365.

Kosten, T., Poling, J., & Oliveto, A. (2003). Effects of reducing contingency management values on heroin and cocaine use for buprenorhine- and desipramine-treated individuals. *Addiction, 98*, 665-671.

Krasner, L. (1971). The operant approach in behavior theory. In A. E. Bergin & S. L. Garfield (Eds.), *Handbook of psychotherapy and behavior change: An empirical analysis* (pp. 612-652). New York: John Wiley & Sons.

Kratochwill, T. R., & Bijou, S. W. (1987). The impact of behaviorism on educational psychology. In J. A. Glover & R. R. Ronning (Eds.), *Historical foundations of educational psychology* (pp. 131-158). New York: Plenum Press.

Ladouceur, R., & Sevigny, S. (2006). The impact of video lottery game speed on gamblers [Electronic Version]. *Journal of Gambling Issues*. Retrieved August 26, 2006 from http://www.camh.net/egambling/issue17/ladouceur.html.

Ladouceur, R., Sylvain, C., Boutin, M. P., & Doucet, C. (2002). *Understanding and treating the problem gambler*. West Sussex, UK: John Wiley and Sons.

Ladouceur, R., Sylvain, C., Boutin, M. P., Lachance, S., Doucet, C., Leblond, J., et al. (2001). Cognitive treatment of pathological gambling. *The Journal of Nervous and Mental Disease, 189*(11), 774-780.

Ladouceur, R., & Walker, M. (1996). A cognitive perspective on gambling. In P. M. Salkovskis (Ed.), *Trends in cognitive and behavioural therapies* (pp. 89-120). New York: John Wiley & Sons.

Langewisch, M. W., & Frisch, G. R. (1998). Gambling behavior and pathology in relation to impulsivity, sensation seeking, and risky behavior in male college students. *Journal of Gambling Studies, 14*, 245-262.

Langhinrichsen-Rohling, J., Rohde, P., Seeley, J. R., & Rohling, M. L. (2004). Individual, family, and peer correlates of adolescent gambling. *Journal of Gambling Studies, 20*, 23-46.

Lantz, P. M., Viruell-Fuentes, E., Israel, B. A., Softley, D., & Guzman, R. (2001). Can communities and academia work together on public health research? Evaluation results from a community-based participatory research partnership in Detroit. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 78*(3), 495-507.

LaPlante, D. A., & Shaffer, H. J. (2007). Understanding the influence of gambling opportunities: Expanding exposure models to include adaptation. *American Journal of Orthopsychiatry, 77*(4), 616-623.

Leary, K., & Dickerson, M. (1985). Levels of arousal in high and low frequency gamblers. *Behaviour Research and Therapy, 23*, 635-641.

Ledgerwood, D. M., & Petry, N. M. (2006). Does contingency management affect motivation to change substance use? *Drug and Alcohol Dependence, 83*, 65-72.

Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of problem gamblers. *American Journal of Psychiatry, 144*(9), 1184-1188.

Lesieur, H. R., Blume, S. B., & Zoppa, R. M. (1986). Alcoholism, drug abuse, and gambling. *Alcoholism: Clinical and Experimental Research, 10*, 33-38.

Lester, D. (1994). Access to gambling opportunities and compulsive gambling. *International Journal of the Addictions, 29*(12), 1611-1616.

Levis, D. J. (1982). Experimental and theoretical foundations of behavior modification. In A. S. Bellack, M. Hersen & A. E. Kazdin (Eds.), *International handbook of behavior modification and therapy* (pp. 33-56). New York: Plenum Press.

Levitz, L. S. (1971). The experimental induction of compulsive gambling behaviours. *Dissertation Abstracts International, 32*(2-13), 1216-1217.

Lewis, D. J., & Duncan, C. P. (1956). Effect of different percentages of money reward on extinction of a lever-pulling response. *Journal of Experimental Psychology, 52*(1), 23-27.

Lewis, D. J., & Duncan, C. P. (1957). Expectation and resistance to extinction of a lever-pulling response as functions of percentage of reinforcement and amount of reward. *Journal of Experimental Psychology, 54*(2), 115-120.

Lewis, D. J., & Duncan, C. P. (1958). Expectation and resistance to extinction of a lever-pulling response as a function of percentage of reinforcement and number of acquisition trials. *Journal of Experimental Psychology, 55*(2), 121-128.

Lewis, M. W., & Petry, N. M. (2005). Contingency management treatments that reinforce completion of goal-related activities: Participation in family activities and its association with outcomes. *Drug and Alcohol Dependence, 79*, 267-271.

Lightsey, O. R., & Hulsey, C. D. (2002). Impulsivity, coping, stress, and problem gambling among university students. *Journal of Counseling Psychology, 49*, 202-211.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Linden, R., Pope, H., & Jonas, J. (1986). Pathological gambling and major affective disorder: Preliminary findings. *Journal of Clinical Psychiatry, 41*, 201-203.

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment: Confirmation from meta-analysis. *American Psychologist, 48*(12), 1181-1209.

Loo, J. M., Raylu, N., & Oei, T. P. (2008). Gambling among the Chinese: A comprehensive review. *Clinical Psychology Review, 28*(7), 1152-1166.

Lopez, K. A., & Willis, D. G. (2004). Descriptive versus interpretive phenomenology: Their contributions to nursing knowledge. *Qualitative Health Research, 14*(5), 726-735.

Lopez Viets, V. C. (1998). Treating pathological gambling. In W. R. Miller & N. Heather (Eds.), *Treating addictive behaviors* (2nd ed., pp. 259-270). New York: Plenum Press.

Lopez Viets, V. C., & Miller, W. R. (1997). Treatment approaches for pathological gamblers. *Clinical Psychology Review, 17*(7), 689-702.

Lowengrub, K., Iancu, I., Aizer, A., Kotler, M., & Dannon, P. N. (2006). Pharmacotherapy of pathological gambling: Review of new treatment modalities. *Expert Review of Neurotherapeutics, 6*(12), 1845-1851.

Lussier, J. P., Heil, S. H., Mongeon, J. A., Badger, G. J., & Higgins, S. T. (2006). A meta-analysis of voucher-based reinforcement therapy for substance use disorders. *Addiction, 101*, 192-203.

Marshall, D. (2005). The gambling environment and gambler behavior: Evidence from Richmond-Tweed, Australia. *International Gambling Studies, 5*(1), 63-83.

Martin, D. J., Garske, J. P., & Davis, K. (2000). Relation of the therapeutic alliance with outcome and other variables: a meta-analytic review. *Journal of Consulting and Clinical Psychology, 68*(3), 438-450.

Martins, S. S., Tavares, H., da Silva Lobo, D. S., Galetti, A. M., & Gentil, V. (2004). Pathological gambling, gender, and risk-taking behaviors. *Addictive Behaviors, 29*, 1231-1235.

McCarty, D., Gustafson, D. H., Wisdom, J. P., Ford, J., Choi, D., Molfenter, T., et al. (2007). The Network for the Improvement of Addiction Treatment (NIATx): Enhancing access and retention. *Drug and Alcohol Dependence, 88*, 138-145.

McConaghy, N., Armstrong, M. S., Blaszczynski, A., & Allcock, C. (1983). Controlled comparison of aversive therapy and imaginal desensitization in compulsive gambling. *British Journal of Psychiatry, 142*, 366-372.

McConaghy, N., Armstrong, M. S., Blaszczynski, A., & Allcock, C. (1988). Behavior completion versus stimulus control in compulsive gambling. *Behavior Modification, 13*(3), 371-384.

McConaghy, N., Blaszczynski, A., & Frankova, A. (1991). Comparison of imaginal desensitization with other behavioural treatments of pathological gambling: A two- to nine-year follow-up. *British Journal of Psychiatry, 159*, 390-393.

McCormick, R. A., Russo, A. M., Ramirez, L. F., & Taber, J. I. (1984). Affective disorders among pathological gamblers seeking treatment. *American Journal of Psychiatry, 141*, 215-218.

McCown, W. G., & Howatt, W. A. (2007). *Treating gambling problems*. Hoboken, NJ: John Wiley & Sons.

McCusker, J., Stoddard, A., Frost, R., & Zorn, M. (1996). Planned versus actual duration of drug abuse treatment: Reconciling observational and experimental evidence. *The Journal of Nervous and Mental Disease, 184*(8), 482-489.

McDaniel, S. R., & Zuckerman, M. (2003). The relationship of impulsive sensation seeking and gender to interest and participation in gambling activities. *Personality and Individual Differences, 35*, 1385-1400.

Meyer, G., & Fabian, T. (1992). Delinquency among pathological gamblers: A causal approach. *Journal of Gambling Studies, 8*, 61-77.

Milby, J. B., Schumacher, J. E., Wallace, D., Freedman, M. J., & Vuchinivich, R. E. (2005). To house or not to house: The effects of providing housing to homeless substance abusers in treatment. *American Journal of Public Health, 95*(7), 1259-1265.

Miller, W., & Rollnick, N. (1991). *Motivational interviewing: Preparing people to change addictive behaviors*. New York: Guilford.

Ministry of Gaming. (2006). Alberta Lottery Fund allocations: 2005/2006. Retrieved February 12, 2007, from http://albertalotteryfund.ca/money_goes/

Monette, D. R., Sullivan, T. J., & DeJong, C. R. (2002). *Applied social research: Tool for the human services* (5th ed.). Toronto, ON: Thomson Learning.

Mood Disorders Society of Canada. (2004). *Mood disorders and problem gambling: Cause, effect, or cause for concern: A review of the literature*. Guelph, ON: Author.

Moos, R. H. (2007). Theory-based active ingredents of effective treatments for substance use disorders. *Drug and Alcohol Dependence, 88*, 109-121.

Morgan, T. J. (2003). Behavioral treatment techniques for psychoactive substance use disorders. In F. Rotgers, J. Morgenstern & S. T. Walters (Eds.), *Treating substance abuse: Theory and technique* (2nd ed., pp. 190-216). New York: Guilford Press.

Morral, A. R., Iguchi, M. Y., & Belding, M. A. (1999). Reducing drug use by encouraging alternative behaviors. In S. T. Higgins & K. Silverman (Eds.), *Motivating behavior change among illicit drug abusers: Research on contingency management interventions* (pp. 203-220). Washington, DC: American Psychological Association.

Morse, W. H. (1966). Intermittent reinforcement. In W. K. Honig (Ed.), *Operant behavior: Areas of research and application* (pp. 52-108). New York: Appleton-Century-Crofts.

Murphy, J. G., Correia, C. J., & Barnett, N. P. (2007). Behavioral economic approaches to reduce college student drinking. *Addictive Behaviors, 32*, 2573-2585.

Murray, J. B. (1993). Review of research on pathological gambling. *Psychological Reports, 72*, 791-810.

Najavits, L. M., Crits-Cristoph, P., & Diergerger, A. (2000). Clinicians' impact on the quality of substance use disorder treatment. *Substance Use and Misuse, 35*(12-14), 2161-2190.

National Council of Welfare. (1996). *Gambling in Canada*. Retrieved March 17, 2005, from http://www.ncwcnbes.net/htmdocument/reportgambling/Gambling_e.htm#_Toc522256763

National Gambling Impact Study Commission. (1999). *Final report*. Washington, DC: Author.

National Institute on Drug Abuse. (2002). *NIDA and SAMHSA enter agreement to expedite transfer of findings from treatment research into clinical practice*. Retrieved June 14, 2008, from http://www.drugabuse.gov/newsroom/02/NR9-27a.html

National Research Council. (1999). *Pathological gambling: A critical review*. Washington, DC: National Academy Press.

Neal, P., Delfabbro, P., & O'Neil, M. (2005). *Problem gambling and harm: Towards a national definition*. Report to the Ministerial Council on Gambling, Melbourne, Australia, November 2005. Retrieved January 5, 2006, from http://www.gamblingresearch.org.au/CA256902000FE154/Lookup/GRA_Reports_Files1/$file/NatDefs_Pt1.pdf#xml=http://search.justice.vic.gov.au/isysquery/irl9a1/2/hilite

Nestler, E. J. (2005). Is there a common molecular pathway for addiction? *Nature Neuroscience, 8*, 1445-1449.

Nixon, G., & Solowoniuk, J. (2005). An insider's look into the process of recovering from pathological gambling disorder: An existential phenomenological inquiry. *International Journal of Mental Health and Addiction, 3*(2), 26-34.

Nixon, G., & Solowoniuk, J. (2008). A transpersonal developmental approach to gambling treatment. In M. Zangeneh, A. Blaszczynski & N. Turner (Eds.), *In the pursuit of winning: Problem gambling theory, research and treatment* (pp. 211-227). New York: Springer.

Nixon, G., Solowoniuk, J., & McGowan, V. (2006). The counterfeit hero's journey of the pathological gambler: A phenomenological hermeneutics investigation. *Journal of Mental Health and Addiction, 4*(3), 217-232.

Nordin, C., & Eklundh, T. (1999). CSF 5-H1AA disposition in pathologic male gamblers. *CNS Spectrums, 4*, 25-33.

Nower, L., & Blaszczynski, A. (2006). Impulsivity and pathological gambling: A descriptive model. *International Gambling Studies, 6*(1), 61-75.

Nsimba, S. E. (2007). Outpatient treatment programs: A review article on substances of abuse outpatients treatment outcomes in the United States. *Addictive Disorders & Their Treatment, 6*(3), 91-99.

O'Connor, J., Ashenden, R., Raven, M., & Allsop, S. (n.d.). *Current 'best practice' interventions for gambling problems: A theoretical and empirical review*. Report to the Department of Human Services, Victoria, Australia. Retrieved March 3, 2005, from http://www.problemgambling.vic.gov.au/researchdata/documents/dhs_bestpractice.pdf

Oakley-Browne, M. A., Adams, P., & Mobberley, P. M. (2004). Interventions for pathological gambling. *The Cochrane Library, Issue 1*. Chichester, UK: John Wiley & Sons.

Oetting, E. R., & Donnermeyer, J. F. (1998). Primary socialization theory: The etiology of drug use and deviance. *Substance Use and Misuse, 33*, 995-1026.

Ohtsuka, K., Burton, E., DeLuca, L., & Borg, V. (1997). Sex differences in pathological gambling using gaming machines. *Psychological Reports, 80*, 1051-1057.

Olmstead, T. A., Sindelar, J. L., Easton, C. J., & Carroll, K. M. (2007). The cost-effectiveness of four treatments for marijuana dependence. *Addiction, 102*, 1443-1453.

Osborne, J. W. (1990). Some basic existential-phenomenological research methodology for counsellors. *Canadian Journal of Counselling, 24*(2), 79-91.

Ovid Websearch Gateway. (2007). *Scope note*. Retrieved June 8, 2007, from http://0-gateway.tx.ovid.com.darius.uleth.ca/gw2/ovidweb.cgi

Pallesen, S., Mitsem, M., Kvale, G., Johnsen, B.-J., & Molde, H. (2005). Outcome of psychological treatments of pathological gambling: A review and meta-analysis. *Addiction, 100*, 1412-1422.

Pallesen, S., Molde, H., Arnestad, H. M., Laberg, J. C., Skutle, A., Iversen, E., et al. (2007). Outcome of pharmacological treatments of pathological gambling: A review and meta-analysis. *Journal of Clinical Psychopharmacology, 27*(4), 357-364.

Papineau, E. (2005). Pathological gambling in Montreal's Chinese community: An anthropological perspective. *Journal of Gambling Studies, 21*(2), 157-179.

Parke, A., Griffiths, M., & Irwing, P. (2004). Personality traits in pathological gambling: Sensation seeking, deferment of gratification and competitiveness as risk factors. *Addiction Research and Theory, 12*, 201-212.

Parke, J., & Griffiths, M. (2007). The role of structural characteristics in gambling. In G. Smith, D. C. Hodgins & R. J. Williams (Eds.), *Research and measurement issues in gambling studies* (pp. 217-249). New York: Elsevier.

Patton, M. Q. (2003). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Paxton, R. (1980). The effects of a deposit contract as a component in a behavioral programme for stopping smoking. *Behaviour Research and Therapy, 18*, 45-50.

Peirce, J. M., Petry, N. M., Stitzer, M., Blaine, J., Kellogg, S., Satterfield, F., et al. (2006). Effects of lower-cost incentives on stimulant abstinence in methadone maintenance treatment. *Archives of General Psychiatry, 63*, 201-208.

Petry, N. M. (2000a). A comprehensive guide to the application of contingency management procedures in clinical settings. *Drug and Alcohol Dependence, 58*, 9-25.

Petry, N. M. (2000b). Gambling problems in substance abusers who are associated with increased sexual risk behaviors. *Addiction, 95*, 1089-1100.

Petry, N. M. (2001). Pathological gamblers, with and without substance use disorders, discount delayed rewards at high rates. *Journal of Abnormal Psychology, 110*(3), 482-487.

Petry, N. M. (2002). Psychosocial treatments for pathological gambling: Current status and future directions. *Psychiatric Annals, 32*(3), 192-196.

Petry, N. M. (2003). Patterns and correlates of Gamblers Anonymous attendance in pathological gamblers seeking professional treatment. *Addictive Behaviors, 28*, 1049-1062.

Petry, N. M. (2005a). Gamblers Anonymous and cognitive-behavioral therapies for pathological gamblers. *Journal of Gambling Studies, 21*(1), 27-33.

Petry, N. M. (2005b). *Pathological gambling: Etiology, comorbidity, and treatment*. Washington, DC: American Psychological Association.

Petry, N. M., Alessi, S. M., Carroll, K. M., Hanson, T., MacKinnon, S., & Rounsaville, B. (2006). Contingency management treatments: Reinforcing abstinence versus adherence with goal-related activities. *Journal of Consulting and Clinical Psychology, 74*(3), 592-601.

Petry, N. M., Alessi, S. M., & Hanson, T. (2007). Contingency management improves abstinence and quality of life in cocaine abusers. *Journal of Consulting and Clinical Psychology, 75*(2), 307-315.

Petry, N. M., Alessi, S. M., Marx, J., Austin, M., & Tardif, M. (2005). Vouchers versus prizes: Contingency management treatment of substance abusers in community settings. *Journal of Consulting and Clinical Psychology, 73*(6), 1005-1014.

Petry, N. M., & Bohn, M. J. (2003). Fishbowls and candy bars: Using low-cost incentives to increase treatment retention [Electronic Version]. *Science and Practice in Action, 2*, 55-61. Retrieved June 19, 2008 from http://www.nida.nih.gov/PDF/Perspectives/vol2no1/06Perspectives-Fishbowls.pdf.

Petry, N. M., Bonnie, M., & Simcic Jr., F. (2005). Prize reinforcement contingency management for cocaine dependence: Integration with group therapy in a methadone clinic. *Journal of Consulting and Clinical Psychology, 73*(2), 354-359.

Petry, N. M., Kolodner, K. B., Li, R., Peirce, J. M., Roll, J. M., Stitzer, M. L., et al. (2006). Prize-based contingency management does not increase gambling. *Drug and Alcohol Dependence, 83*(3), 269-373.

Petry, N. M., Martin, B., Cooney, J. L., & Kranzler, H. R. (2000). Give them prizes, and they will come: Contingency management for treatment of alcohol dependence. *Journal of Consulting and Clinical Psychology, 68*(2), 250-257.

Petry, N. M., Peirce, J. M., Stitzer, M. L., Blaine, J., Roll, J. M., Cohen, A., et al. (2005). Effect of prize-based incentives on outcomes in stimulant abusers in outpatient psychosocial treatment programs. *Archives of General Psychiatry, 62*, 1148-1156.

Petry, N. M., & Roll, J. M. (2001). A behavioral approach to understanding and treating problem gambling. *Seminars in Clinical Neuropsychiatry, 6*(3), 177-183.

Petry, N. M., & Steinberg, K. L. (2005). Childhood maltreatment in male and female treatment-seeking pathological gamblers. *Psychology of Addictive Behaviors, 19*(2), 226-229.

Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry, 66*(5), 564-574.

Petry, N. M., Tedford, J., & Martin, B. (2001). Reinforcing compliance with non-drug-related activities. *Journal of Substance Abuse Treatment, 20*, 33-44.

Petry, N. M., Weinstock, J., Ledgerwood, D. M., & Morasco, B. (2008). A randomized trial of brief interventions for problem and pathological gamblers. *Journal of Consulting and Clinical Psychology, 76*(2), 328-328.

Phillips, E. L. (1985). *A guide for therapists and patients to short-term psychotherapy*. Springfield, IL: Thomas.

Pickens, R., & Thompson, T. (1968). Self-administration of d-amphetamine by rats. *Psychopharmacologia, 12*, 158-163.

Piotrowski, N. A., Tusel, D. J., Sees, K. L., Reilly, P. M., Banys, P., Meek, P., et al. (1999). Contingency contracting with monetary reinforcers for abstinence from multiple drugs in a methadone program. *Experimental and Clinical Psychopharmacology, 7*, 399-411.

Porter, J. C. K., & Ghezzi, P. M. (2006). Theories of pathological gambling. In P. M. Ghezzi, C. A. Lyons, M. R. Dixon & G. R. Wilson (Eds.), *Gambling: Behavior theory, research, and application* (pp. 19-44). Reno, NV: Context Press.

Potenza, M. N. (2001). The neurobiology of pathological gambling. *Seminars in Clinical Neuropsychiatry, 6*(3), 217-226.

Potenza, M. N. (2002). A perspective on future directions in the prevention, treatment and research of pathological gambling. *Psychiatric Annals, 32*(3), 203-207.

Powell, J., Hardoon, K., Derevensky, J., & Gupta, R. (1999). Gambling and risk-taking behavior among university students. *Substance Use & Misuse, 34*(8), 1167-1184.

Prendergast, M., Podus, D., Finney, J., Greenwell, L., & Roll, J. (2006). Contingency management for treatment of substance use disorders: A meta-analysis. *Addiction, 101*, 1546-1560.

Prendergast, M. L., Podus, D., Chang, E., & Urada, D. (2002). The effectiveness of drug abuse treatment: A meta-analysis of comparison group studies. *Drug and Alcohol Dependence, 67*, 53-72.

Preston, K. L., Silverman, K., Umbricht, A., DeJesus, A., Montoya, I. D., & Schuster, C. R. (1999). Improvement in naltrexone treatment compliance with contingency management. *Drug and Alcohol Dependence, 54*, 127-135.

Prochaska, J., Norcross, J., & DiClemente, C. (1994). *Changing for good*. New York: William Morrow and Company.

Productivity Commission. (1999). *Australia's gambling industries* (Report No. 10). Canberra: AusInfo.

Raccioppo, M. (2005). *Substance abuse: Effective treatments*. Report to the Outreach Partnership Program 2005 Annual Meeting, April 1, 2005. Retrieved March 20, 2006, from http://www.nimh.nih.gov/outreach/partners/racioppo2005.cfm

Rand, C. S., Stitzer, M. L., Bigelow, G. E., & Mead, A. M. (1989). The effects of contingent payment and frequent workplace monitoring on smoking abstinence. *Addictive Behaviors, 14*, 121-128.

Rapp, R. C., Otto, A. L., Lane, D. T., Redko, C., McGathat, S., & Carlson, R. G. (2008). Improving linkage with substance abuse treatment using brief case management and motivational interviewing. *Drug and Alcohol Dependence, 94*, 172-182.

Ravindran, A., & Telner, K. (2002). *Effects of medication and cognitive behaviour therapy, alone and in combination, on pathological gambling*. Report to the Ontario Problem Gambling Research Centre. Retrieved June 4, 2007, from http://www.gamblingresearch.org/download.sz/081%20Research%20Summary.pdf?docid=7682

Raylu, N., & Oei, T. P. (2004). Role of culture in gambling and problem gambling. *Clinical Psychology Review, 23*, 1087-1114.

Raylu, N., & Oei, T. P. S. (2002). Pathological gambling: A comprehensive review. *Clinical Psychology Review, 22*, 1009-1061.

Reid, R. L. (1986). The psychology of the near miss. *Journal of Gambling Behavior, 2*(1), 32-39.

Reuter, J., Raedler, T., Rose, M., Hand, I., Glascher, J., & Buchel, C. (2005). Pathological gambling is linked to reduced activation of the mesolimbic reward system. *Nature Neuroscience, 8*(2), 147-148.

Robles, E., Stitzer, M. L., Strain, E. C., Bigelow, G. E., & Silverman, K. (2002). Voucher-based reinforcement of opiate abstinence during methadone detoxification. *Drug and Alcohol Dependence, 65*, 179-189.

Rosenthal, R. (2008, in press). Psychodynamic psychotherapy and the treatment of pathological gambling [Electronic Version]. *Brazilian Journal of Psychiatry*. Retrieved April 27, 2008 from http://www.scielo.br/pdf/rbp/2008nahead/en_2008art06.pdf.

Rosenthal, R. J. (1986). The pathological gambler's system for self-deception. *Journal of Gambling Behavior, 2*, 108-120.

Rosenthal, R. J. (1987). The psychodynamics of pathological gambling: A review of the literature. In T. Galski (Ed.), *The handbook of pathological gambling* (pp. 41-70). Springfield, IL: Charles C. Thomas.

Rosenthal, R. J. (1993). Some causes of pathological gambling. In W. R. Eadington & J. A. Cornelius (Eds.), *Gambling behavior and problem gambling* (pp. 143-148). Reno, NV: University of Nevada.

Rosenthal, R. J., & Rugle, L. J. (1994). A psychodynamic approach to the treatment of pathological gambling: Part 1: Achieving abstinence. *Journal of Gambling Studies, 10*(1), 21-42.

Roy, A., Adinoff, B., Roehrich, L., Lamparski, D., Custer, R., Lorenz, V., et al. (1988). Pathological gambling: A psychobiological study. *Archives of General Psychiatry, 45*, 369-373.

Rugle, L., & Melamed, L. (1993). Neuropsychological assessment of attention problems in pathological gamblers. *Journal of Nervous and Mental Disease, 181*, 107-112.

Rugle, L. J. (1993). Initial thoughts on viewing pathological gambling from a physiological and intrapsychic structural perspective. *Journal of Gambling Studies, 9*(1), 3-16.

Rush, B., Veldhuizen, S., Adlaf, E., Corea, L., & Vincent, S. (2006). *Assessing the geo-spatial association in Ontario between the prevalence of problem gambling, treatment availability and help seeking: Final report*. Retrieved March 18, 2006, from http://www.camh.net/hsrcu/v2/publications/reports/research/2006/FinalGamblingReport.pdf

Sabbatini da Silva Lobo, D., Vallada, H. P., Knight, J., Martins, S. S., Tavares, H., Gentil, V., et al. (2007). Dopamine genes and pathological gambling in discordant sib-pairs. *Journal of Gambling Studies, 23*(4), 421-433.

Sadinsky, S. (2005). *Review of the problem-gambling and responsible-gaming strategy of the Government of Ontario*. Report to the Ontario Ministry of Health and Long-term Care and the Ministry of Economic Development and Trade. Retrieved April 4, 2005, from http://www.gov.on.ca/english/public/pub/ministry-reports/gambling-05/sadinsky.pdf

San Diego Center for Pathological Gambling. (2007). *Online counseling*. Retrieved November 14, 2007, from http://www.sandiego-rx4gambling.com/online_counseling.html

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing and Health, 23*, 334-340.

Saxon, A. J., Calsyn, D. A., Kivlahan, D. R., & Roszell, D. K. (1993). Outcome of contingency contracting for illicit drug use in a methadone maintenance program. *Drug and Alcohol Dependence, 31*, 205-214.

Schmitz, J. M., Rhoades, H., & Grabowski, J. (1995). Contingent reinforcement for reduced carbon monoxide levels in methadone maintenance patients. *Addictive Behaviors, 20*, 171-179.

Schreiber, J., & Dixon, M. R. (2001). Temporal characteristics of slot machine play in recreational gamblers. *Psychological Reports, 89*(1), 67-72.

Schumacher, J. E., Milby, J. B., Wallace, D., Meehan, D.-C., Kertesz, S., Vuchinich, R., et al. (2007). Meta-analysis of day treatment and contingency-management dismantling research: Birmingham's Homeless Cocaine Studies (1990-2006). *Journal of Consulting and Clinical Psychology, 75*(5), 823-828.

Secades-Villa, R., Garcia-Rodriguez, O., Higgins, S. T., Fernandez-Hermida, J. R., & Carballo, J. L. (2008). Community reinforcement approach plus vouchers for cocaine dependence in a community setting in Spain: Six-month outcomes. *Journal of Substance Abuse Treatment, 34*, 202-207.

Shaffer, H. J., & Hall, M. N. (2001). Updating and refining meta-analytic prevalence estimates of disordered gambling behavior in the United States and Canada. *Canadian Journal of Public Health, 92*(3), 168-172.

Shaffer, H. J., Hall, M. N., & Vanderbilt, J. (1997). *Estimating the prevalence of disordered gambling behavior in the United States and Canada: A meta-analysis*. Boston: Harvard Medical Division on Addictions.

Shaffer, H. J., LaBrie, R. A., & LaPlante, D. (2004). Laying the foundation for quantifying regional exposure to social phenomena: Considering the case of legalized gambling as a public health toxin. *Psychology of Addictive Behaviors, 18*(1), 40-48.

Shaffer, H. J., LaBrie, R. A., LaPlante, D. A., Kidman, R. C., & Donato, A. N. (2005). The Iowa gambling treatment program: Treatment outcomes for a follow-up sample. *Journal of Gambling Studies, 21*(1), 61-73.

Shaffer, H. J., LaPlante, D. A., LaBrie, R. A., Kidman, R. C., Donato, A. N., & Stanton, M. V. (2004). Toward a syndrome model of addiction: Multiple manifestations, common etiology. *Harvard Review of Psychiatry, 12*(6), 367-374.

Sharpe, L. (2002). A reformulated cognitive-behavioral model of problem gambling: A biopsychosocial perspective. *Clinical Psychology Review, 22*, 1-25.

Shaw, M. C., Forbush, K. T., Schlinder, J., Rosenman, E., & Black, D. W. (2007). The effect of pathological gambling on families, marriages, and children. *CNS Spectrums, 12*(8), 615-622.

Shoptaw, S., Rotheram-Fuller, E., Yang, X., Frosch, D., Nahom, D., Jarvik, M. E., et al. (2002). Smoking cessation in methadone maintenance. *Addiction, 97*, 1317-1328.

Sigmon, S. C., Dunn, K., & Higgins, S. T. (2007). Brief history of the Contingency Management Working Group. *Drug and Alcohol Dependence, 89*, 314-316.

Sigmon, S. C., & Higgins, S. T. (2006). Voucher-based contingent reinforcement of marijuana abstinence among individuals with serious mental illness. *Journal of Substance Abuse Treatment, 30*, 291-295.

Sigmon, S. C., & Stitzer, M. L. (2005). Use of a low-cost incentive intervention to improve counseling attendance among methadone-maintained patients. *Journal of Substance Abuse Treatment, 29*, 253-258.

Silverman, K., Higgins, S. T., Brooner, R. K., Montoya, I. D., Cone, E. J., Schuster, C. R., et al. (1996). Sustained cocaine abstinence in methadone maintenance patients through voucher-based reinforcement therapy. *Archives of General Psychiatry, 53*, 409-415.

Silverman, K., Robles, E., Mudric, T., Bigelow, G. E., & Stitzer, M. (2004). A randomized trial of long-term reinforcement of cocaine abstinence in methadone-maintained patients who inject drugs. *Journal of Consulting and Clinical Psychology, 72*, 839-854.

Silverman, K., Wong, C. J., Umbricht-Schneiter, A., Montoya, I. D., Schuster, C. R., & L, P. K. (1998). Broad beneficial effects of cocaine abstinence reinforcement among methadone patients. *Journal of Consulting and Clinical Psychology, 66*(5), 811-824.

Silverman, K., Wong, C. J., Umbricht-Schneiter, A., Montoya, I. D., Schuster, C. R., & Preston, K. L. (1996). Increasing opiate abstinence through voucher-based reinforcement therapy. *Drug and Alcohol Dependence, 41*, 157-165.

Simpson, D. D., Joe, G. W., Broome, K. M., Hiller, M. L., Knight, K., & Rowan-Szal, G. A. (1997). Program diversity and treatment retention rates in the Drug Abuse Treatment Outcome Study (DATOS). *Psychology of Addictive Behaviors, 11*, 279-293.

Simpson, D. D., Joe, G. W., Rowan-Szal, G. A., & Greener, J. (1995). Client engagement and change during drug abuse treatment. *Journal of Substance Abuse Treatment, 7*, 117-134.

Simpson, D. D., Joe, G. W., Rowan-Szal, G. A., & Greener, J. M. (1997). Drug abuse treatment process components that improve retention. *Journal of Substance Abuse Treatment, 14*(6), 565-572.

Skinner, B. F. (1953). *Science and human behavior*. New York: The Free Press.

Skinner, B. F. (1954). The science of learning and the art of teaching. *Harvard Educational Review, 24*, 86-97.

Skinner, B. F. (1969). *Contingencies of reinforcement: A theoretical analysis*. New York: Appleton-Century-Crofts.

Skitch, S., & Hodgins, D. C. (2004). Impulsivity, compulsivity and pathological gambling: An exploratory study of pathological gambling as an impulsivity-compulsivity spectrum disorder. *International Gambling Studies, 4*, 175-188.

Slutske, W. S. (2006). Natural recovery and treatment-seeking in pathological gambling: Results of two U.S. national surveys. *The American Journal of Psychiatry, 163*(2), 297-302.

Slutske, W. S., Eisen, S., Xian, H., True, W. R., Lyons, M. J., Goldberg, J., et al. (2001). A twin study of the association between pathological gambling and antisocial personality disorder. *Journal of Abnormal Psychology, 110*, 297-308.

Slutske, W. S., Eisen, S. A., True, W. R., Lyons, M. J., Goldberg, J., & Tsuang, M. (2000). Common genetic vulnerability for pathological gambling and alcohol dependence in men. *Archives of General Psychiatry, 57*, 666-673.

Smith, G. J., & Wynne, H. J. (2002). *Measuring gambling and problem gambling in Alberta using the Canadian Problem Gambling Index*. Edmonton, Alberta: Alberta Gaming Research Institute.

Smith, J. E., & Meyers, R. J. (1995). The community reinforcement approach. In R. K. Hester & W. R. Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (2nd ed., pp. 251-266). Boston: Allyn and Bacon.

Sobell, M. B., Sobell, L. C., Ersner-Hershfield, S., & Nirenberg, T. D. (1982). Alcohol and drug problems. In A. S. Bellack, M. Hersen & A. E. Kazdin (Eds.), *International handbook of behavior modification and therapy* (pp. 501-533). New York: Plenum Press.

Sokolowski, R. (2000). *Introduction to phenomenology*. Cambridge, England: Cambridge University Press.

Sorensen, J. L., Haug, N. A., Delucchi, K. L., Gruber, V., Kletter, E., Batke, S. L., et al. (2007). Voucher reinforcement improves medication adherence in HIV-positive methadone patients: A randomized trial. *Drug and Alcohol Dependence, 88*, 54-63.

Spiegelberg, H. (1969). *The phenomenological movement: A historical introduction* (2nd ed. Vol. I). The Hague, Netherlands: Martinus Nijhoff.

Squires, D. D., Gumbley, S. J., & Storti, S. A. (2008). Training substance abuse treatment organizations to adopt evidence-based practices: The Addiction Technology Transfer Center of New England Science to Service Laboratory. *Journal of Substance Abuse Treatment, 34*, 293-301.

Stark, M. J. (1992). Dropping out of substance abuse treatment: A clinically oriented review. *Clinical Psychology Review, 12*, 93-116.

Statistics Canada. (2004). Fact-sheet on gambling. *Perspectives on Labour and Income*, Statistics Canada Catalogue - no. l 75-001-XIE, 001-006.

Statistics Canada. (2007). Gambling. *Perspectives on Labour and Income, Vol. 8, No. 6.* Retrieved July 20, 2007, from http://www.statcan.ca/english/freepub/75-001-XIE/75-001-XIE2007106.pdf

Steel, Z., & Blaszczynski, A. (1998). Impulsivity, personality disorders and pathological gambling severity. *Addiction, 93*(6), 895-905.

Stevens, R., & Williams, R. J. (2004). *Socio-economic impacts associated with the introduction of casino gambling: A literature review and synthesis*. Prepared for Blue Thorn Research. Retrieved March 3, 2008, from http://www.uleth.ca/dspace/handle/10133/407

Stewart, R. M., & Brown, R. I. (1988). An outcome study of Gamblers Anonymous. *British Journal of Psychiatry, 152*, 284-288.

Stinchfield, R., & Winters, K. (1996). *Gambling treatment outcome study: Treatment effectiveness of six state-supported compulsive gambling treatment programs in Minnisota*. Saint Paul, MN: Minnesota Department of Human Services.

Stinchfield, R., & Winters, K. (2001). Outcome of Minnesota's gambling treatment programs. *Journal of Gambling Studies, 3*, 217-245.

Stinchfield, R. D. (1997). Reliability of adolescent self-reported pretreatment alcohol and other drug use. *Substance Use and Misuse, 32*, 63-73.

Stitzer, M. (2006). Contingency management and the addictions. *Addition, 101*, 1536-1537.

Stitzer, M., & Bigelow, G. (1978). Contingency management in a methadone maintenance program: Availability of reinforcers. *The International Journal of the Addictions, 13*(5), 737-746.

Stitzer, M., & Bigelow, G. (1982). Contingent reinforcement for reduced carbon monoxide levels in cigarette smokers. *Addictive Behaviors, 7*, 403-412.

Stitzer, M., & Petry, N. M. (2006). Contingency management for treatment of substance abuse. *Annual Review of Clinical Psychology, 2*, 411-434.

Stitzer, M. L., & Bigelow, G. E. (1985). Contingent reinforcement for carbon monoxide reduction: Target-specific effects on cigarette smoking. *Addictive Behaviors, 10*, 345-349.

Stitzer, M. L., Iguchi, M. Y., & Felch, L. J. (1992). Contingent take-home incentive: Effects on drug use of methadone maintenance patients. *Journal of Consulting and Clinical Psychology, 60*(6), 927-934.

Stoltenberg, S. F., Batien, B. D., & Birgenheir, D. G. (2008). Does gender moderate associations among impulsivity and health-risk behaviors? *Addictive Behaviors, 33*, 252-265.

Stotts, A. L., Mooney, M. E., Sayre, S. L., Novy, M., Schmitz, J. M., & Grabowski, J. (2007). Illusory predictors: Generalizability of findings in cocaine treatment research. *Addictive Behaviors, 32*, 2819-2836.

Strickland, L., & Grote, F. (1967). Temporal presentation of winning symbols and slot machine playing. *Journal of Experimental Psychology, 74*, 10-13.

Substance Abuse & Mental Health Services Administration. (1995). *Effectiveness of substance abuse treatment* (Publication No. (SMA) 95-3067). Washington, DC: U.S. Department of Health and Human Services.

Sullivan, M., Kone, A., Senturia, K. D., Chrisman, N. J., Ciske, S. J., & Krieger, J. W. (2001). Researcher and researched-community perspectives: Toward bridging the gap. *Health Education & Behavior, 28*, 130-149.

Svikis, D. S., Lee, J. H., Haug, N. A., & Stitzer, M. (1997). Attendance incentives for outpatient treatment: Effects in methadone- and nonmethadone-maintained pregnant drug dependent women. *Drug and Alcohol Dependence, 48*(1), 33-41.

Swan, A. (2006, September 11). *Online counselling.* Paper presented at the International Gambling Conference: Gambling and its impacts: Policy, Practice and Research Perspectives, Auckland, New Zealand.

Sylvain, C., Ladouceur, R., & Boisvert, J. M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Journal of Consulting and Clinical Psychology, 65*(5), 727-732.

Taber, J. I., Russo, A. M., Adkins, B. J., & McCormick, R. A. (1986). Ego strength and achievement motivation in pathological gamblers. *Journal of Gambling Behavior, 2*(2), 69-80.

Tavares, H., Zilberman, M. L., & el-Guebaly, N. (2003). Are there cognitive and behavioural approaches specific to the treatment of pathological gambling? *Canadian Journal of Psychiatry, 48*(1), 22-27.

Thompson, T., & Schuster, C. R. (1964). Morphine self-administration, food-reinforced and avoidance behaviors in rhesus monkeys. *Psychopharmacologia, 5*, 87-94.

Thorndike, E. L. (1965 re-print of 1911 ed.). *Animal intelligence: Experimental studies*. New York: Hafner.

Todres, L., & Holloway, I. (2004). Descriptive phenomenology: Life-world as evidence. In F. Rapport (Ed.), *New qualitative methodologies in health and social care research* (pp. 79-98). London: Routledge.

Toneatto, T., Blitz-Miller, T., Calderwood, K., Dragonetti, R., & Tsanos, A. (1997). Cognitive distortions in heavy gambling. *Journal of Gambling Studies, 13*, 253-266.

Toneatto, T., & Ladouceur, R. (2003). Treatment of pathological gambling: A critical review of the literature. *Psychology of Addictive Behaviors, 17*(4), 284-292.

Toneatto, T., & Millar, G. (2004). Assessing and treating problem gambling: empirical status and promising trends. *Canadian Journal of Psychiatry, 49*(8), 517-525.

Toneatto, T., Skinner, W., & Dragonetti, R. (2002). Patterns of substance use in treatment-seeking problem gamblers: Impact on treatment outcomes. *Journal of Clinical Psychology, 58*(7), 853-859.

Turner, N. E., Zangeneh, M., & Littman-Sharp, N. (2006). The experience of gambling and its role in problem gambling. *International Gambling Studies, 6*(2), 237-266.

Vaillant, G. E. (1995). *The natural history of alcoholism revisited*. Cambridge, MA: Harvard University Press.

van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. London, ON: The Althouse Press.

Vitaro, F., Arsenault, L., & Tremblay, R. E. (1997). Dispositional predictors of problem gambling in male adolescents. *American Journal of Psychiatry, 154*, 1759-1770.

Vitaro, F., Arsenault, L., & Tremblay, R. E. (1999). Impulsivity predicts problem gambling in low SES adolescent males. *Addiction, 94*, 565-575.

Vitaro, F., Brendegan, M., Ladouceur, R., & Tremblay, R. E. (2001). Gambling, delinquency, and drug use during adolescence: Mutual influences and common risk factors. *Journal of Gambling Studies, 17*, 171-190.

Volberg, R. A. (2004). Fifteen years of problem gambling prevalence research: What do we know? Where do we go? [Electronic Version]. *eGambling, The Electronic Journal of Gambling Issues, 10*, 1-19. Retrieved March 18, 2005 from http://www.camh.net/egambling/issue10/ejgi_10_volberg.html.

Volberg, R. A., Reitzes, D. C., & Boles, J. (1997). Exploring the links between gambling, problem gambling, and self-esteem. *Deviant Behavior: An Interdisciplinary Journal, 18*, 321-342.

Volpp, K. G., Levy, A. G., Asch, D. A., Berlin, J. A., Murphy, J. J., Gomez, A., et al. (2006). A randomized controlled trial of financial incentives for smoking cessation. *Cancer Epidemiology Biomarkers and Prevention, 15*, 12-18.

Voon, V., Hassan, K., Zurowski, M., Duff-Canning, S., de Souza, M., Fox, S., et al. (2006). Prospective prevalence of pathologic gambling and medication association in Parkinson disease. *Neurology, 66*, 1750-1752.

Walker, M., Toneatto, T., Potenza, M. N., Petry, N. M., Ladouceur, R., Hodgins, D. C., et al. (2006). A framework for reporting outcomes in problem gambling treatment research: The Banff, Alberta consensus. *Addiction, 101*, 504-511.

Walker, M. B. (1992). *The psychology of gambling*. Oxford, UK: Pergamon Press.

Walker, M. B. (2001). Strategies for winning on poker machines. In A. Blaszczynski (Ed.), *Culture and the gambling phenomenon: Proceedings of the 12th Annual Conference of the National Association for Gambling Studies* (pp. 391-396). Sydney, AU: National Association for Gambling Studies.

Walters, G. D. (2001). Behavior genetic research on gambling and problem gambling: A preliminary meta-analysis of available data. *Journal of Gambling Studies, 17*(4), 255-271.

Wardman, D., el-Guebaly, N., & Hodgins, D. C. (2005). Problem and pathological gambling in North American Aboriginal populations: A review of the empirical literature. *Journal of Gambling Studies, 17*(2), 81-100.

Weatherly, J. N., & Brandt, A. E. (2004). Participants' sensitivity to percentage payback and credit value when playing a slot-machine simulation. *Behavior and Social Issues, 13*(1), 33-50.

Weatherly, J. N., Sauter, J. M., & King, B. M. (2004). The "big win" and resistance to extinction when gambling. *The Journal of Psychology, 138*(6), 495-504.

Weeks, J. R., & Collins, R. J. (1964). Factors affecting voluntary morphine intake in self-maintained addicted rats. *Psychopharmacologia, 6*, 267-279.

Weinstock, J. (2007). *Use of contingency management (vouchers) in problem gambling treatment*. Paper presented at the Alberta Gaming Research Institute Gambling Research Conference 2007: Addressing Gambling-related Harm through Evidence-based Practices. Banff, Alberta, March 30, 2007.

Weinstock, J., Alessi, S. M., & Petry, N. M. (2007). Regardless of psychiatric severity the addition of contingency management to standard treatment improves retention and drug use outcomes. *Drug and Alcohol Dependence, 87*, 288-296.

Weinstock, J., Whelan, J. P., & Meyers, A. W. (2004). Behavioral assessment of gambling: An application of the timeline followback method. *Psychological Assessment, 16*(1), 72-80.

Welte, J. W., Wieczorek, W. F., Barnes, G. M., Tidwell, M.-C., & Hoffman, J. H. (2004). The relationship of ecological and geographic factors to gambling behavior and pathology. *Journal of Gambling Studies, 20*(4), 405-423.

Westphal, J. R. (2006). Are the effects of gambling treatment overestimated? [Electronic Version]. *International Journal of Mental Health and Addiction, 5*, 65-79. Retrieved December 6, 2006 from SpringerLink.

Westphal, J. R., & Johnson, L. J. (2007). Multiple co-occurring behaviours among gamblers in treatment: Implications and assessment. *International Gambling Studies, 7*(1), 73-99.

Whelan, J. P., Steenbergh, T. A., & Meyers, A. W. (2007). *Problem and pathological gambling*. Cambridge, MA: Hogrefe & Huber.

Williams, R. J. (2002). *Prevention of problem gambling*. Final research report prepared for the Alberta Gaming Research Institute. December, 2002. Retrieved July 31, 2008, from http://www.abgaminginstitute.ualberta.ca/Research/williams-mcgowan.htm

Williams, R. J., & Chang, S. (2000). A comprehensive and comparative review of adolescent substance abuse treatment outcome. *Clinical Psychology: Science and Practise, 7*, 138-166.

Williams, R. J., & Stevens, R. (2006, April 21). *The devil is in the details: Overview of the main methodological issues in cost/benefit analyses of gambling.* Paper presented at the Alberta Gaming Research Institute Conference: Social and Economic Costs & Benefits of Gambling, Banff, Alberta.

Williams, R. J., West, B. L., & Simpson, R. I. (2007a). Prevention of problem gambling. In G. Smith, D. C. Hodgins & R. J. Williams (Eds.), *Research and measurement issues in gambling studies* (pp. 399-435). New York: Elsevier.

Williams, R. J., West, B. L., & Simpson, R. I. (2007b). *Prevention of problem gambling: A comprehensive review of the evidence*. Report prepared for the Ontario Problem Gambling Research Centre, Guelph, Ontario, CANADA. December 1, 2007. Available at http://hdl.handle.net/10133/414.

Williamson, A., & Walker, M. (2000). Strategies for solving the insoluble: Playing to win Queen of the Nile. In G. Coman (Ed.), *Lessons of the past: Proceedings of the 11th Annual Conference of the National Association for Gambling Studies* (pp. 444-452). Victoria, AU: National Association for Gambling Studies.

Windle, M., & Scheidt, D. M. (2004). Alcoholic subtypes: Are two sufficient? *Addiction, 99*(12), 1508-1519.

Winett, R. A. (1973). Parameters of deposit contracts in the modification of smoking. *The Psychological Record, 23*, 49-60.

Winters, K. C., Bengsten, P., Dorr, D., & Stinchfield, R. (1998). Prevalence and risk factors of problem gambling among college students. *Psychology of Addictive Behaviors, 12*, 127-135.

Winters, K. C., & Rich, T. (1998). A twin study of adult gambling behavior. *Journal of Gambling Studies, 14*(3), 213-225.

Wohl, M. J. A., & Enzle, M. E. (2003). The effects of near wins and near losses on self-perceived personal luck and subsequent gambling behavior. *Journal of Experimental Social Psychology, 39*, 184-191.

Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Thousand Oaks, CA: Sage.

Wood, R. T. (2001). Straightedge youth: Subculture genesis, permutation, and identity formation (Doctoral dissertation, University of Alberta, 2001) *Dissertation Abstracts International-A, 62/05*, 1962. (Complete pdf version obtained through Theses Canada Portal database. Ottawa: National Library of Canada).

Woodward, A. M., Raskin, I. E., & Blacklow, B. (2008). A profile of the substance abuse treatment industry: Organization, costs, and treatment completion. *Substance Use and Misuse, 42*, 647-679.

Woody, G. E., Cottler, L. B., & Cacciola, J. (1993). Severity of dependence: data from the DSM-IV field trials. *Addiction, 88*(11), 1573-1579.

Wulfert, E., Blanchard, E. B., Freidenberg, B. M., & Martell, R. S. (2006). Retaining pathological gamblers in cognitive behavior therapy through motivational enhancement. *Behavior Modification, 30*(3), 315-340.

Zhang, Z., Friedmann, P. D., & Gerstein, D. R. (2003). Does retention matter? Treatment duration and improvement in drug use. *Addiction, 98*, 673-684.

Zimmerman, M., Chelminski, I., & Young, D. (2006). Prevalence and diagnostic correlates of DSM-IV pathological gambling in psychiatric outpatients. *Journal of Gambling Studies, 22*, 255-262.

APPENDIX A: AADAC Policy on Gambling

The publicly available AADAC gambling policy is reproduced after this page.

Alberta Alcohol and Drug Abuse Commission

POLICY ON GAMBLING
February 2006

POLICY STATEMENT

The Alberta Alcohol and Drug Abuse Commission (AADAC) recognizes that the majority of Albertans gamble. A small minority of those who gamble experience a range of negative health and social consequences. The Commission works with key partners in government, the community and the gaming industry to minimize the harm associated with gambling. This is done while respecting the freedom of individuals to exercise personal responsibility in their gambling activities.

CONTEXT

1. Gambling is the act of risking money, property or something else of value on an activity with an uncertain outcome. Gambling includes not only licensed formats (e.g., casinos, bingos, VLTs, scratch tickets, horseracing) but also informal wagering (e.g., people making bets among themselves). Problem gambling is a term used to cover the individual behaviours and harmful consequences related to gambling.

2. The province of Alberta permits legalized gambling as an economic and recreational activity. Multiple organizations depend on funding provided through gambling revenues. The Government has acknowledged its responsibility to assist those who experience gambling problems and provides funding for AADAC problem gambling services.

3. Approximately 82% of adult Albertans (18 and older) gamble and about 5% experience moderate to severe problems as a result. The prevalence of problem gambling among Alberta adults is higher than in most other Canadian jurisdictions.

4. Excessive or inappropriate gambling behaviour can lead to serious health and social problems, including addiction, emotional distress, suicide, economic hardship and personal dysfunction, as well as disruption to families and communities. Researchers suggest there is a link between playing electronic games (e.g., VLTs and slots) and the development of gambling problems, but further study is needed to verify the nature and extent of this relationship.

5. Many adult problem gamblers have co-occurring substance abuse or mental health problems. As such, they require comprehensive treatment. While recognizing there are some unique differences, experience has shown that alcohol, other drug and gambling problems are amenable to similar treatment approaches.

6. Research indicates that approximately 41% of Alberta students (11 to 19 years) gamble and 9.5% show signs of gambling problems. Among Alberta youth, the prevalence of gambling and problem gambling is similar to that reported in other Canadian provinces.

7. Adolescents define gambling differently than adults. For example, they do not see informal wagering as gambling and they experience less severe financial consequences as a result of their gambling. There is some evidence linking adolescent problem gambling with increased delinquency and criminal behaviour as well as problems with family and other interpersonal relationships.

8. Both risk and protective factors for adolescent problem gambling are beginning to be identified in the research literature. These include age (i.e., as youth get older they are more likely to report gambling), peer behaviour, family history of substance abuse or gambling problems, poor connection to school and signs of school dropout.

9. In 2004-05, 4% of AADAC treatment clients (adults and youth) were admitted for gambling problems alone, and an additional 2% were admitted for gambling and alcohol or other drug problems. Most commonly, clients reported buying lottery (31%) and instant-win tickets (28%) or playing VLTs (26%) and slot machines (17%).

10. A high degree of stigma is associated with problem gambling and other addictions, and many individuals may be reluctant to seek assistance.

11. The increased availability of and access to casino gambling and video lottery terminals (VLTs) in Alberta have been a focus of public debate and concern about gambling problems. This has prompted several communities to take action in limiting or eliminating these forms of gambling. Given the continued expansion of gambling opportunities in Alberta, the potential for increased gambling problems must be closely monitored.

PRINCIPLES FOR ACTION

Information

AADAC will provide current and accurate information on gambling. The Commission will develop and distribute print materials and other resources that assist AADAC staff, clients and stakeholders in acquiring knowledge and understanding the issues related to gambling and problem gambling.

Prevention

AADAC will encourage individuals, families and communities to avoid gambling problems by addressing both risk and protective factors. Prevention programming will include a range of actions that strengthen community capacity and emphasize individual awareness and skill development. AADAC will support individual, family and community actions that assist youth and adults in making healthy and responsible choices.

Treatment

People who are negatively affected by gambling and seek treatment should have access to effective, relevant, and compassionate care that is delivered by qualified staff. A range of treatment options should be available for individuals and their families.

Problem gambling treatment will reflect research and current best practice in the addictions field. Problem gamblers should be actively involved in defining individual treatment goals and methods for achieving these goals, with referral to crisis services, aftercare and self-help groups as appropriate.

Joint Initiatives

AADAC will work with the Alberta Gaming and Liquor Commission to develop and deliver responsible gambling initiatives in Alberta. The Commission will also collaborate with community-based agencies and other stakeholder groups to deliver cost-effective information, prevention, and treatment services for problem gambling.

Responsibility to minimize the risk of problem gambling must be shared among those who benefit from gambling activities, including the gaming industry, community organizations, and the Alberta Government.

Legislation and Regulation

Alberta gambling policies should be routinely reviewed and evaluated to ensure the integrity of the gaming industry and the responsibility of Government in addressing the harm that can result from legalized gambling. Policies should reflect a balance between the legitimate interest to sustain the economic benefits of gambling, and the need to protect and promote the health and well being of society.

Research

Research into the prevalence, causes, prevention and treatment of problem gambling should be conducted on an ongoing basis. The results of such research should be widely communicated to advance public and professional knowledge, inform decision-making and improve service delivery.

AADAC'S APPROACH

Consistent with the above-noted principles, AADAC will deliver information, prevention and treatment services, and undertake gambling program research. The Commission will continue to act as a principal agent of Government in providing problem gambling programs, and in supporting community-based efforts aimed at minimizing the harmful consequences of gambling and problem gambling.

Adopted: March 11, 1994
Amended: September 15, 1995
Amended: April 25, 1997
Amended: November 21, 1997
Amended: June 4, 1999
Amended: September 28, 2001
Amended: November 13, 2003
Amended: February 22, 2006
Review: 2009

APPENDIX B: Review of Research on EGM Reinforcement Parameters

Early laboratory-based studies of electronic slot machine gambling found that when percentage of reinforcement during a trial period of play was lower, longer periods of persistent play resulted after the machines stopped paying out (Lewis & Duncan, 1956), persistence was greater when trial period wins were larger (Lewis & Duncan, 1957), and winning expectancies increased proportionally to percentage of reinforcement (Lewis & Duncan, 1958). A later experimental study of university students involved exposure to variable ratio schedules producing either a net win or a net loss during 22 EGM trials, followed by a net loss schedule for both groups (Levitz, 1971). Findings indicated that prior exposure to the net win schedule resulted in significantly longer gambling persistence in the second phase. More recently, Weatherly and Brandt (2004) found that variations in EGM percentage payback (75%, 83%, and 95%) did not influence response rates or wager size in a 15 minute session. The authors speculated that experienced gamblers may be more sensitive to payback rates than participants in the study. A naturalized observational study of 10 individuals who were high frequency EGM gamblers found that wins considered to be small (< 50 credits) were associated with increased rates of play, whereas wins considered to be large (> 50 credits) were associated with temporarily decreased rates of play ('post-reinforcement pauses') (Dickerson, Hinchy, England, Fabre, & Cunningham, 1992) Similar results were reported in another naturalistic study, along with findings that the number of big wins during a gambling session strongly predicted longer session duration (Dickerson, 1993). Delfabbro and Winefield (1999) also utilized a naturalistic observational study and obtained similar findings regarding immediate effects on rate of play according to small wins versus big wins; no effects on overall rate of play were found. In laboratory-based research, Schreiber and Dixon (2001) and Dixon and Schreiber (2002) found post-reinforcement pauses in EGM play following wins. In the latter study, authors also reported a shortening of response latencies as the number of non-reinforced trials was increased. In contrast to findings reported by Dickerson (1993), Kassinove and Schare (2001) found that a large win in a laboratory setting did not result in greater persistence to extinction, although they suggest that the size of the big win ($10) may have been too small to reflect such an effect. Results were similar in another laboratory study where the size of the big win was smaller yet ($1.60) and stake sizes were $0.10 (Weatherly, Sauter, & King, 2004). In this study, greatest resistance to extinction was evidenced when the 'jackpot' paid out on the fifth trial.

Speed of play EGM parameters have also been the subject of some research. An Australian study of 210 EGM gamblers playing in clubs and hotels found no significant differences in either time or money spent, whether game speed was 3.5 seconds or 5 seconds (Blaszczynski, Sharpe, & Walker, 2001). The authors attributed findings to the fact that only 12% of players normally gambled on machines with a play cycle faster than 5 seconds. Delfabbro, Falzon, and Ingram (2005) found that 3.5 second games increased the number of games played, but not time spent gambling. Results of another study indicated that EGM game play speed of 5 seconds caused gamblers to play significantly more games and spend more money compared to game play speed of 15 seconds (Ladouceur & Sevigny, 2006). Speed of play was similarly implicated in a study conducted in Nova Scotia, where researchers found that a 30% reduction in VLT game speed was reported to be an important factor in a 14% reduction in expenditure and time spent; higher risk gamblers in particular were more likely to report speed play as a factor (Corporate Research Associates, 2006). Finally, it is important to note that auto-play EGMs have recently been introduced in Canadian gambling venues. Such machines operate automatically after money is inserted and an 'AutoPlay' button is pressed. This play parameter may be relevant to issues surrounding the effect of game speed on gambling behaviour, but impact studies have not yet been conducted. Nonetheless, presumptions of greater harm have been evidenced, as reflected in the banning of auto-play EGMs by governments in the Australian states of Victoria, South Australia, and Western Australia (Caraniche Pty Ltd., 2005).

A number of studies have investigated the 'near miss' phenomenon in EGM gambling, a technical feature that has been consistently linked to gambling persistence (Parke & Griffiths, 2007). Electronic gambling machines are designed to create the illusion of almost winning, where "the player sees the high paying symbols more frequently than they would appear by chance alone but the reels are simply used to display the results to the player and have no bearing whatsoever on the odds of the game (Harrigan, 2007, p. 14). Strickland and Grote (1967) conducted an early laboratory-based slot machine study of 'gambling naïve' adolescent males, demonstrating that placement of winning symbols early in the 3-symbol outcome sequences significantly increased length of machine play after a set number of trials, compared to placement later in the outcome sequences. A replication study did not obtain statistically significant results,

although participants in the near miss group played longer, on average, than controls (Reid, 1986). More recent laboratory-based research supports previous findings that near wins result in significantly longer persistence at EGM play. University students (n = 180) were randomly assigned to groups variously exposed to 15%, 30%, or 45% near misses over 50 trials (Kassinove & Schare, 2001). The 30% near miss ratio produced the greatest persistence in gambling behaviour, a percentage considered to be 'optimal' by the authors (followed frequently enough by a win to maintain operant effects, as opposed to a 45% near miss percentage that would effectively decrease win frequency and precipitate extinction). In another study, infrequent gamblers who were exposed to an average of 27% VLT near wins during a period of sustained losses were found to play 33% more games than those in the control condition who were not exposed to near wins (Cote, Caron, Aubert, Desrochers, & Ladouceur, 2003). Wohl and Enzle (2003) investigated near wins and near losses in a laboratory-based study of computerized roulette play, finding that wagers following a near loss were significantly higher in subsequent play. Harrigan (2007) documented the effects of a slot machine technical feature known as 'award symbol ratio' that creates "a high number of near misses above and below the payline [and has] the unintended effect of also creating near misses on the payline which can be explained by a software concept called feature interaction." (p. 1). This research is useful in articulating the technical practice of 'virtual reel mapping' that allows manufacturers to legally incorporate near miss operant reinforcement parameters to encourage persistent play.

Observational studies have additionally shown that EGM gamblers prefer to play a higher number of lines (up to 20), and a minimum bet per line (Walker, 2001; Williamson & Walker, 2000). These results may be due to the occurrence of increased win rate, win size, and number of near misses when more lines are played, indicating that strategies to increase reinforcement frequency were utilized by study participants. Consistent with observational study findings, a laboratory investigation of 72 regular gamblers found that betting three lines resulted in more games played and increased time spent playing compared to betting one line (Delfabbro et al., 2005).

APPENDIX C: Treatment Protocol Manual

Strategic Contingency Management to Enhance Treatment Outcomes for Problem Gamblers

Protocol Manual

Research in collaboration with:
Alberta Alcohol and Drug Abuse Commission

Project funded by:
Alberta Gaming Research Institute

Principal Investigator:
Beverly West, M.Sc. (Health Sciences) Candidate
University of Lethbridge

Thesis Supervisor:
Dr. Robert Williams, Ph.D., C. Psych.
University of Lethbridge

Contact Information

Beverly West
M.Sc. (Health Sciences) Candidate
Rm. AH112
School of Health Sciences
University of Lethbridge
4401 University Drive
Lethbridge, Alberta T1K 3M4
Ph: (403) 329-2278 (Office)
(403) xxx-xxxx (Home)
Fax: (403) 329-2668
Email: xxxxxxxxxxx

Project Timetable

May 2005 - Feb. 2006	Recruitment of problem gamblers; baseline assessment on intake; provision of treatment
Aug. 2005 - May 2006	3-month follow-up assessment of participants Data analysis
May 2006 – Aug. 2006	Post-research thesis preparation; report writing

Project Description

Treatment approaches for problem gamblers are adapted largely from cognitive-behavioural and problem-solving therapies shown to be effective for alcohol and substance dependence. Problem gamblers have been shown to benefit from this type of treatment, whether delivered in residential or outpatient settings, as individual or group therapy, through self-help approaches or as formalized programs. There is room for improvement, however. The present research is an attempt to improve both treatment retention and treatment outcome through contingency management. Effecting behavioural change by means of the contingent application of concrete rewards ('contingency management') has demonstrated utility in the treatment of other addictions, but has never been applied to the treatment of problem gamblers in clinical research settings. The present pilot study will evaluate the treatment retention and treatment outcome of 20 problem gamblers from AADAC's [name deleted] office who receive contingency management in addition to usual treatment, compared to 20 problem gamblers from AADAC's [name deleted] office who receive the usual treatment. The results of this collaborative research will augment the limited amount of literature on optimal treatment approaches for problem gamblers, and contribute to AADAC's research mandate regarding policy and program development. Additionally, the research is expected to guide future research directions, and enhance clinical practice.

Research Questions

1. Does regular treatment plus strategic contingency management produce higher treatment retention relative to regular treatment?

2. Does regular treatment plus strategic contingency management produce superior treatment outcomes relative to regular treatment?

3. What do the retrospective accounts of clients indicate about the mechanisms underlying improved behavioural change?

Recruitment, Intake Assessment, and Informed Consent

Recruitment Inclusion Criteria

All new, adult clients who meet the criteria for problem or pathological gambling are eligible, **including** those with co-morbid alcohol and/or drug problems. If participants discontinue treatment for several weeks and then resume, they will still be included in the study.

Baseline Evaluation on Intake (for **all** prospective participants)

1. South Oaks Gambling Screen
2. Treatment Client Information form for **critical** demographic information:
   - age, gender, ethnicity, marital status, employment status, mailing address, phone number
3. AADAC Adult Screening Assessment Interview Form for **critical** measures of gambling behaviour:
   - past month frequency of gambling for each form of gambling activity identified in 'participation' column of Alcohol, Drug Use & Gambling Information form
   - **time and money spent** on each form of gambling identified
   - **scale measure of quality of life functioning** in the areas of Family, Relationships/Social Life, Financial, and Emotional/Psychological, from question # 4: "On a scale of 1 to 5, with 1 being low and 5 being high, how would you rate the quality of your functioning in the area of _____?"

Informed Consent[13]

To encourage participation, briefly recognize the positive nature of the study (participants will receive enhanced treatment with gift card rewards for achievement of treatment goals; long-term benefits such as help for other individuals with gambling problems and contribution to the treatment knowledge base; additional $50 gift card for participation in brief 3-month follow-up). A brief project description may be given, e.g., "the research will evaluate treatment results for problem gamblers receiving regular outpatient treatment, compared to results for those receiving regular treatment plus contingency management through positive reinforcement."

Treatment and Research Processes

Contingency Management Treatment Process

- A brief contingency management component must be utilized in each treatment session to a maximum of 8 sessions
- Week 1: set an **easily achievable** goal; be very specific; note potential gift card reward; assist the client to identify significant short- and long-term reinforcements from their own resources (natural environmental and social rewards whose purpose is to compete with old behaviors, further reinforce new behaviors, and extend outside of the treatment setting)
- Weeks 2-7: discuss goal achievement; identify gift card reward if applicable (Principal Investigator will mail to the client as soon as possible after each session); encourage use of cards; review client self-rewards; set a goal for the coming week
- Week 8: final discussion of goal achievement and choice of 7th gift card reward
- Goals should primarily target reduction in problematic gambling behavior, but may target improved functioning in other problematic areas of life
- Gift card amounts will correspond to the week of treatment, not the number of goals achieved (e.g., a $35 card will be given for achievement of the goal for week 3, even if the previous week's goal was not reached)

[13] A copy of the consent form was included in the Protocol Manual (reproduced separately as Appendix D for present purposes).

- Utilize all available strategies to assure validity of client self-report, including collateral verification
- Ensure entry in casenotes

Research Process

The Principal Investigator will review participants' case notes on a weekly basis. All clients who attended one or more treatment sessions will be contacted by the Principal Investigator three months after their last treatment session. A 30 minute follow-up assessment will be conducted by the Principal Investigator via telephone or on-site at the AADAC office, and will consist of re-administration of the measures utilized in the baseline assessment (SOGS, gambling frequency, time and money spent, scale measures). Participants will also be asked about things they felt were especially helpful or important in successfully abstaining from gambling or in reducing gambling behaviour (or that interfered with the change process). Counsellors are encouraged to debrief with the Principal Investigator throughout the study. A full and final research report will be presented by the Principal Investigator.

Contingency Management Incentives

Schedule of Gift Card Rewards

Treatment Session	Incentive Amounts (full / partial)	Incremental Total
Week 1	Goal-setting only	N/A
Week 2	$30 (for Goal 1)	$30
Week 3	$30 (for Goal 2)	$60
Week 4	$35 (for Goal 3)	$95
Week 5	$35 (for Goal 4)	$130
Week 6	$35 (for Goal 5)	$165
Week 7	$40 (for Goal 6)	$205
Week 8	$45 (for Goal 7)	$250

Gift Card choices: Wal-Mart, Movie Mill, or McDonalds (to be mailed by the Principal Investigator as soon as possible after each session)

APPENDIX D: Consent Letters

Original Consent Letter (signed by participants at recruitment)

Dear Client,

You are being invited to participate in a treatment study that is a collaboration between the University of Lethbridge and the Alberta Alcohol and Drug Abuse Commission (AADAC).

Should you agree to participate, you will receive the regular assessment and treatment program offered by AADAC, plus an enhancement that includes material rewards for success in reaching your treatment goals (gift cards to a maximum of $250).

If you agree to participate, we would also need your permission:

- For your AADAC counsellor to share your clinical progress notes with the Principal Investigator (myself) for analysis.
- For me to contact you for a 30 minute follow-up assessment 3 months after your last treatment session. You will receive an additional $50 gift card for this.

Confidentiality is assured, and the information you provide will be securely retained at AADAC and the University of Lethbridge. Information will be reported in general terms with guaranteed anonymity and no possibility of individual identification. Information will be destroyed after final data analysis (not later than May 2006). Be aware that you are also free to withdraw from this study at any point and there will be no interruption of service from AADAC. If you choose to withdraw, your study data will be destroyed. Study results will be available during May 2006 or thereafter in the form of a research thesis, and may also be published in journal articles, presented at conferences, or reported in AADAC publications.

If you have any questions about the study, please call Bev West at (403) 329-2278, University of Lethbridge. General questions may be addressed to the Office of Research Services at the University of Lethbridge, (403) 329-2747.

_____
Beverly West, M.Sc. (Health Sciences) Candidate

---------- Detach and Return ----------

I consent to participate in the study entitled “Strategic Contingency Management to Enhance Treatment Outcomes for Problem Gamblers”.

_____ _____
Printed Name Signature

_____
Date

Revised Consent Letter (signed by participants at follow-up)

Dear Client,

You are being invited to participate in a treatment study that is a collaboration between the University of Lethbridge and the Alberta Alcohol and Drug Abuse Commission (AADAC).

Should you agree to participate, you will receive the regular assessment and treatment program offered by AADAC, plus an enhancement that includes material rewards for success in reaching your treatment goals (gift cards to a maximum of $250).

If you agree to participate, we would also need your permission:

- For your AADAC counsellor to share your clinical progress notes with the Principal Investigator (myself) for analysis.
- For us to contact you for a follow-up evaluation that will consist of the regular AADAC assessment and a tape-recorded interview about the process of change. This assessment and interview will take place 3 months after your last treatment session, and will take two hours or less. You will receive an additional $50 gift card for this.

Confidentiality is assured, and the information you provide will be securely retained at AADAC and the University of Lethbridge. Information will be reported in general terms with guaranteed anonymity and no possibility of individual identification. Information, including audio cassette tapes, will be destroyed after final data analysis (not later than August 2006). Be aware that you are also free to withdraw from this study at any point and there will be no interruption of service from AADAC. If you choose to withdraw, your data will be destroyed. Study results will be available during May 2006 or thereafter in the form of a research thesis, and may also be published in journal articles, presented at conferences, or reported in AADAC publications.

If you have any questions about the study, please call Bev West at (403) 329-2278, University of Lethbridge. General questions may be addressed to the Office of Research Services at the University of Lethbridge, (403) 329-2747.

_____
Beverly West, M.Sc. (Health Sciences) Candidate

---------- Detach and Return ----------

I consent to participate in the study entitled “Strategic Contingency Management to Enhance Treatment Outcomes for Problem Gamblers”.

_____ _____
Printed Name Signature

_____
Date

APPENDIX E: AADAC Assessment Instruments

AADAC assessment instruments are reproduced after this page, with permission.

South Oaks Gambling Screen (SOGS)

Client Name_____

Date_____

File Number_____

These questions are about your gambling. Most of the questions require a response for two different time periods: *during the past 12 months* and *in your lifetime prior to the past 12 months.*

Note: "Lifetime" refers to the time period prior to the past 12 months and does not include the past 12 months.

Instructions

1. Carefully read each question and the possible answers provided. Answer each question by placing a check-mark (✔) next to the answer that is most true for you, **for each of the two time periods.**

2. Take as much time as you need. Work carefully, and try to finish as soon as possible. Please answer ALL questions.

If you have difficulty with a question or have any problems, please ask the questionnaire administrator.

For office use only

Completed by client ___
interviewer ___

Results_____ Past 12 months

Results_____ Lifetime prior to past 12 months

AADAC

South Oaks Gambling Screen (SOGS)

Name _____

Date _____

1. Please indicate which of the following types of gambling you have done, for both time periods. For each type, mark one answer: "not at all," "less than once a week," or "once a week or more."

		Past 12 months			Lifetime prior to past 12 months		
		not at all	less than once a week	once a week or more	not at all	less than once a week	once a week or more
a.	play cards for money	—	—	—	—	—	—
b.	bet on horses, dogs or other animals (at off-track betting, the track, telephone pari-mutuels, or with a bookie)	—	—	—	—	—	—
c.	bet on sports (parlay cards, Sport Select, hockey drafts, or with a bookie)	—	—	—	—	—	—
d.	played dice games (including craps, over and under, or other dice games) for money	—	—	—	—	—	—
e.	gambled in a casino (legal or otherwise)	—	—	—	—	—	—
f.	played the numbers or bet on lotteries (Pick 3, Lotto 6/49)	—	—	—	—	—	—
g.	played bingo for money	—	—	—	—	—	—
h.	played the stock, options and/or commodities market	—	—	—	—	—	—
i.	played slot machines, poker machines or other gambling machines	—	—	—	—	—	—
j.	bowled, shot pool, played golf or some other game of skill, for money	—	—	—	—	—	—
k.	pull tabs or "paper" games other than lotteries (Nevada tickets)	—	—	—	—	—	—
m.	some form of gambling not listed above (please specify)	—	—	—	—	—	—

South Oaks Gambling Screen (SOGS)

	Past 12 months	Lifetime prior to past 12 months
2. What is the largest amount of money you have ever gambled with on any one day?		
never have gambled	___	___
$1 or less	___	___
more than $1 up to $10	___	___
more than $10 up to $100	___	___
more than $100 up to $1,000	___	___
more than $1,000 up to $10,000	___	___
more than $10,000	___	___
3. Check which of the following people in your life has (or had) a gambling problem.		
___ father		
___ mother		
___ brother or sister		
___ grandparent		
___ my spouse/partner		
___ my child(ren)		
___ another relative		
___ a friend or someone else important in my life		
4. When you gamble, how often do you go back another day to win back money you lost?		
never	___	___
some of the time (less than half the time I lose)	___	___
most of the time I lose	___	___
every time I lose	___	___
5. Have you ever claimed to be winning money gambling but weren't really? In fact, you lost?		
never (or never gamble)	___	___
yes, less than half the time I lose	___	___
yes, most of the time	___	___

AADAC

South Oaks Gambling Screen (SOGS)

		Past 12 months		Lifetime prior to past 12 months	
		yes	no	yes	no
6.	Do you feel you have ever had a problem with betting money or gambling?	___	___	___	___
7.	Did you ever gamble more than you intend to?	___	___	___	___
8.	Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	___	___	___	___
9.	Have you ever felt guilty about the way you gamble or what happens when you gamble?	___	___	___	___
10.	Have you ever felt like you would like to stop betting money or gambling but didn't think you could?	___	___	___	___
11.	Have you ever hidden betting slips, lottery tickets, gambling money, IOUs, or other signs of betting or gambling from your spouse, children or other important people in your life?	___	___	___	___
12.	Have you ever argued with people you live with over how you handle money?	___	___	___	___
13.	(If you answered yes to question 12): Have money arguments ever centered on your gambling?	___	___	___	___
14.	Have you ever borrowed from someone and not paid them back as a result of your gambling?	___	___	___	___
15.	Have you ever lost time from work (or school) due to betting money or gambling?	___	___	___	___

AADAC

South Oaks Gambling Screen (SOGS)

		Past 12 months		Lifetime prior to past 12 months	
16.	If you borrowed money to gamble or to pay gambling debts, who or where did you borrow from? (Check "yes" or "no" for each.)	yes	no	yes	no
a.	from household money	—	—	—	—
b.	from your spouse	—	—	—	—
c.	from other relatives or in-laws	—	—	—	—
d.	from banks, loan companies, or credit unions	—	—	—	—
e.	from credit cards	—	—	—	—
f.	from loan sharks	—	—	—	—
g.	you cashed in stocks, bonds or other securities	—	—	—	—
h.	you sold personal or family property	—	—	—	—
i.	you borrowed on your chequing account (passed bad cheques)	—	—	—	—
j.	you have (had) a credit line with a bookie	—	—	—	—
k.	you have (had) a credit line with a casino	—	—	—	—

AADAC Guide to the South Oaks Gambling Screen (SOGS)

Description

The South Oaks Gambling Screen (SOGS) is a valid and reliable 16-item interview/questionnaire used to detect gambling problems. The instrument has been useful in a wide variety of clinical and research situations with treatment and general populations.

Note:

The South Oaks Gambling Screen is a screening instrument and must be used in context with other sources of information, such as family members, referring parties, employers, etc.

Treatment planning and other clinical decisions should not be based solely on the results of this instrument. Positive scores suggest a problem, and further assessment is necessary before treatment proceeds. "No-problem" scores should be consistent with other sources of information before "no-treatment" decisions are made.

Administration

- The 16-item SOGS may be administered as either a questionnaire or an interview.
- If being used as a questionnaire, the client should be instructed to carefully read each question and the answers provided.
- All but one of the questions require a response for two time periods: the past 12 months, and in your lifetime prior to the past 12 months. Ask the client to check the appropriate box for each time period. ***Note: "Lifetime" refers to the time period prior to the past 12 months and does not include the past 12 months.***
- Ask the client to ensure that each question (except #3) is answered for both time periods.
- Emphasize that each question must have only one response for each time period. Even if more than one response might be correct, or if no single response is just right, they must choose the **best** answer.

Scoring

(see next page)

AADAC Guide to the South Oaks Gambling Screen (SOGS)

Scoring

Scoring is determined by adding up the number of questions which show an **at risk** response:

		Past 12 months	Lifetime prior to past 12 months
Questions 1, 2 & 3 are not counted.			
Question 4	most of the time I lose, or every time I lose.	____	____
Question 5	yes, less than half the time I lose, or yes, most of the time.	____	____
Question 6	yes, in the past 12 months, or yes, in my lifetime prior to the past 12 months.	____	____
Question 7	yes	____	____
Question 8	yes	____	____
Question 9	yes	____	____
Question 10	yes	____	____
Question 11	yes	____	____
Question 12	not counted		
Question 13	yes	____	____
Question 14	yes	____	____
Question 15	yes	____	____
Question 16 a	yes	____	____
Question 16 b	yes	____	____
Question 16 c	yes	____	____
Question 16 d	yes	____	____
Question 16 e	yes	____	____
Question 16 f	yes	____	____
Question 16 g	yes	____	____
Question 16 h	yes	____	____
Question 16 i	yes	____	____
Question 16 j	not counted		
Question 16 k	not counted		
There are 20 questions which are counted		____ **Total**	____ **Total**

Interpretation is for each time period. Do not add the two totals together.

0 = no problem

1 - 4 = some problem

5 or more = probable pathological gambler

AADAC

AADAC Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

Office Use Only
Client I.D. #:

TREATMENT CLIENT INFORMATION

Welcome to AADAC

To help us serve you, please take a few minutes to fill in the following form. If you have any questions, please ask a staff member.

This information is being collected under the authority of the Alcohol and Drug Abuse Act in order to provide AADAC services. If you have any questions regarding this collection please contact the manager/supervisor at the facility providing you the service. (The receptionist can direct you to the manager or supervisor)

PLEASE PRINT CLEARLY

Today's Date: Y/Y/Y/Y M/M/M D/D

Example: 2003 (Y/Y/Y/Y) JAN (M/M/M) 01 (D/D)

NAMES

1. **What is your legal name?**

LAST _____ FIRST _____ MIDDLE _____

2. **What do you like to be called?** _____

3. **Is there another name that you use or have used?** **Example:** your maiden name

LAST _____ **FIRST** _____ **MIDDLE** _____

GENERAL

4. **Date of Birth:** Y/Y/Y/Y M/M/M D/D

5. **Gender:** ☐ Male ☐ Female

6. **What is your marital status?** Check only **ONE** box that best applies to you

☐ Single/Never Married ☐ Married/Common-law/ Partnered ☐ Widowed ☐ Separated ☐ Divorced

7. **What grade level have you COMPLETED?** Check only **ONE**

☐ None ☐ Grade 7 ☐ Grade 9 ☐ Grade 11 ☐ College/Technical Diploma
☐ Grade 1 – 6 ☐ Grade 8 ☐ Grade 10 ☐ Grade 12/13 ☐ University Degree

8. **Are you going to school now? (If you are on a holiday break, are you going back to school when it starts again?)** ☐ Yes ☐ No

9. **What is your USUAL occupation?** Check only **ONE** box that best applies to you. If you are **retired**, check the occupation you had before you retired.

☐ **Agricultural** (farmer, landscaper, feed mill operator)
☐ **Clerical/Office** (administrative assistant, secretary, receptionist)
☐ **Construction** (carpenter, electrician, roofer, framer)
☐ **Fishing/Hunting/ Trapping**
☐ **Forestry/Mining** (lumberjack, miner, rig hand, tool push)
☐ **Management** (manager, supervisor)
☐ **Manufacturing** (machinist, materials handler, mechanic)
☐ **Professional** (doctor, lawyer, teacher, psychologist, social worker)
☐ **Sales and Service** (waiter, hairstylist, food industry, retail salesperson, real estate, hospitality industry)
☐ **Transportation** (truck driver, taxi driver, railway engineer, pilot)
☐ **Homemaker**
☐ **No Occupation**

For Data Entry Only
Date Entered:
Entered By:

AADAC Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

Office Use Only
Client I.D. #:

TREATMENT CLIENT INFORMATION

GENERAL

10. What is your employment status at this time? Check only **ONE** box that best applies to you

Employed:
- ☐ Full-time
- ☐ Part-time
- ☐ Self-employed

Unemployed:
- ☐ Looking for paid work
- ☐ Not looking for paid work (examples: homemaker, retired, student, on assistance, disability)

11. IF EMPLOYED, what is your job title? _____

12. Cultural Identity:
This question is asked in order for AADAC to improve its services to individuals from a variety of ethnic/cultural backgrounds. If you identify yourself with a particular ethnic or cultural group(s), please tell us which one(s).

- ☐ Aboriginal
- ☐ Other (please specify) _____
- ☐ I do not identify with any ethnic or cultural group

START SERVICE TYPE

13. Why are you here? (Check which AADAC service you require) Check **ALL** that apply

☐ Alcohol ☐ Other Drugs ☐ Gambling ☐ Tobacco ☐ Other (please specify) _____

14. I am here because of: Check only **ONE** box that best applies

- ☐ **My own use** (This does not indicate a problem. We use this information to help determine what service you need. (Go to question 15)
- ☐ **Someone else's use (Complete parts a and b)**

a. I am the _____ of the person who is using alcohol, drugs, gambling, or tobacco.
(Check only **ONE** circle below that fills in the blank)

- ○ spouse/partner
- ○ child/step-child
- ○ other family member
- ○ parent/guardian/step-parent
- ○ sister/brother/step-sister/step-brother
- ○ friend

b. The person using alcohol, drugs, gambling, or tobacco is:

- ○ Under age 18
- ○ Age 18 or older

15. Who suggested that you come here? _____

16. What is their relationship to you? _____

17. Please speak to a staff member if anyone needs information about your attendance or treatment.

ADDRESS/PHONE

18. What is your home address?

Address: _____
City: _____ Postal Code: _____
Province: _____ Country: _____

19. Phone Numbers		**Extension**	**Best Time to Call**
Home:	( )		
Work:	( )		
Fax:	( )		
Cell/Mobile:	( )		
Pager:	( )		

AADAC Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

Office Use Only Client I.D. #:	Service Type:

ALCOHOL, DRUG USE & GAMBLING INFORMATION

To help us serve you, please take a few minutes to fill in this form.

Read each question carefully. Then answer either YES or NO to EVERY item on the form. Please do not leave any item blank. If the answer is NO, check NO on the form. If you have any further questions about how to complete this form, please ask a staff member

This information is being collected under the authority of the Alcohol and Drug Abuse Act in order to improve AADAC services. If you have any questions regarding this collection please contact the manager/supervisor at the facility providing you the service. (The receptionist can direct you to the manager or supervisor)

Today's Date Y/Y/Y/Y M/M/M D/D

Name: LAST NAME FIRST MIDDLE

PARTICIPATION IN ALCOHOL, DRUGS OR TOBACCO Read each question carefully. Answer either YES or NO to EVERY item		1. Have you used the substance 1 or more times in the past 12 months?	2. Have you been concerned about this substance use in the past 12 months?
Alcohol	Example: Beer, wine, coolers, hard liquor, etc	☐ Yes ☐ No	☐ Yes ☐ No
Other alcohol	Example: Lysol ®, vanilla, rubbing alcohol	☐ Yes ☐ No	☐ Yes ☐ No
Marijuana	Example: pot, grass, hash, or hash oil	☐ Yes ☐ No	☐ Yes ☐ No
Cocaine	Example: cocaine, crack	☐ Yes ☐ No	☐ Yes ☐ No
Opiates	Example: codeine, heroin, morphine, methadone, Tylenol 1, 2, 3, & 4®, Percodan ®, Percocet ®, Demerol ®, Darvon ®, etc	☐ Yes ☐ No	☐ Yes ☐ No
Psychedelics	Example: LSD, peyote cactus, magic mushrooms, Ecstasy, PCP, MDA, etc.	☐ Yes ☐ No	☐ Yes ☐ No
Tranquilizers	Example: Valium ®, Ativan ®, Restoril ®, Librium ®, Xanax ®, Serax ®, Dalmane ®, etc	☐ Yes ☐ No	☐ Yes ☐ No
Anti-depressants	Example: Paxil ®, Zoloft ®, Prozac ®, Effexor ®, etc	☐ Yes ☐ No	☐ Yes ☐ No
Barbiturates/ sedatives	Example: Seconal ®, Tuinal ®, Imovane ®, "blue heavens", etc	☐ Yes ☐ No	☐ Yes ☐ No
Amphetamines/ stimulants	Example: Crystal Methamphetamine, Speed, bennies, Dexedrine ®, Ritalin ®, MDA, Ice, etc. (not diet pills)	☐ Yes ☐ No	☐ Yes ☐ No
Inhalants/solvents	Example: liquid paper, gasoline, paint, spray paint, hair sprays, plastic cement, airplane glue, nail polish remover, etc	☐ Yes ☐ No	☐ Yes ☐ No
Talwin and Ritalin	T's & R's	☐ Yes ☐ No	☐ Yes ☐ No
Androgens:	Example: steroids, Creatine ®, growth hormones, beta-blockers, etc	☐ Yes ☐ No	☐ Yes ☐ No
Tobacco-Chew	Example: snuff	☐ Yes ☐ No	☐ Yes ☐ No
Tobacco-Smoke	Example: cigarettes, cigars, pipes	☐ Yes ☐ No	☐ Yes ☐ No
Other drugs	Please specify:	☐ Yes ☐ No	☐ Yes ☐ No

For Data Entry Only Date Entered:	Entered By:

AADAC Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

Office Use Only Client I.D. #:	Service Type:

ALCOHOL, DRUG USE & GAMBLING INFORMATION

PARTICIPATION IN INJECTION DRUG USE Read each question carefully. Answer either YES or NO to EVERY item.	Response
Have you ever, in your life, injected drugs?	☐ Yes ☐ No
Have you injected drugs in the past 12 months?	☐ Yes ☐ No

PARTICIPATION IN GAMBLING OR BETTING ACTIVITIES Read each question carefully. Answer either YES or NO to EVERY item.	1. Have you **participated** in the gambling activity 1 or more times in the past 12 months?	2. Have you been **concerned** about this gambling activity in the past 12 months?
Played bingo for money	☐ Yes ☐ No	☐ Yes ☐ No
Played instant-win/pull-tab/scratch tickets	☐ Yes ☐ No	☐ Yes ☐ No
Bought lottery/fundraising tickets	☐ Yes ☐ No	☐ Yes ☐ No
Played cards/board games for money or other belongings	☐ Yes ☐ No	☐ Yes ☐ No
Played games of skill for money or other belongings	☐ Yes ☐ No	☐ Yes ☐ No
Bet on sporting events	☐ Yes ☐ No	☐ Yes ☐ No
Played VLTs	☐ Yes ☐ No	☐ Yes ☐ No
Played slot machines	☐ Yes ☐ No	☐ Yes ☐ No
Bet in casinos	☐ Yes ☐ No	☐ Yes ☐ No
Bet at horse races or tracks	☐ Yes ☐ No	☐ Yes ☐ No
Bet money on the Internet	☐ Yes ☐ No	☐ Yes ☐ No
Played video or arcade games for money	☐ Yes ☐ No	☐ Yes ☐ No
Played or Bet on OTHER things for Money (Please specify)	☐ Yes ☐ No	☐ Yes ☐ No

YOU ARE FINISHED THIS FORM. Thank you for taking the time to provide us with this important information. Please return the form to the receptionist.

For Data Entry Only Date Entered:	Entered By:

AADAC ADULT SCREENING ASSESSMENT INTERVIEW FORM

(See Reference Guide for instructions on the use of this form)

Client Name _____ **Interviewer Name** _____

Client Phone Number _____ **Date of Interview** _____

What made you decide to come to AADAC at this time? *(If you were referred by someone else, what is your understanding about why they referred you to AADAC?)*

_____

_____

_____

_____

_____

_____

_____

NOTES:

Initial Treatment Plan:

_____

_____

_____

A. Addiction Severity

1. Information on Addiction Severity

IDENTIFY BEHAVIOUR *i.e.; Alcohol, Drug (Specify), Gambling*				
Pattern - (daily, weekends, bender)				
Quantity - per: day, weekend, bender				
When/Age use started				
When problematic use began				
Changes in pattern or periods of abstinence				
Method of Administration				
Context of Use *(where, with whom)*				
Last Use				
Withdrawal - *symptoms & frequency*				

2. What are the good things about your alcohol/drug use and/or gambling behaviour?

3. What are the less good things about your alcohol/drug use and/or gambling behaviour?

4. **What effects have you experienced in your life as a result of your alcohol/drug use and/or gambling behaviour?**

❒ Family	❒ Relationships/Social Life
❒ Employment	❒ Financial
❒ Educational	❒ Physical Health
❒ Legal	❒ Emotional/Psychological
❒ Spiritual	❒ Leisure

5. **When did you first begin to question your alcohol/drug use/gambling behaviour?**

6. Have you made attempts on your own to change your alcohol, drug and/or gambling behaviour? Have you had other (previous/current) treatment for your alcohol, drug and/or gambling behaviour?

_____

_____

_____

_____

7. ADDICTION SEVERITY RATING

	no real problem treatment not indicated		slight problem treatment probably not necessary		moderate problem some treatment indicated		considerable problem treatment necessary		extreme problem treatment absolutely necessary	
Alcohol	0	1	2	3	4	5	6	7	8	9
Drug	0	1	2	3	4	5	6	7	8	9
Gambling	0	1	2	3	4	5	6	7	8	9

ADS Score_____ **DAST Score_____** **SOGS Score_____**

B. Medical

1. **At the present time are you taking any medication prescribed by a doctor?**

   ❒ Yes ❒ No

   If yes, what medication(s)? _____

   _____

   _____

   Current Doctor's Name: _____

   Reason prescribed: _____

   _____

2. **Are you taking any over the counter medications?**

   ❒ Yes ❒ No

   If yes, what medications? _____

   _____

   Reason: _____

   _____

3. **(For Women) Are you Pregnant?**

   ❒ Yes ❒ No

4. **Do you have any chronic medical problems? (that is any medical problem that interferes in your daily life in some way, e.g., asthma, diabetes, back problems, disabilities)?**

   ❒ Yes (Specify) _____

   _____

   ❒ No

5. **Have you experienced any medical problems in the last month?**

   ❒ Yes (Specify) _____

   _____

   ❒ No

6. MEDICAL RATING

no real problem treatment not indicated		slight problem treatment probably not necessary		moderate problem some treatment indicated		considerable problem treatment necessary		extreme problem treatment absolutely necessary	
0	1	2	3	4	5	6	7	8	9

C. Psychological/Emotional Functioning

1. Have you ever seen a doctor or counsellor for psychological, emotional or mental health concerns? (depression, stress, etc.)

   ❒ Yes (Specify) _____ ❒ No

2. Have you ever:

			Related to use		
	Yes	No	Yes	No	Notes
a) Experienced serious depression					
b) Experienced serious anxiety or tension					
c) Experienced thoughts of suicide					
d) Attempted suicide					
e) Have you thought about suicide in the last few days✡					
f) Experienced trouble controlling violent behaviour					
g) Been abused (physical, emotional, sexual)					

✡ If the client is currently having suicidal thoughts, then conduct a suicide risk assessment.

3. At the time of the interview, is the client: (To be completed by the interviewer only. Mark all that apply)

   ❒ Obviously depressed/withdrawn
   ❒ Obviously hostile
   ❒ Obviously anxious/nervous
   ❒ Having trouble with reality testing, thought disorders, paranoid thinking
   ❒ Having trouble comprehending, concentrating, remembering
   ❒ Having suicidal thoughts
   ❒ Other (specify _____)
   ❒ Showing no signs of the above problems

4. Psychological/Emotional Functioning Rating

no real problem		slight problem		moderate problem		considerable problem		extreme problem	
treatment not indicated		treatment not necessary		some treatment indicated		treatment necessary		treatment absolutely necessary	
0	1	2	3	4	5	6	7	8	9

D. Social Stability

1. **At present are you living in:**

   ❒ a house or apartment **(2)**
   ❒ a room **(1)**
   ❒ have no residence **(0)**

2. **Are you currently living with others who are emotionally supportive of you?**

   ❒ Yes **(2)** ❒ No **(0)**

3. **Do you have contact with a support system:** *(Family, 12 Step involvement, Close Friends)*

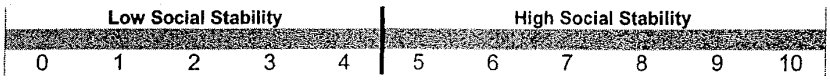
   ❒ Daily **(2)** ❒ Monthly **(0)**
   ❒ Weekly **(1)** ❒ No Contact **(0)**

4. **Do you have a stable source of income?**

   ❒ Yes **(2)** What source?_____
   ❒ Sometimes **(1)**
   ❒ No **(0)**

5. **In the past 12 months have you:**

   ❒ Been a student or employed full time for 12 months **(2)**
   ❒ Been a student or employed full time for 6 – 11 months or part time for 12 months **(1)**
   ❒ Otherwise **(0)**



E. Readiness for Change

1.

Client Rating	Interviewer Rating	Current Motivational Stage
❒	❒	1. Pre-contemplation
❒	❒	2. Contemplation
❒	❒	3. Preparing for Action
❒	❒	4. Action
❒	❒	5. Maintenance

2. **How can AADAC be helpful to you at this time?** *(Pre-contemplators & Contemplators) or* **How can AADAC be helpful to you in making change now?** *(Preparing for Action, Action and Maintenance stages)*

_____

_____

_____

F. Final Question

1. **Is there anything else that you think is important for me to know?**

_____

_____

_____

This information is being collected under the authority of the Alcohol and Drug Abuse Act in order to provide AADAC services. If you have any questions regarding this collection please contact the manager/supervisor at the facility providing you the service. (The receptionist can direct you to the manager or supervisor)

Circle the number that best describes your situation today.

1. I am not worried about my use of alcohol or drugs or my gambling, and I am here only because someone else requested I come.

2. I am not sure if I have a problem with alcohol, drugs or gambling.

3. I know I have a problem with alcohol, drugs or gambling, but I am not sure how to change it.

4. I am ready to make changes, and I am here to get help to make those changes.

5. I have already made the changes I need to make and I want help to maintain those changes.

Treatment Goals Checklist

This information is being collected under the authority of the Alcohol and Drug Abuse Act in order to provide AADAC services. If you have any questions regarding this collection please contact the manager/supervisor at the facility providing you the service. (The receptionist can direct you to the manager or supervisor)

Date: _____

Client Name: _____

The following is a list of goals that people coming to treatment sometimes have. Please indicate which are your present goals by circling Yes and which are not your present goals by circling No.

1.	To deal with my problem of alcohol and/or drug use and/or gambling.	Yes	No
2.	To learn to manage stress appropriately.	Yes	No
3.	To learn to stand up for myself better.	Yes	No
4.	To be able to deal with my feelings and express them directly.	Yes	No
5.	To improve my relationship with members of my family (spouse, children, parents, etc.).	Yes	No
6.	To be able to get along better socially.	Yes	No
7.	To improve my ability to find and keep a job.	Yes	No
8.	To learn to use my leisure time better.	Yes	No
9.	To improve my living arrangements.	Yes	No
10.	To deal effectively with my financial problems.	Yes	No
11.	To deal effectively with my legal problems.	Yes	No
12.	To deal effectively with my medical problems.	Yes	No
13.	To manage my emotional/mental health issues appropriately.	Yes	No
14.	Other – Please Specify _____	Yes	No

SUMMARY

How many goals have you indicated? _____

Of the goals you indicated, which are the most important for you to solve at the moment?

My first most important goal is # _____
My second most important goal is # _____
My third most important goal is # _____

Suicide Risk Assessment Check List

	Low	Moderate	High
Current Plan			
Lethality of means	❑ method unlikely to be fatal or immediate (time for rescue)	❑ method potentially fatal	❑ firearms, hanging, jumping – (highly lethal and immediate methods)
Availability of means	❑ has not thought about it	❑ may not be immediately available but has access to means	❑ has means in hand
Specificity: ❖ Method (what) ❖ Time (when) ❖ Location (where) ❖ Details (how)	❑ vague ❑ unplanned	❑ has some ideas but nothing definite ❑ may have settled on a time and place	❑ well thought out ❑ immediately or near future ❑ has decided on location
Prior Behaviour			
Prior suicidal behaviour	❑ no prior attempts or previously attempted with low lethality.	❑ may have seriously attempted in past	❑ Past attempts of high lethality, may know someone close who has attempted or completed
Resources			
Significant People /Isolation	❑ large support system, concerned and available	❑ few or only one who is available	❑ none or one
Stressors			
Recent Losses (job, divorce, death)	❑ does not appear to have major losses	❑ fairly important & recent losses ❑ may have experienced multiple losses over time	❑ just had important loss (often the last straw) ❑ fearful of impending loss (e.g. divorce, losing job etc)
Symptoms			
Cognitive/Behavioural	❑ cognitive (thinking) and behavioural functioning is fairly stable	❑ may be losing perspective (sees death as only way out) ❑ may have difficulty eating, sleeping etc.	❑ may have difficulty controlling thoughts and managing emotions.
Hopelessness/ Helplessness	❑ vague feelings of depression/isolation, but demonstrates ability to consider other life-sustaining solutions.	❑ Some feelings of helplessness-hopelessness, depression	❑ Overwhelming feelings of hopelessness, helplessness, depression

Source: Suicide Information Education Centre/Suicide Prevention Training Programs Calgary AB 1999

APPENDIX F: Counsellor Survey

Alberta Alcohol and Drug Abuse Commission

Third Party Research Project:
Strategic Contingency Management to Enhance Treatment Outcomes for
Problem Gamblers

AADAC COUNSELLOR SURVEY: [name deleted] AREA OFFICE

Date: _____

Please check-off the theoretical approach you normally use in treating problem gamblers (you can check more than one):

□ cognitive restructuring

□ motivational interviewing

□ behavioural/contingency management

□ psychodynamic

□ problem-solving

□ family/marriage therapy

□ other_____

_____

Note. Confidentiality and anonymity of responses is assured; survey results will be aggregated with no possibility of individual identification, and may be reported in the Principal Investigator's Master's Thesis and other reports and publications.

APPENDIX G: Participant Interview Guides

Table 7. Client Interview Guide

1. What do you feel was the purpose of this research?
2. Had you ever heard of contingency management, incentives/reward programs, or reinforcement strategies before you attended treatment? If yes, please explain.
3. How did you feel about the goal-setting process?
4. Did goal setting include behaviours other than gambling? If yes, what were they? How helpful/unhelpful was it to relate treatment goals to other aspects of life?
5. How did you feel about receiving the gift cards?
6. How did you feel about the gift card amounts? Were they substantial enough/not substantial enough to be rewarding? Why /why not? What was the influence of increasing gift card values over time?
7. Did you like the choice of 3 types of gift cards? What might have been more effective?
8. How did you feel about the time it took to receive the gift cards in the mail?
9. Did you spend the gift cards? How soon after receiving them? Did you find this process rewarding? How helpful was it?
10. Did the incentive program influence your attendance at treatment?
11. Were others aware of the gift card/reward program? If so, how did they feel about it? How did their feelings/actions affect you?
12. Did you use goal-setting and self-rewards in everyday life, outside of treatment? If yes, how often did this occur and what were the strategies or activities used?
13. On a scale of 1 to 5, with 1 being low and 5 being high, how effective was this incentive-based treatment component in helping you to make changes in gambling behaviour? In other areas of life?
14. Do you use goal-setting and self-reward now? If yes, how often and what strategies do you use?
15. What would you change about this contingency management study? About the incentive program used in this study?

Table 8. Counsellor Interview Guide

1. What is your overall impression of this research?
2. What were your experiences with client recruitment?
3. What percentage of clients with gambling problems (including those with co-morbidity) do you estimate refused to participate?
4. What were your perceptions of reasons for client refusal?
5. What were your perceptions of differences between clients who participated and those who did not (if applicable)?
6. What were your experiences with participating clients during the treatment period?
7. How could the research have been improved?