

PATHOLOGICAL GAMBLING:
The biopsychological variables and their management
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N. el-Guebaly, MD and D. Hodgins, PhD

It is our pleasure to submit our interim report of this literature review. The report includes summary tables about biological variables, psychological variables, comorbidities and biopsychological approaches to management. An annotated bibliography is also included.

GAMBLING DATABASE DEVELOPMENT PROCESS

To explore these issues and to present a summary of the pertinent literature, the following process was followed. Themes and elements generally found in the literature were identified so that consistency during article reviews and entry into the database was maintained. Boundaries were set so that only published literature that had undergone peer review and was based on empirical work was used. Once these guidelines were in place, the themes or key words for the psychological, cognitive, biological, co-morbidity, and treatment areas were identified. A database was designed using Filemaker Pro to incorporate those ideas.

Initially, therapists who specialize in gambling treatment provided their articles for review. Relevant literature was also obtained from the library and through an electronic literature search. A search at the end of September on Medline and PsycINFO (1999-2000) ensured that the most recent articles were included. Finally, review articles were analyzed for relevant articles.

Due to the constraints of time and personnel, as well as the enormity of such a task, many more hours than were initially planned were dedicated to this project. The database now holds 231 articles with about 50 more on order or awaiting entry. The *preliminary* summaries of these articles are submitted at this time.

BIOLOGICAL VARIABLES

In this component, the most interesting analysis is that of the designs creatively attempting to investigate the biological nature of gambling. The small sample sizes, the range of variables considered by a limited number of studies lead us to conclude that this area is characterized by great breadth but little depth. The issue of ecological validity in laboratories is reinforced. The more robust area of investigation appears to be in the complementary investigations of dopamine prevalence and genetic epidemiology. A more detailed analysis will be presented at the seminar.

PSYCHOLOGICAL VARIABLES

The literature examining psychological variables in pathological gambling is vast and diverse. The largest group of studies has focused on cognitive processes and biases. Both general irrational cognitions and specific concepts such as illusion of control and misinterpretation of the concept of randomness have been widely studied in student and social gambling samples. Surprisingly, much less research has been reported with

problem and pathological gamblers. The need for this research is clear to determine whether these processes are natural or pathological. Well-articulated conceptual models of the role of cognitive processes and biases in excessive gambling are required.

A large number of individual difference variables have been measured in relation to gambling and problem gambling. This line of research is much more likely than cognitive research to use problem and pathological gambling samples versus student samples. However, the definitions of regular, heavy, problematic and pathological gambling vary across studies. The DSM-IV criteria for pathological gambling are becoming increasingly used in describing samples, which is a helpful development. Many individual difference variables have been studied in only one or two reports (e.g., extraversion, ego strength, boredom proneness) but there are a number of areas where a larger group of studies have been reported: impulsivity, locus of control, sensation seeking, determinants of risk-taking, and dissociation. The results from study to study are quite variable and are very inconsistent in the areas of locus of control and sensation seeking. Impulsivity appears to be one characteristic that is consistently associated with problematic involvement with gambling.

CORMORBIDITIES OF PATHOLOGICAL GAMBLING

This section has more depth. A comorbidity is defined as “two or more disorders present in a single patient occurring independently of chance where each diagnostic entity has the characteristic phenomenology and etiologic basis typically found when each disorder is in isolation”. A statistically significant comorbidity is present between the substance use disorders and pathological gambling. The extent of the comorbidity however, depends on the sample characteristics and the instrument used.

In the association between pathological gambling and mood disorders, the data are not consistent although there is a sub-population of pathological gamblers with this comorbidity, which may play a role in perpetuating their gambling behavior. The case is weaker concerning the relationship with anxiety disorders. Do people with an anxiety disorder seek out an anxiety-provoking stimulus, this counter intuitive association is not supported by the data. Lastly, as crime and gambling are frequently associated, some pathological gamblers present with antisocial features mostly symptomatic of the gambling. Other disorders will be noted in the forthcoming analysis.

TREATMENT OUTCOME – 4 published

A range of pharmacological and psychological treatments are available for clinicians. The field so far musters only 5 randomized controlled trials on psychological approaches, one in press and 2 “hopefuls”. The second tier of some 20 studies describes outcome related to GA attendance, couple therapy and comprehensive inpatient treatment. There is one open label trial of medication and one evaluation of prevention program.

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BIOLOGICAL VARIABLES

I. AROUSAL & HEART RATE

STUDY	DESIGN	KEY FINDINGS
Griffiths '90 & '93; Coulombe et al. '92; Coventry & Norman '97; Coventry & Norman '99	Thorough recordings of every step of gambling: HR monitor, no gambling	Numerous studies have discovered that excitement associated with gambling particularly in a “real situation” makes your heart beat faster!
Anderson & Brown '84	N = 24, case control M: HR:event record, Sensation Seeking Scale	HR increases more significant in “real” casinos than labs
Roby & Lumley '95	N = 64, case control, undergraduate students	HR increases more significant in actual gambling than non-monetary gambling
Leary et al. '85	N = 44, case control M: Sensation Seeking Scale (SSS)	The association with sensation seeking is unclear The increases may be more for high frequency gamblers vs low frequency
McConaghy et al. '88	N = 20 treatment seekers M: Spielberger State-Trait Anxiety Inventory	Reduction in anxiety through imaginal desensitization reduces gambling behavior
Dickerson et al. '91& '92	N = 64 poker machine players M: Profile of Mood States (POMS), Sensation Seeking Scale (SSS) Eysenck Personality Questionnaire	No difference in mood state between high and low frequency gamblers, although depression post subjective excitement may make low frequency gamblers persist Anger/hostility may make high frequency gamblers persist Gambling of high frequency players is a highly stereotyped behavior sensitive to reinforcement from machine characteristics

STUDIES (>15 yrs)	DESIGN	KEY FINDINGS
Coventry & Norman '98	N = 54, cohort, undergraduate students Gender difference	No financial element in gambling task. Slight HR Increase. Women are more confident than men in the Ascending condition (of wins) but less in the descending condition (of wins)
Bachara et al. '99	N = 23, case control, 10 cases with amygdala & ventromedial prefrontal damage (VMF) M: Electrodes attached to palms (SCR) & card selection	Amygdala damage is associated with impairment in decision making but not with those with prefrontal damage. Amygdala damage and prefrontal damage patients unable to generate anticipatory SCR when making risky decisions. VMF damaged patients could generate SCR when reward or punishment involved.
Meyer et al. '2000	N = 10 blackjack players Salivary cortisol	Cortical increase with HR Summary: HR increase differential diagnosis is a long list. In the studies motor activity, age, smoking and the prospect of a win were all relevant. Best definition: low frequency players persistence in gambling may be more affected by mood states while high frequency players are affected by anger/hostility, habits

II – EEG

STUDY	DESIGN	KEY FINDINGS
Goldstein et al.'85 & '88	N = 16, case control M: verbal tasks, eye closed, eye opened EEG signals	PG: lower levels of hemispheric rt & lt differentiation & slower activation of hemispheres!

III – NOREPINEPHRINE

STUDY	DESIGN	KEY FINDINGS
Roy et al.'88 & '89 (2) & '90	N = 44, case control M: SADS, Beck & Hamilton 2 weeks alcohol-free & low monoamine diet; urine & CSF samples Eysenck Personality Questionnaire	PG may have disturbance in noradrenergic system (independent of depression) Greater output of NE and MHPG Correlation with Eysenck Personality Questionnaire, extraversion scale and output of norepinephrine

IV – OTHER; CORTISOL, GABA

STUDY	DESIGN	KEY FINDINGS
Ramirez et al. '88	N = 21 admissions for gambling treatment M: DST, Beck Depression, MMPI	PG's are DST suppressor
Roy et al. '91	Case = 18; Control = 49 M: CSF	GABA may have a role in releasing CRH in brain

V – SEROTONIN

STUDY	DESIGN	KEY FINDINGS
Moreno et al. '91	N = 16, case control M: blood samples	No difference between PG & control on 5-HT, cortisol & growth hormone

VI – TAURINE IN CSF (GLUTAMATE)

STUDY	DESIGN	KEY FINDINGS
Nordin et al. '96	Case = 10, Control = 7 M: CSF	Related to height in cms of gamblers

VII – URIC ACID

STUDY	DESIGN	KEY FINDINGS
Manowitz et al. '93	N = 3, normal males M: blood samples	Increase levels of uric acid during gambling compared to relaxation

VIII – ENDORPHINS

STUDY	DESIGN	KEY FINDINGS
Blaszczynski et al. '86	N = 74, case control Pathological gamblers seeking treatment M: B-endorphin blood levels, HR, Visual analogue scale rating excitement	No difference from controls at baseline and increase of B-endorphin only if sufficiently aroused; tolerance postulated
Shinohara et al. '99	N = 6 Pachinko players M: B-endorphin blood levels	Results support above postulate (plus decrease in T-cells)

IX – DOPAMINE & GENETIC VARIATIONS

STUDY	DESIGN	KEY FINDINGS
Comings et al. '96	Case = 102; Control = 714 Caucasian gamblers from multiple sites M: blood sample, Gambling Questionnaire	Significant increase in prevalence of D2A1 allele among PG's (independent of prevalence of mood disorder & substance abuse but similar to Tourette)
Comings et al. '97	Case = 503, Control = 1,420 M: blood sample, DIS, MAST	Genetic variations of DRD1 gene in some addictive behaviors & interaction with DRD2
Koepp et al. '98	N = 8, healthy volunteers M: c-labeled raclopride (rac) & PET scan	Increase in levels of extracellular dopamine
Perez de Castro '99	N = 136, case control, hospitalized PG's M: blood sample	May be allele difference in SEVERE cases only
Ibanez et al. '2000	N = 136, case control, pathological gamblers M: blood DNA	Allele B (MAO-B) more represented among PG's

X – GENETIC EPIDEMIOLOGY

STUDY	DESIGN	KEY FINDINGS
Eisen et al. '98	N = 6,718 Large cohort of Vietnam twin registry (2 studies) M: telephone interview using DSM III R in 91-92	Pair-wise concordance rate for each PG symptoms higher for MZ than DZ Familial factors explain report of 56% of 3+ symptoms and 62% of 4+ symptoms of PG
Slutske et al. '2000	N = 6,744 M: telephone interview using DSM III R In 91-92	Alcohol dependence accounts for significant but modest proportion of variation.
Gambino et al. '93	N = 93 Smaller cohorts (2 studies) M: questionnaire filled by Veteran's attending treatment	Relative risk of those with grandparents with gambling problems x4-10 those with parents with gambling problems Substances abuser at increased risk for DD with PG
Walters et al. '98	N = 155 reared together twin pairs	General gambling involvement mediated more by environment than genetic. * We need larger samples.

XI – WITHDRAWAL

STUDY	DESIGN	KEY FINDINGS
Rosenthal '92	N = 326, case control GA members & pts of professionals	65% experience withdrawal symptoms; insomnia; headaches, ... 91% experience cravings ...

XI – WITHDRAWAL – cont'd

STUDY	DESIGN	KEY FINDINGS
Fabian '95	N = 437 slot and casino gamblers	More withdrawal symptoms among casino gamblers
Orford '96	N = 32, case control M: attachment questionnaire	Model of attachment

Research Focusing on Cognitive Processes and Biases

I. Social Gamblers and Student Samples

Study	Focus	Design	Key Findings
Ladouceur & Mayrand, 1984	Illusion of control	prediction of success in coin toss with feedback and sequence of wins manipulated	<ul style="list-style-type: none"> tasks do not illicit an illusion of control
Ladouceur, Mayrand, Dussault et al, 1984	Illusion of control	level of involvement in dice throwing task manipulated	<ul style="list-style-type: none"> illusion of control did not vary with involvement
Ladouceur, Tourigny & Mayrand, 1985	Illusion of control	gambling tasks played alone or with others	<ul style="list-style-type: none"> familiarity with game associated with greater illusion of control
Gilovich & Douglas, 1986	Conception of randomness	“fluke event” and illusion of control manipulated during betting task	<ul style="list-style-type: none"> when a “fluke event” led to loss then loss was discounted but not when fluke led to a win. results found only when subject had an illusion of control over task
Ladouceur & Mayrand, 1986	Illusion of control	subjects bet before or after outcome was determined and were actively involved or not in throwing ball	<ul style="list-style-type: none"> active involvement and betting before outcome was determined led to riskier behaviour
Letarte, Ladouceur & Mayrand, 1986	Illusion of control & skill orientation	frequency of wins manipulated in roulette – subjects who had never played	<ul style="list-style-type: none"> skill orientation and frequent wins associated with higher illusion of control
Hong & Chiu, 1988	Illusion of control	questionnaire with Hong Kong residents	<ul style="list-style-type: none"> illusion of control mediates between locus of control and gambling involvement
Ladouceur & Gaboury, 1988	Rational cognitions & illusion of control	degree of risk-taking possible in gambling task manipulated, think aloud method	<ul style="list-style-type: none"> no differences in illusion of control or irrational cognitions between conditions

Study	Focus	Design	Key Findings
Ladouceur, Gaboury, Dumont & Rochette, 1988	irrational cognitions	think aloud method, frequency of wins manipulated	<ul style="list-style-type: none"> no differences between conditions
Frank, 1989	illusion of control	gambling task with children and adolescents	<ul style="list-style-type: none"> winning associated with illusion of control
Gaboury & Ladouceur, 1989	irrational cognitions	think aloud method during slot machine and roulette play	<ul style="list-style-type: none"> skill orientation was associated with more erroneous cognitions
Dumont & Ladouceur, 1990	irrational cognitions	think aloud method during video-poker play	<ul style="list-style-type: none"> no differences between occasional and regular gamblers
Burger, 1991	desirability of control and superstitious behaviours	bingo and lotto players	<ul style="list-style-type: none"> low desirability of control related to superstitious behaviours and to less bingo playing
Holtgraves & Skeel, 1992	probability estimates	hypothetical lottery	<ul style="list-style-type: none"> perceived likelihood of winning varied according to number of winners versus actual probability numbers with repeating digits played more frequently
Walker, 1992	irrational cognitions	think aloud method while playing preferred game	<ul style="list-style-type: none"> slot machines elicited more irrational cognitions than video poker machines – video amusement machines elicited the fewest
Griffiths, 1994	irrational cognitions	regular and non-regular adolescent fruit machine players think aloud method	<ul style="list-style-type: none"> regular gamblers made more irrational verbalizations than non-regular gamblers and viewed themselves as more skills

Study	Focus	Design	Key Findings
Ladouceur, Dube, Giroux et al, 1995	conception of randomness	think aloud method during gamblers scenarios	<ul style="list-style-type: none"> • pseudo-random sequences preferred over patterned sequences
Ladouceur, Paquet & Dube, 1996	Conception of randomness	think aloud method during the instruction of a sequence of outcome from coin toss	<ul style="list-style-type: none"> • majority of cognitions were irroneous, in particular the linking of independent events
Gibson & Sanbonmatsu, 1997	selective hypothesis testing	students betting on basketball teams	<ul style="list-style-type: none"> • when the focusing on a select possibility other possibilities are discounted and probability is overestimated
Friedland, 1998	luck versus chance orientations	betting games with students and soldiers	<ul style="list-style-type: none"> • learning found for change-oriented but not luck-oriented participants
Delfabbro & Winefield, 1999	interaction between reinforcement and expectancies	in vivo measurement of verbalizations and behaviour in poker machine play	<ul style="list-style-type: none"> • reinforcement schedule did not impact expectancy of winning, which appears influenced by cognitive “logic”
Kyngdon & Dickerson, 1999	persistence while losing (chasing) and alcohol	card cutting game with alcohol versus placebo	<ul style="list-style-type: none"> • greater chasing in alcohol group
Pacini & Epstein, 1999	Rational versus experiential cognitive style	correlated response to gambling task and cognitive styles	<ul style="list-style-type: none"> • more non-optimal responses with low rationality • rational and experimental styles uncorrelated

II. Problem Gamblers

Study	Focus	Design	Key Findings
Burger & Smith, 1985	desirability of control	questionnaire with GA members versus controls	<ul style="list-style-type: none"> higher desirability predicted greater persistence in gambling (losses) but gamblers had lower scores than control group
Rosecrance, 1986	illusion of control	ethnographic study	<ul style="list-style-type: none"> attributions of rationality related to problem gambling
Griffiths, 1990(a)	skill orientation	interview, focus group with addicted adolescent fruit machine players	<ul style="list-style-type: none"> belief that skill determines length of time to lose all money
Griffiths, 1990(b)	skill vs luck orientation	questionnaire with adolescent fruit machine	<ul style="list-style-type: none"> problem players have skill orientation
Tonea, Ho et al, 1997	cognitive distortions	open-ended interviews with regular and heavy gamblers	<ul style="list-style-type: none"> more distortions with games with some skill and with positive family history.
McCusker & Gettings, 1997	attentional bias for gambling information	modified stroop procedure GA members versus controls	<ul style="list-style-type: none"> implicit attentional and memory bias for gambling related information in gamblers but not spouses or non-gamblers
Walters & Contri, 1998	outcome expectancies	federal inmates administered SOGS and expectancy questionnaire	<ul style="list-style-type: none"> problem gamblers had greater positive, negative and arousal expectancies for gambling.
Moore & Ohtsuka, 1999	illusion of control & impaired control	youth in school – general survey	<ul style="list-style-type: none"> illusion of control and external control over gambling related to problem gambling.

Individual Different Dimensions Associated with Heavier Gambling

DIMENSION	STUDIES
Attachment / Dependence	Orford
Boredom proneness	Blaszczynski, 1990; Dickerson et al, 1987; Sharpe, 1995
Ego Control / Self Control	McCormick, 1993
Ego Strength	Taber, 1986
Extraversion	Roy, et al, 1989
Escaping Dysphoria	Beaudoin & Cox, 1999
Experimental Cognitive Style	Pacini, 1999
Negative Mood	Dickerson, et al, 1991
Obsessive-compulsiveness	Blaszczynski, 1999
Self-esteem	Volberg, et al, 1997

Locus Of Control

Study	Focus	Design	Key Findings
Malkin & Syme, 1986	problem and social gamblers	questionnaire	<ul style="list-style-type: none">• LOC did not differ between social and problem gamblers
Hong & Chiu, 1988	general population (Hong Kong)	questionnaire	<ul style="list-style-type: none">• for women external loc was associated with gambling, for men this relationship was mediated by illusion of control.
McCormick & Taber, 1988	male pathological gamblers	pre-post treatment questionnaire	<ul style="list-style-type: none">• attributing negative events to internal, global and stable causes predicted poor gambling outcome.
Caroll & Huxley, 1994	slot machine gamblers	self-report	<ul style="list-style-type: none">• dependent gamblers more internal
Moore & Ohtsuka, 1999	young problem gamblers	self-report	<ul style="list-style-type: none">• internal LOC over gambling related to gambling frequency but no problems.

Dissociation

Study	Focus	Design	Key Findings
Jacobs, 1988	pathological gamblers	interview	<ul style="list-style-type: none">altered consciousness when gambling is common.
Kofoed et al, 1997	pathological gamblers	video lottery, mixed gamblers and alcoholics DES	<ul style="list-style-type: none">high levels of dissociation for mixed gamblers but not VLT only.
Rosenthal & Lesieur, 1992	pathological gamblers	Survey	<ul style="list-style-type: none">various dissociative-like states identified.
Bergh & Kuhlhorn, 1994	pathological gamblers	Interview	<ul style="list-style-type: none">altered consciousness when gambling is common
Diskin & Hodgins, 1999	pathological gamblers	DES, VLT play	<ul style="list-style-type: none">pathological gamblers higher DES scores than occasional gamblers

Note: DES = Dissociative Experiences Scale

Sensation Seeking

Study	Population	Measure	Key Findings
Anderson & Brown, 1984	students and gamblers	SSS	<ul style="list-style-type: none"> no difference in SSS between students and gamblers SSS correlated with heart rate in casino setting for gamblers
Blaszczynski, Wilson & McConaghy, 1986	pathological gamblers	SSS	<ul style="list-style-type: none"> Lower scores for pathological gamblers versus general population norms
Dickerson, Hinchey & Fabre, 1987	off-course bettors	SSS	<ul style="list-style-type: none"> Lower scores versus norms but correlation with time and money expenditure; boredom susceptibility and subjective arousal
Allcock & Grace, 1988	pathological gamblers	SSS	<ul style="list-style-type: none"> Gamblers did not differ from normals whereas drug addicts were higher and alcoholics were lower
Wolfgard, 1988	students	SSS	<ul style="list-style-type: none"> no relationship with gambling
Blaszczynski, McConaghy & Frankova, 1990	pathological gamblers	SSS	<ul style="list-style-type: none"> not different than control group of family physician patients
Dickerson, Walker, England & Hinchy, 1990	off-course betters	SSS	<ul style="list-style-type: none"> SSS scores not different than norms

Study	Population	Measure	Key Findings
Blaszczynski, McConaghy & Frankova, 1991	recovered and non-recovered pathological gamblers	SSS	<ul style="list-style-type: none"> • Experience seeking pre-treatment predicted uncontrolled gambling five years later
Dickerson, Cunningham, England & Hinchy, 1991	poker machine players	SSS	<ul style="list-style-type: none"> • not correlated with gambling frequency with age partialled out
Martinez-Pina et al, 1991	gamblers from casino	SSS	<ul style="list-style-type: none"> • not different than age and gender matched controls
Steinberg, Kosten & Rounsaville, 1992	cocaine abusers	SSS	<ul style="list-style-type: none"> • pathological gamblers higher on disinhibition scale
Conventry & Brown, 1993	off-course bettors and general population	SSS	<ul style="list-style-type: none"> • off course bettors lower + casino and track gamblers higher than general population • no relationship with arousal or gambling frequency
Raviv, 1993	pathological gamblers	SSS	<ul style="list-style-type: none"> • not different than normals or sex addicts
Conventry & Norman, 1997	off-course horse racing bettors	SSS – TAS	<ul style="list-style-type: none"> • correlation with arousal at end of race
Breslin, Sobell, Cappell et al, 1999	social drinkers	SSS, Harm-avoidance scale, Tridimensional	<ul style="list-style-type: none"> • high SSS seekers showed less risk aversion in gambling task
Conventry & Constable, 1999	female bingo and snooker players	SSS	<ul style="list-style-type: none"> • no relationship with arousal or gambling frequency

Study	Population	Measure	Key Findings
Kyngdon & Dickerson, 1999	students	NEO Personality Inventory	<ul style="list-style-type: none"> • SSS predicted chasing in gambling task but not when alcohol was administered
Powell, Hardoon, Derevensky & Gupta, 1999	student gamblers	SSS, Arnatt Inventory of Sensation Seeking	<ul style="list-style-type: none"> • Higher scores for pathological versus social gamblers

(Note: SSS – Sensation Seeking Scale / TAS – Thrill and Adventure Seeking Subscale)

Impulsivity

Study	Population	Design	Key Findings
Carlton & Manowitz, 1992	recovered GA and AA members	questionnaire	<ul style="list-style-type: none"> high levels of add behaviour in childhood for both groups subgroup of gamblers show behavioural restraint deficit
McCormick, 1993, 1994	substance abusers	questionnaire battery	<ul style="list-style-type: none"> impulsivity related to severity of gambling problems and polysubstance abuse
Carton & Manowitz, 1994	recovered GA members	Barrat Impulsivity Scale	<ul style="list-style-type: none"> pathological gamblers more impulsive than general population
Castellani & Rugle, 1995			<ul style="list-style-type: none"> impulsivity higher in gamblers than alcoholics
Steel & Blaszczynski, 1996	pathological gamblers	questionnaire battery	<ul style="list-style-type: none"> impulsivity factor identified related to social instability, emotional disturbance and earlier onset of gambling problems
Vitaro et al, 1996	male children	longitudinal study	<ul style="list-style-type: none"> teacher rated impulsivity related to gambling severity
Blaszczynski, Steel & McConachy, 1997	pathological gamblers	questionnaire battery	<ul style="list-style-type: none"> impulsivity related to severity of behavioural and psychological disturbance

Study	Population	Design	Key Findings
Langewisch & Frisch, 1998	students	questionnaire battery	<ul style="list-style-type: none"> • impulsivity related to risky behaviours generally but not severity of gambling within problem gambling group
Vitaro et al, 1998	adolescents	questionnaire battery	<ul style="list-style-type: none"> • impulsivity related to comorbidity (gambling and substance abuse)
Barnes et al, 1999	adolescents	longitudinal interview study	<ul style="list-style-type: none"> • impulsivity and drinking predicted gambling
Breen & Zuckerman, 1999	students	gambling task	<ul style="list-style-type: none"> • impulsivity related to chasing losses
Meyer & Stadler, 1999	pathological gamblers	questionnaire battery	<ul style="list-style-type: none"> • impulsivity directly predicted criminal activity but not severity of gambling with problem gambling group
Vitaro et al, 1999	12 – 14 years olds	longitudinal study	<ul style="list-style-type: none"> • self-rated impulsivity predicted problem gambling

Determinants of Risk Taking

Study	Population	Design	Key Findings
Malkin & Syme, 1984	GA members vs controls	auction games	<ul style="list-style-type: none"> problem gamblers wagered more at low probabilities of winning
Ladouceur & Mayrand, 1987	students	roulette sessions	<ul style="list-style-type: none"> no differences between depressive and non-depressive students
Ladouceur, Mayrand & Tourigny, 1987	social gamblers	roulette sessions	<ul style="list-style-type: none"> risk taking increases with time played experienced gamblers more risky than non-gamblers
Letarte, Ladouceur & Mayrand, 1987	non-gamblers	roulette sessions	<ul style="list-style-type: none"> risk taking increases with time played and with more frequent wins
Dahlback, 1990	male students	gambling risk taking scenarios	<ul style="list-style-type: none"> non-impulsive risk taking factor identified
Kearney & Drahnman, 1992	ages 4 – 5 years	children either did or did not observe another winning a big prize	<ul style="list-style-type: none"> observing a “big win” lead to larger risks
Schmitt et al, 1997	prisoners	card gambling task	<ul style="list-style-type: none"> high anxious Caucasians but not African Americans more risk adverse
Kassinove, Tsytsarav & Davidson, 1998	Russian students	questionnaire	<ul style="list-style-type: none"> risk taking associated with more positive attitudes toward gambling

Study	Population	Design	Key Findings
Barkan & Busemeyer, 1999	students	computer gambling simulation	<ul style="list-style-type: none"> • loss predicted risky change of strategy but win predicted a conservative change
Breslin et al, 1999	social drinkers	gambling task with alcohol or placebo	<ul style="list-style-type: none"> • alcohol or gender did not influence decision making
Powell, Hardoon et al, 1999	students	questionnaire	<ul style="list-style-type: none"> • problem and pathological gamblers exhibited greater risk taking

COMORBIDITY IN PATHOLOGICAL GAMBLING-SUBSTANCE USE DISORDERS

STUDY	DESIGN [M = measures]	KEY FINDINGS
Dell et al. '81	N = 35, case series, retrospective GA members M: MCMI Demographic questionnaire	11% drank excessively during abstinence from gambling 11% parental alcohol abuse 9% sibling alcohol abuse
Ramirez et al. '83	N = 51, case series, retrospective Gambling treatment unit inpatients M: SADS Autobiography Battery of psychological tests	39% alcohol or drug abuse in year prior to admission 47% alcohol or drug abuse in lifetime 50% alcohol or drug abuse in one or both parents 36% alcohol or drug abuse in a sibling
McCormick et al.'84	N = 50, case series, retrospective Gambling treatment unit inpatients M: SADS, Autobiography	36% alcohol or drug abuse 32% alcohol abuse 4% drug abuse
Lesieur et al. '86	N = 458, case series, retrospective Substance treatment unit inpatients M: SOGS	9% PG 10% problem gamblers
Linden et al.'86	N = 25, cases series, retrospective GA members M: SCID (DSM-III version) Interview for DSM-III Axis II disorders Family history of psychiatric illness	36% alcohol use disorder in first-degree relative
Roy et al. '88	N = 24, cases series, retrospective 20 inpatient, 4 outpatient PG M: SADS-L, BDI, HDRS Family History of psychiatric illness	25% substance abuse 8.3% previously treated for alcoholism 25% alcohol use disorder in first-degree relative

STUDY	DESIGN [M = measures]	KEY FINDINGS
Lesieur et al. '88	N = 100, case series, retrospective Therapeutic community residents M: SOGS and SOGS cross-check	14% PG 14% problem gamblers
Lesieur et al.'90	N = 105, case series, retrospective Psychiatric unit inpatients M: SOGS Clinical case records	6.7% PG 11% substance abusers with pathological gambling
Bland et al. '93	N = 7214 (30 lifetime PG) Case-control, retrospective Community survey M: Diagnostic Interview Schedule versi. III	63.3% substance use disorder in lifetime 63.3% alcohol use disorder in lifetime 23.3% substance use disorder in lifetime
McCormick et al.'93	N = 2171, case-control, retrospective Substance treatment unit inpatients SOGS, SUDDS, BDI Barratt Impulsivity Scale The NEO Personality Inventory	13% PG Polysubstance abusers had more severe gambling problems
Elia et al. '93	N = 85 (53 white, 32 Native American) Case-control, retrospective Alcohol treatment unit patients M: SOGS Demographics from chart	13% PG 22% Native American PG 7.3% white PG
Hewitt et al.'94	N = 149 (Native American gamblers) Case series, retrospective "Snowball sampling" M: SOGS Texas Inventory of Grief Demographic survey	10% of substance abusers remained abstinent from gambling 73% of problem gamblers smoked cigarettes

STUDY	DESIGN [M = measures]	KEY FINDINGS
Spunt et al.'95	N = 117, cases series, retrospective Methadone maintenance patients M Interview schedule (incl SOGS)	16% PG 15% problem gamblers
Smart et al.'96	N = 2016 Retrospective community survey M: Interview schedule for gambling, Alcohol and drug use	Alcohol abuse associated with gambling problems Heavy gambling associated with increased nicotine use
Daghestani et al. '96	N = 134, case-control M: SOGS, psychiatric interview	Higher prevalence (33%) of pathological gamblers among hospitalized substance abusers (prior studies 11-14%)
Vitaro et al.'96	N = 631 Quebec students M: SOGS, Personal Experience Questionnaire	At 13, gambling correlated significantly (+) with delinquency and substance abuse
Morgan et al.'96	N = 58 gamblers in addiction treatment centers M: gambling assessment survey	For 88%, problem was VLT
Griffiths et al. '98	N = 4,516 high school adolescents M: behavioral questionnaire	Gamblers used cigarettes, alcohol and illegal drugs significantly more than non-gamblers
Vitaro et al.'98	N = 765 Quebec students M: SOGS, Eysenck scale, Personal Experience Questionnaire	Problem gambling and problem substance use are related although moderately in late adolescence; this comorbidity may increase with age; comorbid patients are clearly different on impulse control measures
Barnes et al. '99	N = 1,324; Longitudinal study of adolescents living at home M: home interviews	The heavier the drinking, the heavier the gambling After control for SES, Blacks drink and gamble less than Whites

STUDY	DESIGN [M = measures]	KEY FINDINGS
Breslin et al. '99	N = 110 healthy participants recruited through ads M: betting tasks under influence of alcohol	Alcohol consumption did not influence decision on betting task
Slutske et al. 2000	N = 8,169 twins from Vietnam era registry M: phone interview	Lifetime diagnosis of DSM III R PG, problem gambling and multithreshold PG were all associated with alcohol dependence
Toneatto et al. 2000	N = 200 treatment seeking subjects	Females reported more lifetime use, abuse and Treatment for abuse of psychiatric medications
Westphal et al. 2000	N = 11,736 Louisiana public schools	Majority gambled infrequently; 59% of students with problem or pathological gambling use substances weekly or more. Gambling behavior (incl. scratch & win) preceded the use of tobacco, marihuana and alcohol

COMORBIDITY IN PATHOLOGICAL GAMBLING - MOOD DISORDERS

STUDY	DESIGN [M = measures]	KEY FINDINGS
Dell et al.'81	N = 35, case series, retrospective GA members M: MCMI Demographic questionnaire	43% depression during abstinence from gambling Neurotic depression scores significantly lower
Ramirez et al.'83	N = 51, case series, retrospective Gambling treatment unit inpatients M: SADS, Autobiography Battery of psychological tests	78% major depressive disorder Substance use related to depression
Moravec et al.'83	N = 23, case series Gambling treatment unit inpatients M: WAIS, MMPI, EPPS, POI	Elevated MMPI depression (Scale 2) scores
McCormick et al.'84	N = 50, case series, retrospective Gambling treatment unit inpatients M: SADS Autobiography	76% major depressive disorder 8% manic disorder; 38% hypomanic disorder 80% with suicidal ideation; 12% had made a "lethal" attempt Depression preceded gambling problems in minority
Russo et al.'84	N = 60, case series, 1-yr follow-up Gambling treatment unit patient M: Self-report survey	71.9% with less depression; 17.5% with more on follow-up Less depression with abstinence from gambling
Linden et al.'86	N = 24, case series, retrospective 20 inpatient, 4 outpatient PG M: SCID (DSM-III version) Interview for DSM-III Axis II disorders Family history of psychiatric illness	7.2% major depressive episode 52% recurrent major affective disorders 24% bipolar; 28% recurrent major depression 32% major affective disorder in first-degree relative

STUDY	DESIGN [M = measures]	KEY FINDINGS
Taber et al.'87	N=44, Case series, retrospective Gambling treatment unit inpatients M: Autobiographies MMPI, MCMI, SADS	90% severe life trauma preceded pathological gambling High trauma patients more depressed Gamblers abusing substances more depressed
Taber et al.'87	N = 57, case series, 6-month follow-up Gambling treatment unit inpatients M: Psychiatric status schedule Time line follow back Gambling behavior survey	32% major depression on admission 18% depression persisted despite abstinence from gambling and improvement in work and family life
Roy et al.'88	N = 24, case series, retrospective 20 inpatient, 4 outpatient PG M: SADS-L, BDI, HDRS Family history of psychiatric illness	75% affective disorder in lifetime (16MDE, 2 dysthymia, 1 hypomania); 58.3% current MDE 37.5% past treatment for depression 33.3 first-degree relative with affective disorder
Roy et al.'88	Case-control (depressed PG N = 14, versus normal controls N = 41) M: PG: HDRS, PRLEI Controls: SADS-L, PRLEI	Mean HDRS = 17.8 ± 5.4 More negative life events in PG but most of these due to gambling
Ramirez et al.'88	N = 21, case series Gambling treatment unit inpatients M: BDI, MMPI, DST	All subjects normal suppressors on the DST
Blaszczynski et al.'89	N = 75, Case series, retrospective Gambling treatment unit inpatients M: SGHQ, SSTAI, BDI	Mean BDI = 18.89 ± 10.33 48% continued gambling because of depression

STUDY	DESIGN [M = measures]	KEY FINDINGS
Lesieur et al.'90	N = 105, case series, retrospective Psychiatric unit inpatients M: SOGS Clinical case records	6.7% PG 2.6% with a mood disorder were PG
Bland et al.'93	N = 7214 (30 lifetime PG) Case-control, retrospective community survey; M: DIS version III	33.3 % affective disorder (controls 14.2%) 20.0% dysthymia (controls 4.9%)
McCormick '93	N = 2171, case control, retrospective Substance treatment unit inpatients M: SOGS, SUDDS, BDI Barrett Impulsivity Scale NEO Personality Inventory	In substance abusers with a gambling problem, severity of gambling correlated to impulsivity and negative affectivity
Hewitt et al.'94	N = 149 (Native American gamblers) Case series, retrospective "Snowball sampling" M: SOGS Texas Inventory Grief Demographic survey	75% recently experienced a death 18% still experiencing extreme grief over that death 48% experienced some other significant loss
Sullivan et al.'94	N = 329, case series, retrospective Gambling hotline callers (61% PG) M: SOGS Demographic survey	92% PG contemplated suicide 24% planned suicide 4% attempted
Ladouceur et al.'94	N = 1471 (college students) Case-control, retrospective M: SOGS; Jacob's health survey	26.8% PG attempted suicide versus 7.2% students without gambling problems

STUDY	DESIGN [M = measures]	KEY FINDINGS
Thorsen et al.'94	N = 400 Case-control, community survey M: CES-Depression Scale	No correlation between gambling (not PG) and depression
Blanco et al. '96	N = 27, case-control, male PG Demographic survey M: Platelet MAO activity	Significantly lower platelet MAO activity in PG
Shaffer et al.'99	N = 3,841 casino employees from 4 sites M: SOGS, CAGE, DSM III and Questionnaire	Employees have a higher prevalence of PG as well as smoking, alcohol problems and depression than the general adult population! These risk behaviors tend to cluster.

SUICIDAL TENDENCIES

STUDY	DESIGN [M = measures]	KEY FINDINGS
Ladouceur'94	N = 1,467 Quebec college students	Suicide attempts significantly in 26.8% of PG vs 8.2% of potential PG and 7.2% of students without gambling problems
Campbell et al.'98	64 Louisiana parishes	Change in suicide rate associated with per capita spending on lottery but not on specific opportunities like video poker. Parishes with suicide prevention centers had lower suicide rates than those without.
Blaszczynski '98	44 coroner cases, 1990-97 in Victoria State, associated with gambling	Majority males; 84% unemployed or low SES; 30% with history of depression but all had financial difficulties

COMORBIDITY IN PATHOLOGICAL GAMBLING-ANXIETY DISORDERS

STUDY	DESIGN [M = measures]	KEY FINDINGS
Linden et al.'86	N = 25, case series, retrospective GA members M; SCID (DSM-III version) Interview for DSM III Axis II disorders Family history of psychiatric illness	28% symptoms of panic disorder, agoraphobia, or OCD continuing after gambling ceased
Roy et al.'88	N = 24, cases series, retrospective 20 inpatients, 4 outpatient PG M: SADS-L, BDI, HDRS Family History of psychiatric illness	12.5% simple phobia or generalized anxiety disorder
Blaszczynski et al.'89	N = 75, case series, retrospective Gambling treatment unit inpatients M: SGHQ, SSTAI, BDI	State and trait anxiety scores not significantly different from normative sample
Bland et al.'93	N = 7214 (30 lifetime PG) Case-control, retrospective Community survey M: DIS version III	26.7% an anxiety disorder (nongamblers 9.2%) 13.3% agoraphobia (nongamblers 2.4%) 16.7% OCD (nongamblers 2.3%)
Black et al.'94	N = 120 probands of OCD patients Case-control, family prevalence M: SADS, DIS III version Interview for DSM-III Axis II disorders	No relatives with PG

STUDY	DESIGN [M = measures]	KEY FINDINGS
Vitaro et al. '99	N = 154 12-14 y/o boys from disadvantaged Montreal neighborhoods M: SOGS, Eysenck Impulsiveness Scale, Teacher rating, computer card task	Less frequent gambling at age 13 among anxious children than non-anxious children; those who persevered more or scored higher on impulsivity were more at risk for problem gambling
Blaszczynski et al. '99	N = 80, case-control M: Padua Inventory Beck Depression Inventory	PG as a group scored higher on obsessive-compulsiveness than normal controls

COMORBIDITY IN PATHOLOGICAL GAMBLING – ANTISOCIAL PERSONALITY

STUDY	DESIGN [M = measures]	KEY FINDINGS
Zimmerman et al. '85	N = 144; case-control; retrospective; GA members M: Inventory Gambling Behavior Items re: home, legal & psychological function	Through clustering, 5 factors distinguish between gamblers and non-gamblers First: neurotic gambling, 5 times more important than any other dimension followed by the other four: psychopathic gambling, impulsive gambling, white collar crime and employment problems
Blaszczynski et al.'89	N = 109; cohort; Pts seeking behavioral trt & GA members	More subjects who committed both gambling and non- gambling offenses were classified as antisocial PD
Kroeber '92	N = 46; cohort M: DSM III R, interviews	33% of game machine players show dissocial development of which 33% antisocial PD
Blaszczynski et al '94	N = 306; cohort M: California Psychological Inventory (Socialization subscale)	15.4% antisocial PD (compared to life time risk of 4.5% for males); more antisocial features after age 15 related to gambling
Dube et al. '96	N = 122; Quebec college students M: Jacob's Health Survey	Illegal behavior provided highest % of variance in factor analysis associated with pathological gambling
Steel et al. '96	N = 115; cohort; Gamblers inpt treatment & GA members M: DSM III, Beck Depression Inventory, California Psychological Inventory	Impulsive antisocial factor associated with early onset of gambling, high number of short jobs, illegal acts, ...
Blaszczynski et al. '97	N = 115, cohort as above; M: DSM III, Beck Depression Inventory, Eysenck Impulsiveness Scale; California Psychological Inventory Socialization Subscale	The severity of associated behavioral and psychological disturbances with gambling is mediated by an impulsivity/ psychopathy construct

COMORBIDITY IN PATHOLOGICAL GAMBLING – PSYCHOSOMATIC DISORDERS

STUDY	DESIGN [M = measures]	KEY FINDINGS
Lorenz et al. '86	N = 206; GA conference	Stomach ailments, high BP, chronic pain even after abstinence
Lorenz et al. '88	N = 215; spouses of Gas	Psychosomatic disorders among spouses & children, too. Sexual difficulties?

TREATMENT OUTCOME FOR PATHOLOGICAL GAMBLING

I The Gold Standard: 5 RCTS (Cochrane Database – Jan 2000) & 2 “Promises”

STUDY	DESIGN	KEY FINDINGS																														
McConaghy '88	N = 20; 1F, 19M, mean age 35; PG by DSM Randomized to Imaginal Desensitization & non-intervention “Imaginal relaxation” F/U at 12 months M: gambling behavior, urge to gamble & Speilberger Anxiety Inventory	<table><tr><td></td><td>S</td><td>F</td><td></td><td>S</td><td>F</td></tr><tr><td>ID 1 m</td><td>90%</td><td>10%</td><td>12m</td><td>50%</td><td>50%</td></tr><tr><td>Control:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1m</td><td>70%</td><td>30%</td><td>12 m</td><td>70%</td><td>30%</td></tr></table> <p>Small sample N = 10 per group</p>		S	F		S	F	ID 1 m	90%	10%	12m	50%	50%	Control:						1m	70%	30%	12 m	70%	30%						
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ID 1 m	90%	10%	12m	50%	50%																											
Control:																																
1m	70%	30%	12 m	70%	30%																											
McConaghy '91	N = 120; Sex?; mean age 43; PG by DSM; Randomized to Imaginal Desensitization, Aversive therapy, “In vivo exposure” & Imaginal relaxation 63 participants (8F, 55M) follow up 2-9 y later M: gambling behavior, Eysenck Personality Questionnaire, Spielberger Anxiety Inventory, System checklist 90 & Beck Depression Inventory.	<table><tr><td>ID</td><td>79%</td><td>21%</td></tr><tr><td>Aversive (N=6)</td><td>33%</td><td>66%</td></tr><tr><td>In vivo</td><td>50-66%</td><td>34-50%</td></tr><tr><td>Imaginal relax.</td><td>57%</td><td>43%</td></tr></table> <p>Sample size still low; almost 50% lost to F/U</p>	ID	79%	21%	Aversive (N=6)	33%	66%	In vivo	50-66%	34-50%	Imaginal relax.	57%	43%																		
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Imaginal relax.	57%	43%																														
Echeburua '96	N = 64; F:M = 5:4; mean age 35; PG by DSM; Randomized to Individual Stimulus Control & “In vivo exposure” with Individual Response Prevention, Group Cognitive Restructuring, Combination of both & wait-list. F/U up to 12 m M: gambling behavior, Beck Depression Inventory & Adaptation Scale	<table><tr><td></td><td>S</td><td>F</td><td></td><td>S</td><td>F</td></tr><tr><td>Indiv trt</td><td>75%</td><td>25%</td><td>At 12m</td><td>68.8%</td><td>31.3%</td></tr><tr><td>Group trt</td><td>62.5%</td><td>37.5%</td><td></td><td>37.5%</td><td>62.5%</td></tr><tr><td>Combined</td><td>37.5%</td><td>62.5%</td><td></td><td>37.5%</td><td>62.5%</td></tr><tr><td>Control</td><td>25%</td><td>75%</td><td></td><td></td><td></td></tr></table> <p>N per group = 16</p>		S	F		S	F	Indiv trt	75%	25%	At 12m	68.8%	31.3%	Group trt	62.5%	37.5%		37.5%	62.5%	Combined	37.5%	62.5%		37.5%	62.5%	Control	25%	75%			
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Control	25%	75%																														

Sylvain '97	N = 29 males, randomized to CBT & Wait-list control. F/U 12 months M: gambling behavior, Perception of control (0-10) & self-efficacy, SOGS	CBT Control N per group = 14, high drop-out rate	<u>S</u> 57% 7%	<u>F</u> 43% 93%	At 6m	<u>S</u> 80%	<u>F</u> 20% unknown
Hodgins, et al, in press	N = 102 randomized to self-help workbook only (W) Workbook & Motivational Enhancement (MET) or Wait-list control (1mos) FU 12 mos M: gambling behavior, SOGS		<u>Success Rate</u>		<u>1m</u>	<u>12m</u>	
			Workbook		61	78.5	
			MI		74	88.9	
			Wait		44		
Petry '2000	N = 200; randomized to 3 interventions Including CBT						
Kim '2000	Naltrexone & placebo study						

II The Second Tier – not RCT's

STUDY	DESIGN	KEY FINDINGS
Seager '70	16 cases, aversion therapy	
Russo '84	Outcome of 60 patients, one year after Inpatient gambling treatment	At 12 m: abstinent 55%, less gambling 91%, more gambling 7% of those attending more than 2 GA meetings, abstinence rose to 70%
Blackman et al. '84	N = 81 outpatients receiving couple/family therapy	After average 65 sessions, gambling frequency significantly lower
Tepperman '85	N = 40; case control; 10 volunteer couples from GA & Gam-anon M: Beck Depression Inventory; Firo-mate (fundamental interpersonal relationship orientation)	3-4 y follow-up all cases but one & all controls fell off GA

Brown, '86 & '87	N = 24 GA, dropouts after more than 1 meeting	Less in debt than continuers, reporting more Positive reactions and more negative about GA
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STUDY	DESIGN [M = measures]	KEY FINDINGS
Taber et al.'87	6 month outcome of 57 out of 66 patients in comprehensive inpatient program	Abstinence: 6 m: 56% & improved subjective distress & others
Harrison et al. '87	N = 10 in couple therapy 1.5 hr/6 weeks	Attitude of greater "favorability" at 6 weeks
Stewart '88	N = 232 GA outcome study	Dropout after 1 st night prospective 41%; retrospective 70% leave within 10 meetings
Dickerson '90	N = 29, random Manual only & manual + interview; not all met DSM III criteria	Another 36 did not complete intake. Initially manual + interview (N = 16) fared worse, then improved at 3 & 6 m
McCormick '91	12 month outcome of 45 out of 66 gamblers in comprehensive treatment program (same team as Russo & Taber)	At 6 m: abstinence 56% maintained at 12 m for patients found
Zion et al. '91	N = 43 GA	40% went back to gambling since initial membership in GA 60% of gamblers had spouses at Gam-Anon Two major strengths of GA: fellowship & friendship and the 12-Steps
Lesieur '91	72 patients followed up 14 mos after treatment in combined alcohol, SA & gambling program M:ASI (mod PG)	Gambling abstinence rate 64% & overall improvement rate 94% but 40% of patients not followed

STUDY	DESIGN [M = measures]	KEY FINDINGS
Schwartz et al. '92	N = 112; case control; 4 m inpatient program; follow-up 1-2y	Abstinence Y1 71%; Y2 62% (37% of PG's had attempted suicide; 50% were also addicted to alcohol)
Bellaire et al.'92 (Germany)	N = 51 gamblers in psychiatric university hospital M: medical record	3 resumed controlled gambling (money from wives); majority reflected low motivation
Ciarrochi et al. '93	N = 86 GA & Gam-Anon attending Conference versus 1,125 control	Long-term members had less open conflict and higher moral-religious emphasis
Gaboury et al. '93	N = 289; case control Quebec students M: PG prevention programs	Experimental group improved knowledge (maintained at 6 m) and had more coping skills (not maintained at 6m)
Ladouceur '94	N = 4; CBT effectiveness for adolescents Multiple baseline design re: perception of control	Therapeutic gains maintained at 3 & 6m & all subjects abstinent
Stinchfield '96	Evaluation of 6 PG treatment programs in Minnesota	?
Ladouceur '98	N = 5; efficacy of CBT – Multiple baseline design re: perception of control	Therapeutic gains maintained at 6 m except one Focus on core cognitive error about gambler's notion of randomness
Hollander '98	N = 10, 8 week single-blind fluvoxamine (Luvox) trial	
Cuadrado '99	N = 5520 callers to gambling hotline	Used more frequently by Anglos with higher debt than by Hispanics

Bibliography

Aasved, M. J., Schaefer, J. M.. 1995. *"Minnesota slots": An observational study of pull tab gambling*, Journal of Gambling Studies, 11 3: 311-341.

Strategies used for increasing the chances of winning and abuses associated with pull tab gambling were described. There was no consistent relationship between alcohol use and gambling, but many patterns, the most common of which was social drinking and controlled gambling. Dealer and manager training, cutting off those displaying early signs of problem gambling, conspicuously displaying gambling help lines and sites, and promoting awareness education is advocated.

Abbott, M., Palmisano, B., Dickerson, M.. 1995. *Video game playing, dependency and delinquency: A question of methodology?*, Journal of Gambling Studies, 11 3: 287-301.

Results suggested that video game play is simply a preferred leisure activity for adolescents. It was suggested that video game play by adolescents has only a weak association with delinquency and that this relationship is not a function of player's impaired control or addiction to play. This study illustrated the potential methodological problems in using heterogeneous measures of problem gambling when exploring its correlates and trying to develop theoretical models.

Adebayo, B.. unknown. *Luck of the dice: Gambling attitudes of a sample of community college students*, College Student Journal, : 255-257.

Rural college students were asked about participation in games of chance such as gambling. The type of gambling people engaged in differed according to age, gender, and marital status. The vast majority of students gambled to win money, followed by gambling for entertainment. It was proposed that awareness prevention programs that rescind students' opinions about gambling be developed.

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.

Compared to controls, pathological gamblers were not more impulsive or higher sensation seekers. Drug addicts scored higher on sensation seeking and impulsivity, and alcoholics scored significantly lower on sensation seeking. It is suggested that the classification of pathological gambling as a disorder of impulse control should be reconsidered and that a "maladaptive behavior" description is more accurate.

Anderson, G., Brown, R. I. F. . 1984. *Real and laboratory gambling, sensation seeking and arousal*, British Journal of Psychology, 75 : 401-410.

Arousal and excitement appear to be major mediators of reinforcement and internal cues for gambling behavior, especially for regular gamblers. Pathological gamblers may become addicted to their own arousal and its' psychological and physiological effects; sensation seeking may affect the repeated seeking for the state of arousal and the capacity to experience it. Doubt is cast on laboratory gambling as a valid analogue of the real gambling situation. This is because this study found significant differences between real and artificial casinos for mean heart-rate increases over baseline, for gambling behavior and in the relationships between sensation-seeking, arousal and gambling in the two conditions.

Barkan, R., Busemeyer, J.. 1999. *Changing plans: dynamic inconsistency and the effect of experience on the reference point.*, Psychonomic Bulletin & Review, 6 4: 547-554.

This article presents a new test of a principle of decision making called dynamic consistency. The main finding was that dynamic inconsistencies occurred in a systematic direction, which is in accordance with the reference point hypothesis –larger shifts in the location of the reference point on the utility function produce greater changes toward risk aversion after a gain and risk seeking after a loss. The present work suggests that experience results in a change of the reference point, and this change inevitably affects the perceived values associated with the next stage of the decision problem, making the original plan less desirable.

Barnes, B. L., Parwani, S. 1987. *Personality assessment of compulsive gamblers*, Indian Journal Clinical Psychology, 14 : 98-99.

When compared with a controlled group of non-gamblers, compulsive gamblers showed significantly higher means on Neuroticism and Depression, but not Extroversion scales. This revealed inadequate adjustment among the gamblers and supported the hypothesis that they indulge in these activities to overcome their personal inadequacies. A program of psychological intervention is recommended.

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 6: 749-767.

Gambling and alcohol consumption were higher in Whites and males in youths; these behaviors co-occur. Impulsivity and moral disengagement predicted alcohol consumption and gambling. Illicit drug use predicted alcohol consumption but not gambling when demographic and individual factors were taken into account.

Baron, E., Dickerson, M.. 1999. *Alcohol consumption and self-control of gambling behavior*, Journal of gambling studies, 15 1 Spring: 3-14.

The exploratory findings of study present a picture of a regular gambler drinking alcohol prior to a session of gambling and having increasing problems with control in resisting urges to begin a session of gambling. Continued drinking of alcohol appears to be moderately associated with progressive levels of impaired control within a session of gambling, and appears to further add to the problems of ending a session of play for the gamblers.

Bartzokis, G., Lu, P.H., Beckson, M., Rapoport, R., Grant, S., Wiseman, E.J., London, E.D.. 2000. *Abstinence from cocaine reduces high-risk responses on a gambling task*, Neuropsychopharmacology, 22 1: 102-103.

The performance on a gambling task designed to quantify ventromedial prefrontal cortex (VmpFC) deficit was examined in recently abstinent and nonabstinent cocaine-dependent males. Cocaine-dependent subjects currently using cocaine achieved a negative outcome score suggesting that cocaine use impairs risk assessment and advantageous decision making. Cocaine-dependent patients with 4 or more days abstinent seem to be able to evaluate risk better, suggesting that an acute pharmacologic effect of cocaine may be partially responsible for the poor risk assessment of cocaine dependent patients.

Beaudoin, C.M., Cox, B.J.. 1999. *Characteristics of problem gambling in a Canadian context: A preliminary Study Using a DSM-IV-Based questionnaire*, Can J Psychiatry, 44 June: 483-487.

Preliminary results of Canadian adults seeking treatment for gambling problems suggests a somewhat difference profile from many United States studies, which often rely on older male pathological gamblers. Only one third of the sample reported taking a lot of risks in life, and contrary to an assumption made in the DSM-IV, more individuals reported they gambled to 'make money' than for excitement. 16% of participants did fit the DSM-IV criteria for pathological gambling, even though they were seeking treatment. Most gambled to relieve dysphoria or to escape from life's problems. More systematic investigation of the presence of major depression and other psychiatric disorder is warranted.

Bechara, A., Damasio, H., Damasio, A.R., Lee, G.P. . 1999. *Afferent contributions of the human amygdala and ventromedial prefrontal cortex to decision-making*, The journal of neuroscience, 13 :5473-5481.

The first hypothesis that amygdala is a critical structure in neural system necessary for somatic state activation and for implementing advantageous decision is supported by the finding that amygdala patients failed to generate anticipatory (skin conductance responses) SCRs before selecting a disadvantageous response. Support of the second hypothesis, that the amygdala and VMF (ventromedial prefrontal) cortex play different roles in the process of decision-making comes from the finding that there were differences in the profiles of impairment in VMF and amygdala damaged individuals. VMF patients did generate somatic states when told that they had won or lost play money, whereas amygdala patient failed to do so. VMF patient did acquire conditions SCRs to a loud sound whereas amygdala patient did not. Thus, in humans, after amygdala damage the loss of money can no longer evoke the somatic state of punishment. Failure to evoke somatic states after winning or losing money would preclude the reconstitution of such somatic states when deliberating a decision with future consequences. It is important to note that SCR's are viewed by psychophysicologists as a measure of only general arousal but this study indicates SCR measures do not necessarily distinguish between positive and negative somatic states. Findings are significant because the nature of the deficit revealed after VMF or amygdala damage may reflect two types of decision-making deficits observable in the behaviors of real-life activities.

Bellaire, W., Caspari, D.. 1992. *Diagnosis and therapy of male gamblers in a university psychiatric hospital.*, Journal of Gambling Studies, 8 2: 143-150.

Gamblers were treated depending on their clinical subgroup. The first group also had severe psychiatric diseases, such as schizophrenia, manic-depressive illness or organic brain disorders. The second group suffered from serious personality disorders. The third group showed deep-rooted problems in their current relationships. Pharmacotherapy is crucial for patients in the first group. Patients in the third group would benefit from some form of family therapy. Treatment of patients with personality disorders can be especially difficult - authors suggest reactivating old interests and introducing new ones. As well, treating patients in group 2 or 3 who experience depressive symptoms or sleeping disorders with antidepressants may be justified for short periods.

Bergh, C., Kuhlhorn, E. . 1994. *The development of pathological gambling in Sweden*, Journal of Gambling Studies, 10 3: 261-273.

Gambling habits in family background appear to play a role in the development of pathological gambling. It takes a considerable period of time to develop gambling beyond control. Although there are collective features in the development, pathological gambling appears to be a secret behavior. Gambling on horse races, roulette and bingo were the only types showing a progressive increase in involvement over time. When gambling heavily, 40% experienced a state of altered consciousness. When abstaining from gambling, withdrawal-like symptoms were experienced by a third.

Black, W.D., Moyer, T. 1998. *Clinical features and psychiatric comorbidity of subjects with pathological gambling behavior*, Psychiatric Services, 19 11: 1434-1439.

Study confirms that individuals with pathological gambling suffer substantial psychiatric comorbidity and support inclusion of pathological gambling in the diagnostic category of impulse control disorders. Although antisocial personality disorder has been singled out as having a close relationship with pathological gamblers, it appears that other personality types are actually more common: antisocial personality disorder may be characteristic of only a subset of pathological gamblers. It is not readily apparent why personality disorders are common in gamblers. However, gambling requires a preoccupation with details (characteristic of OCD) and at least some forms of gambling require little interpersonal contact (slot machines) which fits avoidant or schizoid personality disorder. On the other hand, the impulsivity, recklessness, and irresponsibility characteristic of gambling may seem attractive to person with antisocial personality disorder.

Blackman, S., Simone, R.V., Thoms, D.R.. 1984. *Treatment of gamblers*, Hospital and Community Psychiatry, 37 4: 404.

One page update on research done on the effectiveness of gambling treatment mainly based on family therapy but interpersonal and communication skills also taught. Average number of sessions: 65. Authors found significant difference in overall frequency of gambling reported between the time of entry into the program and termination. Also, the perception of the severity of the problem at initiation and at termination of treatment was found to be statistically significant. This update was provided because of an earlier article (1984) stated that the efficacy of treatment approaches to pathological gambling has yet to be scientifically demonstrated and replicated.

Blanco, C. , Orensanz-Munoz, L., Blanco-Jerez, C., Saiz-Ruiz, J. 1996. *Pathological gambling and platelet MAO activity: a psychobiological study*. , Am. J. Psychiatry, 153 1: 119-121.

Platelet MAO activity and scores on several MMPI scales for two groups (pathological gamblers and control matched on age and tobacco smoking) were significantly different, but measures of sensation seeking were not. No correlation of biological significance were found between platelet MAO activity and psychological ratings. Low platelet MAO activity may be a biological predisposition for impulsivity in pathological gamblers. Although no psychological pattern is characteristic of pathological gamblers, they differ from healthy individuals in some personality traits. No significant relationship could be established between platelet MAO activity and psychological measures.

Bland, R.C., Newman, S.C., Orn, H., Stebelsky, G. . 1993. *Epidemiology of pathological gambling in Edmonton*, Can. J. Psychiatry, 38 March: 108-112.

Through interviewing 7,214 people in the Edmonton, Alberta area, only 30 were found to meet the criteria of lifetime pathological gamblers (prevalence of 0.42% with a ratio of males to females 3:1). Gamblers had high rates of comorbidity with other psychiatric disorders. They were likely to have made suicide attempts, to have been convicted of offenses, to be spouse and child abusers, and to have spent long periods unemployed. In addition, 80% had trouble at home or work because of gambling, and 60% borrowed or stole to gamble.

Blaszczynski, A. . 1999. *Pathological gambling and obsessive-compulsive spectrum disorders*, Psychological Reports, 84 : 107-113.

Pathological gamblers scored significantly higher on obsessive-compulsiveness than normal controls. This finding is consistent with expectations as gamblers display an excessive preoccupation with intrusive thoughts, a feature which defined the disorder and gamblers have greater difficulty coping with simple decision-making processes. Pathological gamblers distressed by their condition reported concern over their persistent urges and impulses to engage in acts that cause themselves or others harm.

Blaszczynski, A., Farrell, E.. 1998. *A case series of 44 completed gambling-related suicides*, Journal of Gambling Studies, 14 2: 93-109.

A number of putative risk factors for suicide among gamblers were identified including comorbid depression, the presence of severe financial debt, relationship difficulties, introversion and low self-esteem. The highest risk period may be following a serious loss and when there is imminent disclosure of a criminal offense or extent of gambling-related debts. Extreme care is required to evaluate the potential for suicide risk.

Blaszczynski, A., McConaghy, N. . 1989. *Anxiety and/or depression in the pathogenesis of addictive gambling*, The International Journal of the Addictions , 24 4: 337-350.

Authors concluded that although the desire to win money was given as the main reason for participation, need for money played a less significant role in precipitating further gambling. Rather, the concept that pathological gambling is a behavioral stress reaction received some support as pathological gamblers had moderate levels of depression. State or trait anxiety scores were no different from neuropsychiatric patients but were higher than those of college students. No significant differences were found between poker-machine and horse-race gambling subgroups on age, years of gambling, years of uncontrolled gambling, state and trait anxiety, or depression. It was suggested that environmental factors are of importance in determining the form of gambling selected, but differences between these subgroups on other psychological dimensions could not be excluded.

Blaszczynski, A., McConaghy, N., Frankova, A.. 1989. *Crime, antisocial personality and pathological gambling.*, Journal of Gambling Behavior, 5 2: 137-152.

Results of this study suggest that a high proportion of pathological gamblers commit crimes and that of those who do, most report their offenses are a direct consequence of gambling induced problems. Pathological gamblers who engage in both gambling and non-gambling related offenses come predominantly from lower socioeconomic classes and exhibit more sociopathic features. These individuals are predicted to have higher recidivist rates and be less responsive to treatment. Subjects reporting gambling-only related offenses showed a significant increase in antisocial features after adolescence, suggesting that antisocial features emerge as a secondary phenomenon to pathological gambling behavior patterns.

Blaszczynski, A., McConaghy, N., Frankova, A.. 1990. *Boredom proneness in pathological gambling*, Psychological Reports, 67 : 35-42.

Pathological gamblers obtained significantly higher boredom proneness and depression scores, but not sensation seeking scores than those of controls. This is consistent with the notion that pathological gambling is in part a maladaptive coping strategy to deal with affective disturbances. Subgroups of pathological gamblers differing according to type of gambling activities did not differ on the above measures, suggesting that some psychological parameters can be generalized to apply to gamblers irrespectively of whether they indulge exclusively in horse-race gambling, slot machine gambling, or engage in multiple forms of gambling. Results indicated the possible existence of three subtypes of gamblers: one group characterized by depression, another by boredom, and a third by a mixture of both.

Blaszczynski, A., McConaghy, N., Frankova, A.. 1991. *A comparison of relapsed and non-relapsed abstinent pathological gamblers following behavioral treatment.* , British journal of Addiction, 86 : 1485-1489.

Study suggests that brief episodes of loss of control may still represent a positive outcome being associated with stability rather than escalation into excess. Lapses may be beneficial in enhancing the learning process of identifying and subsequently coping with or avoiding situation or emotional determinants leading to relapse. An alternative possibility is that underlying 'addiction' processes in pathological gambling differ significantly from those inherent in substance abuse dependency disorders. Episodes of relapse in gambling may not be associated with the same physiological-based reinforcement effect, level of craving, withdrawal symptoms, or tolerance as found in substance addictions. If so, the probability of return to abstinence or continued control may be greater in pathological gambling than in substance abuse

Blaszczynski, A., McConaghy, N., Frankova, A. 1991. *Control versus abstinence in the treatment of pathological gambling: a two to nine year follow-up*, British Journal of Addiction, 86 : 299-306.

Aim of study was to investigate the nature of the outcomes associated with subjects' self-assessment of abstinence or controlled gambling following treatment. The most impressive evidence that abstinence and control are comparable in outcome was the finding that subjects reporting these responses obtained scores within the normal range on psychopathology scales of neuroticism, psychoticism, anxiety and depression when prior to treatment they had shown pathological levels of such psychopathology.

Blaszczynski, A.P., Buhrich, N., McConaghy, N. . 1985. *Pathological gamblers, heroin addicts and controls compared on the E.P.Q. "Addiction Scale"*, British Journal of addiction , 80 : 315-319.

Pathological gamblers were compared to a heroin addicts and controls who were patients from two general practices. Male addicts and gamblers had significantly higher addiction, Neuroticism, and psychoticism scale scores than controls. Female addicts scored significantly higher on the Addiction and Psychoticism scales than their female counterparts. Authors concluded that any similarities between pathological gamblers and substance addicts may reflect a general factor of affective disturbance.

Blaszczynski, A. P., McConaghy, N.. 1988. *SCL-90 assessed psychopathology in pathological gamblers*, Psychological Reports, 62 : 547-552.

Consistent with the literature, pathological gamblers were characterized by high depression. They also scored significantly higher on all scales than those of controls, indicating the presence of increased psychopathology in pathological gamblers. Results are consistent with the interpretation that negative emotional states play a central role in the pathogenesis of this disorder.

Blaszczynski, A. P., McConaghy, N.. 1994. *Antisocial personality disorder and pathological gambling*, Journal of Gambling Studies, 10 2: 129-145.

It was concluded that features of antisocial personality emerged in response to repeated attempts to conceal gambling and gambling induced financial difficulties. While antisocial personality traits may act as a risk factor to increase the probability of offending, there is no evidence to suggest that the majority of offending gamblers suffer from antisocial personality disorders. It may be that in a minority of cases pathological gambling and antisocial personality disorder do coexist, but independently of each other.

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

Authors question whether the assumption that there is no difference between regular and pathological gamblers except for the amount gambled. They suggest that pathological gamblers are not sensation seekers and that avoidance or reduction of noxious physiological or cognitive states in interaction with the behavior completion mechanism are important determinants of persistence in pathological gambling.

Blaszczynski, A. P., Winter, S. W., McConaghy, N.. 1986. *Plasma endorphin levels in pathological gambling*, Journal of Gambling Behavior, 2 1: 3-14.

Pathological gamblers did not differ from controls on baseline B-endorphin levels. B-endorphin levels did not increase in response to gambling (due to low arousal). Horse-race addicts had significantly lower baseline levels as compared to poker machine players and controls, which provides evidence for the hypothesis that distinct subgroups of gamblers exist and raises the corollary that different etiological factors may characterize each subgroup.

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

Authors explored the construct of impulsivity and pathological gambling. Research supports the model of pathological gambling in which the severity of associated behavioral and psychological disturbance is mediated by a impulsivity/psychopathy construct.

Breen, R., Zuckerman, M.. 1999. *'Chasing' in gambling behavior: personality and cognitive determinants.*, Personality and Individual Differences, 27 : 1097-1111.

In this experiment, within-session chasing (as opposed to between-session chasing) was examined in light of impulsivity, sensation-seeking and attitudes and beliefs about gambling. The finding that chasers played more trials than non-chasers indicates that chasers exposed themselves further into the sequence of increasing losses, thus indicating the inability to moderate responses. Chasers were higher in impulsivity than non-chasers suggesting that impulsivity constitutes sensitivity to signals of reward relative to a general insensitivity to signals of punishment.

Breslin, F.C., Sobell, M.B., Cappell, H., Vakili, S., Poulos, C.X.. 1999. *The effects of alcohol, gender, and sensation seeking on the gambling choices of social drinkers.* , Psychology of Addictive Behaviors. , 13 3: 242-252.

After receiving a moderate dose of alcohol, a placebo, or a no-alcohol control beverage, subjects completed a betting task in which they could risk a monetary bonus. The authors evaluated risky decision making in the betting task with monetary incentives and found:

1. participants tended to be risk averse for gains, but risk seeking for losses (i.e.. preference-reversal effect)
2. sensation seeking moderated the preference-reversal effect
3. alcohol consumption did not influence decision making. Given the inconsistent effect of alcohol on gambling, one must also consider the possibility that the alcohol-gambling link is correlational, not causal. Following this, the authors indicate that policies designed to reduce drinking in gambling venues would simply make room for other precipitants of risk taking to become more influential and in turn not change the overall rate of excessive gambling.

Briggs, J.R., Goodin, B.J., Nelson, T.. 1996. *Brief report: pathological gamblers and alcoholics: do they share the same addictions?*, Addictive Behaviors, 21 4: 515-519.

Study examined the cross over between alcoholics and habitual gamblers but results suggested there were not significant degree of cross over or similarity. This gives credence to the theory that they are two different and unique addictions.

Brown, R. I. F.. 1986. *Dropouts and continuers in Gamblers Anonymous: Life-context and other factors*, Journal of Gambling Behavior, 2 2: 130-140.

Life context factors making it more difficult to maintain attendance, commitment to the treatment program, perceived pre-meeting expectations and reasons for coming, impacts of the first meeting, effects of pressures to maintain attendance and the influence of spouses were examined in a group of dropouts and continuers in Gamblers Anonymous (GA). Continuers did seem to have more financial and familial pressures to continue attendance. 50% of dropouts cited changes in circumstance as their reason for dropping out; also mentioned were concerns about personality clashes and cliques. There was nothing specific about the first GA meeting that turned off either dropouts or continuers.

Brown, R. I. F.. 1987. *Dropouts and continuers in gamblers anonymous: Part 3: Some possible specific reasons for dropout*, Journal of Gambling Behavior, 3 2: 137-151.

Dropouts and continuers of Gamblers Anonymous (GA) appeared to share a variety of opinions and beliefs about GA, including their sources of satisfaction and dissatisfaction. Dropouts viewed GA as unsympathetic and punishing, rejected the complete ban on gambling, more felt that there were too few therapies, felt too much time was spent on administration. Fewer dropouts had purely social contacts with GA members, more had problems with identification, and more dropouts described themselves as controlled (as opposed to uncontrolled or destructive) gamblers when compared with continuers.

Brown, R. I. F.. 1987. *Dropouts and continuers in Gamblers Anonymous: Part 2. Analysis of free-style accounts of experiences with GA*, Journal of Gambling Behavior, 3 1: 68-79.

Dropouts and continuers of Gamblers Anonymous (GA) appear to be very similar except that the dropouts make more statements classified as self-positive comparisons from the beginning of their association with GA. An obvious interpretation is that dropouts see themselves as not in as much trouble as other attenders and seem to derive some comfort from this. There was a significant change toward more negative-toned statements with time among dropouts, but not among the continuers at GA. Overall, continuers made more positive evaluations of their experience and dropouts made more negative ones. GA's initial impact appeared to be strong and good, but it is suggested that too extreme of an image may be presented initially and should be muted.

Browne, B.R. . 1989. *Going on tilt: frequent poker players and control* , Journal of Gambling Behavior , 5 1 (Spring): 3-21.

Researchers used the grounded concept of "tilt" to describe the process of loss of control. Tilt is used by players to describe what happens to them or what happened to another player in session where they lost huge amount of money or lost control and implies deviation from the norm. The major contention of the study is that all gamblers experience tilt, and their reactions to tilt and to tilt-inducing situations partly determine whether or not gambling becomes a major problem.

Burger, J.M.. 1991. *The effects of Desire for control in situations with Chance Determined Outcomes: gambling behavior in lotto and bingo players*, Journal of Research in Personality, 25 : 196-204.

Two experiments were done to look at the desire for control and behavior. Experiment #1 found that people high in desire for control were more likely than lows to select their own numbers, rather than rely on a machine selection option when buying a lottery ticket. Experiment #2 found that low desire for control people playing bingo were more likely to than highs to rely on superstitious behavior and to believe that such behavior affects the game's outcomes. Although a low desire for control was associated with more gambling in the lotto game, more frequent bingo playing was associated with a higher desire for control.

Burger, J. M., Smith, N. G.. 1985. *Desire for control and gambling behavior among problem gamblers*, Personality and Social Psychology Bulletin, 11 2: 145-152.

Desire for control (DC) seems to be related to gambling behavior (types of gambling, magnitude of losses) among problem gamblers. Contrary to the author's prediction, gamblers had a lower average DC score than did the nongamblers. It is suggested that a desire to control events is not what drives people to begin or maintain excessive levels of gambling but after they have begun this behavior the illusion of control may influence their gambling. People high in the desire for control appear to be more susceptible to this illusion than are low-DC people.

Campbell, F., Simmons, C., Lester, D.. 1998-99. *The impact of gambling on suicidal behavior in Louisiana*, OMEGA, 38 3: 235-239.

The present study was designed to explore the impact of increasing opportunities for gambling on the suicide rate at the societal level. Suicide rates before and after introduction of gambling were compared. Unemployment and per capita spending on lottery were predictors of the change in suicide rate, although the contribution from the presence of a suicide prevention center was in the direction of reducing the suicide rate.

Carlton, P. L., Manowitz, P.. 1992. *Behavioral restraint and symptoms of attention deficit disorder in alcoholics and pathological gamblers*, *Neuropsychobiology*, 25 : 44-48.

Compared to controls, alcoholics and pathological gamblers reported high levels of ADD behavior in childhood. Alcoholics showed adult deficits in behavioral restraint, but only a subset of pathological gamblers did; the other subset of gamblers showed hyperrestraint. The results provided partial support for the theory that a general, serotonin based deficit in behavioral restraint extends from childhood to adulthood.

Carlton, P. L., Manowitz, P.. 1994. *Factors determining the severity of pathological gambling in males*, *Journal of Gambling Studies*, 10 2: 147-157.

Pathological gamblers were more impulsive than controls. However, they did not differ from controls on an adventure seeking subscale, or the thinking-feeling (TF) and judgmental-perceptual (JP) subscales of the Myers-Briggs Inventory. Impulsivity did not correlate with a measure of disruption caused by gambling, but valuing one's feelings did, supporting Walker's emphasis on "irrationality" as an important component in the determination of pathological gambling.

Carroll, D., Huxley, J.A. (a). 1994. *Cognitive, dispositional, and psychophysiological correlates of dependent slot machine gambling in young people. (FIRST of TWO studies in one article)*, *Journal of Applied Social Psychology*, 24 12: 1070-1083.

The study presented preliminary evidence that young, dependent slot machine players differ from their nondependent counterparts in a number of ways. Dependent players, to a greater extent than nondependent players display a general orientation which tends to attribute outcomes to internal factors such as skill rather than external factors such as luck. Contemporary slot machine design would seem to optimally facilitate this illusion of control and it appears that some individuals are especially susceptible to such devices, possible as a result of early exposure. In regards to estimating returns, dependent gamblers predicted far greater success, even though the two groups did not differ in terms of amount actually recouped.

Carroll, D., Huxley, J.A. (b). 1994. *Cognitive, disposition, and psychophysiological correlates of dependent slot machine gambling in young people. (SECOND of TWO studies in one article)*, *Journal of Applied Social Psychology*, 24 12: 1070-1083.

Slot machine play was associated with an increase in blood pressure, and while dependent and nondependent gambler groups did not differ in terms of the magnitude of the rise provoked, there was a general trend for dependent gamblers to show lower basal level of cardiovascular activity, although this was statistically reliable only in the case of diastolic blood pressure.

Castellani, B., Rugle, L. . 1995. *A comparison of pathological gamblers to alcoholics and cocaine misuses on impulsivity, sensation seeking, and craving. , Gamblers and Substance Abusers*, : 275-289.

The authors compared differences between pathological gamblers, alcoholics, or cocaine misusers in regards to impulsivity, sensation seeking and craving. In contract to alcoholics and cocaine misusers, gamblers scored significantly higher on impulsivity and inability to resist craving; however, gamblers were not significantly higher than either alcoholics or cocaine misusers on sensation seeking. These findings suggest a need to address high impulsivity and inability to resist cravings in treatment and relapse prevention for gamblers.

Ciarrocchi, J.. 1987. *Severity of impairment in dually addicted gamblers*, *Journal of gambling behavior*, 3 1 Spring: 16-26.

Through a systematic, objective case-control study the authors hypothesized that inpatient chemically dependent pathological gamblers will exhibit great impairment on a variety of life-functioning measure than a comparable group of chemically dependent psychiatric inpatients. They following findings emerged: 1. Clinical dependent (CD) gamblers reported more chronic medical problems than CD psychiatry patients; 2. CD gamblers reported more frequent conflicts with relative and family members than CD psychiatric patients; 3) CD gamblers reported more psychiatric symptoms both in amount and duration; and although not reaching statistical significance, 42% of the CD gamblers had made a previous suicide attempt; 4) CD gamblers and CD psychiatric patient appear comparable with regard to employment function and amount of legal problems.

Ciarrocchi, J., Richardson, R.. 1989. *Profile of compulsive gamblers in treatment: update and comparison*, *Journal of Gambling Behavior*, 5 1: 53-65.

This study compared compulsive gamblers from an inpatient treatment program and gamblers from 2 other studies: those from a Gamblers Anonymous (GA) group and those from an inpatient Gambling-Treatment Program at a Veterans Administration Hospital (VA). Psychosocial characteristics include a high incidence of substance abuse in gamblers and high rates of parental alcoholism and pathological gambling. Inpatients in this sample presented more distressed and dysfunctional than the GA or VA groups. Important differences in psychosocial characteristics between male and female compulsive gamblers are noted and indicate the need for further studies with this population.

Ciarrocchi, J. W. . 1993. *Brief report: Rate of pathological gambling in publicly funded outpatient substance abuse treatment.* , Journal of gambling studies, 9 (3) fall: 289-293.

Rates of problem or probably pathological gambling were assessed in substance abusers seeking outpatient treatment in a publicly funded outpatient substance abuse treatment programs. Problem gamblers comprised of 6.2% of the total and 4.5% scored as probable pathological gamblers when using the SOGS for criteria. These rates are 2.5 times greater than would be expected according to a recent state survey using SOGS.

Ciarrocchi, J. W., Kirschner, N. M., Fallik, F.. 1991. *Personality dimensions of male pathological gamblers, alcoholics, and dually addicted gamblers,* Journal of Gambling Studies, 7 2: 133-141.

No differences for personality dimensions on the MMPI emerged for pathological gamblers in comparison to alcoholics or for nonalcoholic gamblers when compared to either alcoholic gamblers or alcoholics alone. This supports a general theory of addictions emphasizing the generality of predisposed personality characteristics interacting with situational factors to influence the type of addiction that develops. The data supports the reasonableness of an addiction treatment setting for pathological gamblers.

Ciarrocchi, J. W., Reinert, D. F.. 1993. *Family environment and length of recovery for married male members of Gamblers Anonymous and female members of GamAnon,* Journal of Gambling Studies, 9 4: 341-351.

Married Gamblers Anonymous (GA) and Gam Anon members experience significantly greater family life dissatisfaction than normals. Length of gambling abstinence was positively related to positive family environment for male gamblers but not for wives of gamblers; length of abstinence also differentiates degree of improvement in perceived social support within the family for gamblers but not spouses. There may be a developmental lag in the recovery of spouses of gamblers compared to the gamblers themselves. The results reinforce the importance of using family therapy with pathological gamblers, the continued clinical support for family members past abstinence, and support the continued practice of referring pathological gamblers and their families to this treatment.

Comings,, D.E., Gade, R., Wu, S., Chiu, C., Dietz, G., Muhleman, D., Saucier, G., Ferry, L., Rosenthal, R.J., Lesieur, H.R., Rugle, L.J., MacMurray, P. . 1997. *Studies of the potential role of the dopamine D1 receptor gene in addictive behaviors.,* Molecular Psychiatry, 2 : 44-56.

The authors sought to test the hypothesis that the DRD1 gene might play a role in addictive behaviors and examined the alleles of the Dde I polymorphism in three independent groups of subjects with varying types of compulsive, addictive behaviors - Tourette syndrome probands, smokers and pathological gamblers. In all three groups there was a significant increase in the frequency of homozygosity for the DRD1 Dde I 1 or 2 alleles in subjects with addictive behaviors. In the Tourette syndrome group and smokers there was a significant additive effect of the DRD1 and DRD2 genes. The results for both the DRD1 and DRD2 genes, which have opposing effects on cyclic AMP, were consistent with negative and positive heterosis, respectively. These results support a role for genetic variants for the DRD1 gene in some addictive behaviors, and an interaction of genetic variants at the DRD1 and DRD2 genes.

Comings, D.E., Rosenthal, R.J., Lesieur, H.R., Rugle, L.J., Muhleman, D., Chiu, C., Dietz, G., Gade, R. 1996. *A study of dopamine D2 receptor gene in pathological gambling,* Pharmacogenetics, 6 : 223-234.

Pathological gambling has been termed both the 'pure' and the 'hidden' addiction. 'Pure' because it is not associated with the intake of any addicting substance, and 'hidden' because it is an extension of a common, socially accepted behavior. The authors sought to determine if there was an association of the human DRD2 gene and pathological gambling. The significant increase in the prevalence of the D2A1 allele in pathological gamblers compared to controls, and the even higher prevalence of the D2A1 allele in the gamblers with alcohol or drug abuse, support a role for genetic defects in the dopaminergic reward pathways and the DRD2 in pathological gambling and addictive behaviors in general.

Coulombe, A., Ladouceur, R., Desharnais, R. Jobin, J.. 1992. *Erroneous perceptions and arousal among regular and occasional video poker players.,* Journal of Gambling Studies, 8 3: 235-243.

The results showed a significant correlation between level of arousal and erroneous perceptions indicating that the more the gamblers denied the role of chance as the determinant of the game outcome, the more aroused they were. Regular gamblers did not show higher levels of arousal than occasional gamblers, but did emit a higher number of erroneous verbalizations, which referred more to internal attributions and skills.

Coventry, K., Brown, R.. 1993. *Sensation seeking, gambling and gambling addictions*, *Addiction*, 88 : 541-554.

Sensation seeking seems to be an important variable involved in high levels of gambling. Off-course bettors are lower sensation seekers than the general population. In contrast, casino gamblers and gamblers who go to the racetrack are higher sensation seekers than the general population. Involvement in many different forms of gambling is associated with high sensation seeking scores (SSS). Factor analysis produced a cluster of variables among off-course bettors associated with impaired control of gambling, among which both SSS scores and chasing were prominent features.

Coventry, K., Constable, B.. 1999. *Physiological arousal and sensation-seeking in female fruit machine gamblers*, *Addiction*, 94 3: 425-430.

This study examined the relationship between sensation-seeking, self reported arousal during gambling, heart rate during gambling and frequency of gambling. Higher HR levels during fruit machine gambling were found in the winning groups, indicating that gambling itself is not significantly arousing for women, but that winning is an important reinforcing element during the gambling process. HR levels in this sample of women fruit machine players are much lower than those reported for males. Negative correlations were found between sensation-seeking and frequency of gambling as well as between subjective arousal and frequency.

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.

Significant heart rate increases were found during horse racing gambling, with peaks occurring during bet placement and toward the end of a race suggesting that certain periods of the gambling process may be particularly rewarding. There was a significant correlation between Thrill and Adventure Seeking Scale (TAS) and the number of gambling forms participated in but not between TAS and bet size or arousal. Overall the results point to the shortcomings of objective arousal as an explanation of continued gambling behavior.

Coventry, K., Norman, A.. 1998. *Arousal, erroneous verbalizations and the illusion of control during a computer-generated gambling task*, *British Journal of Psychology*, 89 : 629-645.

The relationship between arousal, erroneous verbalizations and the illusion of control was examined in a computer generated gambling task. Arousal levels clearly change as a function of winning and losing, although arousal did not correlate with illusion of control or type of verbalization. Interestingly, chasing did not correlate with arousal or illusion of control. Data suggest that long term forecasting behavior is not a function of the explicit verbalizations that are produced during a task, but instead is predicted by the order of wins and losses experienced which appear to be processed at an unconscious level. Results suggest that short-term confidence ratings elicited throughout the task appear to be influenced by recent wins and that participation itself can lead to increased betting behavior. Authors suggest a new type of gambler: one who develops into a high frequency player as a function of perceived early success on the task alone. Thus, continued gambling behavior may have to do with an implicit decision-making mechanism.

Crisp, B., Thomas, S., Jackson, A., Thomason, N., Smith, S., Borrell, J., Ho, W., Holt, T.. 2000. *Sex differences in the treatment needs and outcomes of problem gamblers*, *Research on Social Work Practice*, 10 2: 229-242.

This study looked at the differences between male and female problem gamblers who seek counseling. Case closure was higher for males, but problem resolution rates were found to be lower. One explanation lies in treatment modalities: females tended to receive systemic therapy or supportive counseling while males were more likely to attend for assessment or referral to other programs. Implications of this study are twofold: women can be attracted to problem gambling counseling services and that programs that have been previously effective in treating male problem gamblers may need to be modified for use with female clients.

Cuadrado, M.. 1999. *A comparison of Hispanic and Anglo calls to a gambling help hotline*, *Journal of Gambling Studies*, 15 1: 71-81.

Hispanics were less likely to call a gambling help line about their own gambling problems, or to have gone for previous help. Hispanics also differed on types of gambling activities they engaged in. Group differences caution against using Anglo based prevention and treatment programs with Hispanics populations.

Cummings, T. N., Gambino, B.. 1992. *Perceptions by treatment staff of critical tasks in the treatment of the compulsive gambler*, Journal of Gambling Studies, 8 2: 181-199.

Clinicians perceptions of gamblers and treatment strongly indicate the importance of developing support systems for clients while dealing with crisis situations. Results reveal that approximately equal weight is given to the importance of using both behavioral and psychodynamic methods and goals. The author notes that a major weakness in dynamic models of treatment may be reflected by the fact that all items were rated as very important or critical except for two pertaining to continuity of care.

Daghestani, A.N., Elenz, E., Crayton, J.W.. 1996. *Pathological gambling in hospitalized substance abusing veterans*. , J Clin Psychiatry, 57 8 August: 360-363.

Through a case control design, the authors explored the issue of substance abuse and gambling. They found a high rate of comorbid substance abuse and pathological gamblers was associated with a positive history of childhood experiences of gambling in the family group and with larger family size. In addition, current alcohol consumption was significantly higher in the pathological gambling group. The family data in our subjects gives credence to the possibility of a common pathophysiology to both gambling and substance abuse, as a result of either a genetic or environmental basis.

Dahlback, O.. 1990. *Personality and risk-taking*, Personality and Individual Differences, 11 12: 1235-1242.

Hypothetical gambling (lottery) and roulette problems were presented to subjects and the results were used to construct different measures of risk taking which were then related to different personality factors. There is a general inclination to take risks when decisions can be assumed to be made in a nonimpulsive manner and it was proposed this inclination is affected by the individual's way of coping with conflicts.

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

Regular and occasional poker-machine players were observed and machine events, behavior and cognition were recorded. The results showed that gambling responses are sensitive to machine events. Larger wins were found to disrupt response rates giving rise to larger post-reinforcement pauses, whereas response rates were maintained by small rewards. In addition, behavior and beliefs of regular players were more consistent than those of occasional players. Results provide some evidence to suggest that poker machine gambling may be influenced by beliefs held about the nature of the schedule.

Dickerson, M., Cunningham, R., England, S. L., Hinchy, J.. 1991. *On the determinants of persistent gambling. III. Personality, prior mood, and poker machine play*, The International Journal of the Addictions, 26 5: 531-548.

Sensation seeking and extroversion were not related to level of involvement in gambling or to the persistence of gambling. Different factors predict persistence of gambling for high and lower frequency gamblers. The development of excessive gambling, and possibly other addictive behaviors, involves the interaction of a learnt, stereotyped habit, the mood of the person immediately prior to gambling, and cognition concerning outcomes.

Dickerson, M., Hinchy, J., England, S. L.. 1990. *Minimal treatments and problem gamblers: A preliminary investigation*, Journal of Gambling Studies, 6 1: 87-102.

It is concluded that a minimal intervention approach to problem gambling may be acceptable to some clients and may be associated with short term reductions in gambling involvement. Some personal contact appears to be essential in establishing valid assessments of pretreatment levels of gambling and related personal problems. A self-help manual represents a relatively cheap method of providing help particularly to clients geographically remote from the few existing in-patient services.

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

Play rate, heart rate, winnings, subjective excitement and expectation of winning were recorded for high-frequency poker players. Analysis indicated that wins affect play rate for up to three minutes, while effects of the other variables were inconsistent. It may be that in high frequency players, dysphoria interacts directly with within-session habit dynamics at the non-cognitive level. Such a process may be common to other addictive behaviors.

Dickerson, M., Hinchy, J., Fabre, J.. 1987. *Chasing, arousal and sensation seeking in off-course gamblers*, British Journal of addiction, 82 : 673-680.

Authors looked at the issue of Sensation seeking scores (SSS) and anxiety to assess subjective reports of levels of arousal after betting but prior to the race result. Results showed that male bettors were significantly lower on SSS scores than existing population norms. Significant relationships were shown between SSS sub scales and level of involvement in betting. SSS were positively correlated with level of involvement and the relationship found between the Boredom susceptibility sub scale and arousal was tentatively highlighted as an individual difference that would predispose a person to great loss of control and possible problematic levels of gambling.

Dickerson, M., Walker, M., England, S. L., Hinchy, J.. 1990. *Demographic, personality, cognitive and behavioral correlates of off-course betting involvement*, Journal of Gambling Studies, 6 2: 165-182.

Sensation seeking was not related to gambling and chasing was confirmed as a commonly reported feature of impaired control. There were three main factors: individual differences, control, and process of betting among gamblers. The fact that the latter two are independent provides tentative support for the adoption of controlled gambling as a treatment objective for some pathological gamblers.

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

Attention and dissociation in pathological and occasional gamblers were compared. Pathological gamblers in this study responded more slowly to irrelevant stimuli when VLT playing. They were also more likely to report more symptoms of general dissociation (e.g. lost all track of time when playing). Results suggest that pathological gamblers may experience a greater narrowing of attention than occasional gamblers when engaged in VLT play.

Dixon, M. Hayes, L., Ebbs, R.. 1998. *Engaging in "illusory control" during repeated risk-taking.*, Psychological Reports, 83 : 959-962.

The present study examined the extent to which roulette players would pay additional money for opportunities to engage in an illusory activity that had no influence on the game's outcome. The results showed a significant relationship between chips won and the purchase of control of risk suggesting that noncontingent reinforcement may control behavior. The finding support the suggestion that illusory control may often be present in gambling situations and that people may forfeit money for the opportunity to engage in this activity.

Dube, D., Freeston, M.H., Ladouceur, R. . 1996. *Potential and probable pathological gamblers: Where do the differences lie?*, Journal of Gambling Studies , 12 (4) Winter: 419-430.

The results of this study identify different affective and behavioral dimensions which distinguish pathological gamblers from potential pathological gamblers. These dimensions can be viewed as being symptomatic of gambling habits or as playing an instrumental role in the development of the gambling problem. Illegal behavior, worry, and heavy gambling are all characteristics association with pathological gambling.

Dumont, M., Ladouceur, R.. 1990. *Evaluation of motivation among video-poker players*, Psychological Reports, 66 : 95-98.

Authors used questionnaires to distinguish between regular and occasional gamblers using questionnaires. They found that regular gamblers were higher than those of occasional gamblers. The regular gamblers main motivations were 1) to try one's luck 2) for the fun of it, 3) for the thrill, and 4) to win money. Motivation did not increase with exposure. The modification of these motivations and the correction of cognitive errors should be part of any therapeutic endeavors for the treatment of pathological gamblers.

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.

The three therapeutic modalities (individual stimulus control and exposure with response prevention, group cognitive restructuring, or both combined) were effective to stop the gambling behavior. However, they were not effective in maintaining abstinence, compared to the individual therapy which was superior. Simple treatment was more effective than combined treatment. The control group did not differ from the combined group on gambling dependent variables. Depression, anxiety and inadaptation improved between pretreatment and follow-up for all modalities but the control group. The program of stimulus control and exposure with response prevention appears to be a cost effective therapy for pathological gamblers.

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.

This study aimed at determining the efficacy of stimulus control and exposure with response prevention in stopping pathological gambling as well as to test the comparative effectiveness of two therapeutic modalities (individual or group) for relapse prevention. Stimulus control and exposure with response prevention were successful in helping all subjects quit gambling initially. A combination of individual and group therapies can be considered a treatment of choice in achieving cessation of gambling behavior as well as improvement in the associated psychopathological variables.

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

Approximately half the variation for selected pathological gambling phenotypes is explained by shared experiences and/or inherited factors. Familial factors have an important influence on risk for pathological gambling behavior. The results are consistent with the increasing recognition of the importance of genetic influences on behavior.

Elia, C., Jacobs, D. F.. 1993. *The incidence of pathological gambling among Native Americans treated for alcohol dependence*, *The International Journal of the Addictions*, 28 7: 659-666.

A disproportionately high number of Native Americans in a sample seeking treatment for alcohol misuse also had additional difficulties with pathological gambling. 29% of all alcohol patients showed some difficulty with gambling, suggesting routine gambling screening with substance misusers to be prudent. Educating this high-risk group about the hazards and early signs of problem gambling, as well as providing prompt treatment for this group is advised.

Fabian, T.. 1995. *Pathological gambling: A comparison of gambling at German-style slot machines and "classical" gambling*, *Journal of Gambling Studies*, 11 3: 249-263.

Gambling at slot machines evokes similar feelings as classical games of chance; however, classical gamblers show more pronounced signs of pathological gambling, more severe psychosocial consequences, and have higher stakes, losses, winnings, and debts. Slot machines may be classified as games of chance and can also lead to pathological gambling.

Fong, C., McCabe, K.. 1999. *Are decisions under risk malleable?*, *Proceeding of National Academy of Science*, 96 : 10927-10932.

This study found that in situations with more involvement, subjects place less rather than more value on their lottery tickets. One possible explanation for this is that involvement interacts with loss aversion by causing subjects to weigh losses more heavily than they would otherwise. The risk taking behavior decreased with experience. Involvement, either independently or in interaction with myopic loss aversion, may help explain the extreme risk aversion of bond investors.

Frank, M.L., Smith, C.. 1989. *Illusion of Control and Gambling in Children*, *Journal of Gambling Behavior*, 5 (2) Summer : 127-137.

Study found that people who are involved in gambling situations and win, find ways to take responsibility for winning and that people will seek to exert control and direction of future gambling as well.

Friedland, N.. 1998. *Games of luck and games of chance: The effect of luck- versus chance-orientation on gambling decisions*, *Journal of Behavioral Decision Making*, 11 : 161-179.

The betting pattern of chance-oriented participants indicated a learning process which was not observed in luck-oriented participants. It was indicated that participants with an external locus of control were chance-oriented. Luck- and chance-oriented persons make decisions or "gamble" in qualitatively different ways. There were two different samples of participants and two different sampling methods; in experiment 1, luck oriented participants responded in a quasi-logical way, and in experiment 2, in a magical beliefs manner.

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

Both studies confirmed a predominance of erroneous perceptions during gambling, regardless of the subject's initial judgment of the game as being based on skill or chance. The higher density of verbalizations revealing an inaccurate perception found among those players with an initial perception of skill can be explained by the tendency to confirm one's own hypotheses. Such mistaken perceptions may play an important role in the development, maintenance, and treatment of gambling behaviors.

Gaboury, A., Ladouceur, R.. 1993. *Evaluation of a prevention program for pathological gambling among adolescents*, Journal of Primary Prevention, 14 1: 21-28.

Prevalence of pathological gambling was significantly higher in this study than earlier findings, explained by increased availability and criteria used (DSM-III-R). The prevention program improved knowledge about gambling and coping skills but skills in coping were not maintained over time. The prevention program did not affect gambling behavior or attitudes, indicating that increased knowledge is not sufficient to modify behavior and attitudes. However, improving knowledge about gambling may have long term effects such as seeking help sooner or being aware of similar problems with family or friends.

Gambino, B., Fitzgerald, R., Shaffer, H., Renner, J., Courtnage, P.. 1993. *Perceived family history of problem gambling and scores on SOGS*, Journal of Gambling Studies, 9 2: 169-184.

Participants were attending clinics for problem drinking, drug abuse or other mental disorders and were given questionnaires. Data replicate earlier findings indicating a link between parental problem gambling and pathological gambling. The results extended this association to include grandparents, thus firming the familial relationship. Data suggest that substance abusers are about six times as likely to be addicted to gambling as the general population.

Giacopassi, D., Stitt, B., Vandiver, M.. *An analysis of the relationship of alcohol to casino gambling among college students*, Journal of Gambling Studies, : 135-149.

The study suggests that drinking has a strong effect on gambling behaviors, especially for males, even at the casual drinking and gambling levels in the student population. It appears that the gender differentiated motivations associated with alcohol and gambling combine to support heightened levels of drinking and gambling (such as placing higher wages, obtaining additional money while at a casino, and losing more than they can afford) for males, but not for females.

Gibson, B., Sanbonmatsu, D.M. . 1997. *The effects of selective hypothesis testing on gambling*, Journal of experimental psychology: Applied, 3 2: 126-142.

The role of selective hypothesis testing in probability overestimation and gambling behavior was explored in 3 experiments. Results of evaluating the probability of success of basketballs teams, demonstrated that selective hypothesis-testing processes increase the willingness to gamble. Data suggest that this increased willingness to gamble is mediated by the overestimation of the probability of the final outcome and the increased desire to bet on the outcome. These results illuminate a cognitive mechanism that can lead to gambling and suggest some potential strategies that may help reduce the likelihood that such risky decisions are made.

Gilovich, T., Douglas, C.. 1986. *Biased evaluations of randomly determined gambling outcomes*, Journal of Experimental Social Psychology, 22 : 228-241.

People generally attach more significance to successful outcomes than unsuccessful outcomes, even when the outcomes are randomly determined. Those subjects in illusion of control conditions exhibited a bias in their evaluations of the outcome of the first round; no-control subjects did not show this bias. This bias increases the "resistance to extinction" that is produced by the intermittent reinforcement present in all gambling activities; this bias is not limited to cognitively rich gambling activities.

Goldstein, L., Carlton, P. L.. 1988. *Hemispheric EEG correlates of compulsive behavior: The case of pathological gamblers*, Research Communications in Psychology, Psychiatry, and Behavior, 13 1 & 2:103-111.

Compared to controls, the capability of differentially activating the right and/or left hemisphere is markedly reduced in gamblers. The results point to the possibility that it is difficult for the gamblers to produce a shift of cerebral laterality in response to environmental demands; as if there was an inflexibility of their cerebral processes. This view fits with the observation that repetitive behavior is present in pathological gamblers as they persist in their behaviors compulsively to the point of being obsessive.

Goldstein, L., Manowitz, P., Nora, R., Swartzburg, M., Carlton, P.. 1985. *Differential EEG Activation and Pathological Gambling*, Biol Psychiatry, 20 : 1232-1234.

Authors explored the possibility of a biologically based predisposition which may interact with psychological factors in the development of pathological gambling. Specifically, they explored whether some index of the brain function discriminates between pathological gamblers and controls by studying EEG's . Data suggests that there is a highly selected subset of pathological gamblers that may be characterized by a deficit in task-appropriate hemispheric differentiation and that pathological gambling may be related to dysfunction attention mechanisms, but more specifically deficits in impulse control that characterize ADD.

Graham, J. R., Lowenfeld, B. H.. 1986. *Personality dimensions of the pathological gambler*, Journal of Gambling Behavior, 2 1: 58-66.

Gamblers had significant psychopathology, including depression, anxiety, and substance abuse. Disregard for authority, impulsivity, feelings of masculine inadequacy, and histories of overly close relationships with mothers and faulty identification with fathers were suggested. The mean score on the MacAndrew Alcoholism Scale was similar to that obtained with alcoholics, heroin addicts, and substance abusers.

Greenberg, J., Lewis, S., Dodd, D.. 1999. *Overlapping addictions and self-esteem among college men and women*, Addictive Behaviors, 24 4: 565-571.

The overlapping addictions found in this study suggest a common core of vulnerability to addictive substances and activities found in everyday life. There was a clear tendency among college students to become addicted to more than one common substance or activity. In terms of gambling, men were more addicted than women, and high correlation between gambling and video game playing were found.

Griffin-Shelley, E., Sandler, K., Lees, C.. 1992. *Mutliple addictions among dually diagnosed adolescents*, Journal of Adolescent Chemical Dependency, 2 2: 35-44.

Dually diagnosed adolescents self-reported on measures of addictions. The results support the idea that chemically dependent adolescents may have compulsive/addictive behaviors in more areas than drug and alcohol abuse. More than half saw themselves as having problems with relationships, sex and food. Although gambling symptoms were the least reported difficulties, it was still 3 times higher in these adolescents than that reported in the general population.

Griffiths, M. . 1990. *Psychobiology of the near-miss in fruit machine gambling* , The Journal of Psychology, 125 (3): 347-357.

Study #1: Through interviews and discussion, it was determined that stimulation and arousal was the key factors in playing fruit machines. The addicts reported not getting the same high from other gambling activities. It was established that the fruit machine high was different from that produced by alcohol and other soft drugs because alcohol and soft drugs produced mood altering behavior over a longer period of time. The high experienced during fruit machine playing was described as immediate.

Study #2: Fifty fruit machine gamblers were examined about the role of excitement. Results showed that pathological gamblers reported more excitement during play and also reported that they needed to gamble more to get more excited. It was postulated that when regular gamblers become aroused while gambling, they may be producing endorphins. The more players gamble, the more tolerance they build and eventually they have to keep gambling more to get the initial desired effect.

Griffiths, M. . 1990. *The cognitive psychology of gambling (FIRST of TWO studies in article)* , Journal of Gambling Studies, 6 (1) Spring: 31-42.

Authors looked at the issue of cognitive biases and erroneous beliefs about skill in adolescents who played fruit machines. They found that all group members commented upon the skillful aspects of fruit machine playing. However, it was also explained that chance could still be an overriding factor even with and 'experienced' player which implies some players are better than others through their skillful play. The group unanimously stated they experienced a 'high' while playing which they claimed was physiological (as opposed to psychological) because their heart rate increased.

Griffiths, M. . 1990. *The cognitive psychology of gambling (SECOND of TWO studies in one article)*, Journal of gambling studies , 6 (1) Spring: 31-42.

Authors explored the issue of cognitive factors in the explanation of gambling activity. Respondents indicated that playing fruit machines was a challenge and that is why they started and were maintaining the activity. Knowledge was sited as the most important skill for gambling. When losses occurred this was attributed to bad luck, having a bad day, or not concentrating rather than attributing the losses to external factors.

Griffiths, M.. 1991. *The Observational Study of Adolescent Gambling in UK Amusement Arcades*, , 1 :309-320.

Results of the study suggest that the level of adolescent gambling depends upon both time of day and time of year and regular players conform to rules of etiquette and display stereotypical behaviors when playing fruit machines. Results suggest that adolescents play fruit machines for a wide range of reasons including fun, to win money, to socialize, to escape, and for excitement, and that inland and coastal arcades are frequented by different clientele, probably as a function of the amusement machine available.

Griffiths, M.. 1993. *Tolerance in gambling: An objective measure using the psychophysiological analysis of male fruit machine gamblers*, *Addictive Behaviors*, 18 : 365-372.

Gambling is objectively exciting/arousing for both regular and nonregular fruit machine gamblers. Both regular and nonregular gamblers get a "high" physiologically when playing, but the nonregular gamblers stay higher for longer meaning they do not have to play as fast or as often to induce the arousal peaks, whereas regular gamblers could be seen as becoming more tolerant to the "highs", needing to gamble faster or more often to achieve the same effect. In examining individual heart rates, it is clear that there are many "arousal jags" during the play period of regular and nonregular gamblers but that identifying the cause of the jags was beyond the boundaries of the study.

Griffiths, M.. 1995. *The role of subjective mood states in the maintenance of fruit machine gambling behavior*, *Journal of Gambling Studies*, 11 (2) Summer: 123-135.

The authors explored the issues of how arousal and depression played a role in gambling. Results indicated that regular and pathological gamblers experienced more depressive moods before playing and more excitement during gambling than non regular gamblers. The difference to the matter of degree of mood between regular and pathological gamblers confirms the assertions that there is no clear delineation between the two groups. Subjective moods of the gamblers do appear to have an effect on their gambling behavior but that both 'depressed' and (paradoxically) 'excited' states appear to be important in the maintenance of fruit machine gambling.

Griffiths, M.D.. 1990. *The acquisition, development, and maintenance of fruit machine gambling in adolescents*, *Journal of Gambling Studies*, 6 3 Fall: 193-205.

Fruit machine playing seems to be predominantly male oriented. Significant differences between pathological gamblers and other fruit machine gamblers included: starting at an earlier age, less likely to play because friends do, and to win money. They were also more likely to view playing as a nonsocial activity. Gamblers were more likely to have had a big win in their playing career, were more likely to owe money in addition to obtaining money through borrowing and/stealing, more likely to get into trouble and were more irritable when not playing. Lastly, they were more likely to be attracted by the 'aura' of the machines (i.e. music, noise, and flashing lights) and experienced more excitement during play. No difference was found between the two groups on other gambling activities.

Griffiths, M.D.. 1990. *Addiction to fruit machines: A preliminary study among young males*. , *Journal of Gambling Studies*, 6 (2) Summer: 113-126.

This was a qualitative study of 8 self-professed adolescent gamblers. Some subjects reported that they increased their playing when they wanted to escape from their current situation - especially if they felt depressed. Cognitive variables may be important in the continued playing of fruit machines, and with the introduction of specialist play features "nudge" and "hold" buttons.

Griffiths, M. D.. 1994. *The role of cognitive bias and skill in fruit machine gambling*, *British Journal of Psychology*, 85 : 351-369.

Regular gamblers produced significantly more irrational verbalizations than non-regular gamblers. On subjective measures regular gamblers were significantly more skill oriented; there was little difference between the two groups in terms of the total winnings but regular gamblers turned smaller winnings into larger ones, slightly extending the length of time they play. Gamblers may be rehabilitated through cognitive behavior modification, and the use of audio playback (of irrational verbalizations) therapy is advocated.

Griffiths, M., Sutherland, I.. 1998. *Adolescent gambling and drug use*, *Journal of Community & Applied Social Psychology*, 8 : 423-427.

Authors explored the relationship between under age National Lottery gambling, under age scratch card gambling, cigarette smoking, drinking alcohol and drug use. It was found that these behaviors were closely linked. Adolescent gamblers reported that they were significantly more likely to drink alcohol, smoke tobacco, and take drugs compared to non-gamblers.

Hall, G., Carriero, N., Takushi, R., Montoya, I., Preston, K., Gorelick, D.. 2000. *Pathological gambling among cocaine-dependent outpatients*, *American Journal of Psychiatry*, 157 7: 1127-1133.

Pathological gambling is substantially more prevalent among cocaine-dependent outpatients than in the general population. Patients with pathological gambling differ from other cocaine-dependent outpatients in some sociodemographic characteristics but not in the short-term outcome of treatment for cocaine dependence. A high occurrence of antisocial personality disorder was found for pathological gamblers.

Harrison, C., Donnelly, D.. 1987. *A couples group for alcoholics, gamblers and their spouses in recovery: A pilot study*, Sexual and Marital Therapy, 2 2: 139-143.

After participating in a partnership enhancement program, couples' marital satisfaction ratings were higher than at the beginning. This was maintained to a lesser extent after a 6 week followup period. It was indicated that an aftercare program for addicts that attend with their spouses aimed at supporting the addicts and giving them honest feedback concerning the ways they are coping with the changes in their lives due to recovery may not be enough for all couples.

Holtgraves, T., Skeel, J.. 1992. *Cognitive biases in playing the lottery: Estimating the odds and choosing the numbers*, Journal of Applied Social Psychology, 22 12: 934-952.

Consistent with the anchoring and adjustment heuristic, subjects perceived their chances of winning to be greater when the lottery was based on a single event than when it was based on a disjunctive event. Data do not support the operation of the simulation heuristic; possibly indicating that it only operates after the fact. Support was found for the operation of the representativeness heuristic in the lottery numbers people choose to play; in both hypothetical and real situations, a preference was shown for numbers without repeating digits.

Hong, Y., Chiu, C.. 1988. *Sex, locus of control, and illusion of control in Hong Kong as correlates of gambling involvement*, The Journal of Social Psychology, 128 5: 667-673.

Whether a gambler gambles to confirm their expectancy of control or to regain a sense of (illusory) control seems to be contingent on what is socially expected from the individual. For male subjects, the effect of control by powerful others on gambling is mediated by the need to regain control through the experience of illusory control. Results for women supported the self-confirmation hypothesis, suggesting that they gamble to confirm their expectancy of external control. Gambling may best be regulated through social reforms that would encourage a more self-directed and self-determined society.

Hraba, J., Mok, W., Huff, D.. 1990. *Lottery play and problem gambling*, Journal of Gambling Studies, 6 4:355-377.

The primary objective was to determine the role of lottery play along with other variables in problem gambling. Money spent on gambling was both a predictor of loss of control and gambling consequences. The results show that problem gambling is a progression, with 3 distinct phases: gambling behavior, loss of control, and gambling consequences. Gambling behavior was not always associated with loss of control and undesirable consequences. It appears that once respondents reported a loss of control over gambling, their chances of also experiencing its undesirable consequences increased. It is suggested that gambling behavior precedes loss of control and gambling consequences, and loss of control is prior to consequences.

Hudak, C. J., Varghese, R., Politzer, R. M.. 1989. *Family, marital, and occupational satisfaction for recovering pathological gamblers*, Journal of Gambling Behavior, 5 3: 201-210.

The results support the efficacy of treatment programs for pathological gamblers (nearly one third remained in abstinence in this study). It appears that the recovery of pathological gamblers is significantly influenced by job satisfaction and marital status satisfaction and family life satisfaction to a more moderate degree. In addition to traditional modes of intrapsychic-oriented psychotherapy, multi-interventive services need to be provided in the areas of family and occupational counseling.

Ibanez, A.G., Mercade, P.V., Sanroma, M.A., Cordero, C.P.. 1992. *Clinical and behavioral evaluation of pathological gambling in Barcelona, Spain*, Journal of Gambling Studies, 8 3: 299-310.

Risk of suicide is high among the patients in this study. A tendency for patients to exhibit addictive behavior, especially high consumption of alcohol is seen. Authors deduce that among pathological gamblers studied, there's a tendency to become addicted to socially accepted substances, such as tobacco. The gamblers in this study were reluctant to accept his or her gambling as problematic, explaining the lengthy history of gambling when they first enter treatment.

Ibanez, A., Perez de Castro, P., Fernandez-Piqueras, J., Blanco, C., Saiz-Ruiz, J.. 2000. *Pathological gambling and DNA polymorphic markers at MAO-A and MAO-B genes*, Molecular Psychiatry, 5 : 105-109.

The present study determined whether there was an association between pathological gambling and allele distribution at the marker locus. Secondly, it aimed to uncover the possible associations between pathological gambling and each marker separately. No difference was found in overall allele distribution at the MAO-A gene polymorphism. There was however an association between allele distribution and the subgroup of severe male gamblers compared to the males in the group of healthy volunteers. Authors suggest that allele variants of the MAO-A gene, but not the MAO-B gene, may be a genetic liability factor in pathological gambling, at least in severe male gamblers.

Jacobs, D.F.. 1988. *Evidence for a common dissociative-like reaction among addicts*, The Journal of Gambling Behavior, 4 (1) Spring: 27-37.

The paper presented findings supportive of the theory that addicted persons will experience a common dissociative-like state while indulging that will differentiate them from non-addicts indulging in the same activities or substance use. Compulsive gamblers, alcoholics, and compulsive overeaters were each compared with a nominative sample. As predicted, moderate to high frequencies of four different types of dissociative-like experience were reported by each addicted group. Compulsive gamblers and alcoholics consistently reported a higher incidence of these reactions than did compulsive overeaters.

Jacobs, D. F., Marston, A. R., Singer, R. D., Widaman, K., Little, T., Veizades, J.. 1989. *Children of problem gamblers*, Journal of Gambling Behavior, 5 4: 261-268.

Children of problem gamblers not only indulge more frequently and more heavily in potentially addictive substances and activities, but also that they appear to be at much greater risk for developing a frank addictive pattern of behavior. Across the entire range of psychosocial factors, children of problem gamblers appeared to be at much greater risk than their classmates. Deficiencies in the home life of children with one or two problem gambler parents become evident by their greater involvement in a number of potentially addictive health threatening behaviors, coupled with a consistent pattern of inadequate stress management and inferior coping skills; early and competent intervention is needed.

Johnson, E. E., Nora, R. M.. 1992. *Does spousal participation in Gamblers Anonymous benefit compulsive gamblers?*, Psychological Reports, 71 : 914.

The findings were in the direction of a benefit in terms of length of abstinence for those compulsive gamblers whose spouses participated in Gamblers Anonymous (GA). However, this relationship was not statistically significant. Still, there is a possibility that spousal participation in GA is beneficial to the compulsive gambler's recovery.

Johnson, E.,E., Nora, R.M., Bustos, N.. 1992. *The Rotter I-E Scale as a predictor of relapse in a population of compulsive gamblers.* , Psychological Reports, 70 : 691-696.

Profile surveys, completed Rotter I-E scales and questionnaires on relapse behavior were collected from compulsive gamblers who attended Gamblers Anonymous, and an attempt was made, based on the findings, to predict incidence of compulsive gambler' relapse. Relationships between I-E scores and extent of relapse-free periods, and I-E scores and relapse, with the variables of religious background, age, marital status, type of work , and childhood physical abuse were investigated. In every instance, the relationship found was statistically non-significant.

Kassinove, J. I., Tsytsarev, S. V., Davidson, I.. 1998. *Russian attitudes toward gambling*, Personality and Individual Differences, 24 1: 41-46.

Attitudes of students of a Russian University towards the various forms of gambling and gambling in general were not significantly different. However, Russian women reported more positive attitudes toward the lottery than did men. Positive attitudes toward gambling were found to be related to individual differences in risk taking, liberalism, and previous gambling experience.

Kearney, C.A., Drabman, R.S.. 1992. *Risk-taking/Gambling-Like behavior in preschool children*, Journal of Gambling Studies , 8 (3) Fall: 287-297.

Children were exposed to a risk-taking behavior after being exposed to someone who won a large prize or won nothing. Children in experimental group initiated more risks to win the large prize in the high-risk situation than children in the control group. Results indicated that modeling can enhance risk-taking/gambling-like behavior in young children.

Keren, G., Lewis, C.. 1994. *The two fallacies of gamblers: Type I and type II*, Organizational Behavior and Human Decision Processes, 60 : 75-89.

Type II gambler's fallacy is the bias for people to notoriously underestimate the number of observations needed for a reliable detection of biased numbers. Due to the type II fallacy, many believe that detection of a biased number is possible and try their luck. This fallacy was not found to be due to difficulties associated with producing large numbers. The fallacy remained even in experiments using cues to make certain ways of viewing probabilities salient, and its presence was robust even when the magnitude of the bias was increased. This misconception of randomness related to insensitivity to statistical power was also found among researchers and people with statistical knowledge.

Koepp, M. J., Gunn, R. N., Lawrence, A. D., Cunningham, V. J., Dagher, A., Jones, T. , Brooks, D. J., Bench, C. J., Grasby, P. M.. 1998. *Evidence for striatal dopamine release during a video game*, Nature, 393 May: 266-268.

Binding of raclopride to dopamine receptors in the striatum was significantly reduced during a goal-directed motor task, namely a video game, compared with baseline levels of binding, consistent with increased release and binding of dopamine to its receptors. The reduction in binding of raclopride in the striatum positively correlated with the performance level during the task and was greatest in the ventral striatum.

Kofoed, L., Morgan, T., Buchkoski, J., Carr., R.. 1997. *Dissociative experiences scale and MMPI-2 scores on video poker gamblers, other gamblers, and alcoholic controls.*, Journal of Nervous and Mental Disease, 185 : 58-60.

This study compared pathological gamblers who gamble strictly on video lottery, those who gamble on video lottery and mixed games, those who don't gamble video lottery and alcoholic controls. Due to the relationship found between pathological gamblers who gamble in many forms and prior dissociative experience, authors suggest that video lottery may produce dissociative responses even in individuals with relatively less prior dissociative experience compared with other forms of gambling.

Koski-Jannes, A., Turner, N.. 1999. *Factors influencing recovery from different addictions*, Addiction Research, 7 6: 469-492.

This study compared recovered addicts (alcohol, multiple substances, nicotine, binge eating, and "other" group which included sex, gambling and benzodiazepine) on factors which helped them resolve the problem and maintain the change. Change factors and maintenance factors were identified. However, considering the group of "other", it was found that they were most eager to use self-control techniques, least prone to seek professional help. In terms of coping with pressures to relapse, physical exercise, thinking of negative consequences, positive thinking, and distraction were endorsed. Addiction-related differences appeared in 4 change factors and 3 maintenance factors indicating the different routes to recovery in different addictions.

Kroeber, H.. 1992. *Roulette gamblers and gamblers at electronic game machines: where are the differences?*, Journal of Gambling Studies, 8 1: 79-92.

Gamblers at electronic game machines began to play at an average age of 19 years. They more often belong to the lower classes and show depressive and reactive disorders more frequently. Roulette gamblers began to gamble an average of 9 years later than other gamblers and showed signs of personality disorders, especially narcissistic and cyclothymic patterns, significantly more often. Antisocial behavior and delinquency before the onset of excessive gambling were frequent in both groups.

Kusyszyn, I. , Rutter, R.. 1985. *Personality characteristics of male heavy gamblers, light gamblers, nongamblers, and lottery players.*, Journal of gambling behavior, 1 1: 59-63.

The results suggest that heavy gamblers are as healthy psychologically as light gamblers, nongamblers, or lottery players. The only significant difference between the groups was on risk taking (lottery players lower and combined gamblers higher). The results strongly support the humanistic-existential view of gambling as adult play and as a healthy human activity.

Kyngdon, A., Dickerson, M.. 1999. *An experimental study of the effect of prior alcohol consumption on a simulated gambling activity*, Addiction, 94 5: 697-707.

The interaction of alcohol consumption and gambling behavior was investigated. It was found that 3 standard drinks doubled the duration of gambling when losing and resulted in more players losing all their original stake. Since raising stakes after a loss was a betting strategy for all players, it is suggested that all regular gamblers (whether consuming alcohol or not) perceived that a loss is likely to be followed by a win, and vice versa, and wager accordingly. Relatively small quantities of alcohol were found to have a significant effect on the psychological processes (extroversion, sensation seeking) that underpin self-control over gambling.

Ladouceur, R.. 1995. *Brief report: prevalence of pathological gambling and associated problems in individuals who visit non-gambling video arcades*, Journal of Gambling studies , 11 (4) Winter: 361-365.

The purpose of the study was to investigate the gambling behaviors of individuals who frequent non-gambling video games arcades. It was found that there is a positive correlation between scores of SOGS and use of tranquilizers and that 16.7% of pathological gamblers and 5.6% of problem gamblers and 6.7% of subjects without gambling problems attempted suicide.

Ladouceur, R., Boisvert, J-M. Dumont, J. . 1994. *Cognitive-behavioral treatment for adolescent pathological gamblers*, Behavior modification, 18 (2) April : 230-242.

The study evaluated the effectiveness of a cognitive-behavioral treatment for adolescent pathological gamblers. Perception of control and severity of the problem served as dependent variables. Four adolescent pathological gamblers were treated in a multiple

baseline design across individuals. Results showed clinically significant changes for all subjects, they remained abstinent at 1, 4, and 6 month followups.

Ladouceur, R., Dube, D., Bujold, M.. 1994. *Prevalence of pathological gambling and related problems amount college students in the Quebec metropolitan area*, Can. J. Psychiatry, 39 June: 289-293.

The prevalence of pathological gambling and problems associated with it were measured amount 1471 students of three colleges. The percentage of pathological gamblers was much higher among males (5.7%) than females (0.6%). The results indicate that pathological gambling is associated substance use, illegal behaviors, suicidal tendencies, and eating disorders.

Ladouceur, R., Dube, D., Giroux, I., Legendre, N., Gaudet, C.. 1995. *Cognitive biases in gambling: American roulette and 6/49 lottery*, Journal of Social Behavior and Personality, 10 2: 473-479.

Results support the idea that individuals believe in the deterministic qualities of randomness and apply this belief to gambling activities. This belief provokes erroneous thinking and may explain the development of an illusion of control. The modification of individuals' erroneous perceptions offers a new and exciting challenge for clinicians and researchers.

Ladouceur, R., Gaboury, A.. 1988. *Effects of limited and unlimited stakes on gambling behavior.*, Journal of Gambling Behavior, 4 2: 119-126.

This study showed that irrational thinking dominates the cognitive activity of players during gambling whether stakes are limited or not. No differences on the number of verbalizations, illusory control and motivation were found for limited and unlimited risk-taking conditions. Subjects in limited stakes condition made riskier bets, indicating that limited risk-taking was achieved because subjects found other ways of increasing risks - mainly placing riskier bets with a fixed amount of money. Authors believe that exposure to gambling is crucial in the acquisition and maintenance of this habit and triggers risk-taking behaviors in order to stay "in the action".

Ladouceur, R., Gaboury, A., Bujold, A., Lachance, N., Tremblay, S.. 1991. *Ecological Validity of Laboratory Studies of Videopoker Gaming*, Journal of Gambling Studies, 7 2: 109-116.

This study compared cognitive and behavioral components of video poker players under laboratory and natural settings. The results show no difference between cognitive, behavioral and motivational phenomenon in the laboratory and in a natural setting and thus confirm that laboratory studies conducted under certain conditions have good ecological validity. Authors believe it is crucial that the money won or lost during the gambling session should belong to the participant.

Ladouceur, R., Gaboury, A., Dumont, M., Rochette, P.. 1988. *Gambling: Relationship between the frequency of wins and irrational thinking*, The Journal of Psychology, 122 4: 409-414.

Overall, subjects verbalized more irrational thoughts than rational ones while gambling. The hypothesis that those with a higher frequency of wins would verbalize more irrational thoughts than those with a lower frequency of wins was not confirmed; the two groups did not differ significantly in the number of rational and irrational verbalizations made. The data reveal to what extent the structure of a gambling activity stimulates irrational thinking, regardless of the frequency of wins; a few wins were sufficient to evoke an illusory perception of control.

Ladouceur, R., Giroux, I., Jacques, C.. 1998. *Winning on the horses: How much strategy and knowledge are needed?*, The Journal of Psychology, 132 2: 133-142.

Results suggest that horse race gambling may be less a game of skill than is generally believed. Regular gamblers did not make more money than a random selection did and although experts picked the winning horses more often than a random selection, the outcomes of bets were not significantly different (average was always negative). In contradiction to the results, gamblers perceived themselves as being able to make better predictions than chance. It is suggested that the insight of the presence of these cognitive distortions is crucial to the development, maintenance, and treatment of gambling behaviors.

Ladouceur, R., Mayrand, M.. 1984. *Evaluation of the "illusion of control": Type of feedback, outcome sequence, and number of trials among regular and occasional gamblers*, The Journal of Psychology, 117 :34-46.

In general, subjects did not report an illusion of control towards the experimental task; if anything, they underestimated their amount of personal control. Primacy effects were observed with those having frequent initial wins estimate their amount of personal control as higher than do those beginning with few wins. Feedback did not facilitate objective perceptions or hinder the sense of an illusion of control. The prediction that an increase in the number of trials would evoke the perception of an illusion of control was not confirmed; the greater the number of trials, the less control subjects reported having over the situation.

Ladouceur, R., Mayrand, M.. 1986. *The level of involvement and the timing of betting in roulette*, The Journal of Psychology, 121 2: 169-176.

Results verified an effect of the level of involvement and the timing of betting in gambling. Subjects who bet before the throw took greater risks than those who bet after; players believed they could influence the outcome of the game. Subjects who threw the ball reported a much greater perception of control and assumed a higher level of risk than those who did not execute the task. Subjects expressed more motivation to continue the game following a win than following a loss, but made more precise or risky decisions after a loss.

Ladouceur, R., Mayrand, M.. 1987. *Depressive behaviors and gambling*, Psychological Reports, 60 :1019-1022.

Monetary risk behaviors and subjective control did not differ significantly between depressive and nondepressive subjects. Risk-taking was shown to be a function of the exposure to the game. It is suggested that increases in risk-taking as the game progresses may have something to do with an illusory perception of control which the structure of gambling situations would be responsible for.

Ladouceur, R., Mayrand, M., Dussault, R., Letarte, A., Tremblay, J.. 1984. *Illusion of control: Effects of participation and involvement*, The Journal of Psychology, 117 : 47-52.

Active participation and involvement did not induce an illusion of control in subjects who predicted the outcome of dice throws in this study. Data cast doubt on the value of using the illusion of control to explain the acquisition and/or maintenance of gambling behavior.

Ladouceur, R., Mayrand, M., Tourigny, Y. . 1987. *Risk-taking behavior in gamblers and non-gamblers during prolonged exposure*, Journal of Gambling Behavior, 3 (2) Summer: 115-122.

Results of this study indicate that direct exposure to gambling increased the level of risk-taking behavior among gamblers and non-gamblers. This result has many implications. First, individuals exposed to gambling may not be aware that they are betting more heavily as the game progresses. Second, the implementation of gambling activities may have negative or deleterious consequence: Opportunities for gambling facilitate direct exposure which increases the level of risk-taking.

Ladouceur, R., Paquet, C., Dube, D.. 1996. *Erroneous perceptions in generating sequences of random events*. , Journal of Applied Social Psychology, 26 24: 2157-2166.

The authors hypothesized that erroneous perceptions dominate probably judgment and used two studies to examine this. The first study demonstrated that subjects verbalized significantly more erroneous than accurate perceptions when generating sequences of random binary events. The second study was to assess the role of motivation on the frequency of misconception. Results showed that the total number of erroneous perceptions again outnumbered accurate perception but motivation did not increase the number of misconceptions.

Ladouceur, R., Sylvain, C., Letarte, H., Giroux, I., Jacques, C.. 1998. *Cognitive treatment of pathological gamblers*, Behavior research and therapy, 36 : 111-1119.

The study evaluated the efficacy of a cognitive treatment for pathological gambling. Cognitive correction targeted the erroneous perceptions towards the notion of randomness. Some subjects reported a clinically significant decrease in the urge to gamble, an increase in their perception of control, and no longer met the DSM-IV criteria of pathological gambling. Results suggest that cognitive therapy targeting the misconception of the notion of randomness is a promising remain for pathological gambling, a refractory disorder to most therapeutic interventions.

Ladouceur, R., Tourigny, M., Mayrand, M.. 1985. *Familiarity, group exposure, and risk-taking behavior in gambling*, The Journal of Psychology, 120 1: 45-49.

Direct exposure or familiarity with a game of chance does lead to an increase in the level of risk taking. Group exposure did not significantly affect risk taking behavior in this situation, perhaps due to the mixed-sex groupings. Familiarity was also related to an increase in perception of control, personal efficacy, and level of confidence initially, however after an initial increase, these measures returned to their original levels.

Langewisch, M.W.J., 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 (3) Fall: 245-262.

Male undergraduate university students completed several inventories measuring sensation seeking, impulsivity, gambling, and risky behaviors. Results showed a very high percentage were classified in the pathological gambler range of scores and that there was a significant difference between the relationships of sensation seeking, impulsivity, and risky behaviors with gambling scores in the pathological versus non-pathological groups. Pathological gambler's scores on sensation seeking and impulsivity did not correlate with the degree of gambling pathology. In contrast, the sensation seeking and impulsivity scores of non-pathological gamblers did correlate with their scores of gambling pathology.

Leary, K., Dickerson, M.. 1985. *Levels of arousal in high- and low-frequency gamblers*, Behavioral Research Therapy., 23 6: 635-640.

High and low frequency gamblers were subjected to provocation with gambling or neutral stimuli prior to playing a poker machine. Heart rate and subjective measures of arousal were taken throughout. Neither provocation condition resulted in changes from baseline arousal in either group. Playing was associated with increase in arousal in both groups, but significantly greater arousal was shown by high-frequency players.

Lesieur, H., Heineman, M.. 1988. *Pathological gambling among youthful multiple substance abusers in a therapeutic community*, British Journal of Addiction, 83 : 765-771.

Pathological gambling in a therapeutic community was investigated. Two tentative findings emerged: it appears that substance abusers are at greater risk for having problems with gambling than are other groups; and as people reach their late teens, they are at greater risk for pathological gambling.

Lesieur, H. R., Blume, S. B.. 1990. *Characteristics of pathological gamblers identified among patients on a psychiatric admissions service*, Hospital and Community Psychiatry, 41 9: 1009-1012.

Seven of the 105 psychiatric patients were identified as pathological gamblers, while ten were children of problem gamblers. These rates are higher than those for the general population. A high rate of pathological gambling (11 percent) was found among patients with a secondary diagnosis of psychoactive substance use disorders. The results should alert therapists to the influence of gambling in the family on patients' presenting problems, the need to screen all patients to determine if they or their family members have gambling problems, and the need to include treatment for pathological gambling into the overall treatment plan if necessary.

Lesieur, H.R., Blume, S.B.. 1991. *Evaluation of patients treated for pathological gambling in a combined alcohol, substance abuse and pathological gambling treatment unit using the Addiction Severity Index*, British Journal of Addiction, 86 : 1017-1028.

The Addiction Severity Index (modified for use with pathological gamblers) was used to evaluate the effectiveness of treatment. Reduction in alcohol intake, other drugs and gambling as well as improved in legal, family/social and psychological functions was observed. There was a trend for improvement in medical condition but no net change in employment functions. The study supports the idea that combined treatment is an effective way of dealing with patients whose gambling problems are discovered when they enter treatment for another addiction, as well as for patients whose initial complaints include pathological gambling, with or without additional problems.

Lesieur, H. R., Blume, S. B., Zoppa, R. M.. 1986. *Alcoholism, drug abuse, and gambling*, Alcoholism: Clinical and Experimental Research, 10 1: 33-38.

Authors found gamblers showed clear signs of emotional, financial, family and occupational disruption, and illegal behavior in connection with their gambling which compounded the disruption induced by alcohol and/or drugs. There was also a significant association with parental gambling. Gambling by siblings, alcoholism in the father (but not in the mother), gambling prior to age 20, greater amounts of gambling for more money, and "chasing losses in order to get even" were also positively correlated.

Letarte, A., Ladouceur, R., Mayrand, M.. 1986. *Primary and secondary illusory control and risk-taking in gambling (roulette)*, Psychological Reports, 58 : 299-302.

Results showed that most subjects reported some primary or secondary illusory control during the game; frequent wins induced more personal control than infrequent wins. Exposure to gambling increased the level of risk-taking behavior; opportunities for gambling may therefore lead to direct exposure to gambling and to increased risk-taking. Familiarity may enhance the perception of personal control over the gambling situation and facilitates the acquisition and maintenance of gambling habits.

Linden, R. D., Pope, H. G., Jonas, J. M.. 1986. *Pathological gambling and major affective disorder: Preliminary findings*, Journal of Clinical Psychiatry, 47 4: 201-203.

A relationship between pathological gambling and major affective disorder was indicated such as major depression or bipolar disorder. The study also reported a significant prevalence of panic disorder and obsessive-compulsive disorders in pathological gamblers. There was a 17.2% morbidity risk of major affective disorder in first-degree relatives of the subjects. The study suggests that many pathological gamblers display additional psychiatric disorders which are often amenable to psychopharmacologic treatment.

Lorenz, V. C., Yaffee, R. A.. 1986. *Pathological gambling: Psychosomatic, emotional and marital difficulties as reported by the gambler*, Journal of Gambling Behavior, 2 1: 40-49.

A wide variety of psychosomatic, emotional and sexual/marital problems were reported by a sample of pathological gamblers both at the worst point in their gambling behavior and after abstinence. It is suggested that a concerted effort be made to apprise the medical and mental health professions of the nature and consequences of this disorder. The need for effective professional health services and trained therapists is clearly indicated by these pathological gamblers.

Lorenz, V.C., Yaffee. R.A.. 1988. *Pathological gambling: Psychosomatic, emotional and marital difficulties as reported by the spouse.*, The Journal of Gambling Behavior, 4 1: 13-26.

Wives of compulsive gamblers are not only faced with strong feelings of anger, guilt, isolation, and depression as a result of the gambling, but they also suffer from a multitude of physical symptoms often associated with these overwhelming feelings, such as chronic of severe headaches, breathing difficulties, backaches, stomach problems and menstrual irregularities. Significant findings suggest that it is not those problems engendered by the gambler's behavior which are linked to the wife's distress, but rather her emotions associated with the gamblers behavior. Spouses, as well as gamblers, believe that mental health therapists must have specific training in pathological gambling in order to be effective.

Maden, T., Swinton, M., Gunn. J.. 1992. *Gambling in young offenders*, Criminal Behaviour and Mental Health, 2 : 300-308.

The associations between offenders who gamble and certain criminal variables (first conviction before age 15, financial dependence on crime, etc.) point to the complexity of the links between gambling and offending. Once established, excessive gambling may lead to an increase in acquisitive offending. Excessive gambling may be one marker of a lifestyle associated with recidivism, rather than having any causal significance.

Malkin, D., Syme, G. J.. 1985. *Wagering preferences of problem gamblers*, Journal of Abnormal Psychology, 94 1: 86-91.

There was a tendency for problem gamblers to bet more heavily than social gamblers when there was less probability of winning while social gamblers bid more when there was a higher probability of winning. Different prize levels did not produce significant differences in amounts gambled, and there was no significant difference between the groups on a wagering preference questionnaire. Results indicate that compulsive gamblers prefer more risk than do social gamblers.

Malkin, D., Syme, G.J. . 1986. *Personality and problem gambling*, The International Journal of the Addictions, 21 2: 267-272.

Matched groups of problem and social gamblers were compared in terms of their locus of control and their responses to the Myers Briggs Type Indicator. Contrary to previous studies, no significant differences occurred on the locus of control measure. It was hypothesized that problem gamblers would be more extroverted and intuitive than social gamblers. However, none of the four scales on the Myers Briggs Type Indicator showed a significant difference between the groups.

Manowitz, P., Amorosa, L. F., Goldstein, H. S., Carlton, P. L.. 1993. *Uric acid level increases in humans engaged in gambling: A preliminary report*, Biological Psychology, 36 : 223-229.

There was an interaction of time and activity reflecting primarily an association of increased uric acid levels during gambling over time. The results indicated that gambling can increase plasma levels of uric acid, and the effect can be quite rapid. It is suggested that the increase in uric acid levels noted in the study may be related to psychological activation, and that this increase in uric acid may be directly related to normal and abnormal increases in blood pressure.

Martinez-Pina, A., de Parga, J. L. G., i Vallverdu, R. F., Planas, X. S., Mateo, M. M., Aguado, V. M.. 1991. *The Catalonia survey: Personality and intelligence structure in a sample of compulsive gamblers*, Journal of Gambling Studies, 7 4: 275-299.

Compared with controls, pathological gamblers have an unstable family and work background. Pathological gambling correlates with other addictions, that all the general and specific psychopathology vectors were significant, and that the pathological gamblers' intelligence were lower than in controls. Although the intellectual level affects the results of tests, the results were still significant in pathological gamblers on depression, illness prone behaviors, risk taking and alcoholism when this factor is eliminated.

McConaghy, N., Armstrong, M. S., Blaszczynski, A., Allcock, C.. 1988. *Behavior completion versus stimulus control in compulsive gambling*, Behavior Modification, 12 3: 371-384.

Results support the Behavior Completion Model (BCM) and not the stimulus control model of compulsive gambling; it appears that imaginal relaxation is not inferior to imaginal desensitization as a treatment for compulsive gambling. From the BCM model, imaginal relaxation and imaginal desensitization act by lowering patients' level of arousal, so that failing to complete gambling behavior no longer produced an aversive level of arousal; this was supported in the study. Results indicate that manipulation of an organismic variable rather than a stimulus variable is sufficient to bring about an equivalent therapeutic response.

McConaghy, N. Blaszczynski, A., Frankova, A.. 1991. *Comparison of imaginal desensitization with other behavioral treatment of pathological gambling a two- to nine year follow-up*, British Journal of Psychiatry, 159 : 390-393.

Of 120 pathological gamblers randomly allocated to imaginal desensitization (ID) or to other behavioral procedures (60 to each group) 63 were contacted 2 - 9 years later. Twenty-six of the 33 who received ID reported control or cessation of gambling compared with 16/30 who receive other behavioral procedures. This difference was significant, indicated ID had a specific effect additional to that of other behavioral procedures.

McCormick, R. A.. 1993. *Disinhibition and negative affectivity in substance abusers with and without a gambling problem*, Addictive Behaviors, 18 : 331-336.

Substance abusers (13%) displayed a significant pathological gambling problem, which points to the importance of assessing gambling behavior among substance abusers, especially those who abuse multiple substances. There was a constant, direct relationship between the severity of the subject's gambling problem and measures of impulsivity, disinhibition of aggression and hostility, and negative affectivity, reinforcing an important subtype of substance abusers with these characteristics. Assessing a wide range of impulsive behaviors, including gambling, is critical to designing treatments which address all manifestations of disinhibition simultaneously; assessing psychological traits, such as negative affectivity, can point to supplemental treatments that address precipitants to relapse in subgroups of patients.

McCormick, R.A.. 1994. *The importance of coping skill enhancement in the treatment of the pathological gambler*, Journal of Gambling Studies, 10 (1) Spring : 77-87.

The importance of coping skill enhancement in the treatment of pathological gamblers is discussed. It is particularly critical to assess and enhance the coping skills of relapse prone gamblers who are marked by unusual degrees of impulsivity, high levels of negative affect and feelings of helplessness and hopelessness. A study of 1129 substance abusers, including 140 with serious gambling problems is reported. All were assessed to determine their repertoire of coping skills. The patients with serious gambling problems utilized significantly more avoidance and impulsive coping styles.

McCormick, R.A., Russo, A.M., Ramirez, L.E., Taber, J.I.. 1984. *Affective disorders among pathological gamblers seeking treatment*, Am J Psychiatry, 2 February: 1984.

To assess the frequency of affective disorders in pathological gamblers, the Schedule for Affective Disorders and Schizophrenia was administered to 50 patients. Seventy-six percent of the subjects were diagnosed as having major depressive disorder and 38% as having hypo manic disorder. The patients with major depressive disorder and one patient with schizoaffective disorder, depressed type were significantly more likely to miss work due to gambling. A large number of patients displayed suicidal tendencies.

McCormick, R.A., Taber, J.I. . 1988. *Attributional style in pathological gamblers in treatment*, Journal of Abnormal Psychology, 97 3: 368-370.

This study presents data on the tendency of pathological gamblers to attribute the outcome of events to internal, stable and global cause, as postulated by the reformatted learned helplessness model of depression. There was a positive relationship between measures of depression and the tendency to attribute negative events to internal, global and stable causes. Severity of gambling prior to treatment and attributional style both made significant contributions to the prediction of the severity of gambling on the 6 month follow-up. The measure of depression did not have predictive value.

McCormick, R.A., Taber, J.I.. 1991. *Follow-up of male pathological gamblers after treatment: the relationship of intellectual variables to relapse*. , Journal of Gambling Studies, 7 (2) Summer: 99-109.

Male pathological gamblers entering a comprehensive treatment program were followed-up for 12 months after treatment completion. Twelve month follow-up was obtained for 45 of the 66 patients entering treatment. Total abstinence was reported by 55% (n=25) of the patient located. A relationship was found between abstinence at 6 month follow-up and selected sub-scales of the Wechsler Adult Intelligence Scale, performance scale.

McCormick, R.A., Taber, J., Kruegelbach, N., Russo, A. . 1987. *Personality profiles of hospitalized pathological gamblers: the California personality inventory*, Journal of Clinical Psychology, 43 5: 521-527.

The article presents data on the sample of 70 pathological gamblers, 70 alcoholics in treatment and 70 medical/surgical controls on the California Personality Inventory(CPI). Gamblers and alcoholics differed significantly from hospitalized controls on a numbers of scales, particularly on measure of socialization, ego control, and flexibility. Differences between gamblers and alcoholics were few, with a trend for the alcoholics to be similar to the gamblers and intermediate between the other two groups.

McCusker, C.G., Gettings, B. . 1997. *Automaticity of cognitive biases in addictive behaviors: Further evidence with gamblers*, Journal of Clinical Psychology, 36 : 543-554.

The hypotheses that automatic, non-volitional, attentional and memory biases for addiction-related constructs exist was tested with compulsive gamblers. Gamblers were compared to spouses and to an independent control group using the Stroop procedure and the a word-stem completion task. Gamblers showed selective and automatic interference for gambling-related constructs. Spouses behaved like the control group on this task. An implicit memory bias for gambling-related words was statistically detected only in gamblers although the trend was similar in the comparison with spouses. Further evidence of the specificity of these effects was obtained in subgroup comparisons involving fruit-machine with racing gamblers.

Meyer, G., Hauffa, B., Schedlowski, M., Pawlak, C., Stadler, M., Exton, M.. 2000. *Casino gambling increases heart rate and salivary cortisol in regular gamblers*, Society of Biological Psychiatry, 48 : 1-6.

These data indicate that gambling alters neuroendocrine function - gambling in "real life" situations produces increases in salivary cortisol levels that accompany increased cardiovascular activity. Such effects may contribute to the development of gambling addictions. The data also revealed that persons with less severe gambling problems found the control task to be challenging, whereas this condition provoked no arousal in pathologic gamblers. Gambling has the potential to produce acute, stress-like endocrine responses over the duration of a gambling episode, which can occur for a number of hours.

Meyer, G., Stadler, M.A.. 1999. *Criminal behavior associated with pathological gambling*, Journal of Gambling Studies, 15 1: 29-43.

Addictive gambling behavior is an important criminogenic factor, but this alone cannot explain criminal behavior associated with pathological gambling. Personality variables also directly influence the intensity of criminal behavior whereas social attachment variables have only an indirect effect. This empirical confirmation of the theoretical model (Lisrel) does not imply causality. The predictors of criminal activity are not independent.

Miller, M., Westermeyer, J.. 1996. *Gambling in Minnesota - letters to the editor*, American Journal of Psychiatry, 153 6: 845.

Psychiatric patients were compared to patients in an alcoholism-addictions unit on levels of pathological gambling. The overall rate was about 10 times the rate for the general population. Rate of pathological gambling was lowest among inpatients, although high rates of mild gambling problems occurred in this group.

Mok, W., Hraba, J.. 1991. *Age and gambling behavior: a declining and shifting pattern of participation*, Journal of Gambling Studies, 7 4: 313-335.

The relationship between age and gambling was investigated. It was found that gambling behavior by age varies for different types of gambling; it appears that older gamblers withdraw from multiple types of gambling and concentrate on more limited gambling activity. The sharp decline in gambling behavior for those 65 and older suggests both aging and cohort effects. The general decline in gambling across age groups is thought to be a result of an age decline in experimentation with gambling for self-identity, self-presentation, as well as historical increases in the social acceptance of gambling.

Moore, S.M., Ohtsuka, K.. 1999. *Beliefs about control over gambling among young people, and their relation to problem gambling*, Psychology of Addictive Behaviors, 13 4: 339-347.

It appeared that irrational beliefs supported increased gambling and were strong risk factors for problem gambling, especially when rational control was low. Problem gambling, and to a lesser extent, frequency of gambling, were predicted by control beliefs - Illusion of Control, Need Money, and Belief in Systems. Internal locus of control, measured by the Control Over Gambling scale, was associated with greater frequency of gambling. Younger age and male sex may work independently as risk factors for potential problem gambling.

Moreno, I., Saiz-Ruiz, J., Lopez-Ibor, J. J.. 1991. *Serotonin and gambling dependence*, Human psychopharmacology, 6 : 9-12.

Compared to controls, pathological gamblers showed a blunted prolactin response, but no effects on growth hormone and cortisol levels when the serotonergic probe clomipramine was administered. It is concluded that the 5-HT system shows hypoactivity in pathological gamblers, which supports the inclusion of pathological gamblers in the group of behavioral disturbances characterized by poor impulse control.

Morgan, T., Kofoed, L., Buchkoski, J., Carr, R.. 1996. *Video lottery gambling: effects on pathological gamblers seeking treatment in South Dakota*, Journal of Gambling Studies, 12 4: 451-459.

Results indicate that video lottery gambling is the predominant type of gambling behavior engaged in by gamblers seeking treatment. Subjects who played video lottery along with other forms of gambling, meet more DSM criteria from video lottery gambling than from the greatest "other" type. An association between the video lottery stimulus and a greater severity of addiction is implied.

Nordin, C., Eklundh, T.. 1996. *Lower CSF taurine levels in male pathological gamblers than in healthy controls*, Human psychopharmacology, 11 : 401-403.

The results are consistent with the hypothesis that the amino acid taurine might be involved in the pathogenesis of pathological gambling. The mean cerebrospinal fluid (CSF) level of the inhibitory amino acid taurine was significantly lower in gamblers than in controls; there were no differences regarding other amino acids. Taurine is an inhibitory neurotransmitter and may be related to impulse control; pathological gamblers may have a functional disturbance of the disposition of taurine in the CSF.

Orford, J., Morrison, V., Somers, M.. 1996. *Drinking and gambling: A comparison with implications for theories of addiction*, Drug and Alcohol Review, 15 : 47-56.

When based on attachment and not restricted to substance-related concepts such as tolerance and withdrawal, gambling appears to be just as addictive as alcohol. The results suggest that withdrawal symptoms and their relief by further activity do not play an important role in the maintenance of gambling problems. The complex set of secondary factors, promoting gambling through drive-reduction, in combination with primary, positive incentive derived from the rewards experienced from gambling, seem quite sufficient to explain the state of over attachment which is often termed "addiction" or "dependence", and are proposed as being more central to the process of addiction than withdrawal symptoms in drug addiction as well. Tertiary factors consist of restraints on drug use or activity are lessened, or incentive values increased, as a result of losses caused by excessive activity or drug use.

Pacini, R., Epstein, S.. 1999. *The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon - study 2*, Personality Processes and Individual Differences, 76 6: 972-987.

In a game of chance, when optimality is not an issue, results suggest that there is a strong tendency for people to engage in heuristic processing that is consistent across individuals apart from rational and experiential thinking styles. When optimality is an issue, responses to an increase in incentive depend on differences in both thinking styles. Rationality becomes the determining factor in the degree of nonoptimal responding manifested. An important function of rational processing is to control the influence of maladaptive experiential processing when incentive is high, particularly in people with strong experiential tendencies. Low, but not high, rationality is associated with increasing nonoptimal responding with increasing incentive.

Perez de Castro, I., Ibanez, A., Saiz-Ruiz, J., Fernandez-Piqueras, J.. 1999. *Genetic contribution to pathological gambling: possible association between a functional DNA polymorphism at the serotonin transporter gene (5-HTT) and affected men*, Pharmacogenetics, 9 : 397-400.

This study showed that pathological gambling may be influenced by sex-related factors, at least in the Spanish population, since the short variant of the 5-HTT polymorphism was associated only with male gamblers. A more significant association was found in female than in male patients between a functional polymorphism in the dopamine D4 receptor gene and pathological gambling. It is suggested that the dopaminergic system seems to contribute to susceptibility in women, while the serotonergic system could be involved in susceptibility to pathological gambling in men.

Petry, N. 2000. *Psychiatric symptoms in problem gambling and non-problem gambling substance abusers*, The American Journal on Addictions, 9 : 163-171.

This study compared severity of psychiatric symptoms between substance abusers with and without gambling problems. Data suggest that gambling problems are prevalent in substance abusers and that problem gambling substance abusers suffer from more psychiatric distress than their non-problem gambling counterparts. The need for specialized treatment for such dually diagnosed patients is noted.

Phillips, J.G., Amrhein, P.C.. 1989. *Factors influencing wagers in simulated blackjack.*, Journal of Gambling Behavior, 5 2: 99-111.

Players of the computer simulated blackjack game clearly show a sensitivity to short-term fluctuations in the odds of winning and other factors relevant to their decision making. It is possible to consider wagering in terms of decision processes – slower games, increased control over outcome and winning streaks all increase players wagering. Data suggests that these variables may potentiate each others effects, with the effects of both variables in combination being greater than from each variable alone. This fact stresses the importance of control or involvement in player's decisions. Simulated games can only examine a part of the processes occurring during gambling, thus the extent to which data from simulated gambling can be generalized is limited.

Powell, J., Hardoon, K., Derevensky, J., Gupta, R.. 1999. *Gambling and risk-taking behavior among university students*, Substance Use and Misuse, 34 8: 1167-1184.

The present study examines the relationship between risk taking, sensation seeking, and level of gambling involvement. The Risk Taking Questionnaire was found to be sensitive in distinguishing problem and probable/pathological gamblers. Males were found to be greater risk takers than females, yet females reported greater sensation seeking and risk taking than nonproblem males. This suggests that females scoring high in sensation seeking and risk taking may be at risk for later encountering significant problems associated with their gambling behaviors. Results also indicate that excessive gamblers are significantly greater risk takers than social gamblers.

Rachlin, H., Siegel, E., Cross, D.. 1994. *Lotteries and the time horizon*, Psychological Science, 5 6: 390-393.

The present study aimed to confirm that lotteries are grossly overvalued relative to their normative worth. This was confirmed by the finding that the subjective value of lotteries approaches above-zero value as probability grows smaller and smaller.

Raghunathan, R., Pham, M.. 1999. *All negative moods are not equal: motivational influences of anxiety and sadness on decision making*, Organizational Behavior and Human Decision Processes, 79 1: 56-77.

The 3 related experiments examine how affective states influence the decision process. Results show that 2 negative affective states of the same valence - anxiety and sadness - can have distinct influences on decision-making about gambles. The notion that anxiety increases preferences for lower risk options, whereas sadness increases preference for higher reward (higher risk) options was proved. This was true for different scenarios of gambling as well. An active-feeling monitoring explanation is suggested, whereby anxiety and sadness cease to influence peoples decisions, presumably because peoples feelings are less relevant when they are making decisions on behalf of someone else.

Ramirez, L., McCormick, R., Lowy, M.. 1988. *Plasma cortisol and depression in pathological gamblers*, British Journal of Psychiatry, 153 : 684-686.

These results support the existence of a neuroendocrine correlate to a subtype of pathological gambler. This gambler tends to have a long history of dysphoria and to attribute responsibility and blame to themselves, in comparison to a gambler who is narcissistic, gregarious, and easily bored by all but high arousal stimulation. Authors suggest that some individuals may develop an addictive pattern as a means of coping with the distress that may accompany chronic hyperarousal or hyper-reactivity of the HPA axis (hypothalamic-pituitary-adrenal axis).

Raviv, M.. 1993. *Personality characteristics of sexual addicts and pathological gamblers*, Journal of Gambling Studies, 9 1: 17-30.

Pathological gamblers, sexual addicts, and non-addicts were compared on a number of measures. Individuals in the pathological gambling group were more depressed than the control non-addicted group. Sexual addicts were more depressed than the pathological gambling group but did not differ on any other measures. Present findings are inconsistent with previous research concerning pathological gamblers and personality variables of anxiety, obsessive-compulsiveness, and interpersonal sensitivity.

Roby, K., Lumley, M.. 1995. *Effects of accuracy feedback versus monetary contingency on arousal in high and low frequency gamblers*, Journal of Gambling Studies, 11 2: 185-193.

Physiological reactivity and subjective arousal and displeasure were greater when money was wagered than when only feedback was given regarding accuracy of predictions. These findings suggest that gambling motivation is linked to actual monetary contingencies, as opposed to feedback of whether or not predictions are correct. Results lead to conclusion that many regular gamblers gamble for excitement and become aroused in the process.

Romanus, J., Garling, T.. 1999. *Do changes in decision weights account for effects of prior outcomes on risky decisions?*, Acta Psychologica, 101 : 69-78.

The present study supports the loss-sensitivity principal (i.e.. prior outcome is only added to the expected losses) as an explanation of integration of prior outcomes in risky decisions. The effect of a prior outcome was found to be stronger when the probabilities were inexact than when they were exact, and therefore possibly more open to subjective influences. Ratings of subjective probability were not affected by a prior outcome.

Rosecrance, J.. 1986. *Attributions and the origins of problem gambling*, The Sociological Quarterly, 27 4: 463-477.

Ethnographic data revealed that a disheartening loss or bad bet is frequently the catalyst for the onset of problem gambling and not necessarily a big win, as suggested by clinical data. The process whereby controlled gambling becomes problematic can be understood using attribution theory. It is noted that adaptations to bad bets are related to regaining an internal locus of control. Two main findings were that the process of becoming involved in problem gambling is reversible rather than inexorable and that other gamblers can provide help in coping with gambling problems; permanently discontinuing participation is not necessary to alleviate the symptoms of problem gambling.

Rosecrance, J.. 1986. *Adapting to Failure: The case of horse race gamblers*, Journal of Gambling Behavior, 2 2: 81-94.

Analysis of participant observation data, drawn from several horse betting groups, revealed that the implementation of appropriate strategies largely determines whether gamblers can maintain participation. Adaptive strategies include: voluntary external controls to manage individual participation, a reorientation of goals that involve evaluations of gambling practices, aligning actions to maintain identity and reduce the saliency of problematic events and lastly, increasing short-term rewards in an attempt to deal with a thin reward structure.

Rosenthal, R.J., Lesieur, H.R.. 1992. *Self-reported withdrawal symptoms and pathological gambling*, The American Journal of Addictions, 1 2: 150-154.

Results of this study support the notion that pathological gamblers experience more physiological withdrawal-like symptoms when attempting to stop gambling than substance-dependent controls. There is some support for the connection between a drive for excitement and withdrawal symptoms. Symptoms correlated with number of hours spent gambling, severity of problem, and presence of dissociation. None of the symptoms correlated with gender, type of gambling, or extent of alcohol or drug use while gambling.

Roy, A.. 1991. *Cerebrospinal fluid diazepam binding inhibitor in depressed patients and normal controls*, Neuropharmacology, 30 12B: 1441-1444.

Diazepam binding inhibitor (DBI) is a neuromodulatory peptide of GABA neurotransmission. Levels of DBI in CSF were found to be elevated in depressed patients, when compared to age- and sex-matched normal controls. Levels of the peptide, corticotropin-releasing hormone (CRH), in CSF have been found to be elevated in depressed patients. Significant positive correlations between levels of DBI and CRH in the CSF of depressed patients and normal controls were found. Pathological gamblers were also studied. This data suggest the possibility that DBI may have a role in coordinated responses to stress in humans, in addition to its possible role in the pathophysiology of depression.

Roy, A., Adinoff, B., Roehrish, L., Lamparski, D., Custer, R., Lorenz, V., Barbaccia, M., Guidotti, A., Cost, E., Linnoila, M.. 1988. *Pathological gambling: a psychobiological study*, Arch Gen Psychiatry, 45 April: 369-373.

Authors investigated a substrate of pathological gambling by measuring levels of norepinephrine, monoamine metabolites, and peptide in cerebrospinal fluid, plasma, and urine. Pathological gamblers had a significantly higher centrally produced fraction of CSF levels of 3-methoxy-4-hydroxyphenylglycol as well as significantly greater urinary outputs of norepinephrine than controls. These

results suggest that pathological gamblers may have a functional disturbance of the noradrenergic system. This system has been postulated to underlie sensation-seeking behaviors, aspects of which are thought to be abnormal among pathological gamblers.

Roy, A., Berrettini, W., Adinoff, B., Linnoila, M. . 1990. *CSF Galanin in alcoholics, pathological gamblers and normal controls: a negative report*, Biol Psychiatry, 27 : 923-926.

Authors tested the hypotheses that alcoholics and pathological gamblers would have cerebral spinal fluid (CSF) levels of galanin significantly different from controls. The hypothesis proved not to be supported. This lack of difference suggests that galanin is probably not of pathophysiological importance in either alcoholism or pathological gamblers. CSF levels of galanin suggest the possibility an altered relationship between NE and is a putative neuromodulator in this disorder.

Roy, A., Custer, R., Lorenz, V., Linnoila, M.. 1988. *Depressed pathological gamblers*, Acta psychiatr. scand., 77 : 163-165.

Depressed pathological gamblers reported on life events preceding a depression and were compared with normal controls. Depressed gamblers had more undesirable and exit life events which were dependent on gambling, during the 6 month period before the onset of a major depressive episode than controls. These results suggest that pathological gamblers who become depressed, do so partly as a consequence of the deleterious effects of the gambling on their lives.

Roy, A., Custer, R., Lorenz, V., Linnoila, M. . 1989. *Personality factors and pathological gambling*, unable to determine at this time, unknown unknown: 37-39.

Male pathological gamblers were compared with male normal controls for their scores on 3 personality questionnaires. Pathological gamblers were found to have significantly higher psychoticism and neuroticism scores on the Eysenck Personality Questionnaire than controls. Gamblers also had significantly higher total hostility scores on the Hostility and Direction of Hostility Questionnaire.

Roy, A., DeJong, J., Linnoila, M.. 1989. *Extraversion in pathological gamblers*, Arch Gen Psychiatry, 46 : 679-681.

Pathological gamblers were compared on personality scores and indexes of noradrenergic function. Significant positive correlation between indexes of noradrenergic function in CSF, plasma, and urine and extraversion scores in pathological gamblers were found. Results suggest that the disturbance in the central noradrenergic system in pathological gamblers may be partly reflected in their personality.

Roy, A., Linnoila, M.. 1989. *CSF studies on alcoholism and related behaviors*, Prog. Neuro-Psychopharmacol. & Biol. Psychiat., 13 : 505-511.

This study investigated possible biological substrates of impulsivity. Pathological gamblers showed significantly increased central noradrenaline metabolism, perhaps related to sensation-seeking. Authors suggest that sensation seeking may underline risk taking behavior, and the biological substrate associated with sensation-seeking may be an increased tonic activity of the central noradrenergic system.

Rugle, L., Melamed, L.. 1993. *Neuropsychological assessment of attention problems in pathological gamblers*, The Journal of Nervous and Mental Disease, 181 2: 107-112.

This study determined whether pathological gamblers differed from nonaddicted controls on measures of attention. On measures of attention, which reflect executive, frontally mediated attention functions, gamblers performed significantly worse. Higher rates of childhood behaviors of a form associated with attention dysfunction were found among gamblers. This suggests that attention deficits and the behavior problems associated with them have been a long-term problem in this addicted group. Results suggest attention deficits may be a risk factor for development of addictive disorders.

Russo, A., Taber, J., McCormick, R., Ramirez, L.. 1984. *An outcome study of an inpatient treatment program for pathological gamblers*, Hospital and Community Psychiatry, 35 8: 823-827.

A gambling treatment program for pathological gamblers (program aimed for abstinence, reduction of urges, and restoration of social functioning) was assessed after one year. Significant relationships between abstinence from gambling and improved interpersonal relationships, better financial status, decreased subjective depression, and participation in professional aftercare and self help groups. Authors suggest that inpatient treatment programs include both structured aftercare and immediate introduction into self-help groups.

Schlottmann, A.. 2000. *Children's judgements of gambles: a disordinal violation of utility*, Journal of Behavioral Decision Making, 13 : 77-89.

Judgments for single and duplex gambles were made by 5-10 yrs old children and adults (control) in order to investigate if children make a disordinal violation of utility. When chances of winning a single prize were slim, an additional change of winning a second prize was appreciated. But when chances of winning that single prize was high, the same additional chance of winning the second prize was not appreciated and decreased overall worth. Data indicate that children average part worth's instead of adding them. This result suggests that an additive operator may not be a natural component of the intuitive psychological concept of expected value that emerges in childhood.

Schmitt, W. A., Brinkley, C. A., Newman, J. P.. 1999. *Testing Damasio's somatic marker hypothesis with psychopathic individuals: Risk takers or risk averse?*, Journal of Abnormal Psychology, 108 3: 538-543.

Data suggested that participants scoring high on psychopathy may not differ from controls with regard to using somatic markers, at least as measured by the particular gambling task used. The positive association between anxiety and risk aversion for Caucasians is consistent with theories of anxiety and behavioral evidence; the negative association between these factors for African Americans is not. Caucasians became more risk averse over the course of the trials, but results indicated that African American offenders failed to become risk averse over time (could be due to many factors)

Schwarz, J., Lindner, A.. 1992. *Inpatient treatment of male pathological gamblers in Germany*, Journal of gambling studies , 8 (1) Spring: 93-109.

Demographic and psychological traits of gamblers and control patient with other addictions were compared. Most gamblers were young, often previously convicted of theft, highly indebted, in danger of committing suicide, and susceptible to other addictive substance, especially alcohol. Gamblers and alcoholics were integrated into groups. the pragmatic and symptom-oriented therapy proved to be good for the gamblers. A follow-up with 49 patients for one year and 24 patients for two years found 71% abstinent after one year and 62% abstinent after two years of treatment. These results are similar to those obtained with alcoholics.

Shaffer, H.J., Bilt, J.V., Hall, M.N. . 1999. *Gambling, drinking, smoking, and other health risk activities among casino employees*, American journal of industrial medicine , 36 : 365-378.

A sample of 3841 full time casino employees representing four geographic sites were surveyed about gambling, drinking, smoking and theory health risk behaviors. The study found that casino employees have a higher prevalence over the past year of level 3 (pathological) gambling behavior than the general adult population, but a lower prevalence of past year level 2 (problem) gambling than the general adult population. In addition, casino employees have higher prevalence of smoking, alcohol problems, and depression than the general adult population.

Sharpe, L. . 1995. *Differences in preferred level of arousal in two sub-groups of problem gamblers: a preliminary report.* , Journal of gambling studies, 11 (2) Summer: 221-229.

Authors found that problem poker machine gamblers were more anxious and reported avoiding arousal more frequently than the horse race gamblers. Alternatively, problem horse race gamblers were found to prefer heightened levels of arousal and appeared to gamble to achieve these optimal levels of arousal. However, there was no difference between the groups on proneness to boredom. The present results provide evidence which is consistent with the Reversal theory and its application to the field of problem gambling.

Sharpe, L., Tarrier, N., Schotte, D., Spence, S. H.. 1995. *The role of autonomic arousal in problem gambling*, Addiction, 90 : 1529-1540.

There is a relationship between autonomic arousal and problem gambling in the absence of gambling behavior. Strong support is provided for the role of cognitions in the mediation of this arousal. An optimal treatment would address both the arousal component of gambling behavior and the attributions and cognitions gamblers make in relation to their gambling environment.

Shinohara, K., Yanagisawa, A., Kagota, Y., Gomi, A., Nemoto, K., Moriya, E., Furusawa, E., Furuya, K., Terasawa, K.. 1999. *Physiological changes in pachinko players; beta-endorphin, catecholamines, immune system substances and heart rate.*, Applied Human Science, 18 2: 37-42.

The purpose of this study was to investigate beta-endorphin, catecholamines, immune system responses and heart rate during the playing of pachinko. Results suggest that intracerebral substances such as beta-endorphin and dopamine are involved in the habit-

forming behavior associated with pachinko. The increase in beta-endorphin suggest that playing pachinko also has stress reduction effects for regular pachinko players.

Slutske, W. S., Eisen, S., 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.

Subclinical pathological gamblers (PG) and DSM-III-R PG have many, perhaps all, of the same risk factors but differ quantitatively, perhaps reflecting that subclinical PG may be a milder form of PG rather than an etiologically distinct syndrome. Risk for addictive disorder (AD) accounts for a significant but modest proportion of the genetic and environmental risk for subclinical PG and DSM-III-R PG disorder. The association between gambling related problems and AD were due to additive genetic influences and, to a lesser extent, nonshared environmental influences and measurement error.

Specker, S., Carlson, G., Edmonson, K., Johnson, P., Marcotte, M.. 1996. *Psychopathology in pathological gamblers seeking treatment*, Journal of Gambling Studies, 12 1: 67-81.

Psychiatric comorbidity in pathological gamblers (PG) were identified. Axis I disorder (affective disorders, substance use disorders and anxiety disorders) were all higher for PG's than controls. Half of all lifetime psychiatric disorders were current, with high rates of current psychopathology that preceded the problem gambling. This suggests that persons with specific psychiatric illnesses may be more likely to develop pathological gambling. High rates of Axis II personality disorders were not found. Physical/sexual abuse is a suggested precipitating factor in pathological gambling. 4 possible typologies have been identified: "female avoidant gambler", the "escapist", "male thrill seeking", and the "late onset" gambler with preexisting Axis I psychopathology which was especially common in this sample.

Steel, Z., Blaszczynski, A.. 1996. *The factorial structure of pathological gambling*, Journal of Gambling Studies, 12 1: 3-20.

Results suggest that pathological gambling consists of a number of factors which include: psychological distress, sensation-seeking tendencies, criminal behavior and liveliness, and impulsivity-antisocial dimensions. Female gamblers may differ in relation to manifesting psychological distress. Impulsive Antisocial factor was the most clinically useful because of its association with gambling behavior and indices of poor psychosocial functioning.

Steinberg, M., Kosten, T., Rounsaville, B.. 1992. *Cocaine abuse and pathological gambling*, The American Journal on Addictions, 1 2: 121-132.

In this study, cocaine abusers diagnosed with lifetime pathological gambling problems were found to have greater rates of ADD diagnosis than abusers without gambling problems suggesting that ADD preceded the drug use rather than substance abuse causing the attention deficits. Pathological gamblers in this sample also had greater sensation seeking behavior. Depressive disorders did not differ among groups.

Stewart, R.M., Brown, R.I.F.. 1988. *An outcome study of gamblers anonymous*, British Journal of Psychiatry, 152 : 284-288.

Retrospective and prospective study of Gamblers Anonymous suggest that total abstinence from gambling was maintained by 8% of all comers at one year from first attendance and by 7% at two years. These early losses, which cannot be dismissed as due to mere lack of motivation, must remain a matter of great concern for all who seek to improve the help available to people with gambling addictions.

Sylvain, C., Ladouceur, R., Boisvert, J.. 1997. *Cognitive and behavioral treatment of pathological gambling: a controlled study*, Journal of Consulting and Clinical Psychology, 65 5: 727-732.

The efficacy of a cognitive-behavioral treatment package (components of treatment were a) cognitive correction of erroneous perceptions about gambling, b) problem-solving training, c) social skills training d) relapse prevention) was evaluated over a 12 month period. This study shows the effectiveness of a cognitive and behavioral treatment for pathological gamblers - 86% of treated participants were no longer considered pathological gamblers at end of treatment. They also had greater perception of control over gambling problem and increased self-efficacy in high-risk gambling situations.

Taber, J. I., McCormick, R. A., Russo, A. M., Adkins, B. J., Ramirez, L. F.. 1987. *Follow-Up of pathological gamblers after treatment*, The American Journal of Psychiatry, 144 6: 757-761.

A sizable proportion (56%) of seriously impaired pathological gamblers were able to maintain abstinence and general behavioral improvement after an intensive, short-term, structured treatment program. Participation in Gamblers Anonymous was an important factor in continued abstinence. These results support the proposition that pathological gambling is a treatable disorder and that

clinicians, regardless of their treatment setting, need to become skilled in diagnosing this disorder in their patients and providing or referring them for treatment.

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.

Pathological gamblers were found to be deficient in ego strength and in measure of achievement motivation, and in achievement via conformance. This may be due to narcissistic personality traits. Treatment needs to include vocational training and ego development

Taber, J., McCormick, R., Ramirez, L.. 1987. *The prevalence and impact of major life stressors among pathological gamblers*, The International Journal of the Addictions, 22 1: 71-79.

The present study reinforces the idea that for a select number of compulsive gamblers, severe life trauma is likely to be a major factor. Rates of depression, anxiety and avoidant in personality style were found to be higher in pathological gamblers who experienced higher trauma in their lives. The authors focus on the concept of learned dysthymia, a chronic state of negative affect related to cumulative life trauma and seemingly instrumental in potentiating addictive euphoria.

Templer, D. I., Kaiser, G., Siscoe, K.. 1993. *Correlates of pathological gambling propensity in prison inmates*, Comprehensive Psychiatry, 34 5: 347-351.

A substantial percentage of inmates appear to have gambling problems (47%), and pathological gambling propensity is apparently associated with other psychiatric and behavioral problems, including intelligence, depression, psychasthenia, and alcoholism. Due to the association of other psychopathology with pathological gambling, it is suggested that the treatment plan should sometimes include not only direct focus on the gambling, but also on individual mental health when indicated.

Tepperman, J. H.. 1985. *The effectiveness of short-term group therapy upon the pathological gambler and wife*, Journal of Gambling Behavior, 1 2: 119-130.

Treatment couples showed higher awareness and concerns to the conflicts in neurotic relationships, whereas, the control wives continued to blame gambling as the essential problem rather than the symptom of chaotic, but enduring marriages. Resistance to depression remained intact in the experimental condition. It was concluded that this approach was but a possible stepping stone to break through an intensively well-fortified marital complex.

Toneatto, T., Skinner, W.. 2000. *Relationship between gender and substance use among treatment-seeking gamblers.*, The Electronic Journal of Gambling Issues, 1 : 1-11.

Results suggest that female problem gamblers reported greater lifetime use of psychiatric medications, in particular antidepressants, anxiolytics, and sedatives than male problem gamblers. While the relationship between gender and substance use appears to be consistent with what is found in the general population, the rates are higher among problem gamblers seeking treatment. Elevated rates of psychotropic drug use, especially among the female population, suggests considerable comorbidity in this population.

Torne, I.V., Konstanty, R.. 1992. *Gambling behavior and psychological disorders of gamblers on German-style slot-machines*, Journal of Gambling Studies, 8 (1) Spring: 39-59.

Results of this study had two main conclusions: 1. The amount of time spent on gambling activities per week and the number of years since starting gambling were not significant predictors of the extent of subjective stress related to gambling. 2. There are various sources for the subjective stress of gambling, such as marital discord and lack of social assertiveness. In a subgroup, stress was directly related to gambling. Generally, a higher incidence of alcohol abuse and depression in the stressed group of gamblers was found.

Tremblay, G. C., Huffman, L., Drabman, R. S.. 1998. *The effects of modeling and experience on young children's persistence at a gambling game*, Journal of Gambling Studies, 14 2: 193-210.

Seeing a videotaped model win or lose had no effect on the persistence of children at a gambling game involving incentives; nor did seeing a model vs. not observing one at all. Playing again one week later, children playing for incentives exhibited a more successful strategies, quitting sooner and with more winnings. Children choose to play more trials of the game with incentives than one with no incentives. These results point to the possibility of inoculating children at an early age so that they approach risk-taking opportunities with skepticism.

Trevorrow, K., Moore, S.. 1998. *The association between loneliness, social isolation and women's electronic gaming machine gambling*, Journal of Gambling Studies, 14 3: 263-284.

This study indicated that loneliness and social isolation were not significant motivators in any general way for women engaging in relatively frequent gambling. The problem gamblers in this study saw themselves as more lonely, but not in the sense of social isolation. Problem gambling women were more likely to be involved in social networks for which gambling was normative. It is suggested that loneliness is a consequence or a vulnerability factor for problem gambling.

Vitaro, F., Arseneault, L., Tremblay, R.. 1999. *Impulsivity predicts problem gambling in low SES adolescent males*, Addiction, 94 4: 565-575.

This study investigated whether impulsivity measured early in low socioeconomic status adolescents could predict problem gambling in late adolescents. Results indicate that beyond the effect of maternal occupational prestige, gambling during early adolescence, aggressiveness and anxiety at age 12, two impulsivity measures (card playing task and Eysenck self-rated impulsivity) additively predict problem gambling at age 17. These results are consistent with the view that problem gamblers have response modulation deficits - that is, gamblers ignore negative cues from their environment and consequently do not alter their ongoing behavior. Results are consistent with DSM-IV classification of pathological gambling as an impulse control deficit.

Vitaro, F., Arseneault, L., Tremblay, R.E. . 1996. *Dispositional predictors of problem gambling in male adolescents*, Am J Psychiatry, 154 (12) December: 1769-1770.

The study investigated the possible relationship between impulsivity in early adolescence and gambling status in late adolescence. On both measures of impulsivity, non gamblers had the lowest scores, recreational gamblers had the next higher scores, low problem gamblers had still higher scores, and high problem gamblers had the highest scores. These findings support the DSM-IV classification of problem gambling as a deficit in impulse control .

Vitaro, F., Bujold, A.. 1996. *Predictive and concurrent correlates of gambling in early adolescent boys*, Journal of Early Adolescence, 16 2: 211-228.

As early as age 13, gambling is linked to delinquency and substance use. Although the three are related, they do not share exactly the same personality antecedents. Results indicate that gamblers do not have impulse control deficits, rather, they seem to have inhibition deficits reflected by the low harm-avoidance scores.

Vitaro, F., Ferland, F., Jacques, C., Ladouceur, R.. 1998. *Gambling, substance use, and impulsivity during adolescence*, Psychology of Addictive Behaviors , 12 3: 185-194.

The study tested whether problem gambling and substance use in adolescents are related and whether they could have a common link with impulsivity. Results indicated that problem gamblers were more at risk of also being problem substance users and vice versa than non problem participants. In addition, comorbid participants were more impulsive than problem gamblers only or problem substance users only. It was suggested by the authors that there is a possibility that problem gambling and substance use develop simultaneously during adolescence and share a common impulse-control deficit origin.

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.

Through a descriptive analysis, characteristics of non gamblers, non-problem gamblers, and problem gamblers were explored. Although non gamblers were most likely to be older White women with modest education and income, problem gamblers were most likely to be young, nonwhite males. Problem gamblers were most likely to be male, nonwhite, and single. Their educational attainment and household income were close to that of non-problem gamblers, but they had significantly lower self-esteem scores - the lowest self esteem scores of the three groups.

Walker, M. B.. 1992. *Irrational thinking among slot machine players*, Journal of Gambling Studies, 8 3: 245-261.

Slot machine players verbalized more irrational thinking than video poker or video amusement players, and slot machines elicited more irrational thinking than the other to machine types. Slot machine players exhibited relatively greater amounts of irrational thinking when playing their preferred game. The results provide support for a cognitive view of the origins of gambling problems.

Walters, G. D., Contri, D.. 1998. *Outcome expectancies for gambling: Empirical modeling of a memory network in federal prison inmates*, Journal of Gambling Studies, 14 2: 173-191.

Outcome expectancies for gambling fall along the same two dimensions (positive-negative and arousing-sedating) that have previously been identified for alcohol expectancies and general affective response regardless of race or level of gambling involvement. The primacy of the arousal-sedation dimension for gambling expectancies indicates that gambling is highly arousing. Outcome expectancies may ultimately be the variable that links arousal and gambling. Prevention and treatment based on altering outcome expectancies and experiencing negative consequences of gambling are advocated.

Westphal, J., Rush, J., Stevens, L., Johnson, L.. 2000. *Gambling behavior of Louisiana students in grades 6 through 12*, *Psychiatric Services*, 51 1: 96-99.

A significant minority (12-16%) of Louisiana students acknowledged gambling related symptoms and life problems. The association of problem and pathological gambling with use of alcohol, tobacco, and marijuana provides preliminary support for the inclusion of gambling among other adolescent risk behaviors.

Whitman-Raymond, R. G.. 1988. *Pathological Gambling as a defense against loss*, *Journal of Gambling Behavior*, 4 2: 99-109.

This paper explores the idea that pervasive developmental loss is a core issue for the compulsive gambler resulting in an intolerance for the anticipation of future losses and the certainty of mortality. All subjects reported extensive developmental losses. Treatment should include assessing gamblers' history of formative losses, evaluating the effects of these losses on their way of looking at the world, and building their capacity to cope with the prospect of future loss.

Winters, K.C., Rich, T.. 1998. *A twin study of adult gambling behavior*, *Journal of Gambling Studies*, 14 (3) Fall: 213-225.

A twin study explored the genetic influence on gambling behavior. Male monozygotic (MZ) revealed significantly greater similarity on gambling frequency associated with 'high-action' games than male dizygotic (DZ) twins. The heritability estimated for involvement in these types of games among males were moderate to significant. All MZ versus DZ comparisons among males for 'low-action' games were non significant, as were MZ versus DZ comparisons among females for both types of games. Findings suggest that genetic influence may be important in the origins of certain types of gambling by men.

Wolfgang, A. K.. 1988. *Gambling as a function of gender and sensation seeking*, *Journal of Gambling Behavior*, 4 2: 71-77.

It appears that, in our culture, boys have more experience with gambling than girls; however, there are personality factors independent of gender that make gambling more attractive to particular young adults when they have a free choice. For expected future gambling, there were no gender differences, and ratings were related to disinhibition for males and females with boredom also associated with susceptibility for females. There was no significant differences in reported past/present gambling related to any sensation seeking score.

Wood, R. T. A., Griffiths, M. D.. 1998. *The acquisition, development and maintenance of lottery and scratchcard gambling in adolescence*, *Journal of Adolescence*, 21 : 265-273.

Youths surveyed may not perceive National lottery (and to a lesser extent scratchcards) as forms of gambling. More males were in favor of gambling. A high percentage of adolescents thought that they would win a lot of money on either of these two activities; males were more optimistic than females about winning. Most adolescents had control over their gambling behavior; however, rates of problem gambling were 6% (predominantly male participants) and many more adolescents reported some aspects of problem gambling. Results suggest the possible effectiveness of the media to alter the general public's opinions towards gambling.

Zimmerman, M. A., Meeland, T., Krug, S. E.. 1985. *Measurement and Structure of Pathological Gambling Behavior*, *Journal of Personality Assessment*, 49 1: 76-81.

Pathological gambling appears to be a complex expression of neurotic, psychopathic, and impulsive factors. This study proposes a multidimensional model of the disorder, which could help clinicians differentiate various gambling behaviors more precisely, which would enable more appropriate treatment decisions. Community programs and early detection methods could benefit from this perspective and provide the basis for preventive strategies.

Zion, M. M., Tracy, E., Abell, N.. 1991. *Examining the relationship between spousal involvement in Gam-Anon and relapse behaviors in pathological gamblers*, *Journal of Gambling Studies*, 7 2: 117-131.

No significant difference was found in the relapse of those gamblers with or without a spouse in GamAnon. Spousal involvement in GamAnon did not influence the number of times the gambler relapsed, how long the gambler was clean before s/he relapsed, or the perceived degree of support. Compared with gamblers who relapsed, those who had not relapsed, reported significantly higher past

involvement with addictive-like behaviors for both self and spouse. There might be a need for interventions which focus on multiple addictive-like behaviors rather than the primary presenting one.