

**An Explorative Investigation of the Effects of Information Technology on Gambling
and Gambling-Related Behaviours**

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Statement of Originality

The findings in this thesis are original and independent. No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification at this or any other university or other institute of learning.

Abstract

Raylu and Oei (2002) acknowledged a paucity of research into pathological gambling, and that a lack of a uniform conceptual model outlining integral aetiological processes has restricted development of effective treatments. It is proposed that this problem has increased as a result of the influence of Information Technology on the structural and environmental characteristics of gambling, and gambling-related behaviours. Current conceptualisations of pathological gambling have been based on research into traditional vis-à-vis forms of gambling. It is proposed that current understandings of pathological gambling behaviour that have not incorporated research of online gambling and IT-related gambling behaviour are incomplete. The objective of this research programme was to commence explorative research into IT-related gambling behaviours for the purpose of providing emergent theoretical concepts to investigate in future research as potential risk factors for pathological gambling. Using a mixed-method approach to data collection and analysis, the thesis presents a detailed conceptualisation of cognitive and behavioural processes involving IT that are employed by gamblers. The direction of investigation within the thesis was determined by the emergent theoretical framework presented in the first study, which provided a substantive picture of how IT has affected gambling behaviour. The core category to emerge suggests that IT increases motivation to participate in gambling, and increases pre-occupation with gambling, caused by a perceived increase in the ability to control gambling outcomes, an increase in perceived consumer value and an increase in the expediency of the behaviour. The structural characteristics of online gambling were also implicated as causal factor in the reduction of gambling discipline leading to an increase in participation. Several of the theoretical propositions to emerge through grounded theory were explored in the remaining studies. Implications of emergent findings regarding responsible and pathological gambling were discussed, and recommendations for future research studies were proposed. Overall, the thesis presents a thorough description of how IT has affected gambling behaviour, which provides direction for future research to assist in expanding current aetiological understandings of pathological gambling to be inclusive of the impact of developing technology.

Chapter 1

Introduction

1.1 Introducing the Research Objectives

Gambling availability in the UK has been substantially increased through the passing of the Gambling Bill 2005. By its full implementation in September 2007 the UK gambling industry will experience a significant reduction in trading restrictions. Before the aforementioned act, gambling in the UK had been regulated under the stipulations of the The Gambling Act 1968, which clearly stated that the objective of permitting commercial gambling was simply to satiate demand rather than to stimulate growth. Because of this, the gambling industry was prohibited from advertising their product to the public, along with several other restrictions regarding the provision of gambling activities. The legislative reforms of 2005 meant that for the first time in the UK the industry are able to actively promote their product and in turn expand to meet higher participation rates.

The objective of the restrictive nature of the 1968 legislation in the UK, and the prohibitive stance on gambling throughout the history of the US, was motivated by social concern for the negative impact that gambling and problem gambling would have on the community (Reith, 2006). Several pressure groups in the UK such as problem gambling charities and religious groups protested emphatically against the recent relaxation of gambling laws because of respective fears of increased problem gambling, and the effect of increased gambling on morality in society. Equally, those with vested interests vehemently proclaimed the positive outcomes of the expansion of the gambling industry, with the primary benefit proposed being the regeneration of deprived communities through the construction of new casinos providing jobs and expenditure in the community. The debate remains contentious, driven by the fact that arguments on both sides are supported by evidence lacking objectivity and scientific validity (Reith, 2006).

The lack of quality sources of information from which to evaluate the social costs of gambling is an issue of primary concern because it leaves us in a position of creating social policy on gambling based on incomplete and inconsistent information. Reith (2006) commented that research into the social impact of gambling is still in its infancy internationally, and that such research in the UK is very thin. Furthermore, the National Research Council (NRC) of the US, when evaluating the literature on the social impact of gambling, reported that the majority of the studies used methods that were so methodologically unsound that they invalidated their conclusions. The principal methodological limitations criticised were the lack of large enough samples, the use of treatment seeking problem gamblers and the lack of control groups used in the studies. The inability to achieve sufficient sample sizes for research studies into problem gambling is a pervasive problem, as gamblers are a population whom are hard to identify and furthermore are reluctant participants based primarily on the social undesirability of gambling (Parke & Griffiths, 2002). As a result, researchers often turn to sampling problem gamblers who are receiving treatment, either within the health service or through charitable foundations such as Gambler's Anonymous (GA). As Reith (2006) contended, using treatment seeking gamblers as participants is liable to skew the findings, as it is probable that those who were compelled to seek treatment are more likely to experience more extreme negative consequences in comparison to problem gamblers in the general population.

Further methodological criticisms of existing research on the social impacts of gambling included the predilection to report a snapshot perspective, rather than an expansive longitudinal study of the effects of gambling on a community (NRC, 1999). This criticism stemmed indirectly from the difficulty in transforming the effects of gambling into quantifiable terms, given the complex myriad of behaviours associated with gambling. Problem gambling is strongly associated with several other behavioural disorders and mental health problems such as substance abuse and affective disorders such as anxiety and depression (Lesieur, 1998). This makes establishing causality in the studies problematic as it is a complicated process to disentangle each disorder and determine what effects gambling alone accounts for (Reith, 2006). Through employing a

longitudinal methodology, further data would be provided to aid in identifying effects on society, both positive and negative, of gambling within a community. For example, a study exploring the economic regenerative benefits of introducing a casino in a deprived community may be over-exaggerated if the study was conducted during a period of general economic growth. A longitudinal study would be more equipped to control for external causes of social change, and produce a more valid assessment of the effect of the expansion of gambling.

In contrast to the highlighted shortcomings of the majority of research into the social impact of gambling, two key studies that employed rigorous methodologies are available to illuminate probable effects of gambling on society. The first study is the report carried out by the Australian Productivity Commission (PC) published in 1999, which provided a comprehensive, objective review of the role of gambling in Australian society. Secondly, after the NRC condemned existing literature on the subject, the National Gambling Impact Study Commission (NGISC) procured the National Opinion Research Centre (NORC) to conduct new research in 1999, which evaluated the impact of both gambling and problem gambling on numerous aspects of life in the US, including crime, economic prosperity, social functioning and health.

1.1.1 Crime

As outlined earlier it is difficult to determine accurately what effect gambling has on the level of crime in society because of high levels of co-morbidity, however, we are given an indication of possible effects by exploring the relationship between pathological gamblers and crime. Lesieur (1998; 1987) proposed that pathological gamblers often become involved in white collar crime such as fraud and embezzlement, and also theft, in order to reduce the consequences of incurring substantial losses when gambling. Pathological gamblers are reported to often resort to illegal activities in order to account or conceal for losses and even to acquire more funds to gamble with (Lesieur, 1998). Furthermore, pathological gamblers are more likely to have been arrested in comparison to low risk gamblers and non-gambling individuals; approximately 1 in 3 pathological

gamblers have been arrested in comparison to 1 in 10 and 1 in 25 social and non-gamblers respectively (NGISC, 1999). Furthermore, a pathological gambler has a substantially higher probability of becoming incarcerated than a social or non-gambler. According to the NGISC (1999), each pathological gambler arrested costs the government approximately \$10,000, in policing and correctional costs (i.e. imprisonment). The Australian Productivity Commission (1999) reported similar findings, with pathological and problem gamblers substantially more likely to commit fraud or theft than low risk gamblers although only 40%, approximately, of those who committed a crime were charged. Moreover, a similar finding has been reported in the UK, with GA attendees being significantly more likely to have committed theft or fraud (Brown, 1987).

Blaszczynski and McConaghy (1992) proposed that the stress a pathological gambler may experience, by trying to conceal or correct financial and social problems created as a result of the disorder, may cause distortion in decision making processes, potentially explaining the pathological gambler's involvement with crime. Lesieur and Anderson (1995) found that out of the 184 GA attendees they interviewed, 56% admitted stealing and the median amount stolen was \$500. Thompson, Gazel and Rickman (1996) reported that 46% of pathological gamblers they interviewed admitted stealing as a result of the disorder with the mean amount stolen being \$5738.

The impact of the introduction of casinos on crime is specific to the structural characteristics (i.e. the size and products available) of a particular casino (Reith, 2006). For example, resort casinos or casinos that are not located within a specific community are unlikely to experience any increase in crime in the vicinity of the casino because the negative consequences of gambling is likely to manifest within the patrons' community of residence. However, there is insufficient evidence to draw any solid conclusions about the impact of each type of casino on crime (Reith, 2006). Moreover, it is proposed that any recorded increase in crime is not likely to be an increase per capita, rather a reflection of a population swell in locations surrounding the casino (Baxandall and Sacerdote, 2005; NGISC, 1999). Community perceptions of crime, which may reduce

quality of life for residents, as a result of gambling do not vary from communities that do and do not have casinos nearby (Nuffield & Hann, 2004; NGISC, 1999)

1.1.2 Debt and Bankruptcy

The level of debt and the rate of bankruptcy as a result of problem and pathological gambling is an issue of concern because it often affects the spending power and financial stability of the gambler's family, friends and colleagues who are related to them financially. Lesieur and Anderson (1995) reported that approximately 1 in 4 male pathological gamblers seeking help through GA declared bankruptcy, with 8% of female treatment seekers doing likewise. Aside from declaring bankruptcy, research indicates that pathological gamblers have substantial amounts of gambling related debt (i.e. debt independent of 'legitimate' debt that refers to mortgage and car loans etc.) that is likely to be causing hardship for the dependents of the pathological gambler's family (Lesieur, 1998). Thompson et al (1996) recorded that the median amount of gambling related debt for a sample of GA attendees in Wisconsin was \$20,000 (with a mean of \$38,664). Lesieur and Anderson (1995) in a similar study found that the mean gambling related debt for a sample of GA attendees from Illinois was \$113,640. Looking beyond the US, the average level of debt for problem gamblers receiving treatment in the UK and Australia was £28,000 and AU\$17,000 respectively (Gamcare Services Report, 2003; Productivity Commission, 1999). Lesieur (1998) claimed that because of accumulated debt, spouses of pathological gamblers are required to deal with harassment from oppressive creditors, and as a result suffer from physiological and psychological symptoms such as insomnia and depression.

1.1.3 Effects on family of pathological gamblers

As well as the probable financial limitations placed on the family of pathological gamblers, Lorenz and Yaffee (1988) reported that spouses of pathological gamblers were three times more likely to have attempted suicide. Furthermore, research suggests that intimate partner violence (i.e. domestic violence) is predicted by pathological gambling

(Muellenman, DenOtter, Wadman, Tran, & Anderson, 2002; Lorenz & Shuttleworth, 1983). Overall it has been demonstrated that in comparison to control groups, marriages that contain a pathological gambler are much more unstable (Ciarrochi & Hohnmann, 1989). Epstein (1992) identified that marriages that contain a pathological gambler show more signs of dysfunction because communication and problem solving skills within such marriages are weak. Lesieur and Anderson (1995) reported that 30% of a sample of GA attendees' marriages ended in divorce because of problems created by problem gambling.

The Australian Productivity Commission (1999) also report that as well as spouses suffering as a result of a partner with problem gambling, children who have a parent or guardian with a gambling disorder are more likely to display behavioural problems. Jacobs, Marston, Singer, Widamen et al (1989) concluded that children of problem gamblers were more disruptive in school, demonstrated more mental health problems and were more likely to have substance addictions.

1.1.4 Individual Consequences and Co-morbidity

Along with the economic and social costs that pathological gambling creates for the community, the individuals with the disorder also suffer substantially. Pathological gambling has high rates of co-morbidity with a range of behavioural and mental health problems. McCormick, Russo, Ramirez and Taber (1984) reported that 76% of pathological gamblers suffered from a major affective disorder. Linden, Pope and Jonas (1986) recorded similar findings with 72% of the sample of pathological gamblers suffering from at least one major episode of depression and 52% reported recurrent episodes of an affective disorder. Furthermore, Ibanez, Blanco, Donahue, Lesieur et al (2001) claimed that 63% of a sample of treatment seeking pathological gamblers had a co-morbid psychiatric disorder, and they also demonstrated more severe symptomologies. Lesieur (1998, p158) concluded that "In light of the high rates of anxiety and depression, it is no wonder that pathological gamblers have very high rates of suicidal ideation." Lesieur and Anderson (1995) reported that from a sample of GA

attendees 12% had attempted to commit suicide with a further 48% stating that they had often contemplated suicide.

There is also a large body of research demonstrating the relationship between pathological gambling and substance abuse (Lesieur, 1998). Lesieur (1988) found that 47% of pathological gamblers also received a psychiatric diagnosis for a substance dependency. Furthermore, evidence shows that substance abusers who are screened for pathological gambling demonstrated abnormally high rates of co-morbidity (Lesieur, Blume & Zoppa, 1986; Shepherd, 1996). Ciarrocchi (1993) presented recent admissions to an outpatient substance abuse treatment program the South Oaks Gambling Screen (SOGS, Lesieur & Blume, 1987). He found that out of the 467 participants, 6.2% were scored as pathological gamblers, and a further 4.5% met the criteria for problem gambling. It is highly probable that any co-morbid psychiatric disorder, particularly substance addiction, is likely to exacerbate and compound the economic and social costs of pathological gambling on the community.

1.1.5 Economic and Social Costs of Pathological Gambling

A fundamental problem regarding the expected increase in the prevalence of pathological gambling in light of relaxation in UK gambling regulation increasing the availability of gambling (Griffiths, 2004; Rosecrance, 1988; Cornish, 1978) is that treatment of the disorder is, in many cases, not effective. Knowledge regarding the aetiology of pathological gambling is lacking and therefore there is not a singular conceptual model available from which to develop and provide treatment. As a result treatment strategies for pathological gambling largely consist of varied treatments, with each combination having mixed results across patients. As expected, treatment through this model requires substantial duration and more importantly have low rates of success (NGISC, 1999). Stewart and Brown (1988) provided an example of the high rates of recidivism, demonstrating that only 8% of a sample of GA attendees reported to maintain gambling abstinence one year later and after treatment cessation.

When evaluating the economic and social costs that are associated with problem gambling, in the context of expected rises in prevalence and the lack of efficient, effective treatment, pathological gambling becomes a pertinent social issue that must be addressed. In summary, pathological gambling creates social dysfunction and drains social resources that could be used to benefit society. The most significant issue to be addressed is the paucity of quality, peer-reviewed research that improves our understanding of pathological and problem gambling (Raylu & Oei, 2002). An improved understanding of the aetiology of pathological gambling has obvious implications for treatment professionals' ability to develop and provide suitable, effective treatments. Shaffer and Gambino (1989) strongly advocated that until a valid, cohesive explanatory model is produced, that integrates knowledge from research, theory and practice, we will be unable to reduce pathological gambling.

A comprehensive critical review of existing research on pathological gambling was conducted to outline current understandings of the disorder.

1.2 Problem and Pathological Gambling: A Review of the Literature

1.2.1 Defining the concept of pathological gambling

It is widely accepted that research and treatment of pathological gambling behaviour has been impeded by the lack of uniformity and agreement over the nomenclature used when measuring the construct. With terminology being used intermittently such as 'compulsive', 'problem' and 'pathological', it is difficult or at least inappropriate to compare and substantiate research in the study of pathological gambling because each term may have a different representation to both authors and readers. The lack of rigorous aetiology leaves researchers and practitioners apprehensive about amalgamating the vast body of research that exists, which in turn restricts advancement of understanding of the disorder, and therefore application of such understandings. Because of this, it makes intuitive sense to outline in detail terminology to be used in this thesis.

Such terminology selection can only be successfully attempted after critical review of the various terms used to describe abnormal gambling behaviour.

Traditionally, in abnormal gambling the terms 'pathological' and 'compulsive' were the two major terms used in research studies. The popularity of the term 'compulsive' diminished after Moran (1970) highlighted its inappropriate use based on its connotations to ego-dystonic behaviour. In simple terms, describing dysfunctional gambling behaviour as a compulsion suggests that the individual is trying to cease executing the behaviour. In reality it is highly probable that some pathological gamblers are not motivated to cease gambling, in spite of adverse consequences.

Abbot, Palmisano and Dickerson (1995) dichotomised gamblers into two classifications: excessive and normal. Excessive and normal gambling behaviour is differentiated by time spent, expenditure and frequency of attending gambling establishments. The benefit of such a classification is highly questionable. Even disregarding the subjectivity of the criteria between individuals, you are still only left with a classification which separates frequent and infrequent gambling behaviour. Such classification is normative and has minimal use in identifying pathological gambling behaviour.

Classifications with utility in researching pathological gambling behaviour place more emphasis on the amount of symptoms that individuals have (Winters, Stinchfield & Fulkerson 1993; Gupta & Derevensky, 1998). The trend in classification is to move beyond the traditional dichotomy of pathological and non-pathological gambling, into developing a spectrum of severity in relation to the amount of problems the individual is experiencing.

Fundamentally, an interim classification emerged that bridged the transition between non-pathological gambling and pathological gambling. Once more there was no uniformity about what label should be selected to describe this category or what criteria identifies this interim category. Gupta and Derevensky (1998) favoured the term 'problem', whereas Shaffer, LaBrie, Scanlon and Cummings (1994) utilised the term 'in-

transition'. The reason for development of a severity spectrum of pathological gambling is because development of pathological gambling is a gradual process. As a result, it is very possible to suffer several negative consequences for abnormal gambling behaviour causing extensive dysfunction, yet still not meet enough DSM IV criteria (APA, 1994) for pathological gambling. Furthermore, in researching correlational and causal factors of pathological gambling, the opportunity to research a sample that is currently in the process of developing pathological gambling behaviour has obvious benefits.

Comparative analysis is enabled between the three sub-groups, and perhaps factors present at the embryonic stage can be identified to further increase our understanding of the aetiological processes of pathological gambling.

Blaszczynski, Steel and McConaghy (1997, page 7) defined the concept of problem gambling as “a repeated pattern of behaviour that leads to the emergence of actual problems beyond mere financial strain; this includes marital conflict, accumulated debts, borrowings and impairment in other areas of social and vocational functioning.” When considering the utility of such a classification several concerns about its use must be addressed. Firstly, placing such emphasis on negative consequences and ‘harm’ to the individual will be determined subjectively with the individuals having to make personal evaluations. Walker (1998) in his condemnation of the concept of ‘problem gambling’ highlighted the fallibility of the classification criteria and the potential for false positives. Walker (1998) provided the example of the individual who spends £1 per week on the lottery, but who is causing great marital discord due to the spouse’s strict religious beliefs regarding any form of gambling. Despite the great amount of harm created by gambling it is still highly questionable whether this could be classified as a problem gambler. Blaszczynski et al. (1997) proposed that the individual is the best person to evaluate whether gambling is creating harm. It is probable that for a large percentage of individuals this is the case. However, as highlighted earlier gambling is not strictly an ego-dystonic behaviour, therefore the individual may be biased when making such evaluations.

Making a Type I error puts the validity of research in jeopardy and therefore classification of groups based on subjective measures of harm are inappropriate. It is important to acknowledge that most research studies use non clinical samples. As a result, it is probable that the proportion of pathological gamblers will be small, ultimately increasing the effect such Type I errors will have on conclusions. Aside from the subjective element, there are inherent methodological issues when analysing data across various classifications. Fundamentally, the lack of a distinguishable boundary between problem gambling and pathological gambling can diminish the validity and reliability of research. Using the Blaszczynski et al. (1997) definition of problem gambling, it is evident that pathological gamblers will also be problem gamblers. Unless problem gambling is classified using the DSM IV criteria for pathological gambling (APA, 1994), as suggested by Fisher (1996) and Volberg (1997), then comparative analysis of the subgroups is not possible.

Blaszczynski and Nower (2002) aimed to reduce the miasma differentiating between problem gambling and ‘gamblers with problems’, by highlighting the importance of evidence of impaired control. As outlined earlier, definitions of problem gambling are malleable enough to include any frictions in the domestic, social or vocational lives of the gambler. Preoccupation alone does not constitute a behavioural problem although problems can emerge based on differences in subjective opinions (Blaszczynski & Nower, 2002). Blaszczynski and Nower (2002) indicated that the defining feature of a problem gambler is a sense of impaired control. They stated that impaired control is determined by an inability to stop gambling despite several attempts. However, it must be noted that a sense of impaired control is also fundamentally determined by a subjective evaluation to the same extent that harm from gambling is determined, and therefore such a construct must be treated with the same apprehension.

In summary, the benefits of being able to divide gamblers into three distinct categories (non-pathological, problem and pathological) of gambling behaviour are obvious from a research perspective. However, there are some fundamental issues to be resolved before we do so. If the transitional category of problem gambling behaviour is to be used clear

boundaries need to be created between problem and pathological gambling, and also an element of impaired behavioural control needs to be included. The most appropriate solution to both of these issues is to determine problem gamblers as individuals who meet four of the DSM IV criteria and a stipulation is that one of the four DSM IV criteria includes a positive response to item criterion 3 “repeated unsuccessful attempts to control, cut back or stop gambling.” (APA, 1994. p.618)

1.2.2 Measurement of Pathological Gambling:

Given that we are still some distance from proposing a bona fide definition of the concept of pathological gambling, it is not unsurprising to learn that as a result a similar level of animosity is present in the field when it comes to measuring this concept. As Porter (1995) pointed out, development of standardised measurement tools is always a result of a need for public action for a specific situation, and intuitively it is reasonable to expect a level of controversy. Pathological gambling measurement suffers from the same trend. Not only is there intense dispute between social scientists, regarding which instrument is the most valid, but also many other influential parties have their own predilection for a certain measurement tool, which undoubtedly is influenced by their objectives. For example, now that gambling revenue is an integral source of tax revenue for a large proportion of governmental administrations throughout the world, a need to sustain minimal social costs for legalised gambling is pivotal. As such administrations are often the major source of funding for research into pathological gambling it is not unrealistic to assume that such mandates may exert some influence over the research process. Governmental administrations are not the only party who are subject to applying political pressure on the research process. Many pressure groups such as religious fundamentalists or even organisations that are seeking research grants may wish to use an instrument that is more likely to produce results which are sympathetic to their political agenda. As a result, a thorough objective critique of current pathological gambling measurement indices is essential.

1.2.2.1 Diagnostic and Statistical Manual and Pathological Gambling

The Diagnostic and Statistical Manual is a manual produced by the American Psychiatric Association (APA) which is a directory for mental health disorders. Pathological gambling as a mental health disorder was first introduced in DSM III (1980), as the manual's premise became more systematic psychiatric diagnosis rather than a catalogue of mental health disorders. Diagnostic criteria proposed in the DSM were widely accepted by researchers for prevalence and epidemiological studies, despite their apparent lack of validation (Dohrenwend, 1995). The first widely accepted screen, the South Oaks Gambling Screen (Lesieur and Blume, 1987), was based on DSM III (APA, 1980), and all other traditional screens have subsequently been based on DSM IV (APA, 1994).

1.2.2.2 The South Oaks Gambling Screen (SOGS)

As with most psychiatric measures, the SOGS was developed to be used in the clinic and is therefore not designed to be used in non-clinical research in its original form. The SOGS is a 20-item screen that probes the individual on criteria suggested by DSM III; for example: whether they had borrowed money to gamble, whether they had to be deceptive in order to hide debts or whether the individual was spending excessive time or money gambling.

The SOGS was first used for pathological gambling prevalence research in New York in 1988 (Volberg & Steadman, 1988) and by 1996 the SOGS had been used widely in prevalence research throughout North America, Europe and Asia (Volberg, Dickerson, Ladouceur & Abbott, 1996). As Walker and Dickerson (1996) pointed out, the major benefit of using one standardised measurement instrument on such a vast array research studies, is that it enables direct comparisons between various studies to be made with greater validity.

Conversely, Dohrenwend (1995) outlined the fundamental flaw in applying a clinical screen to the general population. Clinical screens are designed to be used in settings

where the prevalence is likely to be high. However, with such screens being implemented in the general population where the prevalence of pathological gambling is likely to be much lower, there is a decline in the accuracy of the screen's diagnostic proficiency. Abbott and Volberg (1992; 1996) attempted to test the accuracy and validity of the SOGS when used on the general population. Abbott and Volberg (1992) employed a two-phase prevalence study in which current, lifetime and non pathological gamblers were identified through traditional clinical interviews, and subsequently the SOGS was used to repeat the diagnosis attempt in the same population. This research design afforded an opportunity to calculate the validity of the SOGS based on differences in diagnosis between each phase. The results from the study showed SOGS produced more false negatives than the lifetime SOGS, however the fact that it produced fewer false positives than the lifetime scale made it more efficient to measure prevalence in the general population (Abbott & Volberg, 1996).

There were questions regarding the validity of the SOGS, in particular the social undesirability of the pathological gambling behaviour that existed in the general public. There was concern that the accurate prevalence rates were not being obtained because either pathological gamblers refused to acknowledge the extent of their gambling or simply did not want to participate in such studies (Lesieur, 1994). The National Gambling Impact Study Commission (1999) proposed that the diagnostic validity of SOGS deteriorated as gambling became legalised in new markets and regions. Put simply, the nature of gambling activities and the people who have accessibility to gambling activities was changing dramatically, and it was felt that the SOGS did not encompass the rapidly changing industry. For example, Volberg (1992) highlighted the increase in female and middle class pathological gamblers in the mid 1990's. A number of items on the SOGS had potential to be less relevant or interpreted differently across gender, ethnicity and social class. For example, item 16 on the SOGS enquires whether the individual had "borrowed money from the household to gamble or pay gambling debts." (Lesieur & Blume, 1987). The term 'household' could be interpreted differently between a gambler of Maori ethnicity (where the household is often believed to be the

whole ethnic group) and a gambler of Euro-American heritage (where the traditional household unit implies the nuclear family).

1.2.2.3 DSM IV Criteria for Pathological Gambling

The clinical perspective regarding pathological gambling has transformed substantially from the criteria adopted in DSM III. DSM IV (APA, 1994) recognised the growing research linking pathological gambling to other addictive disorders such as substance abuse. In fact diagnostic criteria for pathological gambling and other addictive disorders were practically identical, except for obvious use of terminology and the addition of chasing losses. Ultimately DSM IV classified pathological gambling as an impulse control disorder where persistent gambling behaviour caused significant disruption to the individual's functioning (social, familial, occupational and financial situations).

There are ten (originally nine) factors used to differentiate between pathological and non-pathological gamblers. Firstly, a preoccupation with gambling activities including reliving past gambling experiences or planning future ventures. The second criterion is tolerance for experiencing arousal from gambling increasing. Put simply, the need to increase size and frequency of bets in order to achieve the same level of excitement as previously. Thirdly, the inability to withdraw from gambling successfully is a differentiating factor. The fourth criterion is the experience of irritability when attempting to stop or reduce gambling behaviour. The fifth criterion is using gambling as a way of regulating mood such as escaping dysphoric mood states. The sixth criterion is the need to chase losses and is one of the only criteria in which pathological gambling and other addictive disorders differ. Another factor separating pathological and non-pathological gambling is the recurrent need to deceive others to conceal extent of gambling involvement (criterion 7). The eighth criterion is involvement in criminal acts such as fraud or theft to finance gambling behaviour. The ninth factor is putting one's career, education or a significant relationship in jeopardy or forfeiting them altogether. The final discriminating factor which was subsequently amended to the measure was the

need for a financial bailout to relieve a desperate financial situation which was created through excessive gambling.

Again, consistent with experiences of trying to define the concept of pathological gambling there is discrepancy over how many criteria must be positive to differentiate between pathological and non-pathological gamblers. Discriminant analysis performed by Lesieur and Rosenthal (1998) identified that the differential point was four items. However, the DSM IV (APA, 1994) established a 'cut-off' point of 5 items; and this is the widely adopted diagnostic method. An addendum to the pathological gambling diagnostic criteria was that the recurrent maladaptive gambling behaviour could not be more duly accounted for by manic episodic behaviour.

Despite the popularity of the DSM-IV criteria for pathological gambling there is a paucity of critical evaluation of its psychometric properties. Volberg (1997b) performed an extensive evaluation of the DSM IV's psychometric properties, looking primarily at internal consistency, item analysis, criterion validity and construct validity. Reliability of the screen was reasonably high with a Cronbach's alpha of 0.8. Homogeneity of the scale was established through factor analysis, where only two factors had an eigenvalue above 1 (Preoccupation accounted for 45% of variance; and Tolerance accounted for 13% of variance). Item analysis revealed that all of the DSM IV criteria discriminated between pathological and non pathological gamblers. The most effective discriminant criterion for differentiation was Chasing Losses (69.6%), followed by Preoccupation (59.0%).

A pre-requisite for testing an instrument's criterion validity is that an accepted valid scale assessing the identical variable exists in order to evaluate against. The SOGS was the intuitive choice to assess DSM IV's criterion validity. The SOGS and the DSM IV had a strong, statistically significant correlation ($r=0.7$, $p<0.01$), highlighting their intrinsic similarity. Criterion validity was also assessed by comparing how similar individuals scored on both the SOGS and the DSM IV. According to the DSM IV criteria 1.53% of the sample was identified as pathological gamblers, and in comparison 1.61% of the

same sample was identified as pathological gamblers by using the SOGS. In evaluation it appears that the SOGS and DSM IV have a strong convergent validity.

Construct validity for the DSM IV was also supported highlighting the psychometric value of the measure. Construct validity was evaluated by comparing the DSM IV scores of pathological and non-pathological gamblers (identified by SOGS) as well as assessing the difference on measures that are acknowledged to be strongly related to problematic gambling behaviour (i.e. accepted risk factors). Volberg (1997b) identified that pathological gamblers (M=6.7) had a higher mean score than non-pathological gamblers (M=0.2). Pathological gamblers were also shown to gamble more often, for longer periods, spending more money than non-pathological gamblers. Moreover, pathological gamblers were more likely to have a parent who was a probable pathological gambler, to have started gambling earlier and identify slot machines as their preferential gambling activity, than non-pathological gamblers.

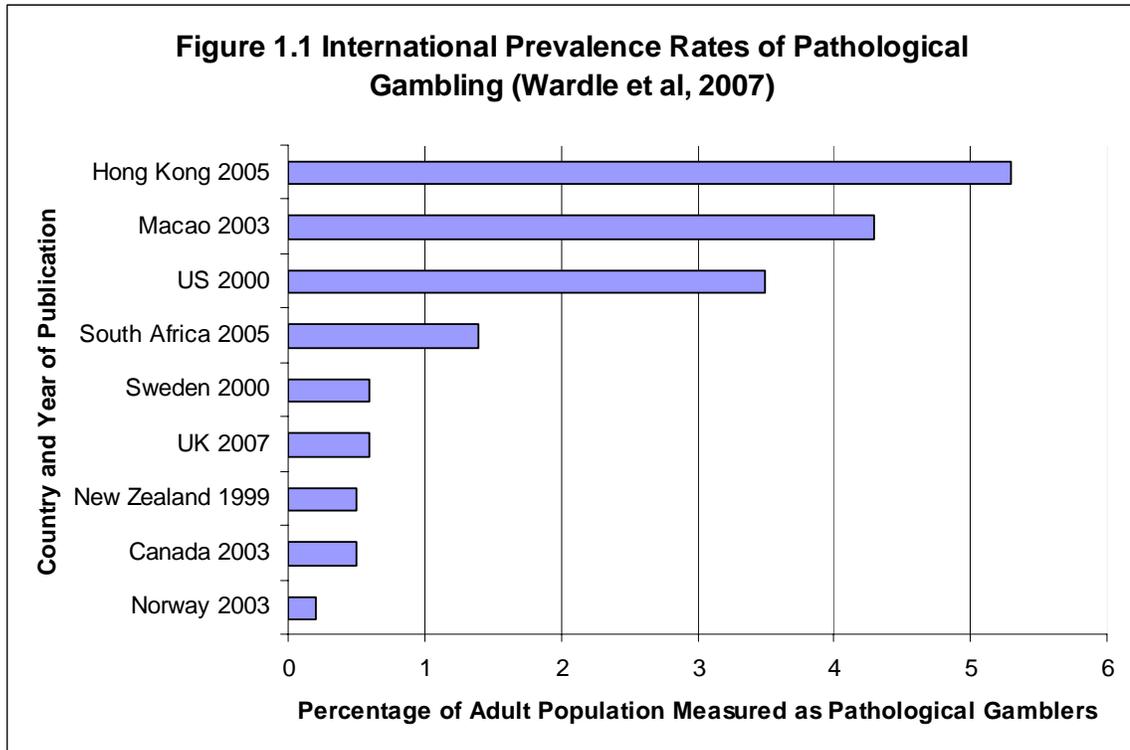
Based on the evident psychometric properties of the DSM IV criteria the vast majority of researchers and treatment professionals have entered or proposed entering the 'DSM IV era' (12th National Conference on Problem Gambling, June 1998; 42nd ICAA International Institute on the Prevention and Treatment of Dependencies, September 1998). As a result, all other emerging screens will now be tested against the DSM IV criteria.

1.2.3 Prevalence of Pathological Gambling

The prevalence of pathological gambling in the UK has remained stable, with 0.6% of the adult population being reported to suffer from the disorder through the DSM IV, between 2000 and 2007 (Sproston, Erens & Orford, 2000; Wardle, Sproston, Orford, Erens, et al, 2007). However, the composition of who is a pathological gambler has changed from measurements reported in 2000. The prevalence of pathological gambling measured through DSM IV criteria showed that 1% of males and 0.2% of females suffered from the disorder. In contrast, in the previous British Gambling Prevalence

Survey (Sproston, Erens & Orford, 2000), reported that 0.9% of males and 0.3% of females suffered from the disorder, indicating that the proportion of female pathological gamblers is decreasing in comparison to males. Furthermore, the 2000 study reported that age was related to pathological gambling prevalence with those between 16-24 years having a prevalence rate of 1.7%, and decreased through to 0.6% of those between 35-44, and decreasing further as age increased. The 2007 report showed that age was still related to pathological gambling prevalence but unlike in 2000, the prevalence only began to significantly decrease after 55 years and old, indicating that the prevalence of pathological gambling between those aged 45-54 has increased since 2000 (Wardle et al, 2007).

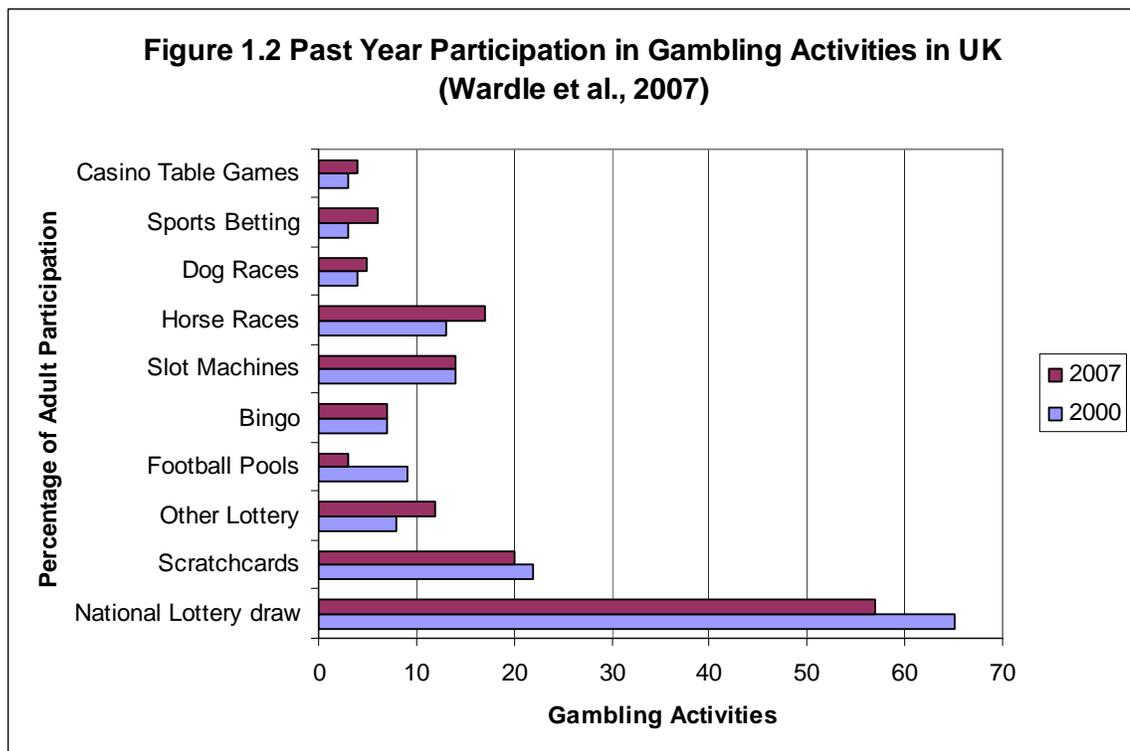
The prevalence of pathological gambling in the UK is comparable internationally to the prevalence levels reported in Canada (0.5%), New Zealand (0.5%) and Sweden (0.6%), yet lower than the prevalence levels reported in Macao (4.3%) and Honk Kong (5.3%) (Wardle et al, 2007; See Figure 1.1). There has not been a prevalence study for pathological gambling in Australia since 1999 suitable for comparison, however there have been several regional studies showing the prevalence rate. The Queensland Treasury (2005) conducted a prevalence survey in 2003 and 2004 that reported a prevalence rate of 0.83. The prevalence rates reported for the provinces of Victoria (McMillen, Marshall, Ahmed & Wenzel, 2004) and Northern Territory (Young, Abu-Duhou, Barnes, Creed, Morris, Stevens & Tyler, 2006) were 0.97% and 0.64% respectively. The comparison of national prevalence rates globally is difficult due to the lack of standardisation in measurement across each report. Measurement error will vary across instruments used in each to study to identify pathological gambling, and moreover, comparisons will be limited because of caveats in each design in terms data collection. For example, some studies employed measurement via telephone calls whereas other studies employed face to face interviewing within the participants private residence (Wardle et al, 2007). As a result, although contextualising the prevalence rate of pathological gambling within the UK in relation to other countries is desirable, caution must be employed when interpreting the findings of such comparisons.



Until the publication of the recent British Gambling Prevalence Surveys (Wardle et al, 2007; Sproston et al, 2000) there has been strictly limited knowledge regarding the prevalence levels of gambling in general, in the UK. The British Gambling Prevalence Survey (Wardle et al, 2007) recorded that 68% of the adult population in the UK participated in at least one gambling activity in the last 12 months. The report also shows that the National Lottery is the most prevalent gambling activity with 57% of adults purchasing at least one ticket in the last 12 months. The second and third most prevalent forms of gambling in the preceding 12 months were Scratchcards and Horse Race betting, with participation rates of 20% and 17% respectively.

Recent data shows that the prevalence of past year gambling, i.e. those that have gambled in the preceding 12 months, in the UK has decreased since the publication of the previous British Gambling Prevalence Survey in 2000. The prevalence of past year gamblers has reduced from 72% of the adult population to 68% of the adult population (Wardle et al, 2007). However, it is important to contextualise the recorded decrease in past year gambling because the decrease has been solely driven by a decrease in the prevalence of

gambling on the National Lottery draw. The only gambling activities to demonstrate a reduction in prevalence since 2000 are the National Lottery draw (reduced from 65% to 57%), National Lottery Scratchcards (22% to 20%) and the football pools (9% to 3%). Of the remaining eight gambling activities that were measured in both the 2000 and 2007 studies, all activities reported either a similar participation level or an increase in participation. Betting on horse and dog races increased, as did sports betting and gambling on table games within a casino (See Figure 1.2)



1.2.4 Causes of Pathological Gambling

1.2.4.1 A General Theory of Addictions (Jacobs, 1986)

Before exclusively exploring the causes of pathological gambling it makes intuitive sense to explore the possibility of accepting a general theory of addiction, broadly

encompassing the universal assumptions of a range of habitual behaviours and substance abuse. Moreover, it would be logical to identify underlying communalities across the addiction spectrum with the aim of gaining an enhanced understanding of the acquirement and maintenance of addictive pattern behaviour. From a clinical perspective, by accepting that addictive patterns share universal features the sheer knowledge base regarding the determinants of pathological gambling would be extended.

Levison, Gerstein and Maloff (1983) undertook a series of meta-analyses of addiction research literature searching for common patterns in the realms of socio-cultural, psychological and biological communalities. The authors concluded while there were some intriguing 'regularities' in the literature there was not substantial grounds from which to support a comprehensive theory of addictions. However, Jacobs (1984, 1985) performed independent studies, producing results which provided a strong basis to develop a unified theory of addiction. Jacobs initially sought to identify communalities regarding biographical information such as attitudinal or experiential factors. Secondly, it was necessary to outline the distinct differences regarding the same biographical factors between the various habitual addictions and substance related addictions. The final stage was to compare the addictive populations with non-addicted normative populations. The range of addicted groups from which comparisons were made includes, exhaustively, pathological gamblers, compulsive overeaters, alcoholics and drug addicts.

Jacob's General Theory of Addictions (1986) posits that addicts have two co-existing pre-disposing factors: a unipolar physiological resting state and psychological disturbances. A unipolar physiological resting state refers to a chronic state at either extreme of the normally distributed arousal curve. In simple terms, this means the individual either experiences chronic hypotension or hypertension. Furthermore, this unipolar physiological resting state affects the individual's response to various stimuli (e.g. gambling activities). The shared characteristic of both groups is the experience and realisation that their unipolar resting physiological state is unpleasant, permanent and that it differentiates them from 'normal' members of society (Jacobs, 1987).

The other integral predisposing factor is psychological disturbance which emerges from an individual's emotional or actual developmental childhood or adolescent experiences. Fundamentally, such developmental experiences render the child with feelings of inadequacy, inferiority, and even feelings of parental rejection. Jacobs (1987) iterated that the child does not develop normal reactions to such emotional states, such as acquiring stress reducing coping mechanisms in order to adjust and withstand the negative aspects of their social environment. Moreover, they do respond aggressively, similar to those who develop anti-social personality disorders, in order to reduce psychological tensions produced by such feelings of rejection and inadequacy. The 'addiction sensitive' individual engages in extensive 'escape' behaviours, where they consciously pretend not to care about such emotions, and instead respond with identity altering fantasies (Kallick, Suits, Dielman & Hybels, 1979; Custer, 1980; Jacobs, 1987).

Milkman and Sunderwirth (1983) pointed to a fundamental misnomer in addiction theory: the individual is addicted to the satiation, arousal and fantasy experience achieved as an outcome of the activity rather than the actual activity. In simple terms, the activity is solely a mechanism to achieve the desired state.

Jacobs (1987) contended that this goal orientated motivation is a primary communality across all addicted individuals. While engaging in the ascribed addictive behaviour the individual experiences a dissociative state where their psychological disturbances which make reality for them uncomfortable are temporarily ameliorated. The dissociative state achieved is the integral factor which effectively reinforces the developing addictive pattern. Jacobs (1985) demonstrated that clinical samples of individuals with an addiction psychopathology (for e.g. gambling, overeating or alcoholism) have a considerably higher incidence of reported dissociative experiences than normative samples. Of a pathological gambling sample, 90% admitted that while gambling they felt like they were in a trance, 85% admitted that when gambling they felt they had taken on another identity, and 68% and 61% of the sample reported 'out of body' experiences and 'memory blackouts' respectively (Jacobs, 1985).

The principal benefit from such an understanding of the aetiology of a general addictive behavioural pattern is the improved ability to identify those at risk and furthermore, make accurate prognoses with clinical patients. However, Jacobs (1987) emphasised that having the two aforementioned predisposing factors is only a requisite for developing an addictive behavioural pattern, and that often the coexisting variables can remain latent. Primarily, the social environment must be conducive to achieving the amelioration of negative affect and negative self-identity. Jacobs (1987) identified three needs which the environment must let the activity satiate in order to reinforce the addictive behavioural pattern. Firstly, the 'blurring out' of an uncomfortable state achieved, including through narrowing attention onto the activity itself. Secondly, a reduction in self awareness which restricts the level of self criticism is necessary. The social environment is pivotal in achieving this. For example, in the gambling environment a culture can exist which tolerates and more importantly venerates 'risky' behaviour, and as a result engaging in the behaviour replaces individual's self-concept with a sympathetic group dynamic that does not criticise individual behaviour. Finally, the addictive behaviour and the environment must enable actualisation of fantasies which diminish and transform the individual's negative self-concept.

The main outcome of the General Theory of Addictions (Jacobs, 1986) is the integration of such knowledge into developing effective treatments. Jacobs (1987) believed that the four cornerstones to treating pathological gambling effectively include: direct physiological management of underlying predisposing factors, psychosocial restructuring, vocational redirection and community re-integration. Direct physiological management of either the hypotensive or hypertensive resting states aims at reducing the need to regulate affective states through engaging in the addictive behavioural pattern. Particular emphasis is directed at controlling acute affective disorders created by the addictive behaviour at the height of the pathology (which usually immediately precedes treatment). The remaining three strategies are aimed at alleviating the developmental disturbances creating negative self concept acquired in childhood, through pro-actively improving self esteem and social adjustment.

As appealing as the General Theory of Addictions (Jacobs, 1986) is, consideration must be given to whether the theory is grounded in the appropriate paradigm. There is much debate about whether pathological gambling can be classified as a bona fide addiction (Shaffer, 2000). Given the loose operational definitions of addiction, and the tautology that exists when diagnosing the disorder, debate continues regarding the capacity to objectively diagnose the disorder of pathological gambling. Akers (1991) highlighted the tautology present in using the term addiction to explain excessive behaviour. Ultimately there is no way to determine whether the 'addict' cannot help themselves from the compulsion, and as a result it is not possible to differentiate between a compulsion and an uncontrolled habit. Shaffer (2000) clarified this further by highlighting that if pathological gambling really is independent and not based on its consequences, then diagnosis should be possible without assessing whether the individual is consistently winning or losing.

For pathological gambling to be classified as an independent, primary addictive disorder then diagnosis probably needs to emerge from bio-behavioural or neurological data (Shaffer, 2000). This tautology must be considered when appraising the merits of the following perspectives, which profess to explain the cause and maintenance of pathological gambling behaviour, because whether pathological gambling is understood to be a compulsion or an impulse disorder affects the question of individual accountability greatly. Fundamentally, it is evident that discriminating between gambling addicts and non-gambling addicts is overly subjective and therefore the explanatory value of the theory of addictions is strictly limited.

1.2.4.2 The psychodynamic perspective

When assessing its principal features, pathological gambling behaviour must be considered to some extent to be a form of masochism. The behaviour appears irrational because for the most part, mathematically it is impossible to profit from commercial gambling over an extended period of time. Secondly, individuals do not seem to respond rationally to the behavioural contingencies that exist in gambling. Put simply,

pathological gamblers invariably lose in the long term and the continuation of gambling effectively indicates the failure of the individual to learn from punishment cues. Moreover, it provides foundation for psychodynamic theory to be used in the explanation of pathological gambling.

Rosenthal (1987) brought our attention to the ritual of gambling activities, highlighting that the anticipation, the victory or defeat, is from a psychodynamic approach considered to be an actualisation of a fantasy. The individual attributes meaning to the ritual; albeit unconsciously. By bringing out and working through the meanings in psychodynamic psychotherapy the pathological gambler is given the opportunity to resolve the intrapsychic conflict causing the destructive behaviour.

As with other psychological perspectives concerning the cause of pathological gambling behaviour, the psychodynamic approach concedes that there is not one unilateral explanation. In fact the psychodynamic approach proceeds on the concept of 'over-determination'. This refers to the acceptance that the mechanism that the unconscious reveals itself through is neurotic symptoms and potentially there are a multitude of causes. Each source is co-existing and overlapping simultaneously. Before criticising the multiplicity of underlying causes of pathological gambling as a deficiency in the merit of the psychodynamic approach, it is useful to consider Laplanche and Pontalis' (1967) rhetoric which emphasised that one exhaustive meaning often doesn't exist because symptoms are structured like language. In simple terms, each element of the symptom and how it is organised can be interpreted on different levels (Rosenthal, 1987).

The three major causes which emerge from the case studies of pathological gambling patients receiving psychodynamic treatment for their neurosis are oedipal conflict, masochism and narcissistic fantasy. These three reported causes are by no means exclusive and they are often interrelated. Simmel (1920) was one of the first psychoanalysts to develop the narcissistic fantasy of the pathological gambler. Simmel believed that the pathological gambler yearned omnipotence, and used gambling to fuel this self sufficiency fantasy. This interpretation also highlights the oedipal conflict in the

narcissistic personality because the pathological gambler is aiming to replace their parents and remove the dependency complex. As Rosenthal (1987) underlined, such omnipotent fantasies were central to Simmel's explanation of addictions in general. Fundamentally, Simmel saw them as a source of false creativity to actualise the fantasy.

Before assessing Freud's contribution to the understanding of pathological gambling, it is important to acknowledge the lack of importance Freud himself put on his contribution: Dostoevsky and Parricide (1928). In reaction to criticism from Reik (1940), Freud conceded that his essay was 'trivial' and should not be read into too deeply. Freud was renowned for his dogmatic defence of his ideas suggesting that his trivialisation of his work on pathological gambling was not false modesty (Rosenthal, 1987). However, in his essay 'Dostoevsky and Parricide' Freud (1928) proposed several integral concepts regarding pathological gambling which today are seen as valid assumptions about the pathology. Firstly, Freud emphasised that pathological gamblers are not motivated to gamble to make profit. They may profess that profit is their motivation and may well be a conscious rationalisation, but the pathological gambler is drawn to the ritual or what is referred to as the 'action'. Freud also was the first to propose that gambling was an instrumental way to self-punish in order to expiate guilt.

The need to self-punish and the cause of guilt according to Freud (1928) was the result of intrapsychic conflict between the ego and the superego which manifests in the Oedipus complex. According to Freud, the son has an ambivalent relationship with his father; the superego seeks identification with the father out of admiration yet out of the same admiration the ego wishes to take the father's place. Such fantasies of parricide are repressed and remain in the unconscious; however such repressed urges unconsciously motivate the pathological gambler to expiate guilt through punishing themselves. The pathological gambler is unconsciously motivated to gamble in order to lose, which fundamentally makes the pathological gambler an unconscious masochist. Freud (1928) elaborated on this theme of masochism by proposing a two tier masochistic motivation. The second level of masochism is what Freud referred to as 'Feminine Masochism', where the son is motivated to lose in order to de-masculinise himself and therefore

warrant parental love. Based on this premise, Freud suggested that the pathological gambler may equate suffering (i.e. losing when gambling) to love.

Bergler (1958) elaborated on Freud's contention that the pathological gambler's main drive was to reduce guilt through self punishment. Bergler (1958) however placed reduced emphasis on oedipal conflict and brought the rejection of 'the reality principle', instilled by the parents to prominence. The reality principle projected by the parents is internalised by the child and the child's pursuit of pleasure is suppressed. The psychic masochism which Bergler (1958) referred to, is the tendency when faced with punishment for seeking pleasure, to invert the punishment and accept it as reward. As a result, pleasure will subsequently be derived from the punishment; in the pathological gambler's case they experience pleasure from loss. Bergler (1958) proposed that this will motivate individuals to seek out humiliation and rejection, and by definition, this means the gambler will adopt an adversarial approach to the world.

It must be highlighted that Bergler's (1958) concept of psychic masochism is markedly different to the masochism which Freud and Von Hattingberg proposed. Bergler's psychic masochism was rooted by what Rosenthal (1987, p.53) describes as a "hatred of reality." Bergler (1958) confirmed that by turning the gambling opponents into 'refusing parents', the gambler can sustain the fantasy that he is underprivileged and therefore to be pitied. My contention is that maintaining an adversarial approach to the world also allows the gambler to experience non-accountability for their actions. By extension, the humiliation experienced (which is considered unconsciously pleasurable) by being 'an addict' is enhanced by the perception that they are the victims of the affliction and not the perpetrators. This contention may claim support from Greenson (1947) who claimed that gambling activities actualise pre-genital impulses of pleasure seeking, and because in gambling environments there is a collective acceptance of the behaviour, there is a diffusion of responsibility and therefore also a diffusion of guilt.

However, Greenson (1947) perceived such motivation as being only part of the attraction of continuous gambling. He proposed that the pathological gamblers' parental

relationships will determine what the individual finds so attractive in gambling.

Greenson (1947) proposed that the adversarial nature of gambling enables a 'battle for supremacy', and/or an act of submissiveness or even to test the love of a parent through testing Lady Luck or Fate (mother and father surrogates respectively).

Moreover, there is not necessarily one oedipal fantasy being actualised, but both the act of winning and losing can carry their own individual meaning to the pathological gambler. Lindner (1950) elaborated on this premise by proposing that winning and losing held both positive and negative significance and the pathological gambler is compelled to continue gambling because of the impossible need to experience both winning and losing simultaneously.

Bolen and Boyd (1968) proposed an addendum to the theme of oedipal conflict in the pathological gambler. One of the ways in which the castration complex is sublimated is through the defence mechanism of identification with the father, and furthermore such identification expiates superego guilt. From the British Gambling Prevalence Survey (Sproston et al, 2000), we see that a major predictor of pathological gambling was incidence of parental pathological gambling behaviour, supporting Bolen and Boyd's (1968) proposals. In fact, a patient of Bolen and Boyd (as cited by Rosenthal 1987) found that gambling was the only medium in which he could relate to his father with any significance. Moreover, he later admitted that he felt his "gambling father is now part of him" (Bolen and Boyd, 1968; as cited by Rosenthal, 1987. p.60).

This identification concept needs to be considered carefully while the UK gambling industry enters deregulation. Rosenthal (1987) perceived authority figures, especially those in public office, as veritable parental surrogates. With deregulation legislation being supported in parliament, essentially we have an advocacy and an apparent tolerance of gambling behaviour. Rosenthal (1987) extended his concern further when questioning what effect gambling endorsements from respected and often admired celebrities, which is inevitable with gambling marketing regulations becoming more relaxed, will have on attitudes towards gambling and gambling behaviour.

Modern psychodynamic theory summarises gambling as a forbidden guilt activation activity which actualises multiple and often overlapping narcissistic and libidinal instincts (Bolen & Boyd, 1968). With more emphasis being placed on identification and narcissistic tendencies, explanation of pathological gambling is shifting into the realm of a developmental neurosis. Taber (1981) stated that more than 50% of his pathological gambling patients could meet the criteria for a narcissistic personality. Custer (1985), in his description of the classic pathological gambler, placed importance on how the gambler compensates for low self esteem through fulfilling grandiose omnipotent fantasies through gambling. Moreover, Custer (1985) perceived that this constant need for attention and admiration is to conceal their inability to develop intimate relationships.

The promotion of narcissistic fantasies through gambling is an idea brought to the forefront by Rosenthal (1986). In fact Rosenthal experienced very similar patterns of risky behaviour from non-gambling patients with narcissistic fantasies. Such gamblers did not gamble in the traditional sense, however similar to Rosenthal's pathological gambling patients, they engaged in activities which sought to test fate by surpassing the line of rational behaviour. Rosenthal (1986) concluded that such narcissistic patients were continually engaged in reckless behaviour to evaluate their unstable self-identity. Effectively, such displays of risky behaviour while gambling were intended to actualise omnipotent fantasies to demonstrate that they were in control of their lives. Whether control is displayed through rational or dysfunctional behaviour is nominal; to the gambler the act of defiance is also an exhibition of power and control.

1.2.4.3 Personality traits and disorders as causal factors

There is a strong theme emerging from the psychodynamic perspective suggesting the existence of a narcissistic personality disorder in pathological gambling patients. There is a distinct lack of rigorous evidence substantiating the assertion, and empirical support is required before it is possible to fully accept this proposition. Unfortunately, as pointed out by the US National Research Council (NRC, 1999), studies linking personality

disorders to pathological gambling have methodological flaws which ask serious questions of the validity of such studies. The NRC (1999) highlighted that the relatively small sample sizes affect the adequacy of the aforementioned studies.

Blaszczynski and Steel (1998) showed that in a clinical sample of 82 pathological gamblers that 93% were diagnosed as having a personality disorder and each patient had on average 4.7 personality disorders. The disorders were found to originate from Cluster B disorders, principally Anti Social Personality Disorder (ASPD), borderline, histrionic and narcissistic personality disorders, and therefore lending support to psychodynamic theories (e.g. Bergler, 1958). Blaszczynski and Steel (1998) acknowledged that the incidence of personality disorders were intuitively excessive, and concluded that it was perhaps a result of using questionnaire data rather than using clinical interviews to discriminate personality disorders. A similar study which did employ clinical interviews (Specker, Carlson, Edmonson, Johnson et al, 1996) found that 25% of their sample was diagnosed as having a personality disorder. Again, the methodological design of this study was questioned, with Blaszczynski and Steel (1998) suggesting that Specker et al's (1996) contrastingly low incidence rate was due to the low participation rate of the sample.

As Orford, Sproston, Erens and White et al (2003) outlined, attempting to explain and understand pathological gambling behaviour is a tentative issue, given the lack of agreement over various assumptions when researching personality disorders in general. The primary assumption is that personality disorders emerge in childhood or may even have genetic origins, and as a result it becomes reasonable to conclude that a gambling pathology may be a manifestation of such a personality disorder. Conversely, the effect of the pathology itself and the negative consequences which it bequeaths cannot be ignored and there is certainly scope to theorise that the pathology may be accountable for development of any existing personality abnormalities. Other assumptions such as personality disorders being singular and opposing, or even denotations of what constitutes a personality abnormality, questions the viability of researching personality disorders seeking to explain gambling pathology.

Outside of clinical samples many researchers working in gambling psychology see trait research to be a more viable route to understanding pathological gambling. Traits, unlike personality disorders, are believed to exist on a normally distributed continuum. However, personality trait research often shares some of the assumptions which personality disorder research entails. For example, the assumption that traits, like disorders, are durable and are an antecedent to gambling behaviour.

A consistently researched personality trait regarding pathological gambling literature is sensation seeking. Zuckerman (1979, p.10) defined sensation seeking as: “the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experience.” Coventry and Brown (1993) highlighted the intuitive link between gambling activities and arousal inducement; however the actual findings from the research are far from unilateral. Orford et al’s (2003) concluded that there are studies which have shown that pathological gamblers have lower, higher and even comparable levels of sensation seeking. Orford et al’s (2003) lack of support for research in personality traits is based, to an extent, on the proposition that such personality constructs are often not unitary constructs. For example, sensation seeking is made up of four factors (thrill seeking, disinhibition, experience seeking and boredom susceptibility). Parke, Griffiths and Irwing (2004), when explaining the lack of predictive value for sensation seeking on pathological gambling, concluded that individuals with a high level of the ‘experience seeking’ sub-trait may find the opportunity cost of gambling in terms of time and money a deterrent that inhibits their ability to experience new things. Consequently, Coventry and Brown’s (1993) assertion that high sensation seekers will be attracted to gambling because of its relationship with arousal may need to be revised to include all four factors of the trait construct.

Greater success was achieved when investigating the relationship between pathological gambling and impulsivity. Barrett (1981, p.286) defined the impulsivity trait as: “a personality trait that is characteristic of individuals who act hastily or are impatient.”

Breen and Zuckerman (1999) speculated that how the highly impulsive individual responds to reward and punishment may be conducive to developing gambling problems. Put simply, the pathological gambler may be more sensitive to reinforcement to unpredictable wins rather than the punishment of recurrent loss. The research literature into impulsivity and pathological gambling endures the same problem as much of personality trait research. Fundamentally, it is difficult to accept with any confidence any emergent findings when there is a substantial lack of uniformity in the research designs. Nevertheless, existing research demonstrated a strong association between impulsivity and pathological gambling. For example, pathological gamblers were found to have higher impulsivity than substance abusers (Castellani & Rugle, 1995), and furthermore, in a college sample a correlation between high impulsivity and pathological gambling also emerged (Langewisch & Frisch, 1998)

Other personality traits to be investigated as risk factors for pathological gambling include extraversion, locus of control, competitiveness and deferment of gratification. Extraversion was considered a potential risk factor based on the hypothesis that extraverts have a higher threshold for arousal and therefore may not be as sensitive to punishment cues in a manner similar to highly impulsive individuals. However, Walker (1992) in his critical review of extraversion studies exposed vastly conflicting findings.

Also, Walker (1992) only found moderate support for an external locus of control as a predictor for problem gambling. An external locus of control refers to an individual attributing (in this case gambling) outcomes to primarily external factors. However, Carroll and Huxley (1994) while performing a study looking at UK slot machine gamblers found a greater proportion of gamblers had an internal locus of control. This highlighted another problem in measuring personality traits as predictors. In the UK slot machines are designed to induce an illusion of control by making the game more interactive than traditional random number generated reel order slot machines (Parke & Griffiths, 2005). This suggests that the predictive value of various personality traits, especially locus of control, will vary across gambling activities. It could be hypothesised that an individual with an external locus of control will be more attracted to random

gambling activities such as lotteries whereas an individual with an internal locus of control may be more drawn gambling activities that contain non-random parameters such as poker. Furthermore, Orford et al (2003) underlined that various traits may be more influential at different stages of the problem gambler's 'career' or across gender and age.

Recently two personality traits have emerged as potentially strong predictors of pathological gambling including competitiveness and deferment of gratification. Parke, Griffiths and Irwing (2004) suggested that highly competitive people may be prone to chasing losses because they seek to reduce the negative affect incurred by losing the competition. Parke et al. (2004) also demonstrated the negative predictive value of gratification deferment, proposing that gamblers with low levels of deferment of gratification may be less inclined to try and improve their financial position by traditional methods which have a long term duration (for e.g. investing). In contrast to long term strategies, gambling appears instrumental in providing the opportunity for instantaneous rewards. Both emergent traits, although promising, still require repeated empirical validation before significant validity can be assigned to such propositions.

Situationist psychologists such as Gergen (1968) refuted that personality is a stable, durable disposition and advocate that their predictive value is negligible because cross-situational consistencies in personality are minimal (Kendrick & Funder, 1988). Moreover, Mischel (1968) outlined that personality trait and behaviour correlations rarely exist above 0.3. Given the relative lack of a definitive explanation for pathological gambling, and considering that even the most powerful experimental effects rarely exist above 0.3 (Funder & Ozer, 1983), perhaps research into personality traits as predictors may not be as spurious as some colleagues suggest (Allcock, 1986). Particularly if research studies are conducted with parallel samples and are differentiated across gambling activities.

1.2.4.4 Learning and conditioning as causal factors

Knapp (1997, p.30) proposed that “no other contemporary public policy issue provides such an isometric fit with the principles of behavioural analysis than gambling.”

Therefore, it makes intuitive sense that pathological gambling could be explained from a behavioural perspective. Behavioural Analysis is grounded in the concept that individual differences are not as important as an individual’s previous experience when it comes to explaining behaviour.

The fundamental principle of operant conditioning is that spontaneous events which are antecedents of favourable outcomes are more likely to be repeated in the future. Such favourable outcomes are referred to as reinforcement. Reinforcement is not synonymous with reward; not all rewards are reinforcing and not all rewards can be described as positively reinforcing (Kazdin, 1975). The variable schedule of reinforcement existing in commercial gambling is believed to be the major factor in continuous gambling maintenance. Laboratory research shows that variable ratio schedules of reinforcement are less sensitive to extinction (Cornish, 1978). More importantly, Lewis and Duncan (1958) found that persistence in the non-reinforced sessions was an inverse function of the proportion of reinforcement received in the ‘learning stage’. Put simply, this means that the lower the percentage of variable reinforcement experienced early on, the more likely the individual is to continue making the response when no longer being reinforced.

Lewis and Duncan (1958) proposed that how sensitive an individual is to extinction is determined by how quickly they can differentiate different ratio reinforcement percentages. In other words, the quicker a gambler can decipher between an activities which are rewarding them 0% of the time compared to 40% of the time, the sooner they will cease in responding to that activity. This theory, in practical terms, cannot be used to explain persistent gambling behaviour because the variable ratio schedules in gambling activities lack comparability, and therefore it is virtually impossible to identify with any accuracy the percentage of reinforcement provided. Furthermore, the generalisability of the work of Lewis and Duncan (1958) on extinction to gambling in a commercial environment is questionable. As Cornish (1978) points out Lewis and

Duncan were using variable ratios of 33%, 66% and 100%, where as in most commercial gambling activities reinforcement is much sparser.

Levitz (1971) found in that in the laboratory setting individuals who, in the acquisition phase, were given the 'winning' schedule of reinforcement were more likely to continue gambling for longer periods in the non-reinforced condition. This finding was in contrast to Lewis and Duncan's (1958) finding that lower reinforcement levels in acquisition caused less sensitivity to extinction periods. Cornish (1978) suggested that they are not necessarily inconsistent and perhaps it is was just that Levitz's (1971) winning and losing sessions (36% and 14% respectively) were not sufficient to enable a 'discrimination' of the two sessions. Conclusively though, Cornish (1978) advocated that differences in the structural and situational characteristics between commercial gambling and laboratory studies was so vast that generalising such findings to commercial gambling lacked validity. For example, in commercial gambling there are no extinction (non-reinforced) sessions.

However, the work of Levitz (1971) highlighted a factor which perennially emerges in pathological gambling research, namely the importance of the acquisition phase. Lesieur and Rosenthal (1991) proposed four stages in the 'career' of a pathological gambler. The first stage is the winning stage where they experience a series of wins, and often a substantial win. Such an introduction is believed to provide an unrealistic portrayal of gambling which those who develop gambling problems find difficult to 'unlearn' (Lesieur & Rosenthal, 1991).

The 'winning phase' enables the acquisition process to progress successfully. Because commercial gambling in nearly all cases exists on a negative ratio of positive reinforcement (i.e. a probability that is less than 1), it is therefore punishing over the long term. Operant conditioning states that a behaviour will decrease when conditioned with punishment highlighting a paradox in pathological gambling. Dickerson (1974) addressed the paradox, by concluding that the pathological gambler needs to experience a winning phase long enough to find other elements of gambling reinforcing. Orford et al

(2003) importantly highlighted that, erroneously, behavioural analysis studies consider financial reinforcement to be the only positive reinforcer in gambling behaviour. For example, Lesieur (1984) and Griffiths (1995) demonstrated that arousal is one of the primary reinforcers of gambling.

Dickerson (1979) suggested that perceiving gambling as operating on a variable ratio of reinforcement might be conceptually wrong. When considering arousal gambling could probably be more accurately described as operating on a fixed interval schedule of reinforcement, because win or lose the gamble reliably creates excitement. So the paradox arrived at when considering behavioural analysis and pathological gambling could be solved by considering that financial reinforcement is not the sole, and probably not the primary, positive reinforcer. Dickerson (1974) explained this concept by proposing that once gambling is acquired, probably through a winning phase (Lesieur & Rosenthal, 1991) it is maintained by classically conditioned reinforcement from other consequences of gambling such as arousal and other emotional rewards.

Cornish (1978) concluded that each gambling activity had its own unique 'recipe' of situational and structural characteristics. By extension, it is reasonable to propose that each newly experienced gambling activity will have its own acquisition period. As a result, the ability to provide a 'winning phase' for a new gambler may appear very lucrative to a gambling proprietor, given that it is demonstrated to increase gambling persistence. The obvious gambling activities which could be manipulated to provide a 'winning phase' are those that are technological in structure (e.g. slot machines and online gaming). In order to gamble online, registration is required, therefore identifying those in the acquisition phase of that specific product. Most scrupulous online gaming providers permit independent auditing to show evidence that their games are truly random. However, there is still room for manipulation in providing a 'winning phase' through providing bonuses and practise games which provide winning outcomes that extend beyond random probability. Sevigny, Cloutier, Pelletier and Ladouceur (2005) demonstrated that 39% out of 117 sites investigated provided a 'demonstration/practice' game which had a probability of above 1. In other words, the demonstration games

evaluated provided more wins than the probability of a cash game would dictate. Although such findings require further substantiation, it is nevertheless an issue of concern, not only from a behavioural perspective but also from a cognitive perspective.

1.2.4.5 Cognitive distortions and biases as causal factors

With the cognitive behavioural revolution of the 1970's it appeared a misnomer to look solely at behavioural perspectives without highlighting the role of cognition in relation to gambling theory (Orford et al, 2003; Shewan & Brown, 1993). Gambling from an economic sense is, in most cases, irrational and therefore it is probably misguided to consider excessive gambling from a paradigm of rational behaviour. In relation to pathological gambling research there are two primary categories of cognitive heuristics, those based on probability error and those based on illusion of control.

Cognitive heuristics can be described as mental 'rules of thumb' used when gambling, and Rogers (1998) specified that the majority of such heuristics are founded upon a poor grasp of the concept of randomness and probability. The main heuristics employed in gambling include: the representativeness bias (i.e. the gambler's fallacy), availability bias and entrapment. The representative bias can be described simplistically as applying long term probability to the short term. Applying the representativeness bias to roulette for example, an individual may choose to begin betting on red if the previous ten spins of the roulette wheel have been black, interpreting that red is under-represented in the previous ten spins and red is therefore due. It is accurate to profess that the laws of probability dictate that over an unlimited period of time the representation of black and red will be equal. However, applying this law of probability to the short term is erroneous. Coups, Haddock & Webley (1998) demonstrated such erroneous beliefs when asking participants the probability of the six numbers drawn last week on the lottery being drawn again the forthcoming week. The lack of understanding of probability was shown when 39% of the sample believed that those same numbers were less likely to be drawn again in the following week.

Entrapment to a large extent is based on the representativeness bias. It refers to believing that the law of averages suggests that the longer you go without winning the closer you come to winning, and as a result you escalate your involvement in the activity. The most lucid example is the finding that over 60% of National Lottery players pick the same 6 numbers every week (Hill & Williamson, 1998). A major motivation to adopt this heuristic is that it diminishes the value of losses experienced in gambling, because it could be interpreted as investment on future wins. A plethora of gambling strategies has been founded upon the erroneous cognitions of entrapment and the representativeness bias. The most notorious being the Martingale system being applied to roulette where gamblers double the size of their bets with each loss incurred and when they eventually win their profit will be the size of their original stake. The obvious flaw in this system is that it is once again applying long term probability to the short term. Put simply, extended periods of loss can occur. Furthermore, the vast majority of casinos have table stake limits decreasing the available duration of sequence making the strategy impotent.

The other major heuristic based on poor understanding of probability is the availability bias; which fundamentally is perceiving the chances of winning as being more likely than the actual mathematical probabilities dictate. Rogers (1998) outlined that it is this misunderstanding of the chances of winning which creates a sense of over-confidence in gamblers which can in turn result in excessive, even pathological, play. The gambling industry can use this cognitive distortion to their advantage by helping to sustain the illusion that winning is not as unlikely as probability implies, by manipulating the situational characteristics of the environment. For example, the National Lottery continually publicise jackpot winners. Moreover, casino environments are filled with the sounds of people winning with outrageously loud jackpot alarms; however losing patrons are not as apparent because there are no obvious signs of loss.

Langer (1975 p.316) defined the illusion of control as being defined as “an expectancy of a personal success inappropriately higher than the objective probability would warrant.” Griffiths (1995) labeled illusion of control as the most influential contribution that cognitive psychology provides in explaining the causes of pathological gambling.

Langer (1975; 1978) demonstrated with several experiments that subjects were prepared to gamble more, and with more confidence, the greater their involvement in the actual wager. For example, participants placed a higher value on lottery tickets in the condition where they chose their own numbers, and a lower value in the condition where their numbers were not personally chosen. Rogers (1998) provided support for this phenomenon by revealing that UK National Lottery players overwhelmingly preferred to choose their own numbers rather than buy a randomly chosen sequence provided by a 'lucky dip'.

Ladouceur and Walker (1996) extended this theory by proposing that the more the gambling activity was perceived as a game of skill, achieved by increased familiarity and active involvement, the greater the illusion of control. For example, Ladouceur and Mayrand (1987) found that participants playing roulette would bet significantly more when they personally released the marble. Furthermore, Ladouceur and Mayrand (1987) demonstrated that in a game of roulette subjects would bet significantly less if the outcome was already decided, even if the outcome was hidden from them, suggesting the existence of illusions of being able to manipulate the outcome.

Another primary heuristic based on illusion of control is the 'hindsight bias' (Gilovich, 1983). Fundamentally, this is when a gambler minimises losses by rationalising why the bet failed. In proposing reasons why their bet lost, gamblers are simultaneously demonstrating that they are fully aware of what determined the outcome of the bet. This expression of omnipotence is also a recurrent theme in psychodynamic understandings of pathological gambling development and maintenance. Moore and Ohtsuka (1999) found that young males were particularly prone to possessing unrealistic expectations of success and beliefs that gambling activities involve more skill than they actually do.

The role of illusion of control appears to have been acknowledged by the gambling industry in the UK with particular reference to UK slot machines. UK slot machines are technology laden making the game very interactive. The players are required to make a series of decisions which fundamentally affect the outcome of the game. However, in the

industry this is referred to as ‘idiot skill’ because such decisions in reality do not cause delineations in probability. This creation of illusions of skill involved, along with continual player active involvement appears to be successful in achieving continuous play. Griffiths (1995) and Carroll and Huxley (1994) found that young problem gamblers in the UK had believed machine gambling involved more skill than it actually did, inflating their perceptions of what they might expect to win.

Using the ‘thinking aloud’ method, Gaboury and Ladouceur (1989) found that approximately four inaccurate verbalisations were made while playing roulette in comparison to one accurate verbalisation. Interestingly, those who were previously shown to have a sound understanding of probability and the structure of the game also made significantly more erroneous than accurate verbalisations. Ladouceur and Walker (1996) attempted to resolve the paradox by suggesting there were two stages of thought process regarding gambling. There is the resting state, the rational objective assessment of probability and subsequently there is the aroused state, a reaction to situational and structural characteristics of the gambling activity that inhibits rational thought. Coloumbe et al (1992) added support to this theory by revealing a positive correlation between arousal and erroneous verbalisations in their sample of video lottery terminal (VLT) gamblers.

Although the DSM IV (APA, 1994) indicated that chasing exists primarily between gambling sessions, O’Connor (2000) demonstrated that ‘chasing one’s losses’ was more salient within session. It is reasonable to propose that after considerable losses are incurred that arousal is at peak levels. Therefore, it is also reasonable to suggest that after incurred losses cognitive processes are distorted significantly potentially accounting for irrational gambling behaviour when trying to recoup past losses. Chasing, by definition, refers to increasing the frequency and size of one’s bet in response to relative losses. O’Connor (2000) showed that gamblers when chasing gambled less sensibly, used poor strategies because of the pressure experienced by the desperation of the need to win back the money previously lost.

Factors which can impair rational cognitive judgement during the chasing phase include near misses and attitudes to risk taking. Firstly, the near miss is perhaps better described as the near win (Orford et al, 2003). The near miss motivates continued gambling because it causes frustration and cognitive regret (Kahneman & Tversky, 1982), which impairs the ability to think logically and apply rational decisions to the gambling activity. When chasing, the frustration caused by the near miss will only be exacerbated by the sheer desperation of how vital it is for the player to recoup some money. Furthermore, because the near miss is suggestive players may believe that they are becoming increasingly closer to achieving a win (Rogers, 1998), making it difficult for the gambler in the chasing phase to cease gambling. As Delfabbro and Winefield (1999) highlighted, advances in technology of gambling devices creates an opportunity for the gambler to experience a near miss after almost every gamble. Given how influential a near miss is to inducing and maintaining chasing behaviour, and in turn how important chasing is when explaining pathological gambling (Lesieur, 1994; Dickerson, 1990), the effect of such technological advances is of primary concern.

Within session gambling attitudes to risk taking can be altered or even reversed under various conditions (Orford et al, 2003). Research suggests that gamblers when faced with significant losses were more likely to increase the risk of their wagers (Tversky & Kahneman, 1981; Breslin, Sobbell & Capell, 1999), explaining to some extent the lack of rationality in gambling behaviour when chasing losses. Furthermore, Nygren (1998) proposed that in negative affectivity and conditions of high risk, variables prevalent when chasing losses, that gamblers are more inclined to make more dubious, risky wagers. Fundamentally, it appears that when chasing one's losses gamblers are less risk averse, therefore potential for experiencing further losses is highly probable compounding the original problems faced by the gambler.

1.2.4.6 Pathways model of pathological gambling: An integrative model

Through reviewing the research literature on the causes of pathological gambling it is evident that dependent on psychological discipline, explanations of gambling pathology

vary considerably. Shaffer and Gambino (1989) highlighted that in order to continue to advance treatment techniques it is paramount that a comprehensive, integrative explanatory model of developmental pathways to pathological gambling is required. Despite many theoretical propositions being dissimilar, this is not evidence of their divergent nature; therefore an amalgamation of theoretical perspectives into an explanatory model may not be unfeasible. Blaszczynski and Nower (2002, p.489) summarised this point by stating that the various perspectives “acknowledge the interaction of key biopsychosocial variables in the aetiological process but emphasise a different set of operations to account for the progression from initial participation to impaired control and persistence.”

Blaszczynski and Nower (2002), based on the premise of pathological gamblers being a heterogeneous group, advocated a three group pathway model to explain pathological gambling acquisition and maintenance, including the following subgroups: behaviourally conditioned problem gamblers, emotionally vulnerable problem gamblers and antisocial, impulsivist problem gamblers. The subgroups share some common features and processes but fundamentally contain specific vulnerability and aetiological processes that are inherent in their particular group.

According to Blaszczynski and Nower (2002) the origin for all gambling pathology is the availability and accessibility of gambling activity in the immediate environment. With a high prevalence of gambling activities in the environment, the behaviour gradually becomes accepted for the most part as a legitimate social behaviour. Subsequently, after the decision to engage in gambling behaviour, the effect of classical and operant behavioural conditioning is ubiquitous across all pathological gamblers. Operant conditioning emerges through the approach state of arousal from the behaviour, which is delivered on a variable ratio schedule of reinforcement. Lesieur and Rosenthal (1991) highlighted the importance of obtaining a big win in the early experiences of gambling, as it reduces sensitivity to extinction regarding experiencing loss during later stages of their gambling career. Furthermore, environmental and social aspects of the activity gradually become classically conditioned as rewarding (Sharpe & Tarrier, 1993).

After the initial decision is made to gamble and the individual has been exposed to the reinforcement aspects of gambling through the aforementioned operant and classical conditioning, the gambler develops cognitive biases regarding attributional processes and one's ability to manipulate the outcome of wagers, maintaining persistence in the activity (Ladouceur & Walker, 1996). Eventually, as probability dictates, over time the individual will experience considerable loss and therefore the propensity to gamble further is increased as the need to repair financial damage escalates. Blaszczynski and Nower (2002) proposed that it is at this stage where the individual begins to display the symptoms of a pathological gambling disorder.

Pathway 1 relates to behaviourally conditioned problem gamblers who are recognised by the absence of any pre-morbid psychopathology. In other words, behaviourally conditioned pathological gamblers only experience psychopathology as a consequence of the detrimental financial aspects of excessive gambling, rather than psychopathology being a risk factor (for e.g. an impulsivity disorder). Behaviourally conditioned pathological gamblers often possess poor decision making skills usually as a result of a substandard grasp of probability creating erroneous cognitive heuristics relating to the likelihood of experiencing success when gambling. Blaszczynski and Nower (2002) advocated that behaviourally conditioned gamblers are inherently 'normal', and that periods of pathological gambling are transient rather than unremitting. This subgroup has the most positive prognosis because of their willingness to enter and comply with treatment procedures. Treatment goals for behaviourally conditioned pathological gamblers include a return to controlled levels of gambling experienced prior to onset of the disorder.

Pathway 2 includes pathological gamblers who are considered to be emotionally vulnerable. Such emotional vulnerability is created through an aggregation of several factors including negative life experiences, developmental problems and generally poor coping skills. Emotionally vulnerable pathological gamblers are affected by environmental factors, behavioural conditioning and development of erroneous cognitive

distortions in the same way behaviourally conditioned pathological gamblers are. However, emotionally vulnerable gamblers are motivated to gamble in order to modulate affective states or satiate psychological needs, such as low self esteem arising from childhood experiences. Emotionally vulnerable gamblers are primed to use gambling to achieve either dissociated states to narrow attention or highly aroused states depending on resting state disposition (i.e. either states of hypo- or hyper-arousal). Unlike behaviourally conditioned pathological gamblers, emotionally vulnerable gamblers possess pre-morbid anxiety or depression. Because of this, treatment must also focus on absolving primary disorders as well as targeting the gambling pathology itself. Because emotionally vulnerable pathological gamblers are recognised as having impaired control, post-treatment controlled gambling is not a realistic treatment objective.

Pathway 3 relates to the antisocial impulsivist pathological gamblers introduced by Blaszczynski et al (1997). Antisocial impulsivists share the same vulnerabilities as both behaviourally conditioned and emotionally vulnerable pathological gamblers, yet show extreme psychological disturbance and neurological vulnerability to impulsive behaviours which are maladaptive and in other behavioural realms beyond gambling (for e.g. substance abuse). The propensity to engage in impulsive antisocial behaviour is believed to be exacerbated under periods of duress and negative affectivity. The vulnerability of the antisocial impulsivist is founded on a dysregulation of neurotransmitter systems (particularly Serotonergic and Dopaminergic systems). Onset of pathological gambling usually begins in childhood with a rapid escalation in gambling involvement and severity. Antisocial impulsivist pathological gamblers are reluctant to commit to treatment, nor when under treatment do they respond positively. Rugle and Melamed (1993) concluded that because research showed that impulsive behaviour and evidence of attention deficit disorder predates onset of pathological gambling behaviour, that impulsivity should be considered a strong risk factor.

The pathways model for pathological gambling proposed by Blaszczynski and Nower (2002) is an integration of empirical and clinical studies. The model is falsifiable and requires empirical validation. Multi-collinearity needs to be minimised so that prognosis

and treatment strategies can be pathway specific. Blaszczynski and Nower (2002) envisaged a paradigmatic shift in pathological gambling treatment, because accepted pathological gambling research has traditionally contrasted pathological gamblers with control samples. This implied that pathological gamblers are a homogeneous group. The partition of pathological gamblers into three discernable groups allows treatment to be tailored to address the specific needs of the patient. Intuitively, the behaviourally conditioned pathological gambler's treatment needs will differ vastly to the requirements of an antisocial impulsivist because they differ significantly regarding aetiology. For example, the behaviourally conditioned pathological gambler may require basic cognitive restructuring to remove erroneous cognitive heuristics or conditioned behaviour. Antisocial impulsivist pathological gamblers will probably require intensive treatment; including pharmacological intervention and cognitive behavioural therapy to restrain impulsive maladaptive behaviour. Similarly, the emotionally vulnerable gambler may also require pharmacological intervention to control affective disorders, yet they may respond better to psychotherapy regarding developmental conflicts and negative life events rather than behavioural therapy. As Blaszczynski and Nower (2002) are the first to point out, the model is tentative and requires repeated validation. However, it remains a progressive step creating a fundamental change in how pathological gambling treatment is conceptualised.

1.3 Internet Gambling: A Review of the Literature

Essentially, describing the following summary as a literature review could be considered a misnomer because to date there is minimal peer-reviewed research published regarding internet gambling. However, there remains a selection of academic research articles to critically evaluate and furthermore, there are several important published studies by research groups that provide information about online gambling behaviour.

1.3.1 Prevalence and the Online Gambling Industry

The online gambling industry is a volatile industry with substantial changes occurring every year in terms of legal restraints, developments in technology and social responsibility manifestos from industry bodies. Because of the rapidly changing structure of the gambling market, accurate rates of prevalence are difficult to determine. For example, early market research studies into online gambling reported that in 2004 the global revenue for online gambling was between \$7-10 billion, with at least 45% of that coming from US gamblers (American Gaming Association, 2006). Furthermore, a report published in February 2005 claimed that there were 5.4 million US citizens actively gambling on online poker alone (Media & Entertainment Consulting Network, 2005). However, in October 2006 a Bill was passed in the US Senate effectively making it illegal to gamble online from within the US. It is highly probable that this change in the legality of online gambling has had a significant impact on prevalence rates. Moreover, the prohibition of online gambling in the US, outlawing the online gambling industry's largest market, is also likely to have substantial effects on the development of future software and gambling products that are made available by the online gambling industry. Such changes in the industry are likely, albeit indirectly, to change online gambling prevalence rates.

The repercussions of the prohibition of online gambling in the US have effects beyond prevalence rates. If it is illegal to gamble online, it becomes more probable that when participating in research, online gamblers will conceal the full extent of their online gambling behaviour for reasons of social acceptability. Fundamentally, attempting to outline online gambling prevalence rates appears to be futile in the context of prohibition, the relative inaccessibility of the research population and social undesirability of gambling behaviour in general. Parke and Griffiths (2004) outlined the principal reasons why recruiting gamblers to participate in research is particularly difficult; including: the high level of activity engrossment, negative social attitudes towards gambling and a general lack of incentive to participate. Researching individuals who gamble online is even more difficult, beyond the reasons mentioned above, because it is difficult to recruit online gamblers without the help of the online gambling industry. The online gambling industry traditionally has been uncooperative in identifying online gamblers because of

concerns for invading the privacy of their customer base. However, this appears to be changing in response to the Reno Model (Blaszczynski, Ladouceur & Shaffer, 2004), which calls for all stakeholders in online gambling including the industry, academics and government groups to work in cohesion to progress knowledge of the research area.

After reviewing existing research studies that attempt to measure the prevalence of online gambling behaviour, it is clear that there is little agreement or consensus across findings. In summary, the general trend of prevalence has been very low prevalence rates leading up to 2000, with exponential growth experienced up to 2006. While specifically focusing on UK prevalence, Griffiths (2001) in a study of 2000 participants found that out of 24% of internet users, not one reported to be an online gambler, with less than 1% of the sample claiming to have ever gambled online. In support of this finding, the British Gambling Prevalence Survey (Sproston et al, 2000) reported that 0.5% of the population had gambled online. These findings must be placed into their cultural context, and recent changes provide mitigation for the low levels of prevalence. In the UK in 2000, there was still apprehension in relation to e-commerce specifically relating electronic cash security, and many homes still did not have access to the internet. The International Communication Union (2005) reported that in 2005 62.9% of UK citizens had regular access to the internet, in contrast to the 24% reported by Griffiths (2001). It is probable that the limited accessibility of online gambling in 2000 played a significant role in the low levels of online gambling prevalence. In support of this, recently the Department for Culture, Media and Sport (DCMS, 2006) estimated that there were approximately 900,000 online gamblers in the UK.

A second British Gambling Prevalence Survey (Wardle et al, 2007) has recently been published providing evidence of online gambling participation within the UK. The study had several minor methodological limitations, including only sampling participants who were in private residency and therefore excluding potential homeless participants. However, overall the study demonstrated high validity across all fronts and achieved a suitable 52% response rate from a random sample of 9003 participants. The study recorded that, of the sample, 4% reported to have gambled on sports with an online

bookmaker. Males were much more likely to have bet on sports online than females, with 6% of males and 1% females reporting to gamble in this format. The gender divide is also present regarding the participation rates in gambling through betting exchange (i.e. an online portal for peer to peer wagering), with 2% of males and zero females reporting to have gambled in this format in the preceding 12 month period. Finally, 3% of the sample reported to have participated in online gambling, including online poker, casino games and bingo, in the preceding 12 month period. Males were also more likely to have participated in online gambling in the last 12 months, with 4% of males and 1% of females reported to have gambled in this format. Overall, of the three forms of online gambling measured (sports betting with an online bookmaker, betting through a betting exchange and online gambling) 6% of the UK adult population reported participating in at least one of the aforementioned types of gambling online, within the preceding 12 month period.

In terms of frequency, the British Gambling Prevalence Survey (Wardle et al, 2007) reported that 23% of the participants, who gambled on sports using an online bookmaker, did so at least once per week, with 40% stating that they gambled at least once per month in this format. In relation to the participants who reported participating in online gambling (i.e. online poker, bingo etc) in the preceding 12 months, 25% stated that they gambled in this format more than once per week, and in total 53% reported to participate in this activity at least once per month. Finally, of the participants who reported to gamble via betting exchanges 33% stated that they did so at least once per week, and 49% stated they did so at least once per month. These findings show that although only a relatively small percentage of the UK adult population gamble online in any format, those who do gamble online gamble relatively frequently. For example, although over the preceding 12 month period considerably more people gambled on offline horse racing than on any form of online gambling, only 17% of offline horse race gamblers gambled in that format at least once per week whereas 35% of the participants who stated they gambled online, gambled at least once per week.

1.3.2 Online Gambling Research (peer-reviewed)

There is a considerable lack of peer-reviewed research studies on online gambling behaviour from which develop even an elementary understanding of the behaviour. After searching research databases (for e.g. PsychInfo, Web of Science, ScienceDirect etc.), it is evident that only two empirical peer-review research studies have been published to date, that explore online gambling behaviour from a psychological perspective. The first study, was performed by Ladd and Petry (2002), who recruited an opportunity sample of 389 patients via a university health care waiting room. The study reported that 8.1% of the sample claimed to be regular online gamblers and those that considered themselves to be an online gambler were more likely to be younger, male, white and score higher on the South Oaks Gambling Screen (SOGS, Lesieur & Blume, 1987).

The second study conducted by Petry (2006), used a much larger sample of 1414 participants but once again used an opportunity sample from a health clinic waiting area. In total 6.9% of the sample reported that they had previously gambled online, and 2.8% of the sample reported that they were frequent online gamblers. In total 0.9% of the sample, reported to gamble online at least once per day. Of the 40 participants who claimed to be regular online gamblers, 65.9% were considered to be probable pathological gamblers based on SOGS scores. In contrast, infrequent online gamblers and non-internet gamblers had a probable pathological gambling prevalence of 29.8% and 7.9% respectively (Petry, 2006).

Petry (2006) concluded that non-gamblers, non-frequent online gamblers and frequent online gamblers were largely comparable, except that online frequent gamblers were more likely to be younger and male. There was also a correlational relationship, when controlling for age and gender, between online gambling and poor mental health and physical health. The most pertinent finding of the study was that approximately half of the participants who reported to have gambled online were measured to be probable pathological gamblers. Petry (2006) concluded that either gambling online is a risk factor for pathological or pathological gamblers are more likely to gamble via the

internet. The direction of causation could not be explored due to the methodological limitations of the research design.

There are significant limitations of both studies' attempts to outline online gambling prevalence rates and associated factors. The principal limitation of the studies is the lack of representativeness of the samples used; both were selected from health care waiting rooms where incidence of poor physical and mental health is expected to be higher than the general public. When contrasting the pathological gambling prevalence rates between Ladd and Petry (2002), Petry (2006) and more representative prevalence studies it becomes more apparent how skewed the opportunity sample was. For example, the NGISC report (1999) stated that 0.1% of the adult population was, and Shaffer, Hall and Vanderbilt (1999) stated that 1.1% could conservatively be, considered as pathological gamblers whereas the prevalence of pathological gambling in Ladd and Petry (2002) was reported to be 15.5%. The evident lack of representativeness of the sample substantially limits the generalisability of the findings. Although the rare attempt to measure prevalence of, and develop an understanding of, online gambling should be commended, the research studies could have been substantially improved if it used more scientific, representative sampling methods and controlled for 'access to IT and internet' as a mediating factor.

1.3.3 Global Online Gambler Survey (Parke, Rigbye, Parke & Vaughan-Williams, 2007)

Although, there remains a void of academic peer reviewed research studies developing our understanding of online gambling behaviour, a major study has recently been published that explored in detail the gambling behaviour of 10,865 online gamblers, globally. This is the first study to use a sample that is representative of the global research population, rather than being geographical limited. Furthermore, the sample was substantially large enough to be more sensitive to existing behavioural relationships that were not evident in smaller samples.

Of the sample measured, 58% were male and age was reasonably distributed between 18 and 65 years. The majority of participants were between the ages of 36-55 (51%) with the smallest amount of participants reporting to be less than 18 years old (0.2%). Geographically speaking, the largest proportion of participants was residents of North America and Western Europe. The US provided the majority of respondents (60.2%), and the UK provided 8.9% of the sample, however in total online gamblers from 96 countries were surveyed. In terms of employment, there was a broad spectrum of employment sectors represented, and also 10.9% of the sample was retired and 4.3% were in full-time education.

There were notable sex differences in online gambling preferences. Eighty four percent of females reported gambling on online slot machines whereas online, 36.9% of males reported participating in online slot machine gambling. Males were significantly more likely to engage in online pari-mutuel wagering and sports betting in comparison to females. There was also a significant sex difference in online poker gambling participation with significantly more males (61%) gambling on online poker than females (22.1%). As expected the majority of the sample reported that their principal location for online gambling was their home (89.7%), however 8.3% of the sample indicated that they primarily gambled online while they were at work. Females were more likely to gamble online at work than males, and furthermore online gamblers who mainly gambled on online poker were less likely to gamble online at work. Again, as expected based on normal leisure hours availability, online gamblers were much more likely to gamble in the evening. Sex differences were evident in when the participants were most likely to gamble with females being statistically more likely to gamble online in the morning and at late night than males.

The research report then evaluates online gambling behaviour by exploring online casino gambling or online poker gambling behaviour individually. Online casino gambling was performed more by females than males, with 91.5% of female online gamblers reporting that they gambled in online casino, whereas in contrast only 56% of males reported to gamble in online casinos. Online casino gamblers were statistically significantly more

likely to be more than 45 years old. Participants who gambled in online casinos did so relatively frequently with 75.8% gambling at least once a week, and 37% gambling two or three times per week. For all age groups excluding 18-25 years, there was a correlational relationship between age and frequency of gambling in online casinos. The over 65 years old category comprised of the largest amount of high frequency online casino gamblers. Sex differences were evident across online casino gambling duration and frequency; although females were more likely to gamble for longer periods of time they reported spending less than males per session.

In terms of total profit or loss from online casino gambling per month, more than double the amount of participants reported, on average, losing more than they won and 13.9% claimed to usually 'break even' each month. Approximately, 1 in 40 online casino gamblers reported losing, on average, more than \$5000 per month, although it must be acknowledged the impact and the relative value of such losses are incalculable without measuring personal wealth and income. When questioned about motivation to gamble in online casinos, only 53% of participants stated that it was to win money, potentially explaining the continuation of the behaviour despite incurring consistent monthly losses. Other primary motivations for gambling online casinos were to relax (22%), provide stimulation (36%) and to avoid boredom (17%).

As reported previously, males were more likely to gamble on online poker than females, but males were also reported to be more likely to gamble on online poker more frequently. Regarding duration of online poker gambling per session males were more likely to gamble for longer periods of time, but there were no sex differences found after eight or more consecutive hours. Males also reported to gamble on online poker at higher stakes than females with males more likely to gamble with antes between \$1 and \$5, whereas females were more likely to gamble with antes less than \$1. Moreover, males were more likely to gamble on more than one poker table simultaneously online than females ($X^2=44.55$, $df=6$, $p<0.001$). Overall, the majority of participants (64%) gambled on only one poker table online at a time.

When evaluating total monthly profit and loss encountered for those gambling on online poker, in contrast to online casino gambling, only 32.5% reported to consistently experience loss each month and 48% claimed to consistent profit each month. However, similar to findings regarding online casino gambling, in online poker males were more likely to be consistently more profitable than females ($X^2=227.95$, $df=25$, $p<0.001$). Furthermore, although more participants reported winning when gambling on online poker than in online casino games, fewer online poker gamblers (48%) stated that their motivation to gamble was to win money. Other motivations for gambling on online poker were relatively similar to motivations for gambling on online casino games, with relaxation, stimulation and boredom relieve all being consistently reported motivations.

The Global Online Gambler Survey (Parke, Rigbye, Parke and Vaughan-Williams, 2007) provided valuable, previously lacking information about the nature of online gambling behaviour; however there were several limitations of the report. One of the main limitations of the study is that it used a sample that, although commendably large and globally diverse, was ultimately 'self selecting'. Participants were recruited through advertising emails sent out to online gambling website's customer bases, and also through advertisements on gambling web-forums. It is reasonable to propose that online gamblers who were more proficient and knowledgeable about, and in general more interested in, online gambling were more likely to be motivated to participate. Conversely, members of the research population who were inexperienced or were experiencing gambling related problems were less likely to be motivated to participate in online gambling research. Furthermore, although participants were recruited from 96 different countries it is probable that there were several ethnical groups not represented in the study because the advertisement for the study, and the survey itself was presented solely in English language. In retrospect, it is highly probable that the findings of this study were not directly representative of online gamblers worldwide and that several important classifications of online gamblers are likely to have been under-represented. Participants who were multi-lingual are intuitively more likely to be better educated and more familiar with Western culture than potential participants who were not fluent in English. Finally, it could also be argued that researching participant attitudes in

languages other than their primary language is likely to be less valid because of misinterpretation of English, particularly considering the often technical nomenclature used in the survey.

Although the research was conducted by an objective research team, the research study was openly sponsored by a prominent member of the online gambling industry (e-Commerce Online Gaming Regulation and Assurance), who was also largely responsible for participant recruitment. It is reasonable to argue that participant reported attitudes and behaviour may, in many ways, have been influenced by industry sponsorship of the research. Fundamentally, participants who were recruited to the study through advertising from their online gambling casino or poker-room may be reticent to reveal their true gambling experiences and motivations for gambling. In a related criticism, there was little attempt in the survey to explore problem online gambling behaviour. Even if the survey was expanded to investigate prevalence of problem gambling online, there would be a strong probability that participants would be reluctant to reveal their disordered gambling behaviour in a study conducted by the online gambling industry social responsibility regulator.

Fundamentally, although the report provided a substantial amount of data regarding gambling behaviour in online casinos and online poker-rooms, the limitations in the research design place significant questions over the validity, and therefore generalisability, of the findings. In addition, it must be acknowledged that the data gathered from the online gamblers was largely prescriptive in the sense that the research team pre-determined the core areas to be investigated based on theoretical hypotheses. Considering the lack of even elementary knowledge available regarding the structure of online gambling, and important theoretical relationships existent in online gambling, it is probable that the surveyed designed overlooked integral variables to online gambling. Effectively, the research only measured the behaviours which the research team hypothesised would be related to online gambling, and therefore the study cannot claim to be comprehensive.

1.4 Summary and Conclusions of Literature Review

What is immediately clear in the study of gambling behaviour is that, in relative terms, very little is known about motivations for gambling behaviour, the aetiological processes involved in the development of pathological gambling and the social costs to communities because of gambling. In the UK recent legislation has provided an opportunity for the gambling industry to expand extensively, which will substantially increase availability of gambling which has been demonstrated to increase the prevalence of gambling and problem gambling within a community (Custer, 1978). Because of this, the social costs of gambling in terms of anti-social behaviour, social dysfunction and depletion of national healthcare budgets spent on treatment pathological gambling, have come to the forefront as an issue of national concern. It is not possible to confidently identify potential negative social consequences of an increase in gambling prevalence, because there is a void of research that is methodologically robust (Reith, 2006), but many negative consequences have been shown to be related to increased prevalence (NGISC, 1999; Productivity Commission, 1999).

It is clear however by evaluating the literature on problem and pathological gambling that this impulse control disorder can be massively debilitating and creates significant disruption to an individual's everyday functioning, therefore it remains imperative to seek a better understanding of the disorder in order to treat and reduce its prevalence. Progress in understanding the disorder has been restricted because of difficulties in defining and measuring incidence of pathological gambling. Furthermore, up until the beginning of the 21st century researchers and clinicians have been reluctant to conceptualise pathological gambling from a multi-dimensional perspective. Explanations and understandings of the aetiology of pathological gambling exist from multifarious psychological disciplines. Behaviourists advocate that problem gambling can be most satisfactorily explained by the individual's response to behavioural conditioning through extinction resistant variable ratio schedules of reinforcement and through consistent stimulus pairings (Dickerson, 1979; 1974). Cognitive theorists propose that abnormal patterns of gambling behaviour can be explained largely by the

individual's adoption of erroneous heuristics that can be summarised as a misunderstanding of probability and an underlying illusion of control over gambling outcomes. Personality theorists emphasise the importance of personality disorders in the development of pathological gambling with strong evidence demonstrating the relationship between pathological gambling and a trait of impulsivity. Moreover, psychodynamic theory emphasises the importance of intrapsychic conflict, where feelings of inadequacy and guilt are extricated through gambling, and gambling becomes a method of mood modification (Rosenthal, 1987).

Until recently there has been a reluctance to integrate various psychological explanations of pathological gambling, however a trend of acceptance of a multi-factorial explanatory model has been developing. Griffiths and Delfabbro (2001) provided a discussion of the limitations of trying to understand gambling behaviour from with an insular single paradigm. Gambling is a multi-faceted behaviour that is heavily contextually dependent and cannot be adequately explained from a single perspective (Griffiths & Delfabbro, 2001). Griffiths and Delfabbro (2001) proposed a three tiered level of analysis where sociological, psychological and biological theories vary in their explanatory importance. For example, it was argued that sociological theories highlighting the importance of gambling availability are integral to explaining the development of the behaviour, whereas cognitive distortions and behavioural conditioning are more relevant when explaining the maintenance of pathological gambling.

Blaszczynski and Nower (2002) effectively extended upon this proposition and developed a pathways model of pathological gambling behaviour which advocates an aetiological process that pathological gamblers engage. Blaszczynski and Nower (2002) proposed, after reviewing the plethora of theoretical explanations of pathological gambling, that individuals can be separated into three classifications based on the existence of pre-morbid psychological disorders. Behaviourally conditioned pathological gamblers were in a social environment where gambling was pervasive and readily available, who were both operant and classically conditioned to be motivated to gamble and erroneously held cognitive biases were existent to maintain the behaviour in spite of

repeated loss. Emotionally vulnerable pathological gamblers were argued to follow the same process, except they were motivated further because of pre-morbid affective disorders. Antisocial impulsivist pathological gamblers follow the same aetiological process, and are argued to possess the same pre-morbid affective disorders as the emotionally vulnerable classification, however they also have pre-morbid impulsivity trait that makes them highly responsive to the reinforcement available in the structural and situational characteristics of gambling. The pathways model (Blaszczynski & Nower, 2002) represented an important shift in conceptual understandings of pathological gambling, where the field begins to consider the disorder from beyond a singular paradigm. Nevertheless, it is important to be cognisant that the model must be empirically validated before it can be accepted with confidence as a valid model. It is probable that as a result of this paradigmatic shift, where pathological gambling is not explained by a single insular perspective and pathological gamblers are no longer considered a homogenous group, that advancements in our understanding of pathological gambling will rapidly increase in the forthcoming years.

Blaszczynski and Nower (2002), and particularly Griffiths and Delfabbro (2001), emphatically highlighted the importance of studying gambling behaviour in its specific structural and situational context. Intuitively, although an elderly widow playing a slot machine and a young male playing poker are both gambling, it is highly probable that the experience, in terms of motivation and reinforcement, is divergent and cannot be explained collectively. This emphasises the importance of understanding the unique structural and situational features of newly developed gambling behaviour such as gambling online. In simple terms, investigating how the structure of online gambling products and the environmental factors experienced when gambling online affect the potential sociological, biological and psychological reinforcement, and cognitive understandings of the behaviour.

As acknowledged earlier there is a significant lack of peer-reviewed research articles providing a detailed understanding of online gambling behaviour. A large proportion of current knowledge about online gambling has been produced by non-academic research

bodies, many of whom may have a vested interest in the findings of such research reports. Because of the highlighted validity concerns and methodological limitations (i.e. lack of representativeness of samples used) of existing research it is not possible to claim to know anything about online gambling, except that consistently research has shown that online gambling prevalence is increasing.

1.5 Aims of thesis

The paradigmatic shift in gambling research from trying to understand gambling behaviour from a singular psychological perspective to focusing on the specific context of the behaviour is a prevailing catalyst for the research aims of this thesis. Gambling behaviour has been shown to be influenced by several integrated psychological processes such as learning models, psychological pre-dispositions and cognitive understandings of the behaviour. As a result, it is hypothesised, that how such psychological processes interact in terms of level of explanatory importance will vary across contrasting forms of gambling, and therefore it is important to research competing forms of gambling individually.

The critical factor propelling development of new gambling products, and new mediums of accessibility for traditional gambling activities, is technology (Griffiths, 1999). The most recent radical development in gambling products currently available has been the provision of gambling through information technology (IT). It is hypothesised that the structural and environmental characteristics of online gambling will vary significantly in contrast to traditional vis-à-vis forms of gambling. As a result, it is hypothesised that existing explanations of gambling behaviour, based on interacting sociological, biological and psychological processes, may not directly translate to new forms of gambling provided by IT. Therefore, it should not be assumed that the existing aetiological process of pathological gambling is representative of pathological gamblers who mainly gamble online.

In addition, because IT has significantly transformed the structural and situational characteristics of gambling, it cannot be assumed that the sociological and psychological processes incumbent in current explanations of gambling behaviour is exhaustive. Put simply, it would not be theoretically sensitive to attempt to research gambling processes that use IT by approaching the phenomenon from the paradigm of current understandings of gambling behaviour. To do so would restrict the emergence of new sociological and psychological processes involved within this new medium of gambling. Research investigating the role that IT plays in gambling behaviour must adhere to a grounded, non-prescriptive philosophy to research design in order to produce a comprehensive understanding of the new phenomenon. This is essential in order to isolate the important processes to investigate in future research designs.

Research objectives:

1. to identify processes of IT use in gambling
2. to explore and understand processes of IT use in gambling
3. to contrast emergent processes of IT use with processes related to traditional forms of gambling
4. to evaluate the implications for IT use in gambling

1.6 Format of thesis:

Chapter 1 discusses the social costs of gambling, and also the costs of disordered gambling to the individual are considered through a critical review of the literature regarding current understandings and explanations of pathological gambling. Chapter 1 concludes with a statement of thesis aims and objectives.

Chapter 2 contains Study 1 which is an explorative investigation attempting to produce a tabulate list of emergent processes of IT use in gambling, using a grounded theory methodological design. The list of processes was drawn from the substantive picture of online gambling and the grounded theoretical framework to emerge from analysis of the data. The most prevalent processes of IT use in gambling to emerge from Study 1 were explored in subsequent research studies of the thesis.

Chapter 3 contains Study 2 which explores in detail the use of Computer-mediated Communication (CMC) in the form of web-community membership and interaction in poker gambling behaviour. Study 2 employed a virtual ethnographical methodological design to achieve the objective of producing a detailed description and analysis of the role of CMC in poker gambling.

Chapter 4 contains Study 3 which, building on findings from Studies 1 and 2, was an attempt to develop an instrument to measure the emergent construct of IT use in Poker (ITP), and to empirically evaluate the predictive value of the ITP construct on online poker gambling frequency and poker gambling profitability.

Chapter 5 contains Study 4 which attempted to further develop findings from Studies 1, 2 and 3, using a phenomenological approach. Through detailed interviewing and Interpretative Phenomenological Analysis (IPA) the role of IT use in Poker was evaluated in terms of changes in the experience, and meaning of gambling, for participants and how this has affected gambling behaviour.

Chapter 6 attempts to integrate the theoretical propositions that emerged from the divergent research methodologies and epistemologies and produces a final statement of findings. Furthermore, emergent theory was critically evaluated in relation to the probable implications for pathological and responsible gambling behaviour.

Chapter 2

Study 1: Effects on gambling behaviour of technological developments in information technology: A grounded theoretical framework

2.1 Introduction

The interactive gambling market accounts for 4.3% of all ecommerce, with the industry at valued \$5 billion (Bear, Stearns & Co., 2002). Despite the enormity of such figures, they are widely regarded as being grossly conservative when considering both the perennial developments in technological mediums for gambling, and the exponential growth of home internet access over the last few years. Specifically, UK bookmakers are reported to have experienced a fivefold increase in profits, believed to be primarily a result of massive growth in remote access gambling, and that participation in online poker in the 12 months leading up to April 2004 has increased by 600% (Global Betting and Gambling Consultants, 2004). It is immediately clear from these statistical indicators that participation in online gambling activities is increasing. The increase in participation of gambling has the compound accumulative effect of removing negative stigma attributed to the risk behaviour, justifying it as a socially acceptable leisure activity (Cornish, 1978).

Naturally, the rapid growth and acceptance of online gambling is concerning to academics and clinicians in the field of pathological gambling research. However, this social problem is compounded by the fact that many treatment professionals and clinicians have little knowledge available about the nature and causes of excessive online gambling simply because there is a distinct lack of research on this subject. Gambling pathology is considered to be an under researched phenomenon (DCMS, 2001). It is highly probable that what is accepted knowledge from pathological gambling research will not necessarily be directly applicable to online gambling. Internet and other forms of remote access gambling comprise of radically variant environmental and structural characteristics than the traditional modes of gambling which current knowledge is based

on. Furthermore, because online gambling is in its infancy, it is probable that we will not be able to predict the important cognitive and behavioural process involved in online gambling during this infancy period.

To date, only a handful of studies are available which focus specifically on online gambling. The majority of these studies are theoretical and speculative rather than empirical. A prominent research problem, regarding initiation of a research programme that aims to outline the cognitive and behavioural processes inherent in remote gambling, is proposing theoretical hypotheses to be tested considering the paucity of literature to base such propositions on. Therefore, the first step of the thesis is to develop a substantive picture of online gambling behaviour from which to develop research questions to be explicitly explored in subsequent chapters.

2.2 Hypotheses Creation

The most appropriate methodology to achieve the required objective is Grounded Theory (Glaser & Strauss, 1967). The Grounded Theory methodological design emerged as a result of the discontent with traditional deductive methods of researching social phenomena (Douglas, 2004). Glaser and Strauss (1967) believed that knowledge can be gained from logical deduction but also can be generated from observation of data. Grounded Theory provided an alternative to verificational approaches to research that held position as the dominant epistemology at that time. Strauss and Corbin (1990) indicated that Grounded Theory is effective in generating knowledge of a social phenomenon that is under researched because it produces a conceptualistic understanding of the individuals, interactions and inter-relationships. The outcome of grounded theory is not a tabulate summary of cause and effect, rather “a set of integrated conceptual hypotheses systematically generated to produce an inductive theory about a substantive area.” (p.2, Glaser, 2004). To date, literature in developing theoretical propositions regarding the effects of online gambling are almost non-existent, therefore, they must emerge inductively through grounded theory.

2.2.1 Emerging Approach versus Systematic Approach to Grounded Theory

Since its inception in *The Discovery of Grounded Theory* (1967) where the core factors were first outlined, grounded theory has experienced a methodological divergence both in terms of the research process and its application. In fact, Glaser (1992) clearly believed that an epistemological chasm has developed between what he terms ‘classic’ grounded theory and Strauss’ interpretation of grounded theory. Glaser (2004) strongly believed that Qualitative Data Analysis (QDA) has been remodelling grounded theory in order to make it fit cohesively within that research paradigm. According to Glaser (2004), grounded theory transcends traditional research methodology, and to integrate the QDA canon into grounded theory not only shows a lack of understanding of the grounded theory process and outcomes, but renders it useless.

Babchuck (1997) emphasised that although such deviations in grounded theory methodology appear superficial, understanding the disagreement is tantamount to understanding grounded theory. The major discrepancy in the variant approaches deals with the role of the researcher in the emergence of theory. Glaser advocated a permissive non-restrictive approach to the data, allowing the concepts and their interrelationships to emerge from the symbolic interactionism conveyed in the participant’s accounts. Strauss and Corbin (1998) believed that grounded theory should adopt a more ‘scientific’ approach by evaluating the accuracy, significance and generalisability of the emergent theory. Glaser (2004) argued that enforcing rules of QDA on grounded theory analysis will distort the data, and instead of generating theoretical hypotheses, grounded theory will produce a detailed description of social phenomena. Glaser (2004) emphasised that verified, precise description is not the objective of grounded theory.

The epicentre of the divergence of grounded theory epistemology is based on approaches to coding data. Strauss and Corbin’s ‘systematic approach’ identified stringent rules for open, axial and selective coding of data in order to produce a blueprint of conceptual causal interrelations and outcomes. Glaser (1992) refuted that this is possible in

grounded theory and stated that forcing a preconceived framework will merely provide accurate conceptual description rather than generation of theoretical frameworks.

Glaser and Strauss also held disparate beliefs about the role of the research question in grounded theory. Glaser (1992) conceded that although social phenomena can be allocated for investigation, the actual research problem can only come from coding emergent data. This is imperative, or consequently the research document will become focused on issues outside the parameters of grounded theory, namely hypothesis validation rather than hypothesis generation. However, Strauss and Corbin (1990) contended that the research problem to examine can emerge from a range of external sources such as previous literature. Consequently, the role of existent research literature in the grounded theory process is also debated with advocates of the systematic approach acclaiming its directive assistance. Naturally, Glaserian grounded theorists purport the influence of existent literature as a further unwanted influence on the conceptualisation of the data.

It is clear from this debate that the methodology most suitable for achieving the objectives in this study is the classic emergent Glaserian approach. The distinct lack of literature regarding online gambling has severely restricted the ability to propose any theoretical approach for data coding. A review of the literature of pathological gambling and also gambling behaviour in general has provided enough scope to make sense and conceptualise the symbolic interactionism displayed within the transcripts without forcing the data to fit a preconceived framework. Issues of validity, generalisability and accuracy are clearly secondary to enabling emergence of a theoretical framework to empirically evaluate in subsequent studies.

Glaser (2004) asserted that the ambiguity that had arisen from the epistemological divergence had made grounded theory methodology appear confusing and therefore discouraging to potential users. In reality, grounded theory is a straightforward methodology. "It is a comprehensive, integrated and highly structured, yet eminently flexible process that takes a researcher from the first day in the field to a finished written

theory” (p.4, Glaser, 2004). However, as Babchuck (1997) noted, the epistemological debate underscores the importance of grounded theorists meticulously disclosing the exact process of their research. From this, the adequacy and efficacy of the research methodology can be objectively assessed therefore removing ambiguity about what the outcome of the study actually means.

The objective of this study was to propose a theoretical framework that outlines the effect of technological developments in information technology on gambling behaviour. The theoretical propositions to emerge from this study were explored and investigated in greater detail in the subsequent research studies using a range of research methodologies.

2.3 Methodology

Glaserian Grounded Theory (Glaser, 2004) was employed to enable an emergent theoretical framework to conceptualise online gambling behaviour and the utility of information technology (IT) in gambling behaviour. A grounded theory research design must be emergent in conception and allowed to unfold and cascade naturally, therefore the grounded theorist in relation to the preconceived design of the study must ‘play it by ear’ (Lincoln & Guba, 1985: p.203). However, it is also prudent to be practical regarding research design and then, where possible, be pragmatic within the boundaries of your proposed research design to best facilitate the emergence of grounded theory. For economical reasons the research process was completed by using computer mediated communication (CMC) and by subsequently integrating existing literature.

2.3.1 Participants

In total, eight participants were interviewed via semi-structured interviews until theoretical saturation was achieved. The mean age of participants was 30.63 and a (SD=10.86), with a range of 31. All of the participants were male.

Purposive sampling was applied to gather participants that would most likely yield information rich data (Patton, 1990). An online, gambling web-community was selected to identify participants for the study. The web-community focused on general gambling issues and was primarily targeted to United Kingdom based patrons of gambling activities. The web-community communication structure was dichotomised into two main sections: traditional forms of gambling and online gambling. The online gambling section was further partitioned into three categories: Interactive Wagering, Online Gaming and Online Poker. Advertisements were placed in each messageboard of the three strands of the online gambling web-community, stating: "Volunteers required for online gambling research. Participants are asked to talk about their gambling behaviour and experience of gambling online."

Upon receipt of interest in participating in the study, participants were fully briefed about what their responsibility in the study would be, and also of their ethical rights as participants. Of the 16 individuals who accepted to participate in the study after full briefing, four individuals were chosen at random for interviewing. Participants were not selected based on priori criteria (demographics, gambling involvement or preferences). This was to enable future, theoretical, sampling to be inductively based on emergent conceptual requirements of the study (Ellis, 1993). There was considerable overlap in gambling activity preference across all participants. Put simply, although individuals appeared to have a distinct preference for one gambling activity, every individual was subsequently seen to have at least preliminary experience in the many gambling activities.

2.3.2 Data Collection and Analysis

Each of the original four participants were interviewed via email. Interviewing via CMC permitted participants to be located in different areas of the United Kingdom, therefore increasing the probability of selecting a theoretically diverse sample. Moreover, a CMC research design was considered to be particularly appropriate for researching gambling behaviour. Hewson, Yule, Laurent and Vogel (2004) proposed that participants are

much more willing to disclose accurate personal information remotely (via email) when they are discussing socially undesirable behaviour. It is probable given the relative anonymity provided with internet mediated research (IMR) that participants will experience less inhibition when disclosing personal information.

The interview schedule unfolded organically. Initially, only data regarding personal details and information regarding gambling behaviour before and after the introduction of internet gambling were gathered. Participants were emailed an initial set of questions and allocated three days to reply within receipt of the aforementioned questions. As part of the feedback loop used to shape the interview schedule, the content of the responses were immediately summarised. The reproductions were sent back to the particular participant to confirm “if I got it right” (Geertz, 1973). The concepts that emerged were then used to develop the subsequent set of questions to be administered. The interview process continued to develop organically, with subsequent questions being developed in line with the information from participants’ responses, until theoretical saturation was achieved.

Analysis began with open coding. In other words, the process was initiated through systematically analysing the transcripts line by line with minimal preconception of what was expected (Glaser, 2004). The analytical objective of open coding is to generate as many categories as possible, and therefore minimise the possibility of missing important concepts in the data. Within each line of the interview transcriptions, in accordance to Glaser’s (2004) recommendations constant comparison of data was employed by continually asking questions such as ‘What category does this incident indicate?’ and ‘What is the main concern being faced by the participant?’ The objective of open coding is to identify behavioural patterns grounded in the data; and through constant comparison with similar concepts, allow substantive patterns to emerge that transcend the idiosyncratic detail of the written transcript. From this, the analyst is given impetus where to focus the study based on the conceptual patterns that emerge from open coding. This aim is actualised further through theoretical sampling.

The next stage in the Glaserian Grounded Theory design process was theoretical sampling. Taking a pragmatic approach, the analyst identifies which subgroups to analyse next, based on the probability of saturating existing concepts with comparative subgroups, and therefore develop the emergent theoretical inter-relationships between the concepts and their properties. It was evident after analysis of the initial interview transcripts that there were no participants who were either female or were parents. With permission from the online gambling web-community moderator, hosted member profiles were accessed and assessed to identify members who were either female or had children. Of the 459 member profiles, 36 were female and only 23 specified that they were parents. Again, with permission of the moderator, each of the identified subgroups to be theoretically sampled were invited personally through email to participate in the research study. After limited preliminary interest from seven members, all seven participants retracted their participation after being fully briefed about what the requirements of the study were.

Furthermore, it became evident that the original sample was exclusive of participants whose primary gambling activity was online poker. As a result, an advertisement was placed on the online poker specific forum, requesting volunteers in a similar process as the original sample. Four participants who specified online poker as their primary gambling activity agreed to take part in the study. However, two individuals withdrew their participation midway through the study for unspecified reasons.

Finally, it was evident from open coding that the initial sample consisted primarily of frequent gamblers. In order to allow the emergent theoretical framework to develop inclusive of infrequent gamblers, messages posted by web-community members over a four-week period were used to identify evidence of 'less frequent' gamblers. Infrequent gamblers were identified based on the assessment of the information they included in their messages within the web-community forum. Of the five web-community members identified as infrequent gamblers that were contacted personally via email to participate in the study, two individuals agreed.

After further theoretical sampling Glaser (2004) advocated a three-stage process of constant comparison method. Initially, incidents across transcripts are compared across other incidents in order to evaluate uniformity in the behavioural patterns. When uniformity occurs across several incidents, the incident and its adjunct conditions are considered concepts or preliminary hypotheses.

Secondly, in order to elaborate theoretically on the preliminary hypotheses, concepts are compared against other incidents to develop their incumbent properties. This comparative process contributes to their validation and comprehensivity, by reaching a juncture of conceptual saturation. The third stage of the constant comparison process is delineating a theoretical framework by establishing conceptual inter-relationships through comparison of emergent verified hypotheses.

The final stage in the coding process after open and axial coding (constant comparison) is initiation of selective coding. Primarily, selective coding is a commitment to coding data in relation to the identified core variable. The purpose of selectively coding around a core concept is to produce an economical, skeletal theory of a substantive research area (Glaser, 2004).

Identification of the core concept is the most intricate process of grounded theory as it requires identifying a singular, all encompassing concept which is both relative and workable around the primary emergent concepts, thus requiring meticulous interpretation and analysis. Glaser (1992) specified that the core variable must account for a large proportion of the variance in the social phenomena being researched. It is also imperative that the core variable has importance in application of the research by influencing formal theory. Traditionally, methods of qualitative data analysis would interpret such identification of an emergent core concept as invalid. However, as Glaser (2004) emphatically pointed out, the purpose of grounded theory specifically is to propose formal theory that is clearly grounded in the data.

In this study, the core variable presented itself very early in the research process and was verified through continual emergence and eventual saturation. Furthermore, all other saturated concepts to emerge had a grounded relationship to the core variable. Through identifying the core variable, the analyst is enabled to solidify the theoretical framework through delimiting the coded items to that which are directly related to the core concept (Glaser, 2004). By default, less relevant factors are removed and in effect the data are reduced to relatively uniform grounded theory.

The final stage of the grounded theory is the articulation of the conceptual hypothetical framework through the process of sorting 'theoretical memos'. In grounded theory, a memo is a theoretical note proposed by the analyst based on the interrelationships of emergent concepts. The benefit of sorting memos is that it raises the concepts from the idiosyncratic detail of the data, which remains in traditional qualitative data analysis, to a level of abstraction necessary for proposing global theory. The sorting of memos into a coherent structure coerces inductive reasoning, enabling theoretical elaboration. In this study, the process of memo sorting was fundamental in constructing a multi-variable theoretical framework to evaluate more intensively through the subsequent studies in the thesis.

In Grounded Theory, an 'all is data' approach is adhered to (Glaser, 2004). Put simply, data are not discriminated based on lack of generalisability or non-objectivity, and therefore existing research can be interpreted and aid development of grounded theory in line with the emerging concepts. A combination of rigorous methodological procedures in grounded theory, and reviewing past research after the primary data is analysed and interpreted, means that the theoretical propositions remain grounded in the data. Relevant existing research of gambling behaviour has been integrated into the emergent theoretical framework during the constant comparison analytic process. Review of the literature did not begin until after the data had been collected and analysed to avoid restricting the emergence of theory by imposing extant theory. Essentially, the emergent substantive picture of remote access gambling was contrasted against existing gambling

research, illuminating which of the emergent concepts should be explored in depth in subsequent chapters of the thesis.

2.4 Grounded Theory

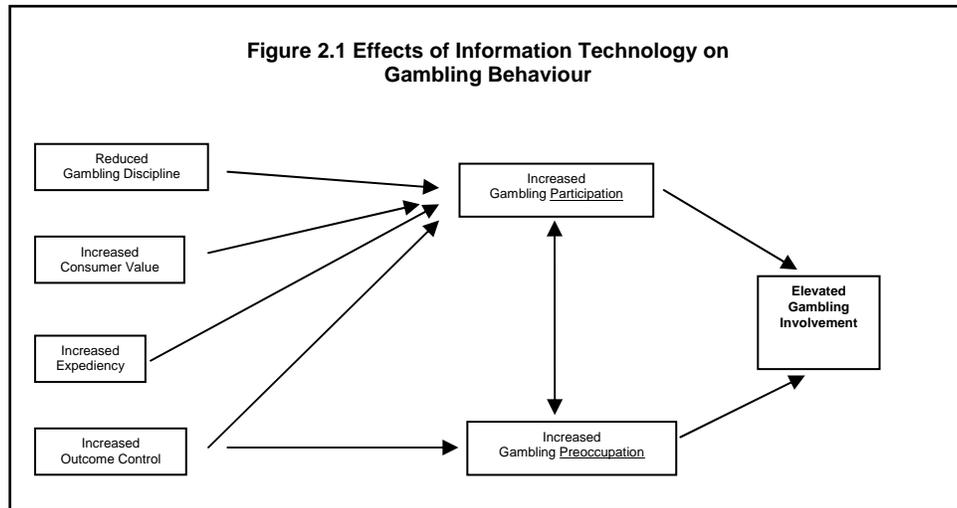
2.4.1 Elevated Gambling Involvement

Whilst analysing the data, the core concept emerged very clearly and appears to account for a large proportion of the variance in online gambling behaviour. Furthermore, all other significant emergent concepts and properties were readily inter-related to the core concept, making developing the relational patterns in the theory relatively uncomplicated.

It was evident from the data that the introduction of online gambling as a new gambling activity, and new IT in general, facilitated elevated levels of gambling involvement (See Figure 1). Elevated Gambling Involvement includes both an increase in actual gambling participation and also an increase in cognitive preoccupation with gambling. Through constant comparison, the data provided little indication that any aspect of the new gambling medium of online gambling promoted a reduction in gambling involvement.

Gambling participation refers directly to amount of time consumed and money staked on remote access gambling activities. Gambling preoccupation refers conceptually to the level of time consumed using IT as a tool to learn about gambling activities, to re-live past gambling experiences, to develop gambling skill, and plan future gambling activities. Increased gambling participation and preoccupation culminate in elevated gambling involvement of the individual. Many of the situational and structural characteristics of online gambling emerged as factors which facilitate elevated gambling involvement. Elicited data indicate that a combination of the new situational and structural characteristics of online gambling enables gamblers to rationalise further, involvement in a risk behaviour which previously required significant caution.

Significant concepts to emerge in relation to Elevated Gambling Involvement include: Increased Outcome Control, Reduced Discipline, Expediency and Consumer Value.



2.4.1.1 Increased Outcome Control

Information technology, and more specifically the internet, has provided a suitable platform from which to initiate, or engage in to a greater extent, gambling activities that contain a skill element (i.e. gambling activities that contain non-random parameters). Participants explicitly stated that their level of engagement and motivation to engage in skill based gambling activities is directly related to the availability of online gambling. Online poker was the preferred gambling activity of the majority of participants. It was revealed that the participants' first experience of poker was online. Previously, they were unable to find or were reluctant to locate a physical venue in which to play poker. The discretion and anonymity provided through remote access gambling motivated gamblers to undertake more skill-based gambling activities because in physical gambling environments a lack of skill and etiquette may prove humiliating. Conversely, online, identity can be concealed and therefore the potential for embarrassment due to inexperienced play is minimised.

For example Participant A stated:

“Losing on the computer though is good because no one sees you lose.”

Extract 1

Furthermore, the structural design of online poker software means that the marginal operating costs of providing opportunities to gamble (i.e. poker tables) has led to the availability of a vast range of types of poker game being made available to the customer. Because of this the novice poker gambler has the opportunity to play micro-limit poker with very small antes to gain experience, and the proficiency and competence that comes with experience. In physical gambling environments, because of vastly reduced economies of scale because of physical limitations in customer base, it is not cost effective to provide poker gambling opportunities at low stakes, and therefore low rake (i.e. house percentage). Therefore, inexperienced gamblers were reluctant to risk significant amounts of money in a skill based activity in which they had negligible experience. Effectively, the internet has removed financial and social barriers to begin participating in skill based gambling activities such as poker.

Sports wagering, another gambling activity that is perceived to contain a skill component, was also demonstrated to have been participated in to a greater extent as a result of developments in IT. It was clear from the data that the participants perceived that their gambling ability was significantly enhanced by assimilation of information available through the World Wide Web. Gambling knowledge was acquired and subsequently adapted by the participants to develop their gambling skill; and resultantly, with increased skill and knowledge, participants perceived they had a greater ability to determine the outcome of their wagers. For example Participant B stated:

“So going onto the webpages about sport you find out everything you need to know. You can get statistics only pages, or even reading the editorials where experts talk mostly about reasons why teams will win or why they are not going to win a game. I find that stuff really useful. I don’t spend that

much. But I do like to gamble and if I get some really good information or read something that really makes sense I would bet a little more.” Extract 2

Ability in skill-based gambling activities, in reference to IT, can be acquired through two major actions. Firstly, gambling knowledge which is objective can be found on the World Wide Web. Fundamentally, gamblers are provided with an opportunity to learn how to play any game at rates that are commensurate to their level of absorption and understanding. The vast majority of gambling websites provide instructional and tutorial sections to educate customers regarding how to play, and often provide strategy to maximise, each gambling activity. For example, instructional information to educate customers regarding complex sports wagering processes such as spread betting or probability based poker strategy. For example, Participant H stated:

“But there’s a big glut of poker related info out there. Like a breakdown of the super system. A less complicated set of rules. When I just started I kept getting beat until I started picking up strategy and tips on poker that I got from the internet.” Extract 3

Acquiring knowledge on the web is significantly more cost-effective and user-friendly in comparison to purchasing published literature. Furthermore, considering the proposed social undesirability of gambling it is probable that the individual may wish to avoid acquiring gambling knowledge from their peers. Objective knowledge regarding optimum strategy and probability has been demonstrated in the data to be easily downloaded to the gambler’s computer terminal. Using the World Wide Web individuals can access and acquire objective gambling knowledge which effectively increases motivation to gamble, by providing an understanding of the structure, and therefore strategy, of any particular gambling activity.

Secondly, ability in skill-based gambling activities can be acquired through the subjective interpretation of gambling knowledge provided in online social interaction and subjective interpretation of objective information such as statistics regarding a sporting

event. Opportunity to procure gambling knowledge regarding sports wagering and poker gambling via CMC has been reported to be profuse.

Such knowledge is predominantly located within gambling web-communities that are accessible via the World Wide Web. There is a plethora of online gambling web-communities available; readily accessible as a source of valued knowledge. Such web-communities are used as a platform to debate and disclose gambling strategy across peer groups. Not only is objective gambling strategy (i.e. strategy based on probability) analysed and discussed, but furthermore the subjective knowledge provided by experienced gamblers within the web-community is also accessible. For example Participant C reported:

“You can pick up some great advice and I like the ‘what would you do’ section where someone describes what happened to them in a previous game looking for advice on how to improve. You get to see how experts would have played that hand and that’s what no limit is about, just learning how to play right and then that’s when you start making real money. I mean you seen the thread about the 30000 jackpot and all the guys all trying to learn tips from him.” Extract 4

Often skill development in gambling behaviour is acquired through a ‘trial and error’ process where the individual must expend both time and funds learning the parameters of the activity. Gamblers seek to forfeit the potentially costly trial and error induction of learning effective gambling strategy. Therefore, the availability of knowledge based on peers’ experimentation and experience is valued highly by the online gambler as it accelerates the learning curve.

Gambling web-communities are usually highly segregated to increase user-friendliness. A gambler can log on to the global site and progress to a specialised area to acquire knowledge regarding a specific skill or strategy. Many web-communities are already gambling activity specific (e.g., online poker, poker, sports wagering), and are further

separated into sub-categories to aid navigation (e.g., no-limit Texas hold'em, pot-limit Texas hold'em, Omaha hi-lo). Within the subcategories, a list of existing threads (i.e. online periodical debates) regarding specific gambling skills and strategies can be accessed. Furthermore, if a gambler's specific query is not comprehensively resolved in an ongoing 'thread', the member may create a separate thread detailing the particular skill they wish to develop. The created enquiry elicits a range of responses from various web-community members, each providing an idiosyncratic repertory of past experiences used as educational information for the questioner to evaluate and analyse.

Subjective value of the knowledge provided can be gauged by evaluating the author of each response. Web-communities usually require members to provide identification labels, and a gambler who is a consistent user of a specific web-community forum will gradually develop an awareness of which members hold veracity over the specific gambling activity that they aim to acquire knowledge of. Put simply, the instigator of the request for knowledge can determine the value of the information provided in the responses by evaluating the respondent's web-community profile and past responses. For example, Participant D explains how he is willing to donate time sharing his gambling knowledge to less skilled players:

“In fact I hold almost a gambling clinic with people asking me for tips. They take my advice because they always see my handle [name] on the tournament listings. They know I am a good player and respect me. If they ask respectfully I'll happily share.” Extract 5

For sports bettors the abundance of statistics available on the World Wide Web on which to base betting selections motivates engagement in gambling behaviour. The selection of a wager, that in the absence of information was determined by impulse and expectation, can now be readily supported by subjective and objective information gathered from the World Wide Web. International sports betting markets are a more realistic gambling activity to engage in for the individual because of the wealth of knowledge available on the internet regarding international sporting events. In the data, sports bettors

demonstrated a willingness to gamble on overseas sporting events because there was opportunity to acquire in-depth knowledge which will inform betting selections and ultimately influence the probability of success. For example, Participant A explains:

“I definitely gamble on more different things now. It used to be just racing and footie but I suppose that was all I watched and more importantly knew about. With the internet its way different because you could be in the know in any sport you want if you went to the right websites. Like I do a few American football bets now because I get to know all about it because of nfl.com and that Sportsline site. Its just a case of reading about it and trying to take it in.” Extract 6

The increased accessibility and availability of skill based gambling activities as a consequence of developing IT has also been demonstrated in past research to elevate gambling involvement. Griffiths and Delfabbro (2001) argued that gambling activities that contain a significant element of skill and therefore provide opportunities to use complex systems, test ability and apply concentration are motivating because they enable the gambler to influence the outcome of the wager. Chantal, Vallerand and Vallieres (1995) demonstrated that gamblers who were motivated by accomplishing challenges and broadening their gambling knowledge repertoire showed greater levels of gambling involvement and persistence. Chantal and Vallerand (1996) proposed that individuals who gamble on activities with a significant skill component are intrinsically motivated to become more involved in gambling than those engaging in chance determined activities because they are provided the opportunity to socially demonstrate competence and improve ability.

The increase in skill-based gambling as a catalyst for elevated gambling involvement is also supported by behaviourist research and theory. In the interview data several online poker gamblers and two sports bettors expressed that a result of IT providing increased accessibility of knowledge and gambling opportunity, was that they experienced greater success in their gambling pursuits. Research suggests that persistent gambling is

maintained by an intermittent schedule of reinforcement where infrequent rewards are allocated after a variable number of responses (Delfabro & Winefield, 1999; Dickerson, Hinchy, Legg England, Fabre & Cunningham, 1992). If developments in IT have increased individuals' ability to influence gambling outcomes then positive reinforcement, in the form of profit and self esteem satisfaction, will increase as a result. The fundamental principles of operant conditioning mean that motivation to gamble will increase if the individuals receive increased positive reinforcement. Effectively, elevation in gambling involvement because of increased gambling ability could be a rational behaviour if it translates to increased success when gambling.

2.4.1.2 Consumer Value

The cost of setting up an online gambling business is substantially lower than the cost requirements to open a physical gambling outlet. Staff requirements and overheads are significantly reduced online. Moreover, many online gambling firms operate from within developing nations such as principalities and therefore receive substantial tax reductions (e.g. Dominican Republic, Antigua etc). Fundamentally, the reduced start up costs and the absence of geographical restrictions has led to the online gambling industry becoming quickly saturated. Consequently, the market has become extremely competitive. As a result, the gambler is directly receiving very competitive gambling prices and promotional offers and therefore a greater overall sense of value of their wager. The perceived increase in value for money of their betting behaviour leads to an increase in gambling involvement.

The promotional bonus is a robust marketing tool for the online casino and online sportsbook (i.e. online betting shop). Bonuses range from matching customer deposit amounts, offering a free stake to gamble with, awarding customer loyalty points to be redeemed for privileges, and even offering refunds on lost wagers under certain circumstances. It emerged in the data that the increase in customer value experienced while gambling online, compared to traditional gambling activities, facilitated

justification of their involvement in the risk behaviour, and lead to an overall increase in gambling participation.

The introduction of interactive wagering (i.e. online sports betting) was the advent for the 'betting exchange'. Betting exchanges essentially provide opportunity for peer-to-peer gambling. As a result, the customers receive enhanced odds for their wager with the removal of betting shop commission. A perceived reduction in 'cost of gambling' was shown to lead to an increase in gambling participation. Furthermore, betting exchanges provide the customer an opportunity to 'lay bets'. In other words they can speculate on negative outcomes. From the data it is concluded that this radically new interactive wagering opportunity provided online further motivates individuals to gamble by generating a new activity to engage in. For example, Participant A states:

“But at the same time you do you feel chuffed when you get great value on [name of betting exchange]. Like say the early morning price was like 6/4 and you can get 9/4 on [name of betting exchange] . That’s like 50% better odds. So you can bet better online with all the info and surfing for prices and it is fun that way.” Extract 7

Another emergent concept regarding consumer value in online gambling was the removal of external costs. Participants revealed that gambling expenditure was not the only cost involved with gambling. The cost of travel, purchasing refreshments and tipping the gambling establishment staff was perceived as unnecessary expenditure and therefore a deterrent to engaging in physical forms of gambling. Such external costs are not experienced when engaging in online gambling. It emerged from the data that the elimination of external costs aided justification of gambling involvement, because the universal cost of gambling has been significantly reduced. Participant D demonstrates this in the following example:

“When I first came here it was very difficult to get reasonable games. That’s the major thing for a semi pro player, getting enough semi-hard

games, where people have money but where you are not the weakest player. But the net, it is a river of easy money I can't explain. Internet gambling without doubt has improved my life, it is awesome. Before online I could only play one game at a time. Now I play 2-4 games at a time with each being faster and with no tips! The rake is also a little less. For me it is what they call a cash cow." Extract 8

Expenditure on IT that is used to provide online gambling availability was considered by participants to be a peripheral issue because internet provision and IT hardware were regarded as an essential personal requirement independent of gambling behaviour.

The reported increase in involvement with online poker gambling was a result of participants perceiving that the behaviour has become a more profitable activity because of the improvements that developing IT has made to both the situational and structural features of poker gambling. Traditional poker rooms have structural and situational limitations; namely players must be in the location of the poker room and must find an unoccupied position. Effectively online gambling technology has provided online poker players with unlimited access to poker games with individuals who they realistically would never have had an opportunity to play against because of physical and geographical limitations. Firstly, the structural and situational characteristics of online gambling have made poker a much more viable activity for many gamblers (with removed barriers to engaging in poker gambling as described in Increased Outcome Control) resulting in a vast number of people playing online. The interview data indicates that the increase in participation rates is a result of individuals perceiving that their ability to profit from playing poker has increased. Fundamentally, because poker is considered a gambling activity with large skill parameters it is inferred that the greater the participation rate, the greater the amount of unskilled players to profit from.

Secondly, online gambling technology permits gamblers to participate in numerous poker games simultaneously. It is evident from the data that gamblers perceive that because poker has a large skill component and is not solely determined by chance, they will

become more profitable per gambling session because they are no longer restricted to playing in only one game at any given time. Effectively, if skilled poker gamblers possess an advantage over less skilled opponents, profitability will increase as participation increases. The perceptual increase in the economic utility of poker gambling is concluded as a concept that allows the individual to further rationalise gambling involvement and therefore leading to elevated gambling involvement. In the following extract Participant D describes this concept in detail:

“Online I usually play three \$25/50 tables at a time and if you add them all up it would probably work out the same as the big table [physical poker room]. But I have a much bigger edge over the players online so I am making more money. Internet players are generally weaker than the ones who find themselves at poker rooms. To break it down I would say that I risk about the same amount of money online but because I can multi table online it takes me less time to hit my target. Internet means I can play more tables more quickly which means I hit my target sooner giving me more time than if I was playing real games. The net is good for losing streaks because the speed of play means that they are inevitably shorter than when you are in the poker-rooms.” Extract 9

2.4.1.3 Reduced Discipline

The structural and situational characteristics of online gambling reduce social barriers that previously existed in relation to gambling involvement appraisal. An emergent concept within the data was that the advent of online gambling and its radically improved accessibility has increased participation levels of gamblers in general. Participants commented on how the increase of gambling participation in society has removed a lot of negative stigma attached to the behaviour. Cornish (1978) described a similar concept, outlining how negative social attitudes towards gambling erode in proportion to participation levels within society. Put simply, as the popularity of gambling increases, social tolerance towards the behaviour increases, which leads to increased gambling

involvement. Moreover, the impact of engaging in an activity that is negatively stigmatised by society is significantly eroded further because online gambling can be performed in isolation and gamblers can operate unobserved. The asocial nature of online gambling means that gamblers can conceal their involvement in gambling. Participant B describes the ability to conceal gambling more using online gambling technology:

“Its not like cloak and dagger stuff where I wait until she sleeps and get up and bet the kitchen sink. As I said it is only a few pound here and there so its not like anybodies going to mind much. And it is not like, to use and example from a few days ago blackjack. It’s not like that where I am glued to the screen for hours on end. I can just log on and quickly put on a bet log off, no harm done.” Extract 10

A highly prevalent concept emerged from the data representing a reduction in within-session rational gambling judgement; data indicated that the unique structural and situational characteristics of online gambling acted as the catalyst in the reduction of responsible gambling behaviour. The cyberspace gambling environment lacked natural intermissions in gambling which significantly affected event frequency of the behaviour. Furthermore, it is widely acknowledged that online casinos having unlimited accessibility reduces the opportunity for a natural cessation in gambling behaviour. For example, Participant C states:

“Blackjack is very fast online and you could empty your pockets just as soon as you sit down whereas in the casino you take it laid back with a beer in your hand maybe miss a few hands etc. Online its bang, bang, bang, game over.” Extract 11

However, high event frequency is not the only factor to reduce the opportunity for a reflective ‘time-out’. The data revealed that being able to deposit money instantly into

one's account caused participants to gamble beyond what they had anticipated prior to gambling commencement. It appears that the removal of naturally occurring time-outs, such as operating hours of gambling businesses and needing to withdraw further funds in a more time-consuming process, has reduced rational collective thinking and consequently lead to reduced discipline when gambling. In extract 12 Participant C describes this phenomenon:

“There's always a tendency to get a bit excessive online isn't it. Its the whole credit swipe tactic isn't it. When you keep having to go to the hole in the wall in the casino or when you're playing the slots you think better of it don't you. You look at the money coming out and it hits home doesn't it? Handing over your twenties to the croupier for a few coloured chips is pretty hard. Well for someone with a low income like myself it is. But online you click the deposit box and you're back in the game quick.” Extract 12

This concept of reduced discipline extends beyond online gaming into interactive wagering. In effect, through developments in IT, sports wagering opportunities are constantly available through accessibility of betting markets in differing time zones. Traditional barriers to these overseas sports betting markets, including lack of information of betting selections, an inability to observe 'in progress' sports wagers or even obtaining the result of sports wagers are circumvented through the application of the World Wide Web. Participants have outlined the ability to research potential sports bets in an in-depth manner via the World Wide Web, and also that watching live overseas sporting events through a World Wide Web portal has increased motivation to engage in international sports betting markets. Effectively, data indicates that the ability to bet continuously has significantly elevated gambling participation and involvement.

The increased frequency of gambling and the ability to instantly replenish gambling funds online appear to reduce the clarity of gambling behaviour. Participants reported finding it more difficult to mentally track financial expenditure and lapses in time, leading to corrosion of rational judgement and their ability to maintain disciplined,

control of gambling exposure. Existing theory has substantially demonstrated how increased event frequency increases the risk of the individual losing control when gambling (Walker & Dickerson, 1996; Griffiths, 1995; Dickerson, 1989). O'Connor, Dickerson and Phillips (1995) demonstrated that the event frequency of a gambling activity increases the risk of the gambler losing control. In effect, the more money that can be staked and re-gambled, the harder it is for the individual to maintain discipline. Online gambling has dramatically increased the potential event frequency of casino style gambling, poker gambling and sports betting and therefore is a probable cause of the core variable of elevated gambling involvement

2.4.1.4 Expediency

An emergent pattern from the data was the convenience of online gambling, which was influential in rationalising involvement in gambling. Firstly, it was indicated that gamblers perceived that new technology has reduced the amount of time usurped when gambling. For example, Participant D states:

“All the above means that I can still make as much as I used to in poker but in much less time. This frees up time for me to other things that help to improve my life.” Extract 13

Traditionally placing a wager required the gambler to physically enter a gambling outlet. In contrast, wagers can now be placed instantaneously from any computer terminal or even an internet enabled communication product (for e.g. a mobile phone, a PDA etc). The removal of unnecessary time consumption through online gambling is another restriction to gambling participation that has now been eroded. For example, Participant A states:

“I suppose I gamble more often on the net. Actually probably every day at that. I read the form with my breakfast and before I leave I put a few pound

on. It is so much easier than walking round to the betting shop. And its always pissing it down [raining] up here anyway.” Extract 14

The data also indicated that the experienced increase in working hours, which previously obstructed engagement in gambling because of time restrictions, is no longer a significant factor in deciding whether to gamble. Essentially, a process of leisure activity substitution is being experienced for the participants. Leisure activities, such as watching television and socialising outside of the home, are being surpassed by engaging in gambling to a greater extent. There was evidence of the rationalisation that participating in gambling within the home is less disruptive to one’s lifestyle and well-being than a range of other leisure activities such as consuming alcohol, which therefore enables the gambler to justify elevated involvement in gambling. Consequently, time spent gambling has enhanced viability and is perceived as a more suitable leisure activity because it can be performed with greater efficiency and time management because of technological developments.

Existing literature prolifically demonstrates a strong positive correlation between accessibility and participation rates (McMillen, 1995; Dickerson, 1995, 1989; Rosecrance, 1985; Custer, 1982; Weinstein & Deitch, 1974). Such data indicated that gambling involvement is significantly affected by situational determinants and therefore cannot be solely attributed to individual differences. As online gambling infrastructure continues to develop, more technological variations of gambling products are being made available. Griffiths and Delfabbro (2001) proposed that the availability and improved accessibility of new gambling activities will increase the demand for gambling in general. Therefore, based on emergent data and existing research interpreted as data, a cause of elevated gambling involvement is likely to be the substantial increase in accessibility of a variety of new gambling activities.

2.4.2 Theoretical Propositions:

From the data, four universal theoretical propositions have emerged in relation to technological developments in IT and online gambling. Fundamentally, the emergent hypotheses delineate the probable causes of the observed Elevated Gambling Involvement.

Theoretical Proposition 1: An increase, or perceived increase, in gambling outcome control, based on increased accessibility of gambling activities that have non-random parameters and increased ability to procure objective and subjective gambling knowledge, has lead to elevated gambling involvement

Theoretical Proposition 2: An increase, or perceived increase, in the economic utility of money staked when gambling, based on a reduction of external gambling costs and the increase in industry competition has lead to elevated gambling involvement.

Theoretical Proposition 3: A reduction in rational judgement, caused by the situational and structural characteristics of online gambling, has lead to elevated gambling involvement.

Theoretical Proposition 4: A decrease, or perceived decrease in the opportunity cost of gambling because of increased expediency when gambling online, has lead to elevated gambling involvement.

2.5 Discussion

There is a substantial lack of research available regarding how developments in IT have affected gambling behaviour. The objective of this study was to construct a substantive picture of online gambling behaviour and the use of IT in relation to gambling behaviour. A theoretical framework outlining the dynamics and relationships of this phenomenon has been developed and this framework will be explored further through quantitative and

qualitative research in an attempt to improve our understanding of how developing IT has affected cognitive and behavioural gambling processes.

The nature of gambling behaviour has evolved considerably in relation to developments in IT and more specifically with the emergence of the internet and the World Wide Web. The primary change is an increase in gambling involvement directly resulting from technological developments. The major catalyst for the increase in gambling involvement is the ability to justify engagement in gambling activities because IT has increased the ability to increase control over gambling outcomes, has reduced the costs associated with gambling and reduced the opportunity cost of gambling. Moreover, the structural and situational characteristics of online gambling have reduced the level of self-control when gambling also elevating gambling involvement.

Effectively, the financial and social restraints associated with gambling involvement have been reduced significantly by the increased utility of the behaviour, provided by the introduction of online gambling and the World Wide Web. Superficially at least, gambling could be rationalised by the individual to be less disruptive and dysfunctional online because of the reduced costs of gambling, the increased accessibility and the perceived increase in ability to control gambling outcomes.

The negative implications of the proposed rational motivation to elevate gambling involvement are largely dependent on whether the behaviour is merely a demand characteristic to justify engagement in risk behaviour. Gambling has become cheaper when considering the increased competition in the market and the removal of external gambling costs that are associated with gambling in physical environments. Also, gambling behaviour can now be performed more efficiently, leading to a reduction in time usurped and therefore reducing the opportunity cost of gambling. Moreover, theoretically, there is scope to conclude that one's ability to control gambling outcomes by acquiring objective and subjective gambling information has increased and therefore (*ceteris paribus*) the profitability of gambling has increased. Because some activities such as poker and sports wagering do contain non random parameters, to determine

whether the increase in motivation to gamble is rational rather than a demand characteristic it is necessary to research individual gambling strategy. It is probable that whether the increase in gambling involvement is a rational reaction to the proposed increase in gambling utility and ability to control outcomes, or whether it is a demand characteristic employed to enable individuals to justify increased gambling exposure, will vary across gamblers and can only be determined by analysis of gambling behaviour.

It is probable that the reported reduction in gambling discipline caused by increased event frequency, a reduction in 'time-out' periods when gambling and substantially increased accessibility to multifarious gambling activities is a cause for concern. Effectively, the structural and situational characteristics of online gambling increase the propensity to gamble in a disordered, problematic fashion. The current study only denotes an increase in gambling participation and pre-occupation and therefore direct measurement of online gambling behaviour in relation to pathological gambling criteria is required before the unique factors of online gambling can be assessed as risk factors

2.6 Implications for future research

The overall aim of the thesis is to initiate knowledge generation regarding the effects of technological developments in IT on gambling behaviour, which is currently an under-researched phenomenon. The first step of the research process was to develop a substantive picture of online gambling and the use of IT in gambling behaviour. From the emergent theoretical framework several research questions and theoretical propositions were extracted to be investigated in detail through subsequent qualitative and quantitative research studies within the thesis. The objective of the subsequent research studies was to explore and develop theory that has emerged from the current study, and therefore improve our understanding of the role of technological developments in cognitive and behavioural gambling processes. Theory proposed after subsequent qualitative and quantitative research was completed will be contrasted against existing problem gambling literature in attempt to propose potential risk factors for pathological gambling development and maintenance in relation to IT use in gambling.

The first theoretical proposition to be explored further was the use of IT to increase control, or perceived control, over gambling outcomes. A general trend in Study 1 data was an increase in participation in poker and pre-occupation in developing poker gambling skill. This phenomenon was subsequently researched through two separate research designs. Study 2 was an explorative, qualitative design using virtual ethnography to investigate the role of CMC (specifically gambling web-communities) in increasing outcome control in relation to poker gambling. It was evident in the interview data of Study 1 that many poker gamblers interacted with peers on gambling web-communities to acquire both objective and subjective poker gambling knowledge. The gambling web-community was proposed to hold significant utility for the poker gambler in improving skill level and therefore, theoretically, increasing the profitability of the behaviour. The objective of the ethnographic study was to outline and assess the cognitive and behavioural processes that are observed within the web-community, in order to improve understanding of the use of IT in developing poker gambling skill and its subsequent affect on gambling behaviour. Essentially, the virtual ethnographic study developed theoretical propositions relating to the use of gambling web-communities found in the Study 1, by focusing research to produce a more detailed description of the phenomenon through concentrated investigation.

Study 3 measured poker gambling behaviour and the use of IT to develop poker gambling ability. The items measured within Study 3 were primarily informed by the findings of both the Study 1 and Study 2. The grounded theoretical propositions relating to using IT to increase poker gambling outcome control were measured empirically in Study 3. Furthermore, the cognitive and behavioural concepts extracted from the ethnographic findings of poker specific gambling web-communities were examined empirically and in relation to poker gambling behaviour. The objective of this study was to outline the relationship between using IT to increase poker outcome control and poker gambling behaviour, specifically frequency and profitability.

Current psychological explanations of gambling behaviour and gambling as a psychopathology have been developed in relation to traditional physical gambling activities and structures. The radically different situational and structural characteristics that exist because of technological developments in IT means that it is probable that such explanations may not directly translate into explanations of online gambling behaviour. The culmination of the four research studies which comprise the research thesis provides an in-depth explanation of how gambling behaviour has been affected by developments in IT. The objective of the thesis was to increase understanding of online gambling and the use of IT in gambling behaviour. The overall aim of the research was to generate knowledge that could be incorporated into current psychological explanations of gambling behaviour and development and maintenance of pathological gambling.

Chapter 3

Study 2: Computer Mediated Communication and Poker Gambling Cognition and Behaviour

3.1 Introduction:

Because accurate prevalence rates for online poker gambling continue to emerge slowly perhaps the most effective indicator of substantial growth comes from the online gambling industry itself. A report by the Global Betting and Gaming Consultants (GBGC, 2004) estimated that £40 million is wagered on online everyday, and at least 10% of that comes from the United Kingdom. Specifically, online poker gambling was measured to have increased by approximately 600% in the 12 month period prior to April 2004. Globally speaking, a more recent report from the Media and Entertainment Consulting Network (2005) revealed that if the figures for the first quarter of 2005 continue for the successive quarters that the amount gambled on online poker websites in 2005 will be over \$60 billion. In the report, industry analysts believed that within a three year period poker will emerge as the dominant gambling activity online. Crucially, the rapidly increasing participation rates in poker gambling indicated by the gaming industry itself, renders online poker gambling an important area of research and worthy of detailed investigation.

Bolen and Boyd (1968), producing the most pertinent definition, described gambling as placing a value on an event that has an unpredictable outcome, and in which the result is determined to some extent by chance. The magnitude to which the outcome is determined by chance varies considerably across gambling forms, with poker (at least perceptually) being situated firmly towards the 'skill-based determination' end of the spectrum, to the point of being almost an anomaly in comparison to other gambling activities. Parlett (1990, p.105) summarised poker as the transfer of "one or more chips from one's personal stack into a communal pool or 'pot', which is eventually won by the

player who either has the best hand or has persuaded everyone else that he has.”

Fundamentally, success in poker is determined by three factors: individual mathematical ability, subjective interpretational and representational skills, and random chance. The ability to use psychological skill, for example, the interpretation of opponents’ physical and verbal behaviour to determine the relative strength or weakness of their ‘hand’, is not afforded in other casino table games. Therefore, in relative terms at least, there is scope to develop and acquire skill to control the outcome of poker gambling activities by using objective and subjective reasoning, which effectively should increase the profitability of the activity. As a result, if potential to develop outcome control in poker exists, accumulation of such skill may provide strong motivation for poker participation.

From evaluation of previous research into cognitive explanations of gambling motivation, the level to which the activity is deemed to be influenced by skill is pivotal. According to Dickerson (1993), gambling activities that require skill, or at least are perceived to be influenced by player skill, are more likely to cause impaired control and motivate further gambling despite experiencing loss. Furthermore, Ladouceur and Walker (1996) specified that the more a gambling activity is perceived as a game of skill (achieved by increased familiarity and active involvement), the greater the perception of outcome control. From a problem gambling perspective, Toneatto, Blitz-Miller, Calderwood, Dragonetti and Tsanos (1997) found that in a population of problem gamblers the more a gambling activity was related to skill, the greater the amount of cognitive disorders were identified. Fundamentally, a large number of research studies clearly show that there is a strong relationship between perception of control and motivation to gamble (Langer, 1975 1978; Ladouceur & Mayrand, 1987; Rogers, 1998).

Griffiths (1995) highlighted perception of outcome control as the most influential contribution that cognitive psychology provides in understanding the causes of pathological gambling. Griffiths (1996) found that slot machine gamblers that professed skill to be important in determining gambling outcomes were more likely to believe that they had more skill than non-regular gamblers. Developing this finding further, there is scope to speculate that poker gamblers may consider skill level to increase in relation to

exposure to poker gambling. As a result, it is probable that the potency of the behavioural contingencies of losing (i.e., punishment) is reduced if the poker gambler believes that through consistent playing, independent of winning or losing, skill is simultaneously being developed.

Study 1 indicated that a substantial amount of the variance in poker participation can be explained by the introduction of the internet and other IT systems. The internet is principally an expansive electronic communications network. However, in application it becomes an instrumental tool with great utility that acts as a transmitter of varied interpersonal communication and a remote information receptacle. The theoretical propositions extracted from the emergent grounded theory of Study 1 proposed that IT provides the individual greater control, at least perceptually, over determination of gambling acts. Intuitively, it follows that the greater the influence that skill has over a gambling activity the greater the utility of IT in developing such skill. The objective of the following ethnographical study is to reveal in what ways IT influences poker gambling cognition and behaviour, both online and offline.

Crucially, if gambling is considered to be a behaviour that is primarily motivated by risk and the potential rewards and by-products of such risk, then to understand the cognitive framework of the individual, the risk must be placed in both its social and technological context. Friedman, Sterk, Sufian, Des Jarlais and Stephenson (1990) highlighted that individual choice, in relation to risk, is not separate from peer groups, social etiquette and community norms. Therefore, the interpersonal network of poker related web-communities provides the ideal starting point to build a valid representation of poker gambling behaviour and cognition.

Power, Jones, Kearns and Ward (1996) revealed that qualitative research held particular utility in unravelling behavioural experience of 'hidden' populations that may be interpreted as socially deviant. Qualitative research triumphs where traditional formal methodologies falter, based on challenging accessibility of suitable research samples. The primary objective of the following study is to outline the cognitive and behavioural

processes involved in using IT to develop poker gambling skill. A virtual ethnographical study of the network of poker gambling web-communities is the most efficacious research methodology to begin frame-working the relationship between poker skill development using IT, cognitive processes and behavioural processes that are incumbent in poker gambling.

3.2 Methodological Considerations

3.2.1 Application of ethnography to the study of poker skill development within a web-community

Study 1 concluded that online poker gamblers utilise IT to develop their online and offline poker proficiency. Emphasis therefore shifts onto delineating the most efficient research design to investigate this emergent concept. An ethnographic investigation of the cognitive and behavioural processes involved in using IT to develop poker skill is understood to be the most logical application. In effect, ethnography begins where the grounded theory process ended, by providing further inductive analysis of the proposed theoretical concept. There is potential to engage in an empirical study prior to further qualitative analysis. However, logically such a quantitative study would be executed more efficiently and accurately if informed through further descriptive findings. Moreover, the aim of the ethnographer is to explore the community with relative naivety to maintain sensitivity to emergent findings, rather than seeking to substantiate empirical claims (Atkinson & Hammersley, 1994).

Ethnography, which is achieved primarily through participant observation, focuses on accounting for the actions and intentions of the studied social agents, and outlining how such behaviour is rationalised and understood by the wider group (Ley, 1988). Herbert (2000) stated that the role of the ethnographer is unearthing what the group accepts as cultural tacit regulations, and illuminate such 'meaning structures' as a blueprint for understanding that community. Indeed, Goffman (1961) emphasised all processes of social groupings will become meaningful, and perhaps reasonable, when submitted to its

core. It is rational to speculate that online gambling, and even gambling in general, is not fully understood and endorsed by society because, at least superficially, the negative consequences are more apparent than the positive consequences. Ethnography is critical to gaining an 'insider's perspective' and apprehending knowledge from which to understand elevated involvement in poker gambling.

According to Lofland (1976), the key aspect to performing an ethnographic analysis is to balance the role of being an active part of the selected community, while intermittently assessing emergent findings against existing and developing theory.

Further validation for engaging in ethnographical work prior to commencing quantitative analysis comes from Silverman (1985), who highlighted that categorical order should emerge from the field rather than be imposed by rigid pre-determined categories.

However, at a fundamental level ethnographers must possess a rudimentary knowledge of the social processes being observed in the community, which is exactly what was provided by completion of Study 1. Lofland (1995) maintained that despite such prior knowledge, ethnography remains an entirely inductive process because the findings of the study emerge from progressive interaction and integration into the community.

Ethnography as a method of data collection and analysis is particularly applicable when trying to understand behavioural and cognitive gambling processes because survey and interview data only measure professed data, whereas ethnography includes measurement of behavioural data. Effectively, ethnography reveals the relationship between behavioural intent, attitudes, and beliefs against actual behavioural patterns (Eyles, 1988). Previous research has consistently demonstrated that within, and even between-session, gambling, the cognitive performance of the gambler is influenced by arousal, dissociation and various structural and environmental characteristics of the gambling activity (Ladouceur & Walker, 1996). For example, several researchers (e.g. Walker, 1992; Griffiths, 1994) demonstrated that slot machine gamblers when playing their preferred game were more prone to verbally accounting for their gambling behaviour through irrational cognition. Fundamentally, it is probable that a discrepancy will exist between how the gambler perceives and explains the behaviour, and how the behaviour is

executed in reality. It is probable that this incongruity could be identified through participant observation within the ethnographic study.

Ethnography can be criticised as a valid methodological tool of analysis within social science based on its perceived lack of objectivity, the generalisability constraints and how data is represented. Herbert (2000) addressed each of those methodological concerns, justifying ethnography as a valid and effective analytical framework. Firstly, although conceding that interpretation may be overly subjective based on the nuances and biases of the ethnographer, Herbert (2000) emphasised that all scientific methodologies are subject to interpretation by the researcher no matter how objective they at first appear. Put simply, objective scientific methods, including measures of reliability and validity, are effectively social processes themselves. The culture of the specific scientific paradigm undoubtedly influences how data are interpreted.

Furthermore, the subjectivity of ethnography is not simply a limitation; rather the subjectivity of experience is the analytical tool from which to generate knowledge of the community being studied (Herbert, 2000). Indeed, Smith (1984) declared that in order to analyse and explore the behavioural contingencies within the social processes while performing participant observation, a continual reflexivity, stemming from personal experience is vital. Subjective experience within the group may illuminate profound underlying social processes integral to the group. For example, Weider (1974), reflecting on his frustration at being unable to unlock information from a group of adolescent offenders, revealed that an underlying 'convict's code of silence' was affecting the behaviour of the offenders towards the research. In the current study, it is probable that the experiential effects of participating in computer-mediated communication (CMC) regarding skill development in poker, and participating in poker, will aid in the understanding of the rationality of engaging persistently in a high risk behaviour.

However, this does not dismiss the importance of remaining sensitive to emergent understandings of the observed culture. Primarily, the ethnographer must continually re-evaluate their personal understandings and seek to consistently confirm such knowledge

or amend and develop such knowledge by remaining reflexive when interpreting meaning. To reduce concerns about ethnographical findings being rendered useless by over-subjectivity of the researcher, Cicourel (1964) strongly advocated that the researcher vigilantly describes the logic of the interpretation process for others to discern the validity of claims made.

Regarding the limitations imposed on the generalisability of ethnographic findings, Herbert (2000) conceded that due to the intensity of the analysis placed upon the observed community, descriptive findings are effectively historical. However, several techniques are available to the ethnographer to make findings more readily generalisable to a wider scale. Firstly, the ethnographer can select communities to research that are reflective of the integral dynamics of similar communities. In reference to the utilisation of CMC in the current study, it is prudent to assess a range of online poker web-communities to assess the salience of the structural dynamics of the selected web-communities in relation to unobserved competing communities.

Conversely, the ethnographer can engage in comparative ethnography by contrasting one community against another, and therefore generate knowledge by identifying idiosyncratic features of the observed community. Comparative ethnography aids in unravelling the unique social processes and attributed meanings, thus identifying where exactly the findings can be generalised to. Finally, the generalisability of the ethnographic findings will be enhanced if they are produced in tandem with empirical quantitative research. Study 3 has provided such data from which to triangulate the validity of the ethnographic findings. In other words, contrasting findings from the second and third study will elucidate to what extent the participant observation is reflective of the wider community of online poker gamblers.

According to Herbert (2000), critical assertions of the technique used to represent data in ethnography are based on the argument that ethnographers do not remain sufficiently cognisant of how preconceptions and research objectives affect the collection and interpretation of data. Fundamentally, a tendency exists in social science research to

produce an uncomplicated explanation of observed social processes and agency to meet research objectives. As Atkinson (1990) noted, ethnographical findings may be more reflective of the need to find order in social processes rather than rendering a comprehensive analysis of the cultural patterns of the community under research.

Herbert (2000) highlighted the importance of the ethnographer acting with forthrightness, reflexivity and modesty of claims. Fundamentally, what the ethnographer chooses to exclude is just as important and relevant as the knowledge generated in the study. Forthrightness refers specifically to the ethnographer revealing the objectives of the study to the community under research as to remove any opportunity to restrain the necessity of meeting preconceived research objectives. Moreover, this candidness extends to the audience of the research in so far as providing a logical progression of interpretation of experiences and observation within the ethnographical procedure.

Reflexivity in interpretation remains a prerequisite in ethnography because as Jackson (1991) emphasised, the key to superior analysis lies in the ethnographer's ability to identify how their own culture and social processes affect the interpretation of the observed social processes and meaning. Therefore in the current study, consideration must be given to how this author's pathological gambling research background and prior gambling experiences and pre-existing beliefs affect how observed social process are interpreted. Herbert (2000) argued that the ethnographer must create a space between personal culture and the observed community by constantly shifting from the role of 'insider' and 'outsider' to recognise similarities and differences.

Herbert's (2000) belief that the ethnographer must adopt humility when assessing the value of the claims made in the study, is rooted in the acknowledgement that partiality is inherent in all knowledge claims. Essentially, the role of ethnography is, while accepting the impartiality of the findings, to provide the audience with detailed descriptions of concepts that can be used to understand further the behavioural and cognitive processes inherent in a specific community.

The aim of engaging in an ethnographic study of the gambling web-community who utilise CMC to develop gambling proficiency, is to outline the behavioural and cognitive processes involved, and furthermore, to reveal the shared meaning attributed to such processes. The objective is to illuminate how the structure inherent in poker and IT is interrelated with agency of both on- and offline poker gamblers. Smith (1984) declared that the structure-agency inter-relationship must be resolved on a practice level rather than ontological level. In simple terms, the significance in ethnographical data lies in its contextual detail of process which more objective qualitative research often occludes. Essentially, through generating knowledge of the social process on a micro-logical level, understanding of the behaviour on a macro-logical level will be enhanced. Other qualitative and quantitative methodologies may not provide the necessary contextual reference from which to understand poker skill development within a web-community. Furthermore, when acknowledging the paucity of research in regards the application of IT in poker gambling behaviour in general, it is highly probable that a catalogue of detailed descriptive analysis of the behaviour would be a valuable resource from which to design future quantitative studies of the phenomenon.

3.2.2 Development of virtual ethnography methodology and its application to the study of poker skill development within a web-community

Wittel (2000) delineated how ethnography, which has traditionally been focused and centred around locality, must adapt to the changing nature of community in modern society. Geertz (1973) commented on the straightforwardness of ethnographical research in the mid-20th century whose mandate was simply to provide as much description of the processes, and their attributed meanings, as possible. However, Wittel (2000) contended that is no longer a viable approach to research modern communities because defining community by locality restricts the level of description possible, by failing to consider the inter-penetration of several cultures resulting from the developing globalisation of society. Essentially, communities have become increasingly inter-connected as a result of developing technology enabling improved communication and mobility. Gupta and Ferguson (1997a) explained that, somewhat paradoxically, ethnography no longer

focuses on a finite community because the idea of community isolation in modern society is socially constructed and imposed by researcher pre-conceptions.

Wittel (2000) argued that a possible solution to the increasing redundancy of ethnographic methodology to research modern society is Gupta and Ferguson's (1997a) contention that culture should no longer be conceptualised by geographic locality but by socio-political location. Gupta and Ferguson (1997b) re-conceptualised the idea of traditional fieldwork immersion through participant observation to a focus on the inter-connections of multiple socio-political locations. Wittel (2000) therefore proposed that ethnography is adapted to become a study of the 'network', where the nodes (i.e. contiguous communities) are just as relevant as their inter-connections. The primary aim of ethnographical research is to provide a 'thick description' of the complexity of community processes and interaction (Geertz, 1973). Wittel (2000) outlined how in the previous century such complexity was ascertained through long-term participant observation, whereas now such a methodology would reduce the complexity of description because it would exclude the interpenetration of communities.

Nowhere more so is the importance in adapting ethnographical methodologies from being focused upon geographic locality to a broader analysis of the modern network community evident than in the study of virtual communities. Naturally, the principles of ethnography do not readily translate into a blueprint for researching online communities. For example, the increase in nodes required to accurately research an online web-community requires the researcher to make subjective, political decisions about which nodes and connection to focus on and which to occlude. Furthermore, multi-sited ethnography often requires a number of gate-keepers who traditionally permit access, act as a guide and provide the ethnographic researcher with credibility within the observed community. Finally, the necessity to observe and participate economically across the various sites often will lead to a reduction in the ability to understand and explicate underlying levels of meaning.

A logical obstruction in being able to perform ethnographic research online is the inability to engage in participant observation. Wittel (2000) proposed that sole analysis of CMC does not constitute ethnography, and relates more to conversation analysis or even discourse analysis. However, with reference to this particular study, this issue is redundant since the concept being research relates specifically to online behaviour which the researcher can participate in to a large extent. Naturally, the research suffers from the inability to record ancillary forms of data such as physical cues such as facial expression and pitch and tone in dialogue. Fundamentally, the ethnographical data in the analysis of the use of CMC to develop poker skill will not be impeded by de-contextualisation since the actuation of such behaviour is performed online by default.

Wittel (2000) argued that virtual communities are not a replication of reality but rather an extension of reality and therefore should be evaluated in relational terms to physical reality. Ward (1999) extended this position, by claiming that virtual ethnography observes an amalgamated network locality that contains both the physical and virtual reality. Ward (1999) strongly advocated the application of virtual ethnography, rather than employing the principles of traditional ethnography, when researching virtual communities because the concept of what constitutes community is altered regarding the properties of web-communities. The utilisation of traditional ethnographical methodology would, by default, assert that virtual communities share the same structure as physical communities.

Virtual communities are propelled by the aim of achieving a collective goal, however participation is transient and requires minimal commitment, and Ward (1999) believed that the term virtual aggregation is more reflective of their true structure. Participants are motivated to engage in virtual aggregations to fulfil personal objectives through a mutual provision of resources necessary to achieve such goals. Ward (1999) argued that because virtual aggregations transcend traditional physical reciprocity, this does not mean that their interaction does not influence the participants' physical world. Put simply, the use of CMC to develop poker skill does not solely influence virtual behaviour. The development of poker skill may have considerable influence on the participants' physical

existence such as increased wealth and self esteem. The nature of virtual aggregation often facilitates and promotes community development in the physical world, either through something as tangible as physical interaction or at least developing a shared community consciousness.

Gajjala (1997) claimed that virtual ethnography is the study of online interaction; and that it is the ability of the participant to respond during the research process which sustains the utility of the data. Virtual ethnography enables the dialogue between the ethnographer and the community to emerge as new form of ethnographic data (Ward, 1999). As a result, the participants are given prominence in how the research is shaped. Normative frameworks of community are not imposed on virtual aggregations because virtual ethnographers do not assume they contain similar dynamics to traditional communities. The virtual aggregation itself is given liberty to define its own boundaries, and therefore the validity of the thick description of the dynamics of the network should be enhanced.

The fundamental research concern in the application of virtual ethnography to web-communities (i.e. the perception that virtual aggregations are transient and unbounded because of the lack of central locality), is no longer problematic. Virtual aggregations are united by shared socio-political objectives, and are simply a reflection of structural changes in communities of modern society. Moreover, the redundancy of traditional ethnography as an inclusive factor is seen a positive step in development of modern communities as it provides participants with a more eclectic perspective on the shared objective which delimits the social group.

3.2.3 Research Design

The study is a virtual ethnographical research design looking at how poker gamblers utilise CMC to develop their poker skill and profitability. The first stage comprised of a 6 month participant observational analysis of two independent poker web-communities. After a 4 week latency period of exclusive observation to become familiar with specific

community protocol, the researcher began participating in web-community interaction. The researcher participated in poker gambling during the entire 6 month study period; and used strategies proposed from members to develop poker ability. This provided an 'insider's' perspective into how skill development through CMC affects poker gambling behaviour. The researcher generated web-community discussions regarding specific behavioural concepts and cognitive processes based on accumulative analysis of emergent data and personal experience of using CMC to develop poker gambling skill. Gambling web-community interaction was observed, monitored and analysed through traditional content analysis.

3.2.4 Procedure

Two poker web-communities used were selected from a group of ten that were proposed from poker gamblers in a pilot study. The selection criteria required each of the web-communities to be independently regulated (i.e. non-industry owned), have a member base of at least fifty and be currently active. A web-community was considered to be adequately active if it hosted at least 5 periodical debates (i.e. web-postings) per day in the preceding seven days. Six web-communities met the inclusion criteria and subsequently the moderators (gatekeepers) of each web-community were approached to participate in the ethnographical research study. The gatekeepers were provided with full details of the research study's aim and design. Of the six poker gambling web-communities approached, initially only one agreed to participate. However, another web-community moderator agreed after a request to verify the credentials of the researcher was met. The moderator of this web-community explained that it was necessary to be vigilante against, and screen for, members of the gambling industry who seek to use information provided within the web-community for commercial purposes.

Several requests were made by the moderator of one of the observed gambling web-communities. First, to provide a hyperlink to the researcher's curriculum vitae so that when the moderator introduced the study and the researcher into the group, individual members could evaluate whether they wished to participate in the study. Secondly, to

refrain from posting messages for a period of four weeks and to solely observe the social interaction of the members in order to understand interaction protocol and etiquette. Finally, that after cessation of the study to provide the group information regarding responsible gambling practices in the spirit of reciprocity. The aforementioned prerequisites of conducting the study were only requested in one web-community however they were adhered to in each case based on the calibre of each request.

On the agreed start date of the study, the moderator of each web-community posted a notice for all members, stating the purpose and design of the study, introducing the researcher (and his username: “cyber_ethnographer”) and providing hyperlinks to the International Gaming Research Unit and the researcher’s current research history. Each member was asked to use the hyperlinks to view the validity of the research study and evaluate the credibility of the researcher. The moderator requested that those members who wished not to participate in the study provided their usernames for identification, and assured them they will not to be included in the analysis. Several members withdrew their abstention when anonymity of identity was assured. During the initial four week observational period the idiosyncratic characteristics of each gambling web-community were noted and subsequently adhered to. For example, web-community B maintained a formal, respectful decorum whereas web-community A maintained a more unperturbed ethos.

In the subsequent five month period of participation observation, the researcher logged on to each web-community at least four times per week. Each discussion thread was followed meticulously. The ethnographer would interact where compelled to; asking emerging questions or providing an opinion on the discussion topic. Each discussion transcription was printed and analysed prior to logging onto the web-community forum at the next designated time. After further analysis the ethnographer would post more considered statements on to the specific discussion thread. Furthermore, where necessary the ethnographer would return to a discussion thread to request that a member, or members, elaborated on and clarified their statement in order to aid comprehension of the debates.

During the study the researcher participated in low stake online poker (cash games and tournaments) with various members of the web-community at specified meeting times. On average the researcher spent 5 hours per week playing poker online. The purpose of playing online poker in regards to the ethnographical study is: Firstly, to understand the dynamics of poker gambling and to observe online poker behaviour of members of the web-community. Secondly, it was integral to understanding how online poker gambling affects disposition, namely fluctuations in affectivity and arousal. Thirdly, it was necessary to experience the act of developing poker skill through CMC. Data from participation in poker gambling was not recorded because it was performed solely for introspective purposes, therefore enabling the ethnographer to analyse data from an 'insider's' perspective in combination with the existing 'outsider' perspective.

The final stage of ethnography of the web-community required detailed content analysis of the transcripts of social interaction regarding poker skill development. Conceptual themes to emerge, in relation to developing poker skill through application of CMC, were identified, evaluated and articulated as findings of participation observation.

3.3 Research Findings

Despite each web-community being created for differing reasons and experiencing different methods of expansion, the information provided, sought and discussed on each web-community forum shared a similar pattern. Before delineating the common themes found regarding poker skill development, it is necessary to contrast the structural variations between each analysed web-community, to transcend idiosyncrasy.

3.3.1.1 Web-community A

Web-community A initially emerged as an annex to a general multi-topic gambling message-board. The website was first available online in September 1996 and was constructed to provide US sports betting gamblers a platform to discuss and analyse

forthcoming betting events. The web-community was gradually expanded to include global sporting events, and as a result, membership of the web-community from non-US residents increased. Eventually, moderators created another web-community specifically for members to debate issues relating to poker, and other casino games to a lesser extent. Currently, the poker specific web-community is significantly more active in terms of the amount of concurrent debates and visitors accessing the debates.

At the time of the study there were 1936 members registered to the entire web-community, and over the 6 month observational period, on average 6.1 new debate topics were initiated per day and each topic received a mean rate of 5.2 responses. Every discussion thread created within the five month period was viewed a minimum of 50 times and it was not uncommon for debates that had more than 20 replies to be viewed on over 1000 occasions overall. The 150 most recently responded to discussion threads were available for viewing, and if requested, a specific discussion thread could be re-introduced at the moderator's discretion based on relevance.

3.3.1.2 Web-community B

Web-community B was initially created to foster a sense of community between local poker gamblers in a large West coast city in the US by developing a platform for social interaction through discussing poker related topics. The web-community was created by two locally well-known professional poker players of this specific city. Membership grew organically through word-of-mouth in the local casinos but it gradually acquired a global member base because of the quality of information available to poker players aiming to develop their ability. Naturally, the essence of the web-community became less insular to accommodate global members. Online poker is the focus of the majority of debates created on web-community B.

Web-community B has been available online since February 2001 and at the time of writing has 424 members registered. On average 8.9 new debate topics are created per day, with each topic receiving a mean of 4.6 responses. Viewing figures for web-

community B were not available to the researcher. Inactive threads were placed into an archive file, organised under content, available to all registered members.

3.3.1.3 Differences between web-community A and web-community B

There were three major observable differences between web-community A and web-community B. Firstly, the message responses on web-community A varied widely in style, etiquette and verbal ability. It was not uncommon for poker strategy discussion to become vitriolic if members held ardently opposed perspectives. When the nature of debates became overly contentious, the response rate of the thread decreased, along with the viewing rates, suggesting that such behaviour was not instrumental in developing poker knowledge and proficiency. However, web-community B consistently maintained a very formal and non-personal social ambience, which is largely due to the careful moderation of content from the web-community administrators.

Secondly, it was observed that a greater sense of community existed in web-community B. Although, the tone of dialogue was primarily formal, members referred to each other individually by name or alias and displayed interest in the gambling experience of the other members of the web-community. Given that web-community B was created as an application for a local community of poker gamblers it is not surprising that a collegial environment was maintained. Interestingly, web-community B hosts a bi-monthly private online poker tournament available for all registered members to play in and non-members to observe. Participation rates in the bi-monthly tournaments are reasonably high (at least 50 players in each tournament of 2004), and the outcome of each tournament is thoroughly discussed over subsequent days. In contrast, moderators of web-community A continually tried to arrange private online poker tournaments for its members but received little participatory interest. Nevertheless, participation in private web-community member-only tournaments could be seen as both a cause and effect of a greater sense of community within the gambling web-community.

Finally, there was an observable difference in how credibility of advice available on the web-community forum was determined by the members. On both forums it was common for a strategy questions to be addressed personally to a member who was considered an expert in that particular area of poker. On web-community B, the label of expert was not attributed to any member who was not a web-community founder or administrator. Whereas within web-community A, a member was given group status as an expert based on the frequency of responses and the veracity shown in each of the responses. Interestingly on web-community A, a member's credibility and status was openly debated on the forum, based not only on responses but observed online poker play. Frequent contributors often disclosed the location of the online poker site they used along with their username to allow members an opportunity to observe and grade their poker playing ability. Such members were primarily graded on their profitability in the context of the calibre of opponents they played against, which was determined by the stake size of the particular game.

Observed behaviour on gambling web-community

Three core behavioural themes were revealed through participant observation to be performed on both web-communities. The three observed behaviours present include: Experiential Reporting, Development of Poker Skill and thirdly, Structural Knowledge of Online Poker.

3.3.3 Experiential Reporting

Experiential reporting consists of members describing events and outcomes when participating in poker gambling and how they interpreted such events. Members aim to convey to other web-community members their own personal experience for peers to read, analyse and comment on. Information disclosed varies depending on the motivation to report the occurrence. Reports range from brief overviews of an entered tournament or particular hand played, to a detailed annual report of performance as a full-time poker gambler. Ultimately, members aim to disclose as much detail as is

needed for other members to fully appreciate the described scenario. For long-term reports such information includes overall profitability, short term fluctuations i.e. notable profit and loss, level of stake risked and the rate of participation. For example:

Extract 1: Web-community A

“**PT:** November was a very exciting month for me poker-wise. Lots of very interesting developments, and of course, lots of ups-and-downs that only poker can bring. A big tourney win, a new venture online, a jump up in limits, and my biggest single day cash loss ever.

After a very poor October (up only \$3k) salvaged single-handedly by a \$2,700 Halloween win I was hoping to put up some big wins in November, with Christmas and taxes (UGH this year's gonna hurt) coming up.

The first week of November went very well, with an \$8k profit including a \$3k single day it helped put my mind at ease. In the 6 months I have been pro I have had 4-6 week stretches where I barely win anything, and it seems like you'll never get out of it. Also, when I go through those long stretches, I begin to wonder if the money in online poker has dried up, that maybe the bad players have finally run out of money.”

Members reporting on a specific tournament or cash game i.e. ring game will primarily describe the structure of the game (for e.g. maximum buy-in, size of ante), the outcome of the game and only describe specific hands played that were integral to the outcome of the game in great detail. For example:

Extract 2: Web-community B

“**TP:** Last night I played in my second live tournament. It was part of the Heavenly Hold Em events being held at [name of casino] this month. The event I entered was the \$220 buy in Limit Hold Em.

Me and a friend of mine get to the tournament area about 20 minutes before the tourney starts to sign up. I was expecting to see many of the people I play 6-12 and 4-8 [ante] with, but I only recognize a handful of people that I played with which means the majority of these players probably played in the high limit section...

I still hadn't won a pot. But towards the end of the level I pick up pocket 9's and not only do I flop a set, but I hit quads on the turn taking in a huge pot. I gain some confidence and chips and start playing aggressively building a nice stack...

After all was said and done, I finished 44th, just missing the money by about 10 spots."

Singular hands that are reported are often described in intricate detail including: betting position, size of available funds, individual disposition, opponent disposition and exact occurrences during each round of betting. Great emphasis is placed on detail in such descriptions, especially the reasoning behind the behaviour because the member in this case is primarily seeking detailed feedback from other members of the web-community, regarding the quality of their play. For example:

Extract 3: Web-community A

“HC: 5 handed table. Crazy loose and aggressive. The first guy, who raises every 3rd or 4th hand, is very loose, and has about 600 bucks, makes it 18 which is nothing for that crazy table. All three call the 18 to me. All three are very loose players and have between 200 and 500 bucks in front of them. I'm last to act and have been very tight, having not seen a decent hand in about an hour. I have about 230 in front of me and look down and find J/J [pair of jacks]. The pot is about \$72. Do i just call and hope to hit trips [three of a kind] on the flop? If I raise to 45-65 everyone will call it - its

been like that all night and J/J against 4 other players just plain sucks. Plus the pot would be 250-325 and giving odds to chase...

I went all in and here's why: the first guy in could have anything so I had no read on him. The next caller probably had a hand but not good enough to re-raise so I wasn't too concerned. The last two just called for pot odds. No re-raises left me pretty certain I was the best hand at that point. Well I went all in and got called by the original raiser. Everyone else folded and he turned over AA and hit his set on the flop.”

Naturally, a bias may exist regarding information disclosed based on what the member feels is the integral part of the gambling experience. Furthermore, the member's knowledge of poker and what factors influence the outcome of poker games will determine which factors they perceive as integral to the event. Put simply, out of ignorance, an amateur poker gambler may neglect to include the playing styles of opposing players when disclosing their own gambling behaviours.

From observational analysis of member behavioural interactions within the web-community it was evident that Experiential Reporting served one or a combination of the following objectives: to provide Social Reinforcement, to Extricate Frustration or to obtain Peer Comparison.

3.3.3.1 Social Reinforcement

In many respects online gambling can be a solitary activity. While experiencing the benefits of remote accessibility of gambling online, individuals must forfeit the social reinforcement available in traditional gambling environments. The level of social reinforcement forfeited in online poker is substantially greater than many other forms of gambling because of the inbuilt non-random parameters. In other words, a significant win while poker gambling could be interpreted as a display of skill with reasonable validity. Even if the level of influence skill plays in determining the outcome of poker

gambling is over-estimated, the social reinforcement and increase in self-esteem is maintained based on this perceptual bias. It is probable that poker gamblers are motivated to seek further gratification, in terms of social reinforcement, for their success by replicating their experience literally on a gambling web-community. The poker gambler through experiential reporting can revive the pleasurable experience of winning by discussing it with fellow poker gamblers within the web-community forum. For example:

Extract 4: Web-community A

PT: I qualified for the World Poker Tour's Party Poker Million event in March tonight!!!

Only took 9 hours of playing online in a 1,810 man no limit event (\$200 - \$20) the Top 30 got entry into the \$10,000 event...

8 and a half hours and 425 hands into a 1,810 player No Limit tournament on [Name of operator]. Down to 33 players. 30 of us will win a \$12,600 package including a seven day cruise aboard a luxury cruise liner and entry into the [tournament event]. 3 of us will go home with nothing but some consolation money. The play at the tables was ultra-tense as one wrong raise, check, or fold, and you flush \$12,600 and a chance at the \$2 million dollar first prize in the WPT event down the toilet...

I am not exactly sure of the details, but it's a \$12,600 package, \$10,200 goes to the entry fee, and \$2,400 gets me accommodation and some spending money.

HW: Congrats! that's huge. Hopefully we'll see you on TV at the final table

FR: That's freakin awesome man. Congrats and well done.

WK: Go get ‘em! Limit at beginning and no limit final table? Good luck”

In the above example PT has demonstrated his poker skill by outperforming 1780 opponents. PT subsequently received acclaim from his peers i.e. social reinforcement, for the triumph through 26 members of the web-community expressing their support and commendation for the achievement. Furthermore, PT also demonstrates to the members of the forum the level of risk he undertakes when poker gambling, which was in this case a \$200 entrance fee to participate in a large tournament.

Members of the gambling web-community who report their successes in poker also receive indirect social reinforcement. For example, when members acknowledge that PT has performed very well in a large, high stake tournament, social status in the form of credibility will be attributed to PT. In other words, the responses of PT to issues discussed on the forum will be given greater significance now that PT has demonstrated to others members of the web-community the calibre of his poker ability and the level of risk he engages in.

3.3.3.2 Extricate Frustration

The second motive for experiential reporting is the need to extricate frustration. Although poker is regarded as a game of skill based on probability calculation and interpretation of situational variables, the outcome of poker gambling within the short-term is determined to a large extent by chance. Therefore, skilled players may experience significant losses based on the outcome of random probability. A skilled poker gambler may in fact be manipulating their opponent into doing precisely as they intend, however the skilled player may experience loss because the opponent experiences fortune that was statistically improbable. Understandably the skilled poker gambler experiences frustration when, despite playing optimal strategy and out performing their opponent, they lose based on extreme fortuity by the opponent. Within poker culture such an instance is referred to as a ‘bad beat’.

The implicit rule in poker gambling is not to display any frustration, because having a neutral disposition is believed to be an integral part of maintaining optimal strategy. Frustration is perceived to impinge rational evaluation of situational variables, leading to poor gambling decision making. Within the gambling session, and during periods of elevated arousal, deterioration in gambling decision making is often cyclical. In other words, poor gambling decision based on emotional reactivity is likely to cause the gambler to incur further losses, which in turn will lead to increased levels of negative affectivity. Within the context of poker, the aforementioned process of deteriorating rational cognition and gambling behaviour is referred to as ‘tilting’. Therefore, skilled poker gamblers attempt to be exceptionally resistant to expressing frustration while poker gambling. Furthermore, because the structural characteristics of online poker do not permit oral dispensation of frustration, online poker gamblers may seek to vent frustration through disclosing instances of incurred ‘bad beats’ on an online forum. For example:

Extract 5: Web-community B

“PL: HOW MANY TIMES CAN A MAN BE ONE OUTED?! GONNA KILL THESE CHASERS!! Not to mention missing cards for about 3 hours. It's like all the options I have are check and fold. "Bet" and "raise"not so good. They call until the river and then raise. Set over set, Straight flush over ace high flush, you name it. Honestly, how long can the negative rush continue? I'm not down with suicide but I wish I were dead. End rant.”

Additionally, it is probable that such individuals may feel the need to vent frustration verbally in order to extricate it, and therefore reduce the possibility of making emotionally based poor gambling decisions in the near future. By discussing the bad beat with peers on the web-community the gambler often receives empathy and reinforcement in the form of encouragement to continue gambling. Through sharing bad beat experiences the gamblers acknowledge that they are common occurrences and are therefore less likely to be a result of skill deficiency. By disclosing the incident the

gambler will often receive feedback from other members of the web-community; and many of whom the frustrated gambler may regard as skilled players. Conciliatory feedback from respected, experienced gamblers helps minimise the negative affectivity that arises from experiencing a bad beat. Poker gamblers learn to accept that occasionally they will experience statistically improbable misfortune, and that such occasional bad beats are to be expected.

Extract 6: Web-community A

CR: God awful bad luck. No action before the flop. I got K[ing] 10 hearts on big blind [ante]. I push a little action get one caller. Flop comes A[ce] 10 10. Guy bets small, I push him and he comes back. I call. Turn is a K. I make my boat [full house] and move all in [risk all one's stake]. He immediately calls.

River is nothing. He turns over AA. Son of a bitch slow played them. It was online so I couldn't get any good read. Thought he just had one A and I was suckering him in.

MK: Chris the same thing happened to me yesterday. I lost Q[ueen] over 10's to Aces over 10's. Son of a bitch got me good.

JG: Sorry about the bad beat. That hand must have opened up some sort of cosmic rip in the fabric of probability.”

3.3.3.4 Peer Comparison

A final motive to report gambling experiences via CMC is to achieve peer comparison through feedback from other poker gamblers. As mentioned previously online poker gambling is largely performed in isolation so there is minimal opportunity for the individual to obtain social comparison information by contrasting their own gambling behaviour and other online poker gamblers. Put simply, the online poker gambler is

seeking validation of their specific gambling behaviour, and how this relates to their peers' gambling behaviour. Reading experiences of other poker gamblers fundamentally provides a benchmark to gauge your own performance in poker gambling. If the individual's reported experience is incongruent to the experience of other poker gamblers, more specifically those gamblers who share similar characteristics in terms of game preference, length of poker 'career' and proportion of time spent gambling, they are given the opportunity to evaluate their poker skill level. Such an evaluation may significantly reflect future gambling and gambling-related behaviour such as time spent gambling and time spent developing gambling skill. For example:

Extract 7: Web-community B

QS: I'm a micro limits player who plays small stakes NL Sit N Go's [tournament variation]. These range from \$4+.40, 20 person events to \$10+1 [ante], 6-10 person events which make up the bulk of it. And the odd \$20+2 or \$30+3. I just went through my last 50 Sit N Go's, not sure if that's a big enough sample size to get anything relevant but it sure was an eye opener.

50 Sit N Go's in the money 24/50 times. When I first looked at this I was like wow, that's not to bad at all, almost 50% of the time I'm breaking even at least if not winning something. Then I added up everything I've won and subtracted all the entry fees including the rake dividing that number by 50 to come up with a grand total of \$1.11. Yup I'm not even averaging enough to buy a large coffee from [coffee shop].

PL: Actually, these stats are amazing. Very very few people make the money 48% of the time. I know many players who I consider very good, and make a ton of money playing SnGs regularly, but they don't win nearly that much of the tourneys they enter. You can be very proud of that figure.”

Conversely, if the reported experiences of other poker gamblers are relatively similar the behaviour is validated. Furthermore, such indirect endorsement of gambling behaviour may aid rationalisation of future gambling by minimising and trivialising negative behavioural contingencies. For example, the effect of experiencing an elongated losing streak on motivation to continue to gamble is reduced if the individual is informed by other members of the web-community that such losing streaks are universal and eventually cease. For example:

Extract 8: Web-community A

PT: Let's see, well, I just finished my worst ever month for poker online.

Down about \$10,000. Just could not win. The river card, no matter what it was, would make my opponent's hand. The longest bad luck streak I've ever hit. That's my first losing month ever online.

WK: Man I feel for you, Limit holdem [poker variation] streaks are the WORST! That one bet unit is not enough to drive out or protect the best hand, when you are running bad that means losing streak.

I say start studying no limit, BUT the best reading I ever did for limit was Roy Cooke? West? the guy in card player that writes about specific scenarios pertaining to 30-60 level of play. His way of thinking and analyzing specific hands is great for tough mid limit games.

HD: Wow, rough luck. Getting through a slump is a hard thing. On the one hand you want to play through it figuring the more hands you play the, faster your luck will even out but on the other hand, it just never seems to end. I still don't know the answer to that one.”

3.3.4 Development of Poker Skill

Poker is regarded as a gambling activity where a significant proportion of the outcome is determined by skill. Skill in poker gambling can be dichotomised into two categories; either objective probability or subjective reasoning.

3.3.4.1 Development of objective probability poker skill

Fundamentally, objective probability competence relates to the gambler's ability to make gambling decisions that are solely based on optimal mathematical theory. Poker gamblers are continually required to calculate probability of success based on the strength of their hand against potential hands that opponents may be possessing based on what other accessible cards are available (for example, using the community cards in Texas Hold'em and Omaha poker to calculate opponents' possible hands). Additionally, proficient poker players need to be able to accurately calculate the probability of subsequently obtaining i.e. drawing specific cards based on what cards are known to be left in the deck.

Aptitude in objective probability is essential to developing proficiency in poker gambling as it enables the individual to make informed strategy decisions. Further mathematical skills required include calculating 'hand odds', to facilitate interpretation of opponents' behaviour with increased accuracy based on the likelihood of their opponents possessing specific hands. For example, in Texas Hold'em the probability of obtaining a pair (e.g. 8,8) as a starting hand is 0.059 or 5.9%, and the probability of obtaining a third match (i.e. 8,8,8) from the first three community cards is 0.118 or 11.8%.

The skilled poker gambler is also required to consistently and accurately determine 'pot odds'. Adeptness at this further mathematical calculation is necessary if the individual is to make optimal tactical behaviours while poker gambling. Pot odds simply refer to the ratio of the amount of money in the pot compared with how much money it takes to call an opponent's bet. For example, if there is £100 in the pot and it takes £10 to call, your pot odds are 100:10, or 10:1. If there is £50 in the pot and it takes £10 to call, then your pot odds are 50:10 or 5:1. This calculation helps the gambler determine the utility of

calling an opponent's bet, because as the value of the bet increases the greater the amount that can be potentially won is (i.e. the pot).

By contextualising hand odds with pot odds the poker gambler is enabled to use gambling strategy based on optimal mathematical functions. For example, in Texas Hold'em if the player receives a pair (8,8) as a starting hand. The size of the pot is £100 and it costs you £5 to call (pot odds of 20:1). The probability of your pair becoming three of a kind (8,8,8) is approximately 7:1. Therefore, making the call is mathematically sound because the amount of money potentially won is greater than the probability of making the hand.

The web-community is considered to be pivotal by its members regarding mastering objective probability calculation because they are given the opportunity to, not only request mathematical formulae, but acquire such skills through learning techniques and advice disclosed by other members. After learning the structural framework of a specific poker game, learning how to calculate probability is considered to be the first integral ability to master when aiming to increase poker skill. The ability to obtain information regarding objective probability based optimal gambling strategy for free via the World Wide Web reduces the need to purchase external learning materials. Examples of using poker web-communities to acquire objective probability knowledge and calculation ability are provided below:

Extract 9: Web-community A

HC: Wait, I'm getting confused here...wouldn't he need pot odds of at least to 3 to 1 on his money to justify the call from a purely mathematical perspective? Am I figuring this right? Where is WK when you need him?

WK: HC your math is off, maybe you are calculating with 1 card to come? His call is only slightly off mathematically

AN: His math is wrong. HC is not realizing that 33% for something is 2:1 odds, not 3:1 odds. The fraction is 1 in 3, 2 times against it, 1 time for it”

Extract 10: Web-community B

“**ST:** Anyone know any way to figure out pot odds?”

PW: Say you need to make your flush. Assume if you do, you will win the pot, and if you don't you will lose the pot. Say for ease of calculation the chance of you making your flush is 4:1 or 1 in 5 (see how those are the same?) i.e. for every 1 time you win, you lose the pot 4 times.

Now what if the pot is \$30? That gives you 4:1 risk against reward ratio. So to calculate you lose \$10 4 times, and once you win \$30. So in the long run, on average you will lose \$10 every five times. Calling [betting] to make your flush has a negative expected value of \$2 per event.

Now what if the pot is \$100? Using the same calculations, you come up with a positive expected value of \$6. Call!”

3.3.4.2 Development of subjective reasoning poker skill

Poker skill is not solely determined by calculating objective probabilities. A large element of success in poker is determined through subjective reasoning. A key skill is being able to evaluate the situational characteristics in order to interpret the motives for opposing player strategic behaviour. By doing so, the poker gambler is enabled to not only accurately judge the value of his hand in relation to his opponents', but also speculate how the opposing players value their hand. Put simply, the gambler uses auditory and visual cues of opposing players to decide what the optimal strategy to win the pot is. For example, if the gambler's hand is very strong (e.g. four of a kind) and they perceive, based on objective probability and interpreting an opponent's behaviour, that the opponent is holding a mediocre hand (e.g. one pair), it would appear that to maximise profitability of this hand the objective would be to raise small amounts to keep

the opponent in the hand and still betting money. If the bet was too large it is probable the opponent would fold his hand perceiving that he had a weaker hand and therefore would not win the pot.

The provided example is of minimal complexity in relation to the subjective reasoning skills needed to be successful at poker. It is generally perceived that development of such interpretative skill is primarily acquired through experience, and even trial and error. Such a 'trial and error' learning process could potentially be expensive for the novice poker gambler and therefore the process is desired to be circumvented. However, the gambling web-community provides a source to acquire such subjective reasoning proficiency from interacting with peer poker gamblers and debating experiences to extract strategic knowledge from. For example:

Extract 11: Web-community B

“DP: So this guy on the [operator name] no limit site has been treating me like his little bitch all day long and I've been taking it like one. Check-raising the turn, moving in on the river, pushing me off hands left right and centre. Anyhow this guy is harsh isolating anyone with anything.

I limp in the cut off with AJ suited [Ace, Jack of same suit], he makes it \$45 on the button [betting position], it comes around to me and I make it 125, and he calls.

Flop: A88, flush draw [possibility of a flush]. I check, he bets 250, I call.

Turn: red 7 two flush draws now, neither of them for me and we both check.

River: black 7, I check he goes all in for 900, I call.

What do you guys think? I hate the hand, but I felt I got to let go if I got raised at any point, though I really wanted a showdown.

PS: Ugh I don't like it [name], but a huge part of big NL games is the history of the games between you and your opponent. In general, in a one hand vacuum obviously this play is awful. But with your read [interpretation], it may have been a great way to get your opponent to hang himself. Let me ask you how confident were you when facing that \$900 all-in? Did you think, "AHA! Finally!" Did you KNOW he was going to push on the river if you checked the turn?"

At the more complicated end of the spectrum, advice is provided regarding how to display verbal and auditory cues in order to cause your opponent to misread your gambling behaviour and therefore increase the likelihood of achieving your desired behaviour from your opponent. For example, the above skill is referred to as 'setting a trap', namely providing behavioural cues to make your opponent perceive that you have a weak hand and that it is likely that you will fold your hand rather than call their bet.

Extract 12: Web-community B

“PW: 5-handed [operator name] \$30/\$60 table.
I am in the Big Blind with King clubs, 9 spades
I raise. Middle position calls, then small blind re-raises! We call.
Flop: 2 hearts 2 diamonds 3 clubs \$270 in pot
Small blind bets, I raise?!?!

I thought the Small blind play of calling, then re-raising was very unusual but typical of a player with a small stack at a table. He only had \$418 at the table, which is less than 7 Big Bets [ante] at the \$30/\$60 table. He limped initially, which represents a weak hand - letting the Big Blind see a flop for free is usually a mistake short-handed.

I felt his initial limp as more indicative of his hand than the re-raise. So when the flop was a bunch of rags, I raised his bet as a position play to set

up the turn [next community card]. Depending on what the turn was, I could either bet and maybe take down the pot, or check and take the free card.

That was my thinking. Did I just waste \$60??

MF: What do you know about the small blind? What have his raising standards been like so far? Although 7 big bets is shortstacked [low betting funds], it isn't shortstacked enough for most people to go crazy. It is enough that he can almost certainly play a hand normally to the end without going all-in. I find that most crazy small stack plays only happen when the player is in danger of going all-in anyways.

This could easily be the slow play of a big hand like AA [pair of Aces] or KK [pair of Kings]. It is a mistake for the small blind to limp here with those hands, but most people don't know that!

King 9 is a marginal hand, even shorthanded. The raise might be marginally profitable, but I think it's so marginal that the leverage you're giving up by making the pot bigger is worth more. The flop raise is better than calling, but I'm not sure it's better than folding.”

Knowledge of objective probability, and how to calculate it, is expected from skilled poker gamblers as the basic foundation to become profitable, and therefore it is unrealistic that poker success will be determined based on player variation regarding objective probability because such knowledge is highly prevalent. However, subjective reasoning and behaviour interpretation ability contrasts to a much greater extent across playing ability of poker gamblers. Subjective reasoning skills are extremely intricate and multi-faceted. To elevate success rates above that of standard poker gambling, improving subjective reasoning is pivotal as it is likely that such skill will be how poker gamblers will be differentiated regarding profitability. Once again, the web-community provides a suitable, cost-effective method of acquiring subjective reasoning skills in

poker by learning from others' experience, and therefore potentially reducing the cost of learning such skills through trial and error experience.

Fundamentally, the objective of such skill acquisition is to become consistently profitable when poker gambling. At the pinnacle is the ability to apply the aforementioned subjective reasoning, using objective probability to base interpretative reasoning on, to maximise the likelihood of winning each individual hand/game. However, subjective reasoning is not solely based on behavioural cues present in the current hand, rather historical behavioural cues and gambling behaviour are also considered. Therefore, there is scope to manipulate use of information provided by the situational characteristics available to determine optimal strategy. Put simply, it is possible for an individual over the course of several hands of poker to deliberately create an image (or behavioural typology e.g. tight aggressive, loose or loose aggressive) that opposing gamblers will identify and subsequently use to interpret future behavioural cues. For example,

Extract 13: Web-community A

“WK: Highest level is changing gears at the right time. Reading all the information out there and processing it correctly, weighing all factors, player tendencies and coming up with correct play. Accurately knowing how you are perceived is very important also, when they think your (sic) a different kind of player than you are that is strong weapon.

Good example was the large bluff I pulled on Phil H. He had top pair but I knew he would lay it down, because when board paired middle pair on turn and I check raised him, he thought me a amateur and I must have it. I read Phil accurately and knew he makes big usually correct lay-downs. I knew him he did not know me.

Knowing your opponent well is key. Knowing what he thinks of you is huge too. Strategy, giving the accurate amount of consideration to each

piece of info you see is huge too. People see the info but do they weigh the info correctly?”

The poker skill inferred in the above extract is a clear example of the need to determine the level of influence that objective probability and subjective reasoning will have on each specific gambling action in poker. Over time the individual will learn to evaluate the antecedent and consequence relationship implicit in such gambling behaviour. However, as mentioned previously the less experienced gambler will seek ways of learning how to determine the predominance of either objective probability and subjective reasoning in gambling decisions as quickly as possible to minimise the amount of time and money lost during the acquisition phase. The gambling web-community is an instrumental tool in accelerating proficiency.

Another intangible skill that differentiates poker gamblers in terms of profitability is controlling emotional disposition. Emotional reactions can negatively influence the ability of the poker gambler to make rational decisions based on available information. Maintaining dispositional control is often difficult when highly aroused and frustrated. By displaying affective state overtly, opposing gamblers can use such behavioural cues to interpret your gambling behaviour. Intuitively, dispositional control will vary across individual differences (e.g. personality) and therefore the effectiveness of a technique for remaining in control of affectivity while playing poker will vary from person to person. Through peer gambler interaction and experience sharing via CMC, an individual can acquire a variety of methods of maintaining emotional control during poker gambling; and through trial and error learn which technique is most effective for their specific profile. Furthermore, through peer comparison individuals are able to speculate which techniques will be most effective for them, based on their own similarity or divergence to the members who are advocating a specific technique. For example,

Extract 14: Web-community A

“**KV**: How do you deal with bad beats? Do you meditate? get drunk? what do you do? Because I think I'm gonna be sick.

Won like 50 from a freeroll last month. Built it up to 1100. Just yesterday, I had all signs pointing to me not to play, mainly I was just not into it. And I lost it all. I can't believe it. I went against every rule I put forth against me. Started off with a bad beat, tilt, bad beat, tilt, risking the whole stack on unfamiliar playing field. Now my mind is just really drained.

JM: I religiously wash my hands when I feel the tilt coming. It's how I "wash my hands" of the evil of the bad beat. Stupid? Yeah, but it helps me get back on point. Take yourself away from the table for a break and get things into perspective.

JN: It depends. If I play my best game, and take a bad beat I am cool with it. If I make a stupid mistake and it's my fault then I get more upset. I always write down in my notes after a SnG [tournament variation] and list what mistakes I make, so hopefully I learn from them and don't repeat them. Amazing how well this works.

GU: You need to change your perspective. The best way to deal with bad beats is to understand the game. Poker is making correct decisions based on incomplete information about a yet to be determined event – it's gambling and in gambling there will be times where you just plain get screwed. Just look at bad beats as the cost of doing business.

TR: Read poker forums, improve your game. Every time you end a losing session, put time into reading forums and understanding and improving your game. As a rule I don't play when I'm mad, tired, or hungry. Impatience will destroy your bankroll. Act as a professional. You wouldn't step into a boxing ring without preparing mentally before hand would you?"

The trial and error learning process can be reduced through applying knowledge procured from interacting with other poker gamblers, and the gambling web-community is an

efficient cost effective method to achieve this. Effectively, the web-community acts as a catalyst for poker skill development.

3.3.4.3 Critical evaluation from experienced, skilled members

The utility of interacting with peer poker gamblers from a skill development perspective is emphasised when considering the behaviour of seeking critical evaluation from superior poker gamblers with the web-community. The overall aim of the poker gambler is to reach a skill level that produces maximal profitability, where loss is solely dependent on random probability. Therefore, the developing poker gamblers within the web-community seek the tutelage of experienced, skilled poker gamblers. Skill level is determined within the web-community by displayed veracity in feedback to member questions within the forum, and increasingly commonly, through being observed while playing online. Within each web-community studied, members were required to specify their online poker operator and username as part of their registered member profile. The members who were perceived to be highly skilled would often be observed by less skilled poker gamblers to observe profitability, and therefore validate the superiority of such members. When a skilled poker gambler is recognised within the web-community, developing poker gamblers would directly request critical analysis of their own play and also seek strategic advice regarding a specific hypothetical scenario from the more proficient gambler.

The most efficient method for an individual to improve poker proficiency is to identify weakness, and subsequently seek to eradicate it and replace it with optimal strategy. Identification of weakness, within the web-community, is achieved through reporting an experienced gambling event; ranging from a micro-event such as one specific betting action or a more substantive report of an entire gambling session or tournament. Other members are given the opportunity to critically evaluate the gambling behaviour and provide feedback in terms of grading the suitability of the play, and more importantly proposing more effective strategy for future reference. Naturally, the feedback from the more experienced and respected members of the web-community are given precedence over

weaker members. Furthermore, members can request further elaboration from the superior poker gamblers, or for them to reduce the complexity of the response to enable them to comprehend the information more clearly. Such critical evaluation ‘threads’ i.e. online debates are observed not only by the instigator of the question but by other gamblers, who can acknowledge and learn the mistakes of peer gamblers, and also obtain the optimal gambling practice for the specified scenario. For example:

Extract 15: Web-community B

“TO: Is my play correct? I was in a 10 handed limit game on [poker operator] with blinds of 1/2. I’m in mid position 2 and get King Jack both hearts pre-flop. Under the gun calls as the guy next to him, mid position 1 folds, I call as does the Small Blind. Big blind checks.

Flop is King diamonds, Jack clubs, 9 spades. Small Blind bets, everyone folds to mid-position 1 who calls, I raise and all players call my raise.

Turn is 4 diamonds. Checked to me, I bet, mid-position 3 raises, all call

River is 5 hearts. Mid-position 1 bets, I call, the rest fold. The pot is 17 big blinds. Was this the correct play?

PT: You need to raise this pre-flop for a couple reasons. One, you have a very solid hand, and after three limpers, a raise would really build the pot - which with KJs, you want to do as it can make big hands. Two, you have a guy who's posted, and the blinds. Your raise will take away the opportunity for THREE opponents to see the flop for free, or really cheap. This perhaps is the more important reason to raise.

The second comment I have is putting in a re-raise on the turn. It would be my default play, to re-pop it once, and call down if capped. But it's really

hard to put MP1 [opponent] on a hand we beat, if he's a reasonable player. He could have QT [Queen, 10], 99, KJ, or perhaps J9 [Jack, 9]. Even though we have the top two pair, it's horrible if we get capped.

However I still think we have to three-bet here. While we do have a strong hand, it is fragile, especially against three opponents. This is the crucial reason we have to raise: to eliminate the two opponents trapped in the middle! If we do not raise, we give them 13.5 to 1 pot odds! This means they can correctly call with just a gut-shot straight! That is, a guy with Ten clubs, 2 diamonds would be correct in calling if you don't raise.

More realistically, a 3-bet here would make charge the two other opponents the maximum, on this very draw heavy board.”

Not only are actually played hands or experienced gambling events discussed, but hypothetical poker scenarios are described with the creator seeking to learn the most effective gambling behaviour in the specified situation. Despite the hypothetical poker scenarios being very event specific (including precise details about the situational and structural characteristics of the scenario), they remain salient enough that other members would benefit from observing and participating in the debate. For example,

Extract 16: Web-community A

JJ: What hands do you consider to be raising hands pre flop and how much in regards to say a 25/50 blind structure, no Ante. This is in early position, in a long handed tournament game

JM: I would raise to \$200 with AA & KK and go all in if re-raised. Raise \$200 with QQ & JJ (call another bet, see the flop, and act accordingly). Raise or limp with AK (it IS only a drawing hand). AK is the most overrated hand ever.

BJ: If you are a new player or relatively unskilled, then raise with AA and KK. Can be hugely profitable to slow play those hands, though. I would raise moderately with QQ and AK but wouldn't raise with a medium pair like JJ. It is dominated by virtually everything. More profitable to limp and see the flop while being ready to dump it if overcards [cards higher in value] come.

CH: when did JJ become a "medium pair"? its only the 4th best starting hand in hold'em and "dominated" by only three other starting hands.

BJ: JJ is a decent, not great hand pre-flop BECAUSE of the problem it presents post flop. It is the fourth-best starting hand but only SLIGHTLY better than 50/50 against AK, AQ, KQ. Post flop, it is extremely difficult to play.

WK: It depends on your opponents whether or not to slow play AA or KK up front, it can be much more profitable. Also good players, can get away from [fold] AA KK after the flop. When you have AK it is mathematically much less likely that you run into AA KK. When you have 10/10 JJ or QQ you will run into AA KK more often when facing action. When new stick to basics, as your skill over your opponents increases, you can vary your play to make the most money on these hands”

Finally, developing poker gamblers are provided an opportunity to receive critical evaluation by experienced skilled members, of their own strategic propositions that may laterally deviate from accepted optimal mathematical strategy. The benefit of discussing such propositions with experienced, skilled gamblers, and to an extent peer gamblers, is obtaining multiple perspectives and therefore increasing the probability of identifying theoretical flaws in proposed strategic behaviour. In effect, the web-community acts as a theoretical drawing board for members to generate and develop existing poker strategy seeking to increase profitability. In practise, identification of flawed reasoning through critical evaluation of such propositions by experienced, skilled gamblers is also a vehicle

for less experienced gamblers to understand the innate strategy in poker gambling. For example,

Extract 17: Web-community A

JG: Wanted to toss out a germ of an idea I'm working on. When we calculate odds, post flop; we are basically calculating them on the amount of cards that we know that are in our hand and on the board. All odds that I've seen are based on that concept.

However, in a 9 handed ring game, what's left in the deck, post flop is 30 cards The question is, is there a better way to figure out what those remaining cards are based on the number of hands played or folded pre-flop?

If I hold aces, but I'm called by 5 guys, well chances are that at least one of those guys has one of my aces, or I should at least adjust my expectations on the hand. If I'm called by one or two people, odds are I probably have a better chance of hitting trips [3 of a kind] than the odds would seem to suggest, if I calculate the odds by the conventional method. Any of this make sense?

TM: you may be onto something: you probably have a better chance of hitting trip 2's with a pair in a pot where the whole table calls a raise as most would have folded a single 2 and any other card to any raise so the other two 2's would probably still be in the deck. The opposite might be true if you hold AA against 9 players all calling a raise

CH: I always try to consider what cards the other players might be holding in my decisions, but since they are really "unknown", the only way to figure odds is by going on what you know which is only your hole cards and the board. It's not perfect but its the best tool you have to figure the odds.

WK: When cards are out of the deck that you don't know the math is still the same! Ratio is the key word. The ratio of outs left in the deck is the same making your chances the same.”

3.3.5 Structural Knowledge of Online Poker

3.3.5.1 Critical review of instructional tools and software

Strategy information available through web-community interaction has structural limitations. For example, the individual may not be able to obtain a hard copy of valuable information for continual reference unless they have the appropriate hardware and software. Moreover, the information available may not be presented in the format most appropriate for absorption because it is probable that each member will vary in experience and comprehension of strategic gambling concepts. As a result, individuals will consult external sources of information such as instructional books and, increasingly more common, instructional audio visual resources. The gambling web-community facilitates the selection of such secondary sources by providing an opportunity to request critical evaluation of specified instructional tools.

Obtaining a critical review from peer gamblers of the utility of an instructional resource before purchasing may aid in selecting suitable learning tools. This useful mechanism can be maximised by providing personal information regarding current skill and experience within poker gambling. From such information other web-community members will be in a privileged position to recommend instructional tools that are most likely to meet the requirements of the requester. For example:

Extract 19: Web-community B

“DA: Do you think Lee Jones' book is the best resource for someone in starting my position looking to play micro and low limit for profit eventually to start with, with a few home games on the side? There were several people seemingly slagging the book for being 'too' tight. What other books do you recommend? Any that I should avoid at all costs?

EP: It has worked well for me so far. I purchased and finished reading this book a little over a month ago and I felt that it has definitely helped increase my winnings playing 4-8 [ante level]. The last three weeks, playing twice a week for 5-6 hours a day, I've made a little over \$1200 in live games. Not too bad. I'm trying to strictly follow the book and it has worked for me. Plus it doesn't hurt that I'm making much better reads against these dumbass low-limit players. Before reading this book, I was doing fairly ok. I was up overall. But now, I really feel confident playing low-limit against these very loose players. Notice that I'm talking about low-limit. My no-limit game leaves much to be desired.”

The effort of continually improving poker skill is displayed further with the application of IT software that allows individuals to review and develop their poker gambling behaviour. From observational data it appears that the most prevalent IT application is ‘PokerTracker’, which produces a database of an individual’s online poker gambling behaviour for interrogation, and ultimately unveiling the individual’s shortcoming. PokerTracker is compatible with the vast majority of online poker operator software (for e.g. Microgaming, Cryptologic), and automatically downloads ‘hand histories’ i.e. highly detailed inventory of gambling behaviour within each hand/game. The database will provide the gambler information including records of success within various situations e.g. specific starting hands, rate of performance in an online tournament and identify which opposing gamblers they experience the most success with. Furthermore, IT software exists that automatically performs objective probability calculations when playing poker online. For example, ‘Hold’em Odds Calculator’ is an application compatible with the majority of online poker operators, and automatically provides the user with information regarding the probability of success with specific hands and the utility of a specific betting behaviour in relation to probability of achieving success.

An ever-expanding range of IT software is available to assist in maximising optimal mathematical betting strategy and identifying weak components of poker gambling ability. Similar to the availability of critical reviews of instructional resources, the poker

gambling web-community provides access to critical reviews of the utility of specific IT poker software applications. The same principles regarding the benefit of having access to critical reviews of instructional materials apply to IT applications; namely, peer gamblers' experience with the programme and therefore its suitability is contrasted to the individual's reported level of ability. Moreover, members are given the opportunity to access advice about how to obtain maximum utility out of such IT applications. For example,

Extract 20: Web-community B

“PL: Just an FYI if you use Poker Tracker to track your hand histories:

Many people immediately leave a table after folding their hand when they are UTG [betting position]. The problem this causes is that PokerTracker does not capture that hand because you need to stay at the table until that last hand is completed. This ensures that [operator] writes the hand history to your computer, and that means that PokerTracker can properly record that particular hand history (HH).

If you have a habit of leaving the table as soon as you fold your last hand then you are missing HH in your records. Since people most often leave tables when they are under the gun this results in people having far fewer hands UTG than UTG+1 and the rest of the seats, skewing results. All you do is fold, and click the "Deal Me Out" box. Is that so hard to insure accurate record keeping?

YJ: I agree with PL in that it's very important to stay for the hand you fold in UTG. Over just a short period of time this will severely affect your stats, especially if you like to move from table to table a lot until you find 4 good ones.”

3.3.5.2 Knowledge of structure of various online poker operators

The theme of seeking to maximise profitability of poker gambling is continued with members of the web-community sharing and receiving information regarding the structural and situational characteristics of online poker gambling. Given the vast geographic diversity across members of the web-community there would be minimal utility in discussing the features of physical poker-rooms, unless they were in extremely popular locations such as Los Angeles, Las Vegas or Atlantic City. Therefore the majority of information available relates to online poker-rooms.

Members of the web-community actively seek knowledge from peer gamblers about the various online poker operators that are available to them. For example, as acknowledged previously, many poker gamblers use IT applications to maximise their profitability in poker, however many of the IT software packages available are not compatible with all online poker-rooms. As a result, before registering with a specific online poker operator, a member may question peer gamblers within in the web-community which IT applications are compatible with that particular 'skin' (i.e. gambling software such as Microgaming).

Other structural factors of competing online poker-rooms are believed to have significance on the individual's ability to maximise profitability when poker gambling. For example, the available poker games both in terms of structure type (e.g. no-limit Texas Hold'em, Omaha Hi-Lo, 7-card Stud ante etc.) and the stake level (e.g. minimum and maximum buy-ins, ante etc.) are perceived by poker gamblers to have substantial influence on their ability to gamble with optimal strategy. For example, several experienced poker gamblers reported that to maximise profitability it is necessary to have gambling funds that amount to 300 times the ante.

Extract 21: Web-community A:

JM: My biggest problem early on as an amateur was playing outside my bankroll. You want around 30 big bets [ante] per session and a total bankroll for 10 sessions or around 300 big bets. So if you play \$3/\$6, you should have a total bankroll of around \$2000 and when you sit at the \$3/\$6 table you should have \$150-\$200.”

Intuitively, therefore, for an online poker gambler to maximise profitability they must play within the parameters of the funds available to them for gambling. As the amount of available funds vary across web-community members it is necessary to identify an online poker operator that provides poker games within the boundaries determined by the size of available funds. The web-community provides a suitable medium to ascertain such essential information. For example, ‘Ultimate Bet’ offers a range of poker games with a very low ante level (\$0.01/\$0.02) whereas when gambling at ‘William Hill Poker’ the lowest ante available is (\$0.5/\$1). Online poker gamblers can use such structural information to select poker games that provide them with the best opportunity to apply optimal betting strategy and aid maximisation of profitability.

The most debated structural characteristic of online poker within the web-community relates to promotional incentives available to new and existing members of online poker-rooms. When aiming to maximise profitability, it is essential not only to identify which online gambling website is offering the most competitive ‘bonus’ but also to apprehend the most efficient way of extracting maximum utility from the offer. Through experience and investigation several web-community members possess significant knowledge of where to locate the most valuable bonuses. Members reported in the study to be prepared to share such information with peer gamblers for two reasons; firstly they expect to receive information in return and secondly the more bonus money gambled from peer gamblers means an increase in potential revenue. The promotional bonuses offered by online poker operators are an effect of competition within the industry. The bonuses available often have various stipulations to circumvent to prevent manipulation from customers. Primarily the bonus cash must be gambled several times before it may be withdrawn. Members of the web-community provide and discuss potential strategy to

maximise redemption of available promotions whilst risking as little as possible. For example:

Extract 22: Web-community A:

“**JM:** [Operator] is having a 25% reload bonus of up to \$150 (deposit \$600 to get the \$150). You have to deposit by Sunday April 10 and have 7 days to clear the bonus.

You have to be dealt a raked hand for 7 times the amount of the bonus. I deposited \$500, got a \$125 bonus and need to clear 875 raked to get the \$125. I four tabled \$25NL [played 4 tables simultaneously] last night for 4 hours and cleared 440 hands and have a profit of \$65 so far.

You should be able to clear 100 raked hands an hour if you 4 table \$25NL. This seems to be the ‘cheapest’ way to clear the bonus.”

In addition, information is provided of negative experiences when aiming to redeem promotions with maximum efficiency and value. In this respect the web-community acts as a ‘watchdog’ against online poker websites who are not congenial to customers aiming to achieve maximum profitability. For example:

Extract 23: Web-community B

“**PT:** [Operator] has decided to continue it's tradition of being the worst large online poker site by taking yet another step backwards.

They have a Comp Points system where you would earn 1 bonus point for every \$10 you wager on raked hands. 100 Comp points could be converted to \$1. For a \$15/\$30 regular, this could add up to a couple hundreds dollars a month. Of course, the lack of multi-tabling and the slowest deals in online poker ensure that the amount of bonus money you could earn is limited. For

an example of how minor this bonus is: you need to wager \$1,000 to earn \$1 in bonus money. This means that at 5/10 you need to wager 100 Big Bets to earn \$1. Think about how many hundreds of hands it takes to wager 100 Big Bets.

Now I just received this email tonight:

Dear [PT],

This is JX from the Operations Department at C Ltd. C Ltd operates [operator]. I am contacting you in regards to your [operator] account.

Our bonus points scheme is a great benefit that we are happy to present to our members. This scheme is not targeted towards expert poker players but rather to help the average player overcome losing streaks... Since you are a very successful poker player (as can be seen from your total winnings), we have decided to stop bonus points from being added to your account.’

What a cheap way to save money. Penalize those that pay you the most rake
- That's good business.”

Members of the gambling web-communities do not solely disclose subjective experience regarding the structural information of various online poker-rooms. The web-communities also operate as a directory for secondary and more comprehensive assessments of the intrinsic facets of competing online poker ‘skins’. Members often provide the web addresses of external online sources to inform peer gamblers seeking structural information of documents that they should consult for informational purposes. For example:

Extract 25: Web-community A

“**SG:** I'm on [operator] and should be receiving a deposit bonus (initial deposit) some time this week. Do these bonuses occur frequently or is it a one time deposit bonus for 1st timers?”

JM: One time for first deposit. They have reload bonuses every 2-3 months or so. Here is all the bonus information you need:

<http://www.bonuswhores.com> . It tells you everything you could possibly want to know about each skin.”

Structural and situational information, beyond maximising profitability, is also regularly provided and discussed between peers across the web-community. Online poker is a relatively new gambling activity and as expected the activity is approached by amateurs with scepticism and caution, and therefore information regarding the trustworthiness. For example:

Extract 26: Web-community A:

“**BA:** I was considering playing at one of the online poker sites, but curious, how can you trust them? How can you actually trust the game when there's no actual cards being dealt, just a computer program supposedly "randomly" assigning cards to players?”

PT: Software programs have been designed to accumulate all cards dealt. Many people have compiled lists to try and determine if the sites are dealing effectively randomly, such as this one:

<http://groupsbeta.google.com/group/rec.gambling.poker/msg/3c3f29d3340e65d7?hl=en&lr=&ie=UTF-8&oe=UTF-8>

So far, no one has statistically proven any funny stuff in the major sites' shufflers.”

In addition, information regarding electronic withdrawal and deposit systems are regularly discussed within the web-communities' member forums. For example:

Extract 27: Web-community B

JJ: Hi, I have no experience with Net Teller accounts. [Operator] won't accept my visa. So I need another withdrawal method. How do I open one? Can you recommend one?

SK: OK I'm a paranoid person, but if I were you and was about to open a NetTeller account, I'd first go to a local bank that offers a 100% free checking account, and open up a basic account and then link that to NetTeller. Now again, I'm a paranoid person like that, but that's what I did before linking my account to paypal. That way if anything gets compromised it's only my secondary free account where I don't keep much money in it that is vulnerable. My main account where my pay check gets automatically deposited is still safe (or at least as safe as it was before, and not more vulnerable by being linked to online sites)."

3.4 Discussion

The objective of this qualitative investigation was to outline in detail, and understand, how CMC within web-communities affects poker gambling cognition and behaviour. It is clear that for web-community members that IT is perceived to have significant utility in acquiring poker gambling knowledge and skill, and in providing optimal structural and situational characteristics for poker gambling. Membership and participation in such web-communities provides the individual opportunity to benefit from the consequences of reporting gambling experience and acquiring both poker gambling structural knowledge and skill.

Experiential Reporting

The disclosure of poker gambling experiences within the web-community allowed individuals to relive past wins and receive secondary reinforcement through positive appraisal from peer gamblers. Individuals who gamble solely online may not experience the social reinforcement of winning that is afforded at physical poker rooms. As poker is considered to be determined to a large extent by skill, being able to display ability and expertise is probably a strong source of intrinsic motivation to participate in such behaviour. Specifically for online poker gamblers, reporting wins within the web-community is a method of circumventing the asocial limitations of online gambling, and therefore increases the positive reinforcement available within online poker gambling.

In several ways experiential reporting may actually help promote and maintain responsible gambling behaviour. By reporting gambling experiences to the web-community the individual is effectively evaluating behavioural patterns and inferences that occurred when gambling. For other members of the web-community to fully appreciate the report's value, the author is required to provide accurate, detailed information. Although inferential biases will be prevalent, the individual is motivated to be as objective as possible if they seek to receive feedback to learn from. As a result, it is probable that erroneous cognitive heuristics will be minimised when behaviour is analysed in retrospect; particularly when other community members are assessing from a detached disposition. Moreover, the reporting individual's future gambling behaviour may be influenced by the feedback received. By discussing events from an objective standpoint with peers, the propensity of the individual to maintain rational cognition when poker gambling in future is likely to increase if erroneous biases are acknowledged.

Developing this concept further, there is cause to speculate that by reporting gambling experiences via CMC to the web-community, particularly negative experiences, the individual is given the opportunity to vent frustration. The pinnacle of problematic gambling behaviour is the 'tilt', where the individual gambles recklessly devoid of any rational cognition. The tilt is mainly precipitated by an unstable emotional disposition. The ability to discuss frustrating events such as bad beats and improbable luck can provide an extrication process whereby members vent their negative affectivity. More

importantly, they receive supportive feedback emphasising that such events occur regularly and must be ignored if they desire to be successful gamblers. Such conciliatory, supportive feedback will undoubtedly affect how negative gambling experiences are interpreted and how such interpretation affects future gambling behaviour.

By having web-community members adjudicate experienced poker events, and through reading the experiential reports of other peer poker gamblers, the individual is effectively provided with a 'benchmark' to gauge their own poker gambling ability. If seeking to be successful, the individual is motivated to replicate the gambling behaviour of web-community members who appear to be the most profitable. If individual's gambling behaviour gradually becomes more mathematically sound, emotionally stable and is continually, objectively re-evaluated, then the probability of the individual experiencing monetary based negative effects of excessive gambling is reduced. Naturally, the non-financial negative effects of excessive gambling (for e.g. familial or occupational neglect) may increase simultaneously with increases in poker gambling skill and therefore profitability. Put simply, the individual will receive increased positive reinforcement via increased profits and derivative reinforcements such as increased self-esteem, which will ultimately make the activity more appealing and rewarding.

Fundamentally, the benefits of experiential reporting gambling events to web-community members, in regards precipitating responsible gambling behaviour, is dependent on the accuracy and validity of peer interaction. In fact, the gambling web-community could potentially be a source of cognitive distortion. The author of the experiential report may provide inaccurate details, perhaps unconsciously, to induce desirable feedback to meet their requisite needs. For example, if the individual in reporting a sequence of losses fails to report their gambling errors in the account, they may receive feedback indicating that such losses were a result of random probability and therefore ignore the flawed gambling practice. As a result, the individual remains ignorant of their behavioural flaw and continues to gamble interpreting incurred losses as bad luck rather than deficient practice. If peer gambler interaction via the web-community has such potential to

influence gambling behaviour, it is crucial that information provided by each member is as accurate and objective as possible. Ultimately, the validity of the information disclosed in the exchange process between peer gamblers will determine whether the process is effective in reducing or precipitating potential pathological gambling behaviour.

Development of Poker Skill

The ability of peer gambler interaction via CMC to aid in developing poker gambling skill is likely to, paradoxically, encourage increased levels of participation but also reduce the risk of pathological gambling behaviour. Via web-community interaction, the poker gambler is provided opportunity to develop both objective and subjective based poker gambling skill. The web-community is a source of free, user-friendly information regarding how to manipulate the structural characteristics of poker to maximise profitability based on mathematical theory. Moreover, the web-community is perceived to be an effective learning tool for developing interpretational and representational skills in poker, reducing the need to acquire such skills through time consuming and often expensive trial and error periods. By acknowledgement of 'best-practice and pitfalls' outlined by experienced poker gamblers in the web-community, the need to waste money and time learning such nuances is reduced. Effectively, the major obstacles impeding novice gamblers from poker gambling have been significantly eroded by the emergence of the poker web-community. The individual is motivated to participate in poker gambling further if they possess, or at least perceive they possess, the requisite skills to be successful. If the individual does experience increments in poker gambling skill from participation in online interaction, the probability of being successful is increased, and therefore the likelihood of suffering from the monetary-based negative consequences of excessive gambling is reduced. The requisite skills to be successful in poker gambling, by default, are the requisite behaviours necessary to gamble responsibly. For example, remaining continually cognisant, and evaluative, of every behavioural contingency within and between poker gambling sessions, seeking to isolate and correct detrimental actions. Moreover, it is crucial to remain emotionally detached from the activity and

view it from an economic framework rather than interpersonal competition. Remaining in control is both the pinnacle of successful poker gambling and responsible gambling.

As with experiential reporting, it is crucial that the individual *is* developing skill, and being accurate in self-appraisal, otherwise the façade of developing gambling skill is a demand characteristic to rationalise excessive gambling behaviour. Cognitive biases may develop reducing the effect of the natural behavioural contingency of losing (i.e. punishment) through being able to minimise the effect of losing by rationalising it as simply bad luck or a learning process rather than a consequence of engaging in a risk behaviour. If losses are essentially dismissed as being caused by external forces such as probability, the individual is more likely to be able to rationalise future involvement in the activity. Player involvement in gambling activities is a powerful motivator to engage in the behaviour because it provides the perception of outcome control (Ladouceur & Walker, 1996). There is danger that the individual may use the potential to ascertain skill in poker, in this case via web-community participation, as a demand characteristic to justify excessive exposure, and therefore reducing the probability of gambling responsibly.

Structural Knowledge of Online Poker

The utility of the poker web-community in promoting responsible gambling behaviour is displayed further, when considering the effect of the availability of structural online poker information. Essentially, through the acquisition of information available within the web-community, the online poker gambler is provided with a blue-print of how to maximise profitability by applying poker gambling skill in the most efficient manner. For example, the individual can identify a particular online game that is most conducive to being successful in relation to the individual's ability and stake levels. Furthermore, the individual can acquire information about where and how to use poker IT software programmes such as PokerTracker, which automatically calculates complicated algorithms necessary to play optimal strategy, while also compiling a detailed database of player behaviour necessary for isolating poker gambling weaknesses. Promotion of usage of such software alone is tantamount to promoting responsible gambling, as it

reduces the likelihood of incurring losses based on human error and encouraging the individual to be cognisant of the outcomes of their gambling behaviour.

Data indicates that the most important source of non-strategy related poker information is the notification and evaluation of promotional and introductory bonuses and reward schemes provided by online poker operators. The cost of gambling is reduced by receiving promotional bonuses, and more importantly by intricately maximising the structure of the reward to obtain full value. For example, many online poker-rooms offer a rake-back i.e. a percentage return of operating fee for using their software. However, the percentage of rake-back available is variable depending from where the individual receives the promotional bonus code. Information such as which promotional bonus code offers the highest rake-back percentage is available from within the gambling web-community. The web-community primarily operates on a quid-pro-quo basis, where the relationship is based on reciprocation, meaning such information is distributed unreservedly.

The more the individual is able to minimise the cost of participating in online gambling, the lower the risk of suffering from monetary-based negative consequences of excessive gambling. However, the same hazards exist regarding structural online poker information procurement as with the other two aforementioned processes available through the interaction within the poker web-community. The ability to reduce the cost of poker gambling through maximising the structural facets of online poker could be used as a demand characteristic to rationalise excessive participation in what ultimately is a behaviour with substantial risk. Again, the procurement of information which is believed to increase profitability will probably motivate further participation in poker gambling, which independent of monetary outcomes, may lead to problematic gambling behaviour.

3.5 Implications

While acknowledging the infancy of the theoretical propositions, and the need for supporting empirical quantitative research, the role of gambling web-communities in promoting best-practice responsible gambling strategies is certainly intriguing. Fundamentally, the web-community encourages its members to be constantly evaluating the outcome and effects of their poker gambling behaviour from a disengaged emotional disposition. If members strive to maintain this behavioural process, the probability of a pathological gambling disorder developing from impulsive, irrational gambling behaviour is significantly reduced.

The primary concern when considering the role of poker web-communities in the development of skill is that members are more likely to become successful and receive monetary and derivative social rewards, therefore positively reinforcing participation in poker gambling significantly. Several of the diagnostic criteria for pathological gambling exist independent of monetary components (DSM-IV, APA, 1994). For example, becoming pre-occupied with reliving past gambling experiences or planning the next gambling activity is an indicator of problematic gambling behaviour. Moreover, another indicator is jeopardising a significant relationship or occupational position because of excessive gambling. If the poker web-community members are improving significantly, and acquiring rationale to justify consistent participation in poker gambling, there is potential for members to over-expose themselves to the point of being detrimental to their social lives, independent of monetary outcomes. Therefore, the web-community would benefit strongly from understanding and deliberating the potential social, and even personal, hazards of excessive gambling that are not related to monetary outcomes.

Moderators of poker web-communities should take a pro-active role in educating community members about best-practice for responsible gambling, or at least raise such issues for group notification and discussion. It is clear from interpreting the ethnographical data in this study that group members place value on the information extracted from within the web-community. It is probable that senior members of the web-community would be in a privileged position to educate other members about how

to operate responsibly and the importance of balancing gambling with other activities by outlining the potential existential costs of excessive gambling. It is evident that senior, experienced members of the web-community are respected because of the veracity of their poker knowledge, providing the authoritative influence necessary for responsible gambling principles to be given appropriate consideration by other members of the web-community.

Parallels are drawn with the community intervention practice for risk management in intravenous drug users (Power, Jones, Kearns & Ward, 1996). After ethnographical analysis of various illicit drug communities, the structure of the inherent knowledge transfer system became apparent and was subsequently advocated as a channel to disperse and promote best-practice regarding intravenous drug use. Again, the 'senior' members of the community were also encouraged to become educators of intravenous drug risk management, as they were seen as influential within that specific social network. It is unrealistic to attempt to eradicate all poker gambling participation; however it is not unrealistic to encourage responsible gambling based on informed choice within the poker gambling community online. If information is available regarding the negative consequences of excessive gambling and the most appropriate strategies to protect against problematic gambling behaviour, then at least members of the community are able to engage in a risk behaviour while also maintaining some element of sentience and behavioural control.

Given the evident utility of gambling web-communities for its members, and the potential to encourage responsible gambling behaviour, perhaps online poker operators should take a pro-active role in developing such educational platforms as part of a corporate social responsibility initiative. To be effective the moderators of the web-community must complete responsible gambling training to be able provide useful content regarding encouraging responsible gambling behaviour, educating members how to recognise a gambling problem and providing information about where seek to help if a gambling problem does develop. Many online poker operators already provide peer to

peer interaction facility, however little or no emphasis is placed on educating members about responsible gambling.

Admittedly, application of the findings of this study is proposed tentatively given the lack of validity attributed to the emergent concepts. However, the importance of potential applications in promoting responsible gambling, within an activity that because of its considerable skill component is primed for problematic gambling behaviour, emphasises the need to investigate further the affect of CMC and poker gambling cognition and behaviour. Furthermore, the behaviours observed within the study need to be measured empirically to assess the prevalence of such web-community interaction and its component processes across poker gamblers. This will enable critical evaluation about the feasibility and probable outcome of use CMC as a method to disclose responsible gambling information.

Chapter 4

Study 3: Measurement and predictive value of IT use in Poker in gambling frequency and profitability

4.1 Introduction

One of the aims of the research thesis is to explore in what ways developments in information technology (IT) affect gambling behaviour. Study 1, through grounded theory, produced an emergent framework identifying various affects of IT use in gambling behaviour. Study 2, through virtual ethnography, looked at the emergent relationship between computer-mediated communication (CMC) and poker gambling behaviour and cognition, and outlined in detail the various applications of CMC in this regard. Ultimately, a substantial list of applications of IT in gambling behaviour, and in particular poker gambling behaviour, has emerged during the explorative research. However, because of the epistemological limitations of the research methodologies employed in both Study 1 and Study 2, the behavioural findings cannot be generalised to the wider population of gamblers because the research lacks external validity.

The implications of the emergent behaviours found in Study 1 and 2 are currently unknown because it is not yet possible to claim what proportion of the gambling population participate in such IT-related behaviours when poker gambling, and what relationships such behaviours have with gambling frequency and expenditure. In summary, the primary objective behind each application of IT in relation to poker gambling is either making the activity more pleasurable through enhancing the situational and structural characteristics or increasing profit through ascertaining further outcome control. Previous literature has demonstrated a strong link between perceptions of control and pathological gambling behaviour (Langer, 1975; Griffiths, 1993; Dickerson, 1993). Previous research studies looking at the relationship between cognitive biases relating to perceptions of control and pathological gambling, have assumed that the perceived control is illusory. Currently, we are unable to determine

whether the perceived control of poker gambling outcome ascertained by manipulating various applications of IT is valid or illusory.

An aim of this study is to attempt to outline the factorial structure underlying the construct of 'IT use in Poker'. Currently, regarding this concept, only a tabulate list of behaviours is available, with minimal understanding of their relationships with other IT processes associated with poker gambling. One of the initial objectives of this study is to develop an instrument to measure IT use in Poker (ITP). Through initiating development of an ITP measurement tool it may be possible to outline the relationship between ITP and patterns of gambling behaviour, and potentially provide implications of ITP in relation to problem gambling. The instrument will be used to collect data through self-report making it easier to administer and also more cost-effective in research terms. Although self report measures may have the disadvantage of relying on accurate recall of participants, the previously documented multifarious, complex processes regarding ITP make observation difficult, if not impractically invasive. It is acknowledged that accuracy in behaviour measurement is upheld by multiple methods of data collection, therefore development of a self-report behaviour inventory is an initial step towards achieving this, by providing one source of data collection to be used in cohesion with other sources.

An extended list of applications of ITP has already been made available through Study 1 and Study 2. The first step in developing a valid measure of IT use in Poker will be to determine which behaviours are integral to the psychological construct and which behaviours are idiosyncratic and not applicable to the wider population of poker gamblers. Secondly, given the substantial variation of behaviours observed to date, it is probable that the construct of ITP has more than one underlying factor. The objectives of this study are:

- 1) To explore the factorial structure of the construct of ITP (Section 4.2 using Sample 1).

- 2) To explore the stability of the factorial solution of ITP observed in Section 4.2 by comparing it with data from a second sample (Section 4.3 using Sample 2).
- 3) To explore the predictive value of the underlying factors of ITP on online poker gambling frequency and poker gambling profitability (Section 4.4).

4.2 Development and Initial Validation of the ITP inventory

4.2.1 Defining the Construct of ITP

The first step of initiating development of a measure of IT use in Poker is to clearly define the construct. IT use in Poker relates specifically to the application and manipulation of various IT software, programs and telecommunication hardware in a capacity to enhance reward derived from, and/or outcome control in poker gambling. The construct of ITP does not relate solely to online poker gambling, but can also be used in an offline poker gambling capacity, such as developing skill for vis-à-vis gambling or gathering information about offline poker-rooms.

4.2.2 Method

4.2.2.1 Generation of Inventory Items

The traditional process of item generation is to extract items from existing measures of the construct in question by accessing related empirical articles through a research database. IT use in Poker is an emergent construct of the research thesis and therefore has not been documented in the research literature to date. As a result, potential items to include in the inventory were accumulated through re-assessing data of Studies 1 and 2. Raw data from Studies 1 and 2 were inspected and all behaviours relating to the use of IT in Poker gambling were recorded. After data were thoroughly inspected for possible inclusions, items that demonstrated substantial similarity were combined to produce a more representative singular item. Combined items were assessed and agreed by both research supervisors in terms of the commitment to, and representation of, emergent

behaviours within the raw data. Overall 19 potential inventory items remained. The remaining items appeared to theoretically cluster into three groups of ITP behaviours based on Study 1 and Study 2 data, namely: behaviours relating the use of the World Wide Web, behaviours relating the use of Computer-mediated Communication and behaviours relating to the use IT software.

The frequency of engagement in observed ITP behaviours was measured through self report on a 5-point Likert scale ranging from *very infrequently* to *very frequently*. (The list of 19 items included in the draft ITP inventory is available in Appendix 1)

4.2.2.2 Item analysis for Sample 1

The draft 19 item ITP inventory was administered online within a poker gambling newsgroup that published online. An online poker gambling newsgroup was selected to achieve a sample that had, at least, an interest in poker gambling and some familiarity with IT. An introduction of the study, describing the objectives of the research, the participation requirements, the research credentials of the author and potential participants' ethical rights, were posted within the newsgroup forum and members were invited to participate by clicking on the hyperlink. By clicking the hyperlink participants were directed to an online version of the draft ITP inventory hosted by an online survey firm (i.e. SurveyMonkey). Prior to completing the draft inventory participants were required to provide their age and gender. In total, 272 participants completed the draft ITP inventory online. The sample had a mean age of 25.84 years ($sd = 11.36$) and 87.86% of the sample were male and 12.14% were female.

The factorial structure underlying the construct of ITP was investigated using Exploratory Factor Analysis (EFA). The objective of developing the measurement tool is to make generalisations about the wider population of gamblers who use IT in Poker; therefore the method of extraction selected was Maximum Likelihood. Items included in the draft ITP inventory were comparatively disparate at face value; therefore orthogonal rotation was used as it was probable that clusters would be relatively independent. Given

the highly explorative nature of the factor analysis, Varimax rotation was selected to make the clusters more interpretable. Data were screened to reveal items that do not contribute significantly to the model. Firstly, the correlational matrix was inspected for items that do not significantly correlate with any others. Furthermore, data were inspected for evidence of singularity between items, and items that correlated above $r=0.9$ were removed. In summary, no items correlated at a 0.9 level or above, and each item significantly correlated with at least one other item, and therefore all items were initially retained.

The KMO statistic was 0.85, which is considered highly appropriate for factor analysis as such compact correlations are likely to yield distinct and reliable factors (Hutcheson & Sofroniou, 1999). This finding was supported further by observing that individual KMO statistics between items, as reported in the Anti-image Matrix, were all substantially above the established cut-off mark of 0.5 (Kaiser, 1974). Bartlett's Test of Sphericity was highly significant ($p<0.001$) rejecting the null hypothesis that the correlation matrix was an identity matrix, and therefore, because some relationships exist between items, factor analysis was suitable for this data.

4.2.3 Results

4.2.3.1 Initial factor solution

The initial factor analysis solution, after Varimax rotation, retained 5 factors that had an eigenvalue of greater than one (Kaiser, 1974). However, after inspecting the table of communalities and the rotated factor matrix it was apparent that 5 items in the inventory contained a small level of shared variance, and did not load adequately onto any of the 5 factors. Stevens (1992) recommended that in a sample of less than 300 that researchers should only view factor loadings above 0.364 as important. As a result, the following 5 items were removed from the draft ITP inventory: Item 3 - *How often do you use the World Wide Web to learn about the changing legality of online gambling?*, Item 7- *How often do you use the World Wide Web to read poker articles?*, Item 11- *How often do you*

use IT applications to analyse competitors' poker gambling behaviour patterns?, Item 12 - *How often do you use IT applications to analyse randomness of poker games?* and Item 19 - *How often do you use CMC to share information about past gambling experiences?*

4.2.3.2 Factor solution after non-loading items are removed

Exploratory Factor Analysis, with Maximum Likelihood extraction and Varimax rotation, was repeated with the remaining 14 draft items of the initial ITP inventory (See Appendix X for list of retained ITP items). Once again, data were screened for item correlations and indications of singularity through inspecting the correlation matrix. Each item correlated significantly with several other items, and no pair of items correlated above the 0.9 level. The data appeared appropriately suitable for EFA (KMO = 0.86; Bartlett's Test of Sphericity $p < 0.001$). After inspecting the table of communalities, no items appeared to need removed at this stage because after extraction each item accounted for a shared common variance above 0.364 (Stevens, 1992).

From the analysis there appeared to be 3 factors underlying the construct of ITP, accounting for 56.1% of the variance. After rotation, Factor 1 accounted for 25.81% of the variance, Factor 2 accounted for 17.58% of the variance and Factor 3 accounted for 12.69% of the variance. Table 3.1 adapted from the rotated factor matrix displays the components of each factor. By evaluating the items that load onto Factor 1 it is evident that they all are related to usage of the World Wide Web in gathering information relating to poker gambling. As a result Factor 1 was labelled '*World Wide Web use in Poker*'. Items that loaded substantially onto Factor 2 were all related to Computer-mediated Communication usage in various respects; therefore Factor 2 was labelled '*Computer-mediated Communication use in Poker*'. Finally, items that loaded strongly onto Factor 3 all relate to using software for poker gambling, and therefore Factor 3 was labelled '*Software use in Poker*'. From the analysis it was probable that underlying the ITP inventory are three subscales measuring the following sub-components: World Wide Web use in Poker, Computer-mediated Communication use in Poker and Software use in Poker.

4.2.3.3 Internal Consistency and Split Half Reliability from Sample 1 data

Cronbach's alpha for the ITP inventory from the Sample 1 was 0.86 indicating that the scale was internally reliable. After inspection of the table of item-total correlations (displayed in Table 4.2), it was evident that each item was a reliable part of the final scale. Furthermore, the proposed subscales within the ITP inventory were demonstrated to have internal reliability: the World Wide Web use in Poker subscale had a Cronbach's alpha of 0.88, the Computer-mediated Communication use in Poker subscale had a Cronbach's alpha of 0.85 and the Software use in Poker subscale had a Cronbach's alpha of 0.77. After randomly separating items into two sets, the Split-Half reliability was 0.76 suggesting the each set reliably measures the same construct.

Table 4.1 – ITP inventory item factor loadings for Sample 1			
IT use in Poker factors	Factor 1	Factor 2	Factor 3
(Item 3) How often do you use the World Wide Web to learn how to calculate probability of various poker games?	0.76		
(Item 7) How often do you use the World Wide Web to get information about the rules of various poker games?	0.75		
(Item 6) How often do you use the World Wide Web to get information regarding poker software (e.g. PokerTracker)?	0.72		
(Item 4) How often do you use the World Wide Web to get information about the strategy of various poker games?	0.70		
(Item 1) How often do you use the World Wide Web to get information about playing features of online poker rooms?	0.67		
(Item 5) How often do you use the World Wide Web to get information about instructional poker tools (e.g. books)?	0.66		
(Item 2) How often do you use the World Wide Web to get information about available promotions of online poker rooms?	0.63		

(Item 12) How often do you use CMC to share information about offline poker-rooms (e.g. tournaments, clientele)?		0.81	
(Item 13) How often do you use CMC to discuss strategy of various poker games?		0.78	
(Item 11) How often do you use CMC to share information about online poker-rooms (e.g. credibility, promotions)?		0.72	
(Item 14) How often do you use CMC to seek advice from advanced/experienced poker gamblers?		0.66	
(Item 10) How often do you use IT applications to review and evaluate poker profitability/success?			0.93
(Item 8) How often do you use IT applications to analyse personal poker gambling behaviour patterns?			0.71
(Item 9) How often do you use IT applications to help calculate probability when poker gambling?			0.52

4.2.3.4 Normative Data

The most frequently engaged in use of the World Wide Web in poker was seeking information about promotions available for online poker-rooms, with 50.6% of the sample indicating that they engage in this behaviour at least occasionally. The least employed use of the World Wide Web in this respect was using the system to learn techniques for calculating probability in poker with 8.5% reporting to perform this behaviour at least occasionally. The most frequently engaged in use of CMC in poker was the discussion of poker gambling strategy with peers, with 36.5% of the sample reporting to engage in this activity at least occasionally. However, each item of CMC use in Poker had a similar frequency of engagement with each item recording a frequency of engagement, at least occasionally, of between 26.6% and 36.5% of the Sample 1. In terms of Software use in Poker, the most frequently engaged in behaviour in this respect was the use of software to evaluate personal success and profitability in poker with 39.1% of the sample reporting to engage in this activity at least occasionally.

Table 4.2 reports means and standard deviations for each item, each factor and the complete ITP inventory. The mean score on the ITP inventory was 29.63 (SD=9.64), out of a possible 70. The mean scores of the factorial subscales of World Wide Web use in Poker, Computer-mediated Communication use in Poker and Software use in Poker were 14.96 (SD= 5.97) out of a possible 35, 8.16 (SD= 3.76) out of 20 and 6.53 (SD= 3.13) out of 15 respectively. There appeared to be little variance across items, with Item 3 (*How often do you use the World Wide Web to learn how to calculate probability of various poker games?*) having the lowest mean at 1.76 (SD= 1.03) and Item 2 (*How often do you use the World Wide Web to get information about available promotions of online poker rooms?*) having the highest mean at 2.71 (SD= 1.33).

Table 4.2 Means, Standard Deviations and Item-Total Correlations for the IT use in Poker Inventory			
	Mean	SD	Item-Total r
IT use in Poker Inventory	29.63	9.64	0.86
<i>World Wide Web use in Poker subscale</i>	14.96	5.97	0.88
(Item 1) How often do you use the World Wide Web to get information about playing features of online poker rooms?	2.61	1.10	0.59
(Item 2) How often do you use the World Wide Web to get information about available promotions of online poker rooms?	2.71	1.33	0.56
(Item 3) How often do you use the World Wide Web to learn how to calculate probability of various poker games?	1.76	1.03	0.61
(Item 4) How often do you use the World Wide Web to get information about strategy of various poker games?	1.89	1.02	0.58

(Item 5) How often do you use the World Wide Web to get information about instructional poker tools (e.g. books)?	2.14	1.09	0.62
(Item 6) How often do you use the World Wide Web to get information regarding poker software (e.g. PokerTracker)?	2.06	1.08	0.57
(Item 7) How often do you use the World Wide Web to get information about the rules of various poker games?	1.80	0.92	0.58
<i>Software use in Poker subscale</i>	6.53	3.13	0.77
(Item 8) How often do you use IT applications to analyse personal poker gambling behaviour patterns?	2.30	1.39	0.37
(Item 9) How often do you use IT applications to help calculate probability when poker gambling?	2.01	1.10	0.38
(Item 10) How often do you use IT applications to review and evaluate poker profitability/success?	2.22	1.26	0.35
<i>Computer-mediated Communication use in Poker subscale</i>	8.16	3.76	0.85
(Item 11) How often do you use CMC to share information about online poker-rooms (e.g. credibility, promotions)?	2.07	1.07	0.50
(Item 12) How often do you use CMC to share information about offline poker-rooms (e.g. tournaments, clientele)?	2.10	1.10	0.55
(Item 13) How often do you use CMC to discuss strategy of various poker games?	2.13	1.18	0.56
(Item 14) How often do you use CMC to seek advice from advanced/experienced poker gamblers?	1.86	1.05	0.48

4.2.3.5 Discussion of ITP inventory psychometric properties

This research is the first empirical analysis of the use of IT in Poker gambling. Validity for the existence of the construct ITP that emerged in the qualitative studies has been provided to an extent. However, five items that emerged from Studies 1 and 2 that were hypothesised to be a component of ITP were removed from the inventory because they were not significantly related to any other items, and therefore did not load significantly onto any factor. As a result the construct validity of the initial ITP inventory improved after those five items were removed from the measure.

After exploring the factorial structure underlying the construct, it is probable that there are three distinct factors comprising the construct, including the application of the World Wide Web, Computer-Mediated Communication and various Software programs in poker gambling. Evidence suggests that each subscale is a component of the construct and not independent as each subscale is significantly correlated ($p < 0.001$). The application of the World Wide Web was the most prominent factor accounting for the most variance in ITP (25.81%) in comparison to CMC use (17.58%) and Software use (12.7%). Factor analysis in this methodological design is purely an explorative tool and cannot be used to prove hypotheses regarding factorial structure of the emergent construct. However, overall, based on analysis of data from Sample 1, the ITP inventory shows promise as an internally consistent and valid tool in measuring ITP. In order to increase the construct validity of the measure, the factorial structure of the construct was explored again through EFA on data from Sample 2, to determine whether a consistent factorial structure emerges.

4.3 Inventory validation using a different sample

4.3.1 Method

4.3.1.1 Participants

A sample of 200 poker gamblers was sampled in the city of Las Vegas in August 2005. Full description of sampling procedure can be accessed in section 4.4

4.3.1.2 Validation of ITP inventory factorial structure on Sample 2

The findings of initial exploration of the factorial structure in 4.2 suggest that the ITP inventory comprises of three subscales measuring three factors underlying the construct. Before any confidence can be placed in the model produced in the previous study, the analysis must be replicated on a different sample to evaluate the robustness of the factorial structure. Sample 1 was selected from an online poker web-community, therefore to assess the external validity of the measure, a second, divergent sample was selected to analyse. In simple terms, another EFA assessment on a new sample was required to increase confidence in the proposed operationalisation of the emergent construct.

4.3.1.3 ITP inventory item analysis using Sample 2 data

Data from Sample 2 underwent similar EFA as data from Sample 1, to assess the stability of findings in Section A. Maximum Likelihood extraction was employed with Varimax rotation in order to increase the interpretability of the underlying factorial structure. Data were screened for non-contributory items i.e. items that did not display significant correlations with at least one other item, and factor loadings were also inspected. Data were also screened at this stage to assess singularity, and items that correlated above 0.9 were to be reduced to a single item to reduce the potential for excessive multi-collinearity. In summary, none of the 14 items correlated above 0.9, and each item significantly correlated with at least two other items.

Findings showed that a similar factorial structure to Sample 1 data was achieved, with 3 clear factors emerging, underlying the construct of IT use in Poker. The three factors to emerge from the EFA comprised of the same items as in section 4.2. Table 4.3 displays factor loadings for Sample 2 items, and also provides the factor loadings for Sample 1 for

comparative purposes. Because identical items comprise each factor, designated factor labels were retained from section 4.2. The three factors retained accounted for 59.53% of the variance in ITP. The largest factor in the model was still World Wide Web use in Poker, and remained stable accounting for 26.03% of the variance in Sample 2. The prominence of factor 2, CMC use in poker, had increased with Sample 2, accounting for 21.41% of the variance. The Software use in Poker remained the smallest factor in the model and accounted for 12.08% of the variance.

4.3.1.4 Internal Consistency and Split Half Reliability using Sample 2 data

Cronbach’s alpha for the ITP inventory using Sample 2 was 0.85, demonstrating appropriate internal consistency. The table of item-total correlations was inspected for items that did not correlate adequately with the other items in the inventory, however from the table it was determined that reliability of the measure would not be improved if any item was removed. Cronbach’s alpha for the World Wide Web use in Poker (0.88), the CMC use in Poker (0.92) and the Software use in Poker (0.74) subscales demonstrated their internal consistency. After randomly separating items into two sets, the Split-Half reliability was 0.74 suggesting the each set reliably measured the same construct.

Table 4.3 Factor Loadings of ITP Inventory from Sample 1 and Sample 2 data				
IT use in Poker factors	Sample	Factor 1	Factor 2	Factor 3
(Item 3) How often do you use the World Wide Web to learn how to calculate probability of various poker games?	1	0.76		
	2	0.68		
(Item 7) How often do you use the World Wide Web to get information about the rules of various poker games?	1	0.75		
	2	0.78		
(Item 6) How often do you use the World Wide Web to get information regarding poker software (e.g. PokerTracker)?	1	0.72		
	2	0.78		
(Item 4) How often do you use the World Wide Web to get information about strategy of various poker games?	1	0.70		
	2	0.77		

(Item 1) How often do you use the World Wide Web to get information about playing features of online poker rooms?	1	0.67		
	2	0.53		
(Item 5) How often do you use the World Wide Web to get information about instructional poker tools (e.g. books)?	1	0.66		
	2	0.81		
(Item 2) How often do you use the World Wide Web to get information about available promotions of online poker rooms?	1	0.63		
	2	0.57		
(Item 12) How often do you use CMC to share information about offline poker-rooms (e.g. tournaments, clientele)?	1		0.81	
	2		0.88	
(Item 13) How often do you use CMC to discuss strategy of various poker games?	1		0.78	
	2		0.89	
(Item 11) How often do you use CMC to share information about online poker-rooms (e.g. credibility, promotions)?	1		0.72	
	2		0.92	
(Item 14) How often do you use CMC to seek advice from advanced/experienced poker gamblers?	1		0.66	
	2		0.71	
(Item 10) How often do you use IT applications to review and evaluate poker profitability/success?	1			0.93
	2			0.88
(Item 8) How often do you use IT applications to analyse personal poker gambling behaviour patterns?	1			0.71
	2			0.59
(Item 9) How often do you use IT applications to help calculate probability when poker gambling?	1			0.52
	2			0.58

4.3.2 Discussion

After exploratory factor analysis of the ITP inventory on Sample 2, the factor structure to emerge in Section B was very similar to the factor structure to emerge in Section A. Further support has been provided for a 3 factor structure of the ITP construct. Although continued support for the ITP inventory must be provided before the validity of the measure can be fully acceptable, current evidence suggests that the measure is internally consistent and representative of the construct.

4.4 The predictive value of the ITP inventory on online poker gambling frequency and poker gambling profitability

Throughout Studies 1 and 2 it has been revealed that participants had been using various forms of IT to increase reinforcement from poker gambling. By using IT applications, participants reported to be able to increase outcome control in poker and also increase reward from the activity. The objective of section 4.4 is to determine what effect using IT in Poker has on gambling behaviour in terms of both frequency of activity engagement and achieved profit or loss, of the activity per month. From the grounded theory to emerge in Study 1, it was reported that IT had transformed the nature of gambling behaviour for participants. Participants could now engage in the behaviour more easily through reduced opportunity costs. However, a competing motivation to engage in gambling more frequently was the perception that by using IT participants could increase outcome control, making gambling more profitable and therefore more reinforcing.

Many of the items in the ITP inventory relate to behaviours that are external to poker gambling, such as developing poker gambling skill, measuring poker gambling profitability or discussing poker gambling strategy. Given that such behaviours are extraneous to the act of gambling, they could be interpreted as pre-occupation with gambling. From the DSM-IV criteria for Pathological Gambling (APA, 1994), it is evident that being consumed with gambling related behaviours such as planning next gambling activities and discussing past behaviour are risk factors for problem gambling. Whether online poker gambling frequency is a valid indicator of problem gambling, in relation to of ITP, is questionable. As reported in Study 1 and 2, participants claim that they can control poker gambling outcomes better and are therefore more successful and profitable. It appears logical that if outcome control is obtainable, then frequently engaging in a profitable activity is a rational behaviour and not an indicator of a potential gambling problem. As a result, it not possible in this study to make inferences about the relationship between online poker gambling frequency and problem gambling.

Nevertheless, engagement in several ITP behaviours does suggest that the individual perceives that objectives are met through such activities, and therefore, if control and/or rewards are produced by such behaviours, motivation to gamble will increase. It was hypothesised that participants who score higher on the ITP inventory will gamble on online poker more frequently per month.

Secondly it has been reported repeatedly in Studies 1 and 2 that through engaging in IT behaviours in a poker gambling capacity increases outcome control and therefore increases profit acquired from poker gambling. As a result, it was hypothesised that those who score higher on the ITP inventory will be more profitable when poker gambling.

Ultimately, the construct and factors being measured in the hypothetical relationships investigated in this study are at a very premature phase, and therefore at this embryonic stage descriptive data recorded, such as mean scores of ITP inventory items, will also be reported and discussed. The proposition of the ITP construct requires continuous empirical support to build on the rich, qualitative findings as its existence has not been reported outside of this body of research. The primary objective of this chapter was to provide empirical data to integrate with, and enhance, the detailed descriptions of changes in gambling behaviour reported in Studies 1 and 2. This study provided an opportunity to explore the level of engagement in ITP behaviours and whether engagement in such behaviours are related to particular patterns of gambling behaviour such as online poker gambling frequency and acquired profit per month.

4.4.1 Method

4.4.1.1 Participants

Sample 2 was recruited through convenience sampling in Las Vegas in August 2005. Las Vegas was selected as an ideal location to sample participants because it was probable that there would be a high concentration of individuals who participate in poker

gambling in comparison to competing locations. Data collection was carried out over a period of 11 days. Data collection was terminated after a sample 200 participants was measured because of practical restrictions. Inclusion criteria required participants to play poker regularly, either offline or online, which was determined to be at least once per month. Each evening after data collection, completed surveys were inspected for incompleteness and the surveys that were not completed in entirety were removed from the study.

The sample comprised 182 males (91%) and the remaining 18 participants were female (9%). The mean age of the sample was 32.17 years ($SD=10.87$), and there was a large range of ages, with the youngest participant being 19 years old and the eldest being 59 years old. Given Las Vegas' status primarily as a tourist destination it was deemed appropriate to consider the home location of the participants. As expected the large majority of the participants were US residents (84%), whereas 8.5% were residents of Canada and the remaining 7.5% of participants reported to be residents of the UK. Finally, 52.5% of participants reported that they had been regular poker gamblers for less than 3 years and 19% reported that they had been regular poker gamblers for over 10 years.

4.4.1.2 Design

This is an explorative study investigating the predictive value of IT use in Poker in predicting online poker gambling frequency and acquired profit per month. The predictive value of the subscales of the ITP inventory was measured. Hierarchical multiple regression was performed to produce a prediction model for both online poker gambling and poker gambling profitability per month, with the factors *World Wide Web use in Poker*, *Computer-mediated Communication use in Poker* and *Software use in Poker* being entered into the regression equation as a block.

4.4.1.3 Measures

IT use in Poker was measured by a 14 item self-devised ITP inventory. The ITP inventory consists of 3 subscales which measure a specific category of ITP, including: *World Wide Web usage in Poker*, *Computer-mediated Communication usage in Poker* and *Software usage in Poker*. For full description of development and current psychometric properties of the ITP inventory see sections 4.2 and 4.3.

Online poker gambling frequency was measured by self-report where participants were required to estimate how many days per month they participate in online poker. Days per month is a limited indication of online poker gambling frequency because periods of heavy gambling i.e. binge gambling, will be distorted as such sessions will only be scored as 1 episode. In contrast, periods of brief gambling, for example playing poker for 15 minutes may be misrepresented in data collection because they will also be scored as 1 episode. Put simply, through this method of data collection a 15 minute period of gambling will be scored as equal to a continuous 15 hour period of gambling. Although a limited data collection method to record online poker gambling frequency, using days as units of measurement appeared to be the most appropriate method when considering that the accuracy of measurement is determined by participant memory recall across an extended period of time. Measuring a smaller unit of time than a day would be unfeasible within a self-report measure, and as such is more suitable for observational data collection.

Poker gambling profitability was measured by self-report where participants were required to report how much profit or loss they accumulated, on average, per month in US dollars. Participants reported either average profit or loss per month by indicating a positive or negative value. There are limitations regarding the validity of self-reports of gambling profitability because of social desirability, however observation of profitability in poker gambling, particularly online, over several months would be unfeasible within this study design.

4.4.1.4 Procedure

Participants were approached in a pedestrian zone in the city of Las Vegas, and were asked to participate in the research study. After displaying my credentials and ID tag, participants were informed about the objectives of the study, and what would be required if they wished to participate. Individuals willing to participate were handed a questionnaire and a pen, and the researcher took a few steps back to enable the participants complete the questionnaire in privacy. All participants were informed that if they did not understand the meaning of a question or any terminology, simply to indicate this and I would explain it to them.

The questionnaire consisted of brief demographic information regarding age, sex and country of residence. The questionnaire included the ITP inventory, and also a single question measuring average monthly online gambling frequency and poker gambling profitability through average profit or loss per month in US dollars. The questionnaire took each participant approximately 10 minutes to complete. An accurate rate of participant attrition could not be recorded because of the speed of which participants were approached and size of groups approached. Incomplete questionnaires were removed from the sample, and sampling ceased after 200 completed questionnaires were collected.

Data was entered into SPSS and screened for suitability for factor analysis and the validity and reliability of the ITP inventory was evaluated. Descriptive and demographical information was explored and reported. Finally, multiple regression analysis was performed to explore the predictive value of the factors of ITP (i.e. *World Wide Web use in Poker, Computer-mediated Communication use in Poker and Software use in Poker*) on online poker gambling frequency and poker gambling profit or loss acquired per month.

4.4.1.5 Ethical Considerations

When potential participants displayed interest in taking part in the study, they were informed clearly about the objectives of the study, the type of information they would be

required to provide and approximately how long the questionnaire would take to complete. After agreeing to participate in the study, individuals were clearly informed of their ethical rights to not answer any question they didn't want, without needing to explain why, and that all information was anonymous and confidential. After completion of the questionnaire participants were thanked and provided with a business card that included the researcher's email address and permission to contact them if they had any questions regarding the study or outcomes of the study.

4.4.2 Results

4.4.2.1 Descriptive findings

World Wide Web use in Poker subscale

The mean score on the World Wide Web use in Poker subscale was 11.56 (out of 35) (SD=5.35) with only 8% of participants scoring 20 or more. The most frequently engaged in behaviour on this subscale was using the World Wide Web to gather information about poker gambling promotions ($x=2.22$, $SD=1.37$), closely followed by gathering information about the structure of a specific poker room ($x=2.05$, $SD=1.28$). The least frequently engaged in item on the subscale was using the World Wide Web to gather information about poker related software ($x=1.26$, $SD=0.67$). Of the sample, 29% and 24.5% reported to frequently or very frequently use the World Wide Web to gather information about promotions and the structure of specific poker rooms, respectively. In terms of the remaining items on the World Wide Web use in Poker subscale, between 7% and 19.5% of the participants engaged in each of the behaviours either frequently or very frequently.

Computer-mediated Communication use in Poker subscale

The mean score of the Computer-mediated Communication use in Poker subscale was 5.52 (out of 20) (SD=3.77). The most frequently engaged in behaviour on this subscale

was using CMC to discuss poker gambling strategy ($x=1.4$, $SD=1.07$). However, the remaining items on this subscale including using CMC to share information about offline poker rooms, to share information about online poker rooms and to seek advice from experienced players had means of 1.39, 1.37 and 1.36, respectively. Of the sample, between 10.5% and 11.5% engaged in each item in the Computer-mediated Communication use in Poker subscale either frequently or very frequently.

Software use in Poker subscale

The mean score of the Software use in Poker subscale was 5.36 (out of 15) ($SD=3.2$). The most frequently engaged in behaviour within this subscale was the application of software to aid in probability calculation ($x=1.88$, $SD=1.37$). The mean score for using software to calculate poker gambling profitability was 1.86 ($SD=1.31$), and 1.62 ($SD=1.13$) for using software to analyse personal poker gambling patterns. Of the sample, 24.5% either frequently or very frequently used software to aid calculating probability. Furthermore, 19.5% and 15% of the sample used software to calculate profitability of poker gambling and analyse personal poker gambling patterns respectively, either frequently or very frequently.

Online poker gambling frequency (in days per month)

The mean frequency of online poker gambling was 7.24 days per month ($SD=5.66$). There was a recorded range of 30, with a minimum reported of 0 days per month to a maximum of 30 days per month.

Poker gambling profitability

The mean profit or loss accounted on average per month was a profit of US\$69.28 ($SD=49.69$). There was a range of \$520, with a reported minimum average monthly profit of -\$170 and a maximum of \$350.

4.4.2.2 Multiple Regression Findings

The aim of section 4.4 was to measure whether the factors underlying the construct of ITP, namely *World Wide Web use in Poker*, *Computer-mediated Communication use in Poker* and *Software use in Poker*, account for variance in either online poker gambling frequency or acquired poker gambling profit per month.

Predicting online poker gambling frequency

Using a stepwise method of predictor entry, Model 1 indicated that *World Wide Web use in Poker* was predictor of online poker gambling frequency accounting for 38.7% of the variance. However, when *Software use in Poker* was added in Model 2, both Software use in Poker and World Wide Web use in Poker combined to account for 48.7% of the variance in online poker gambling frequency. It is therefore possible to reject the null hypothesis that the underlying factors of ITP do not predict online poker gambling frequency ($F=93.49$, $p<0.01$). When *Computer-mediated Communication use in Poker* is added to the model it fails to statistically significantly increase the predictive value of the model and is therefore removed. Correlation for the predictor variables, World Wide Web use in Poker and Software use in Poker, was moderate ($r=0.38$, $p<0.001$). For Model 2, multicollinearity of predictor variables is not an issue of concern because the Tolerance statistic is above 0.2 (tolerance=0.84) (Menard, 1995).

Table 4.4 shows the relative importance each factor has in predicting online gambling frequency. The most powerful predictor of online poker gambling frequency is World Wide Web use in Poker (Beta=0.48, $t=8.76$, $p<0.01$) and Software use in Poker (Beta=0.35, $t=6.37$, $p<0.01$) is the weakest predictor in the model. In summary, participants who used the World Wide Web more frequently and used Software in a poker gambling capacity more frequently were more likely to gamble online in poker more frequently.

Table 4.4 – Regression coefficients for the IT use in Poker factors in the online poker gambling frequency prediction model			
Model 2	<i>Standardised Coefficients (Beta)</i>	<i>t</i>	<i>Significance Level</i>
World Wide Web use in Poker	0.48	8.76	p<0.01
Software use in Poker	0.35	6.37	p<0.01

Predicting average monthly acquired poker gambling profit

Using a stepwise method of predictor entry, Model 1 shows that World Wide Web use in Poker accounts for 27.4% of the variance in poker gambling profitability. However, as demonstrated in Model 2 when Software use in Poker is entered alongside World Wide Web use in Poker as predictors, they combine to account for 29.9% of the variance in poker gambling profitability. Because of this we can reject the null hypothesis that the factors underlying IT use in Poker do not predict poker gambling profitability ($F=41.95$, $P<0.01$). Computer-Mediated Communication use in Poker was removed from the multiple regression analysis as it failed to be a statistically significant predictor of poker gambling profitability.

Table 4.5 – Regression coefficients for the IT use in Poker factors in the poker gambling profitability prediction model			
Model 2	<i>Standardised Coefficients (Beta)</i>	<i>t</i>	<i>Significance Level</i>
World Wide Web use in Poker	0.45	7.12	p<0.01
Software use in Poker	0.16	2.61	p<0.01

Table 4.5 outlines the relative predictive strength of each factor in predicting poker gambling profitability. In this predictive model, World Wide Web use in Poker accounts for substantially more of the variance (Beta=0.45, $t=7.12$, $p<0.01$) than Software use in Poker (Beta=0.16, $t=2.61$, $p<0.01$). Fundamentally, participants who engaged more

frequently in World Wide Web use in Poker and Software use in Poker were more likely to ascertain profit while playing poker.

4.4.3 Discussion

4.4.3.1 Online poker gambling frequency prediction model

The results show that use of the World Wide Web and the use of Software in a poker gambling capacity is predictive of online poker gambling frequency in days per month. World Wide Web use in Poker is the more powerful of the two predictors in the model, with an individual scoring one standard deviation higher on the World Wide Web use in Poker subscale predicted to gamble on online poker an additional 2.72 days per month.

When contemplating the component items of the World Wide Web use in Poker subscale, it is evident that the essence of this factor is using the World Wide Web to ascertain knowledge about poker gambling. The knowledge that can be acquired is varied, ranging from learning how to calculate probability effectively, to learning about poker gambling strategy and even gathering information regarding which instructional tools i.e. books are most effective in developing poker gambling skill. Along with information gathered to develop poker gambling skill, information is also sought regarding the structural and situational characteristics of various poker gambling operators, such which poker-rooms are offering the most rewarding promotion and which operators provide features that the individual find most conducive to maximising rewards from poker gambling (for e.g. suitable ante availability). By locating a poker-room that is most conducive to successful gambling outcomes, based on structural features and promotional rewards, individuals are provided with increased motivation to engage in poker gambling. By using the World Wide Web to increase poker gambling knowledge, and therefore skill, and to reduce opportunity cost in gambling through locating promotional rewards that lower the amount of money that needs to be risked, individuals are provided with increased motivation to gamble on poker online. Effectively, the knowledge acquired through using the World Wide Web can be used to increase the

ability to rationalise engagement in a risk behaviour, as participants can claim to hold increased control over gambling outcomes.

The finding that World Wide Web use in Poker is a predictor of online poker gambling frequency is supportive of qualitative findings from Studies 1 and 2, where participants reported that acquisition of knowledge from the World Wide Web increases their ability to control gambling outcomes, and as a result, increases the profitability of the activity. This linear relationship between increased outcome control and gambling participation was a key relationship to emerge from the grounded theoretical framework that was recorded in Study 1.

Another predictor of online poker gambling frequency was the application of software in a poker gambling capacity. An individual scoring one standard deviation higher on the Software use in Poker subscale is predicted to gamble on online poker an additional 1.98 days per month. The factor of Software use in Poker comprises of the following behaviours: using software to calculate probability, analyse poker gambling behavioural patterns and to evaluate the profitability of poker gambling. The theoretical relationship between the aforementioned behaviours and increased online poker gambling frequency is not immediately obvious. However, it is probable that participants who use software applications in this manner are likely to improve their ability to profit from poker gambling. Using software to calculate probability in poker reduces the potential for error in mathematically determined gambling strategy. Moreover, using software to calculate probability is likely to reduce cognitive load and time usurped, providing the individual increased time to evaluate the potential consequences of various gambling decisions more thoroughly. Put simply, the individual has more time to evaluate subjective information available in cohesion with objective probability.

It is also probable that using software to evaluate profitability of poker gambling, and personal poker gambling patterns, the individual is provided with useful information regarding the shortcomings in their poker gambling ability. Through evaluating such information, individuals remain cognisant of whether they are making profit overall, and

in which poker situations they are most frequently losing. If the participant, by evaluating the outcomes of, and the patterns within and between, gambling sessions remain cognisant of areas of weakness in their poker gambling ability, it is probable that they will take steps to reduce such areas of weakness and improve poker gambling ability. A perceived increase in poker gambling ability is likely to increase motivation to gamble more frequently on poker, potentially explaining the predictive relationship between Software use in Poker and online poker gambling frequency.

Computer-mediated Communication use in Poker was shown not to be a predictor of online gambling frequency. The items within this subscale, such as sharing information about various poker-rooms and discussing strategy, have a similar objective to the behaviours related to World Wide Web use in Poker and Software use in Poker, in that they are orientated towards achieving outcome control in poker. However, differences exist between factors in the method of knowledge extraction that outcome control stems from. Using the World Wide Web and running Software programmes while playing poker takes considerably less time than engaging in peer interaction that is required when exchanging knowledge via Computer-mediated Communication. Study 2 describes in detail the reciprocal nature of peer interaction in sharing poker gambling knowledge; where participants are required to complete written questions or statements, interpret information provided by peers and engage in detailed debates regarding gambling strategy. The time usurped using Computer-mediated Communication to acquire and distribute poker gambling information, in comparison to alternative methods of knowledge acquisition using IT, may account for the inability of Computer-mediated Communication use in Poker to predict online poker gambling frequency.

4.4.3.2 Poker gambling profitability prediction model

World Wide Web use in Poker and Software use in Poker have been identified as predictors of the amount of profit participants acquire, on average, per month from playing poker. Similar to the online poker gambling frequency model, World Wide Web use in Poker is the stronger predictor, with an individual scoring one standard deviation

higher on the World Wide Web use in Poker subscale being predicted to win an extra US\$31.18, on average, per month. Similarly, an individual scoring one standard deviation higher on the Software use in Poker subscale being predicted to win an extra \$11.09, on average, per month.

These findings support qualitative findings in Studies 1 and 2, where participants consistently proposed that by manipulating various forms of IT, it was possible to increase outcome control and therefore making poker gambling more profitable. The mean amount of profit, on average, per month was reported to be \$69.28, which means that participants scoring one standard deviation higher on the World Wide Web use in Poker subscale would increase their average monthly profit by 45.01%. Effectively, this means that individuals who use the World Wide Web to gather information about poker gambling skill and available promotions record significantly higher profits per month. Furthermore, participants scoring one standard deviation higher on the Software use in Poker subscale won 16% more, on average, per month.

4.4.3.3 Implications

As this is the first study to identify World Wide Web use in Poker and Software use in Poker as predictors of online poker gambling frequency and poker gambling profit, the findings provide cautious optimism for future research. Increased online poker gambling frequency is, superficially at least, perceived as a negative outcome and potentially a risk factor for problem gambling. However, when this finding is put into the context of participants engaging in both World Wide Web use in Poker and Software use in Poker being, on average, more successful and consistently more profitable than those who don't, the increase in frequency is seen less as an indication of disordered, problematic gambling and more as rational goal-orientated behaviour. Qualitative findings from Studies 1 and 2 clearly demonstrate that participants, using various application of IT in relation to poker gambling, perceive that they have increased outcome control, and therefore the probability of the outcome being profitable is also increased. The

quantitative findings of this study provide significant support to the participants' reported perceptions.

As evidence suggests that poker gambling outcomes, through World Wide Web use and Software use in poker, can be controlled to a consistently profitable level, there is cause to speculate that the negative financial consequences of poker gambling may be reduced for individuals who gamble in this format.

It is probable that there will be several variables that influence an individual's ability to gamble in a consistently controlled, profitable format. For example, the individual's ability to comprehend and interpret mathematical information, their ability to execute various IT processes effectively and their ability to remain emotionally stable during periods of extended improbable bad luck, may all influence an individual's ability of being able to successfully gamble with increased outcome control.

There is a danger however in poker gamblers acknowledging that under certain conditions it is possible to be consistently profitable over the long term. As proposed earlier, before individuals can achieve such goals they must meet several criteria that enable them to exert outcome control in poker (for e.g. stable emotional disposition), and not all individuals will have such pre-requisites. Effectively, this means that poker gamblers may perceive that incurred losses will eventually be remedied when they are able complete the IT processes required for outcome control. If this happens, the potency of the naturally occurring behavioural contingency to gambling i.e. experiencing punishment the in form of monetary losses, will be reduced when contextualised against perceptions of expected consistent profits in the future. Put simply, individuals who do not have the requisite skills to gamble in a consistently profitable manner may continue to gamble in the face of continuous losing periods because they erroneously perceive that in future they will be able to consistently make profit. This process will become an erroneous bias; and there is a strong body of research demonstrating the link between pathological gambling and erroneous cognitions, particularly illusions of control (Langer, 1975; Griffiths, 1993; Dickerson, 1993).

Even if there are individuals who can apply IT effectively to increase outcome control in poker, not all criteria for pathological gambling are specifically related to monetary loss. An individual who gambles on poker and is consistently profitable is likely only to evade the following risk factors for pathological gambling: criteria 6 ‘chasing losses’, 8 ‘committing illegal acts to finance gambling’ and 10 ‘needing others to relieve a desperate financial situation’ (DSM IV, APA, 1994). In fact, the increased motivation to engage in poker gambling from the prospect of making consistent profit is likely to increase the probability of the individual engaging in the activity excessively. Although the activity can be perceived as rational and functional, there is potential for individuals to become over-involved in gambling to the detriment of other aspects in their lives. It is pivotal for poker gamblers who do employ ITP to make consistent profits to balance the role of gambling with other important aspects of social functioning such as familial and occupational commitments. For example, exploring criteria 9, where a risk factor for pathological gambling is jeopardising or losing a significant relationship, career or educational opportunity because of gambling, a poker gambler who is making consistent profits, who gambles excessively, may still encounter social costs because of gambling, independent of monetary outcomes. Moreover, another risk factor for pathological gambling is becoming pre-occupied with planning future, and ‘re-living’ past, gambling events. When inspecting the items on the ITP inventory it is evident that many IT applications in poker are specifically related to planning future and re-living past gambling events.

Fundamentally, whether the findings from this study are positive in relation to responsible gambling concerns is dependent on the individual creating parameters for the behaviour so that other important aspects of their everyday functioning are not compromised. It could be speculated that the perception that poker gambling can now be executed in a profitable manner over the long term may make controlling the extent of gambling in one’s life that much more difficult.

4.4.3.4 Summary and Future Research

After exploratory factor analysis it was concluded that the construct of ITP has three underlying factors, including: World Wide Web use in Poker, Computer-mediated Communication use in Poker and Software use in Poker. It was concluded that each of the three factors represented a subscale of the ITP inventory. The newly developed 14-item ITP inventory demonstrated suitable internal reliability consistency. After, performing factor analysis again on a second sample, a similar factorial structure emerged providing support for the newly developed measure of ITP.

Before the ITP inventory can be ascribed strong psychometric qualities further extensive research is essential. The objective of sections 4.2 and 4.3 was to initiate development of a measure of ITP, however it is imperative in future research that the factor structure must be evaluated through Confirmatory Factor Analysis, to provide a more detailed evaluation of the construct validity of the measure. This will provide comprehensive information to assess the fit of the three factorial subscales of the inventory. Providing support for the ITP inventory will be a long process because the construct has newly emerged through explorative qualitative research. Because of this, it is difficult to ascertain suitable scales to use in convergent and discriminant validity assessments because the construct has not been documented previously, and little is known about ITP's relationship with other constructs. Moreover, ITP, despite the strong support from the qualitative studies (i.e. Studies 1 and 2), is not yet well established and of unquestionable validity itself it, meaning that criterion validity is not appropriate to assess. Future research that aims to develop the measure further through re-assessing the validity and reliability of the ITP inventory should focus on replicating the factorial structure through CFA using several large samples.

The newly developed ITP inventory was used to measure the level of engagement in the three sub-types of ITP: World Wide Web use, Computer-mediated Communication use and Software use. The predictive value of the aforementioned sub-types on both online poker gambling frequency and poker gambling profitability was measured. World Wide Web use in Poker and Software use in Poker were both predictors of online poker

gambling frequency and poker gambling profitability. There are limitations within the multiple regression section of the study, namely that the measurement of online poker gambling frequency and poker gambling profitability was dependent on retrospective self-report, potentially reducing the accuracy and therefore validity of the measurement. Although questionnaires were completed anonymously it is probable that social desirability biases existed. It is probable that participants are more likely to evaluate their behaviour positively rather than from an objective perspective, most likely explained through cognitive dissonance theory (Harmon-Jones & Harmon-Jones, 2002).

Future research studies should focus on measuring both online poker gambling frequency and poker gambling profitability via more objective, empirical methods that are less dependent on memory recall and subjective interpretation. It is probable that online poker gambling frequency is highly variable because of irregular periods of social and occupational demands in an individual's life. As a result, a longitudinal study looking at online poker gambling frequency over an extended period of time using a diary method of data collection would be appropriate. Not only would this reduce the demand on accurate memory recall, but researchers through inspecting diary data may be able to explore frequency while controlling for possible covariates of frequency. Diary data collection in a longitudinal study may also be suitable for accurately measuring poker gambling profitability however in order to substantially reduce the prospect of subjective biases reducing the validity of the measurement, experimental design may be required. Because poker to a substantial extent is still determined by random chance, it is essential that experimental analyses are completed over an extended period of time. In order to determine whether World Wide Web use and Software use in Poker predicts poker gambling profitability, independent of chance effects, several hundred hours of experimental data would be required to provide valid measurement. The feasibility of such an extensive, long term studies is highly dependent on research budgets available, and therefore were not feasible within this body of research.

Chapter 5

Study 4 Beyond illusion of control: An interpretative phenomenological analysis of gambling in the age of information technology

5.1 Introduction

Previously, commercial gambling was determined to be an unprofitable venture for individuals over a consistent period of time (Delfabbro & Winefield, 2000; Griffiths, 1994; Walker, 1992; Wagenaar, 1988). Delfabbro and Winefield (2000) proposed that if evidence shows that a primary motivation for gambling is to accumulate profit (Griffiths, 1994, 1995; Walker, 1992), then it is probable that gamblers have an irrational understanding of probability and determinants of gambling outcomes. Wagenaar (1988) questioned the contribution of individual differences and sociological factors to the development and maintenance of pathological gambling behaviour, and instead proposed that gamblers are in fact led by reasoned action, however fundamentally, the heuristics used when gambling are erroneous.

Several studies, using the 'thinking aloud method' have supported the theoretical link, in both laboratory and ecologically valid locations, between cognitive biases and gambling (Delfabbro & Winefield, 2000; Griffiths, 1994; Ladouceur, Gaboury, Bujold, Lachance & Tremblay, 1991; Gaboury & Ladouceur, 1989). The 'thinking aloud method' is a data collection technique where the individuals are required to discuss their thoughts continuously, without censor, while gambling. The validity of the thinking aloud method has been questioned on several occasions (Delfabbro & Winefield, 2000; Griffiths, 1994; Walker, 1992), however the validity of such experimental findings could be supported by the evidence showing how the removal of specific cognitive biases in cognitive therapy is related to reduced gambling frequency and expenditure (Sylvain, Ladouceur & Boisvert, 1997; Coulombe, Ladouceur, Desharnais & Jobin, 1992).

Toneatto (1999) produced an updated list of the main cognitive biases that individuals employ when gambling. According to Raylu and Oei (2002) gambling related cognitive distortions can be dichotomised in two categories: either a belief that they have an extent of control over gambling outcomes, or a belief that they have the ability to make accurate predictions of gambling events. The most predominant cognitive bias used is the illusion of control. Langer (1975) stipulated that the illusion of control is a belief that one is more likely to experience success than objective probability would dictate. Griffiths (1993) demonstrated how the structural characteristics of slot machines, such as specialist play features, were effective in developing and maintaining illusions of control. Moreover, Dickerson (1993) also outlined how several situational factors, such as whether the game is believed to be determined by skill, influenced gamblers' perceptions of control and a willingness to continue gambling despite incurring repeated loss.

The relationship between illusion of control and persistent gambling has been demonstrated in several studies (Ginakis & Ohtsuka, 2005; Moore & Ohtsuka, 1999; Griffiths, 1994). Delfabbro and Winefield (2000) found that irrational cognitions were just as prevalent in periods of losing as in periods of success, lending support to the claim that irrational cognitions are instrumental in the development as well as the maintenance of pathological gambling. Griffiths (1994) recorded that regular gamblers displayed greater difficulty verbalising their behaviour when performing the 'thinking aloud task' while playing slot machines. This was interpreted as an indication that after repeated participation, gambling becomes less cognitive and more like an automatic behavioural response. If this interpretation is accurate, and gambling does become more habitual rather than a product of reason then the effect of irrational cognitions will be more powerful during development of pathological gambling behaviour (Delfabbro & Winefield, 2000).

Delfabbro and Winefield (2000) commented that significantly more research is required before a comprehensive understanding of the causal relationship between irrational cognitions, such as illusion of control, and gambling behaviour can be achieved. However, the concept of illusion of control within gambling is potentially under threat

from the development and manipulation of IT in gambling, based on explorative findings of Studies 1, 2 and 3 of this thesis. An emergent theme of Study 1 was the perception that the extent of control on gambling outcomes has been increased to the point where gambling is no longer necessarily an activity with negative expected economic utility. This available increase in control is created by employing multiple strategic gambling processes that use IT (for e.g. arbitration of sporting event probabilities using betting exchanges, for review see pages 81-87). Although the findings from Study 3 did demonstrate a positive relationship between ITP and acquired poker profit, there remains no empirical evidence directly supporting the proposition that gambling can be performed in a controlled and therefore profitable manner, by using various functions of IT. However, this is irrelevant to an extent because there is empirical evidence that gamblers perceive that because of IT there is the possibility of profitable control, and furthermore evidence shows that those who carried out such processes reported that they won significantly more money, more often (Parke, Rigby, Parke & Vaughan-Williams (2007).

Social psychological theory, namely the Theory of Planned Behaviour (Ajzen, 1991, 1988) clearly states that perceived behavioural control is a primary causal factor in determining behavioural intention. Perceived behavioural control was initially believed to be a one-dimensional construct that related to the individual's perception of how difficult completion of a task will be (Ajzen & Madden, 1986) and was conceived to be a sum of perceived difficulty and perceived control. However, Trafimow, Sheeran, Conner and Finlay (2002) provided substantial evidence that both perceived control and perceived difficulty were distinct dimensions of the overall construct of perceived behavioural control. Nevertheless, there is overwhelming evidence clearly outlining how behavioural intention is causally affected by perceived behavioural control. This means that independent of objective reality, individuals who perceive that gambling, if performed in a controlled process, can be consistently profitable are given rational motivation to engage in the behaviour. Fundamentally, beliefs of control in gambling may no longer be illusory, and this change, driven by IT processes, is likely to affect current gambling attitudes and behaviour.

The purpose of this study is to explore how this concept of profitable, controlled gambling is affecting how individuals understand and execute their gambling behaviour. This study uses a phenomenological approach, where the researcher aims not test hypotheses, but to bracket and set aside pre-conceptions of gambling behaviour using IT, and produce a detailed description of the behaviour in question. The proposed causal relationship of gambling motivation and behaviour is complex and probably does not follow a uniform process, given the multitude of explanatory models of gambling behaviour (Blaszczynski & Nower, 2002). Furthermore, as discussed earlier it is probable that this conception of control over gambling outcomes might not be an objectively valid concept, and might just be a subjective belief. As a result, epistemologically speaking, it makes sense to explore the cognitive understandings of gambling through interpretative phenomenological analysis (IPA; Smith & Osborn, 2003). IPA's central concern is the subjective experiences of the individuals, independent of reality; its focus is on making sense of individual's motivations and behaviour (Eatough & Smith, 2006). Given the lack of empirical validation for the concept under investigation, and minimal evidence to identify the effect of this concept on behaviour and attitudes, the IPA approach is particularly suitable because it will enable unanticipated phenomena and relationships to emerge. During data collection, participants were given substantial flexibility to direct the focus of the study, in terms of what they believed were the key concepts to discuss. The idiographic handling of the data may also provide a more comprehensive understanding of the phenomena in relation to contextual factors, by identifying shared and unshared experiences (Shaw, 2001). Put simply, the integral contextual factors will be retained by emerging as salient, preserving the essence of the phenomenon.

5.2 Method

5.2.1 Participants

Participants were recruited using a variant of purposive sampling (Willig, 2001). Patton (2002) highlighted the importance of selecting participants based on their ability to

provide rich data, making purposive sampling the most effective method of recruitment for an IPA study. The inclusion criteria for participation were that individuals must be current regular gamblers (gamble at least once per week) and must have gambled regularly for the last 5 years. The specified inclusion criteria were selected to obtain a sample that may have experienced changes in gambling activities and their environments, associated with technological advances. Participant fulfilment of the inclusion criteria was assessed through self-report.

Participants were recruited from several gambling establishments in a large city in the East Midlands area of the UK. Patrons were approached as they left the establishments and were briefly informed of the nature of the research study, and were handed an email address to contact the researcher and either participate in the study or request more information about the study objectives or research process. The objective of participants accepting to participate via email was to demonstrate that they had at least partial access to IT resources and the World Wide Web. In total, 200 printed cards outlining the nature of the study and the contact email address were distributed opportunistically to gamblers across various gambling establishments during a summer weekend in 2006. In total there were 18 responses to the invitation to participate. All 18 participants were fully informed about what the data collection process would involve, the confidential nature of the findings and any disseminated research, and also their ethical rights during the study. After receiving this information 11 participants agreed to participate. During the data collection process 3 participants retracted their participation, and after data collection one participant requested that he no longer wanted to take part and that he would like to retract his data from the study. All data from individuals who rescinded their participation were destroyed.

In total 7 participants took part in the study, 6 of whom were male and one female, and the mean age was 29.1 years, with an age range of 20 - 42 years.

All nominal information relating to the identities of the participants, such as names and place names, were altered to protect anonymity. Participants, after data collection, were

requested to select an alias. This process acted to reassure participants of the anonymity of their disclosed, personal data.

5.2.2 Background Details

Jason is a 34 year old male who was first introduced to gambling through his father and friends as a young teen. He states that he has been a regular gambler for over 20 years. He is a university lecturer in Business and Finance.

Jeff is a 42 year old male, who grew up in a council housing estate in a large industrial city in the Midlands. He works as an engineer. He states that he has a '*love/hate relationship with gambling*' stemming from his fascination but also cautious approach to gambling.

Tom is a 26 year old male who has been working within the civil service for 8 years. He was introduced to sports betting through his immediate family, and later to online gambling through house-mates and work colleagues.

Trevor is a 29 year old male who after college developed a career in IT networking. He was introduced to gambling during family holidays to British seaside resorts, and is a currently a regular online poker gambler.

Charlie is a 24 year old male who was introduced to gambling by playing poker with family as a pre-teen. Charlie works as a store manager for a high street fashion outlet, after completing a degree and masters degree in business administration.

Chris is a 20 year old male who is currently in his final year at university completing a business degree. Chris began gambling on slot machines with friends as a teenager, and currently gambles regularly on online poker along with house-mates.

Caroline is a 29 year old female. Caroline has a degree in Tourism but is currently an expectant mother and therefore is currently unemployed. She was introduced to various forms of online gambling through her current partner.

5.2.3 Procedure

Data was collected through semi-structured interviews. The objective of data collection was to accumulate rich, considered and highly contextualised disclosure about attitudes and gambling behaviour and any particular changes that may have occurred in their gambling career. The quality of the analytical interpretations is highly dependent on the level of accurate and candid disclosure. As a result, participants had a choice of either completing a single vis-à-vis interview or a periodical interview via CMC i.e. participants were required to answer questions via email over multiple days. Participants were asked to select the data collection method that they would feel most comfortable discussing their attitudes and behaviour with and also which method best suited their availability.

All participants selected a singular, in-depth vis-à-vis interview rather than an extended interview via CMC. The semi-structured interviews each lasted between 50-90 minutes, and were all carried out in a university meeting room. The room consisted of an extended table and several office swivel chairs. Interviews were recorded on a digital Dictaphone, and subsequently transcribed verbatim by the researcher.

The researcher was reluctant to design a detailed semi-structured interview, because of concerns of how findings of past research may bias any wording and directional influence of questions. Based on this reflexivity concern, the structure of the interview was determined without specifying any particular question wording, and simply posing open-ended questions to initiate discussion when entering each section of the interview. The interview was separated superficially into three areas of interest: Section 1: Early gambling attitudes and behaviour, Section 2: Current gambling attitudes and behaviour and Section 3: Future changes in gambling attitudes and behaviour. The interview

questions cascaded organically, with the researcher selecting lines of questioning based on participant responses to earlier questions. This method of interviewing was particularly conducive to collecting personal data, as the interviewer explored each disclosed incident and perspective in a detailed, critical manner. Data collection remained focused on attempting to make participants discuss their interpretations of gambling experiences and understandings of their behaviour as lucidly as possible.

In an attempt to preserve the essence of these experiences, the participants were invited to read their transcripts and provide any further information they feel is integral to their 'story'. The participants were each emailed the transcripts of their interview to read and decide whether to add further comments or provide further contextualisation. Each participant positively responded that their data transcripts accurately reflected their attitudes and gambling career.

5.2.4 Data Analysis

Data transcripts were analysed in accordance with the canons and techniques of IPA methodology (Smith & Osborn, 2003). In IPA the technique involves a double hermeneutic, whereby the participant attempts to interpret the significance of their own experience and the researcher, in turn, makes interpretations about what has been represented in the interview. Although such inductive reasoning is criticised for being too subjective, in IPA this level of subjectivity is considered to be of pivotal importance rather than an epistemological limitation. The aim is not to produce an objective narrative of the transcripts but rather a narrative that is “a co-construction between participant and analyst in that it emerge from the analyst’s engagement with the data in the form of the participant’s account,” (Osborn & Smith, 1998, p67). Fundamentally, in IPA, unlike many other phenomenologist methods, analysts do not profess that they can access the ‘lived experience’ of the participant directly, but instead acknowledge that the analyst must draw from their own existence and experience for successful interpretation (Willig, 2001). IPA stems from a relativist ontology, and therefore makes no attempt to produce claims about objective reality, because as Kvale (1996) stated the only important

reality is people's perceptions of reality. Throughout the interpretative process the analyst maintains strict reflexivity, carefully considering the potential of individual bias in making interpretations.

The analysis process was essentially idiographic where each case was analysed in its entirety before commonalities across the transcripts were extracted and retained as the essence of the experience of gambling using IT. Each interview audio recording was listened to twice in succession, and transcripts were read several times, in order for the researcher to become intimate with the experiences and cognitive understandings discussed in the data. Subsequently, on further reading, initial 'gut reactions' to the information conveyed and comments of interests were recorded on the left hand margin of the transcript. Afterwards, the transcript was read a further time, this time with the objective of transforming initial comments and interpretations into more abstract constructs, and writing them down in the right hand column.

After a list of themes had been recorded, the next process was the clustering of themes into coherent categories, reducing themes into more abstracted relationships. Smith (2004) illustrated this clustering process as if several themes are attracted to separate magnetic poles. Each cluster of themes was provided with a super-ordinate descriptive title that accounts for the incumbent themes. Continuing the idiographic nature of the study, care was taken to interpret data and extract themes on a case by case basis initially. After each of the seven transcripts had been independently analysed and reduced into hierarchical thematic structure, attempts were made to merge the thematic structure of each transcript into a more coherent, global model that maintained the essence of the phenomena being studied.

In order to maintain credibility of analysis, the interpretative process and the final model of super-ordinate and their sub-ordinate themes, was audited by a colleague (Smith, 2003). There was a dialogue with the 'independent auditor' who ultimately was satisfied with inductive reasoning and representation of data. Finally, the agreed hierarchical structure of themes was transformed into a narrative account, supported substantially

with verbatim extracts. The inclusion of a substantial amount of verbatim accounts is important as it retains the voice of the participants while also providing an opportunity for the reader to critically appraise the interpretations made by the researcher (Newton, Larkin, Melhuish & Wykes, 2007).

5.2.5 Ethical Considerations

IPA requires full and candid disclosure regarding experiences and interpretations of a phenomenon, which in this case could be considered to be socially undesirable. Therefore, it was essential to evaluate the ethical considerations of participants within the study. Participants were approached with subtlety as they left various gambling establishments. The researcher briefly described who they were and the aim of the study, provided them with a contact email address and were told to email that address if they wanted to discover more about the study, the researcher or wanted to participate. The researcher physically retracted at this point, to remove any feelings of obligation or social pressure to take part. It was hoped that this created an opportunity for potential participants to consider at length whether they wanted to take part, and therefore make participation a more reasoned activity.

Upon requests for further information about the study, each potential participant received a personal response to their queries and concerns. Furthermore, potential participants were fully informed of their ethical rights during the study such as immediate, unrestricted withdrawal, retraction of data and the ability not to answer any question they did not want to without needing to explain why. Potential participants at this stage were informed about the requirements of the study, and that participation would require disclosing personal information such as feelings about gambling and past gambling behaviour.

Each of the participants were given the opportunity to propose where to conduct the interview session, but when offered the use of a university room in a central location of the city, all 7 participants requested this option. Before interviews were conducted

participants were read their ethical rights again and given the opportunity to ask questions about their rights during and after the study. Participants completed an ethical consent form.

During the interview process participants were monitored closely for signs of discomfort and general apprehension. If the participant appeared to be uncomfortable with the line of questioning, a new direction of questioning was followed. It was decided that no action would be taken if symptoms of pathological gambling emerged during data collection, unless the participant directly asked for intervention or advice. If this was to occur participants would have been provided with contact details of professional services for problem gambling. At no stage in the data collection process was this required.

5.3 Results

After analysis, four super-ordinate themes emerged from the corpus of interviews that illuminate understanding of how gambling behaviour and attitudes to gambling behaviour have developed amidst the emergence and proliferation of information technology (IT) within the social and behavioural domain of gambling. Super-ordinate theme 1 identifies that participants unanimously report that control is possible in modern gambling activities with the use of IT however the impact of this phenomenon is limited because *'there are much more lucrative and secure ways to make money with less effort'*. Secondly, and evidently linked to attempts to understand one's motives in gambling, each participant discusses or alludes to a new, enlightened understanding of their gambling behaviour referred to as an 'epiphany' (Super-ordinate theme 2: *'I've had my own epiphany'*).

The third super-ordinate theme to emerge has been labelled *situational determinants of gambling behaviour*, describing the cluster of themes illustrating how environmental variables influence how the participant perceives their gambling behaviour and the behavioural contingencies of gambling. Finally, the fourth super-ordinate theme to emerge from analysis of the transcripts was labelled *'Playing online made a lot more*

sense'. Fundamentally, this major theme represents how changes in gambling activities resulting from developments in IT have made gambling a much more rational risk activity.

Each of the 4 super-ordinate themes to emerge in the analysis is constructed of component sub-themes. The thematic structure of each super-ordinate theme is presented in Table 5.1.

5.3.1 Super-ordinate theme: **There are much more lucrative and secure ways to make money with less effort**

It has emerged clearly from the transcripts that it is perceived to be possible to profit in both offline and online forms of gambling, by manipulating various forms of IT. The significance of this belief was moderated, in the sense that although participants professed that such profitable control was indeed possible they indicated that there were also negative consequences of gambling in a controlled and profitable manner. This profitable, yet highly restricted form of gambled was described by one participant as 'trawling', highlighting the demanding and onerous nature of the behaviour.

5.3.1.1 Significant opportunity cost when 'trawling'

Opportunity cost in terms of gambling comes in various formats, but what participants are primarily referring to within this theme is the opportunity cost of time spent when gambling and engaging in gambling-related activities. This concept of time spent, refers in a finite sense of sacrificing time that could be spent on everyday responsibilities and leisure, but also refers in a more existential sense to wasting opportunities for life-enriching activities such as creativity, perhaps best summarised as 'self actualisation'. For example, when asked whether the idea of using winnings from poker gambling as a primary source of income appealed to him, Jason responds negatively.

“Jason: No because like I said I don’t think there is a lot of joy in it. It’s ok now and again as I say like a leisure thing, trying to pit your wits against someone else.

Interviewer: How does it make you feel pitting your wits against the other guy?

Jason: I quite enjoy it. Like I said if I did it all the time I wouldn’t feel like I was doing anything useful with my life.

Interviewer: What about those who work in a factory, would they not be more challenged playing poker for a living?

Jason: Well I suppose people would argue that working in a factory is still contributing to society. You are still creating something... You know, there are many levels to this conversation.” Extract 1, Jason

In extract 1 Jason clearly suggests that there is limited pleasure in gambling in a profitable, and therefore one would assume controlled, manner. Jason removes the act of making money in gambling to a more abstracted level and contemplates it as a core area of his life, and views the behaviour as waste of one’s life. Furthermore, when asked to compare the activity of profitable, controlled gambling with what the author considered to be a menial and unrewarding occupation (factory work), Jason found more accomplishment in factory labour. Jason retorts that the factory worker has the benefit of an end product that can contribute to their external environment as well as their own remuneration, whereas profitable poker gambling is interpreted to be devoid of this dividend. Through more detailed interpretation, Jason may be expressing the insular nature of gambling, highlighting the self-indulgent motives of gambling, even within profitable gambling.

Caroline, as demonstrated in extract 2, expressed similar perceptions to Jason regarding the insular, ego-centric nature of excessive gambling by suggesting that she was not attracted to increasing gambling exposure in coherence with her ability to ascertain profits from gambling.

“If I was winning a decent amount... I might, might consider it. But there are so many other things to consider like the fact I have a family. If it was just me then maybe... I don't think I'll stop playing poker but I don't think I'll play it as much. Because with the baby coming I don't want to be playing... Yeah, imagine you got aces and people are going all in and the baby starts crying and its like 'well, which do I do?' Obviously you have to go for the child but you don't want to feel like you're trying to get it sorted out quickly so you can get back to your poker hand.” Extract 2, Caroline.

It is evident from extract 2 that Caroline perceives gambling to be a secondary concern to her role as care-giver to her family. However, indirectly she illuminates the level of engrossment involved in playing poker successfully. Caroline demonstrates clearly that her attention while poker gambling is strictly limited, and therefore if she engages in this behaviour to a substantial extent, then she will compromise her ability to perform other roles within the family that are important to her. Ultimately, although not expressed explicitly it is implied that the role of contributing to the family is perceived by the participant to be more rewarding than acquiring profit from poker gambling.

Further evidence of the limited nature of the rewards from profitable gambling is presented by Chris who professes that his current, admittedly excessive, involvement in gambling is merely a transitional phase which is likely to be reduced when opportunities to engage in more gratifying activities, such as his future career, emerge.

“Interviewer: So how do you understand your gambling now...and what role does it play in your life?”

Chris: It doesn't play a role as such. It's a game and I can stop if I want. There have been times I've stopped for like three weeks and sometimes more. Like when my exams start I'm going to stop playing and start studying. I put all this money into college and it's all a waste of time unless I get a good degree out of it. I want to get into banking or finance or something like that. That's where the real money is. Poker is just a hobby on the side" Extract 3, Chris.

Chris, despite strongly advocating that it is possible to ascertain profits, consistently throughout the transcript, demonstrates in extract 3 that gambling is a peripheral consideration when opportunities to work towards a career become available. Essentially, this demonstrates that although profit can be consistently obtained when gambling, this profit is minor in comparison to other activities such as having a successful career. This is illustrated through describing money obtained from working in banking and finance as 'real money', and therefore implying that money acquired from gambling is somewhat less significant. Jason echoes this disposition in extract 4 by indicating that there are more simplistic and productive ways of accumulating profit.

"Jason: To some extent I think the rules work [rules of profitable, controlled gambling] but at the end of the day I think it comes down to the basic argument that if you did it purely to make money there are much more lucrative and secure ways to make money with less effort." Extract 4, Jason.

The large opportunity cost of trawling must be placed into the context of the consistent amount of profit that can be acquired. Intuitively, the lower the amount of money that can be acquired the higher the opportunity cost, when considered as a trade-off. Perhaps the weak standing of acquiring profit through gambling, in comparison to one's career and role within the family, is largely determined by the limited amount of money that can be made. Charlie, in extract 5, once again confirms that it is possible to make consistent profit when gambling in a controlled, strategic fashion. However, Charlie indicates that

the amount of money that can be made by gambling in such a method is negligible and not commensurate with the effort required to obtain it.

“Interviewer: Give me an example [of the difficulty making consistent profits on betting exchanges].

Charlie: Ok say United [soccer team] are even money to win the league next year. Then a guy on the exchange puts them at 2/1. Think. That guy is probably some 15 year old who doesn't know what he is doing. Like, say he puts this up, he'd need to put 30 on in order for us to put 15 on that bet. So a lot of value is snapped up very quick. You can be the quickest but it's a real hassle and you aren't going to make much because as I have said at the start, usually idiots don't have much money or if they do they don't have it for very long. You'd need to be trawling all day to make a few pounds”

Extract 5, Charlie.

From the extract we see that it requires considerable hassle for little reward when manipulating the gambling infrastructure that has been provided by developments in IT. The use of the term trawling for such forms of controlled gambling conveys an impression that is similar to commercial sea fishing; not only is it an arduous task but also several external factors influence profitability such as luck. Chance in this instance may refer to being the first person to find ‘value’ on the betting exchange, or locating an ‘idiot’ who has risked a substantial amount of funds.

5.3.1.2 Even a broken watch is right twice a day

Although the participants strongly profess that it is possible to profit consistently from gambling through using IT, all acknowledge that chance and random events influence profitability to a significant extent. From the transcripts it is evident that frequent improbable occurrences such as ‘bad beats’ are a significant deterrent from engaging in controlled, profitable gambling. There appears to be indignation at gamblers profiting

through playing recklessly, and at incurring losses despite adhering to the strict rules required to profit from gambling.

“Jason: ...if I’m awake and I’m with it I can make money. My biggest problem no matter how many times I tried to address it over the last few years is that when I get a bad beat I just can’t control the emotions. It’s a combination of frustration and the other factor is usually, say you have ace/king and an ace comes on the flop [community cards]. You raise it significantly pre-flop like you’re supposed to, like the books tell you to. Then some moron with ace/7 calls and pairs both his ace and the seven. You think to yourself well why, this is the moment of frustration not when you’re thinking clearly again, but in the moment of frustration, why should I just play best cards because I’m never going to get to suck out?” Extract 6, Jason.

In extract 6 Jason describes the frustration experience at losing despite playing in a methodical and professional manner to an individual who superficially appears to be a weaker player. It appears that Jason is frustrated at sacrificing the joy element of gambling which he alludes to throughout the transcript and not succeeding to a great enough extent. In moments of frustration like this, the opportunity cost of gambling in a consistently profitable manner is too high. It is evident that although it is theoretically possible to control outcomes to a significant extent, the proportion of control is not extensive enough to outweigh the opportunity, emotional and behavioural costs required. In extract 7 Jeff confirms that the amount of control that is available in poker gambling is limited and that luck is still a crucial determinant of success, and that this acknowledgement is a primary reason for his reduction in gambling involvement.

“Jeff: It’s not as much fun as it used to be. I think it’s because I see it [poker] as it really is now. Skill only gets you so far in that game and what cards you get is very important. I still play a bit but not as much as I used to.” Extract 7, Jeff.

5.3.1.3 It's a grind

This subordinate theme highlights the taxing and laborious nature of gambling in a profitable, controlled process. The participants having acknowledged that the control available is still limited, and the significant opportunity cost is required, also disclose that once the gambling activity becomes centred on maximising profits that the activity loses its appeal.

“Trevor: It's hard to be disciplined at the table but hey that's the cost if you want to make money. Successful poker when you get deep down isn't about fun, it's a grind. Don't get me wrong, it's a fun game but not if you are playing professional or looking to win money... That's the way I see it.”
Extract 8, Trevor.

According to Trevor poker gambling is void of fun and enjoyment if your objective in poker becomes about making money. This suggests that it is the creativity and spontaneity of gambling decisions that enjoyment emanates from, in contrast to adhering to strict strategic patterns. The metaphor 'grind' indicates that profitable, controlled poker is a mechanical behaviour that is oppressive and repetitive, and devoid of pleasure and excitement.

When discussing the fastidious behaviour of his friends who spend a considerable amount of time developing their poker gambling skills in order to increase outcome control, Tom evaluates their behaviour in a derisory tone.

“Interviewer: Do you not try and learn about the game as well?”

Tom: I kind of do. I watch what others do and when I make a careless mistake I know not to make it again. It's like different with the others though. They actually put time into it like they were studying for exams or something. I wouldn't be bothered to really do all that.” Extract 9, Tom.

Tom realises that reducing mistakes is still an integral part of enjoying gambling however, he is reluctant to approach the gambling activity from an academic perspective, indicating his perception of gambling as a source of leisure. This disposition is echoed strongly by Jason who in Extract 10 demonstrates the banality of playing professional poker.

“Jason: I think it’s possible for people to make money when playing poker particularly if they have a high level of rake-back which is all these types of bonuses that they can get. Rake-back, loyalty bonuses, um free-rolls, there are all sorts of ways to maximise your income. I think I wouldn’t advocate it personally for two reasons and this is my own personal opinion. First one is I think it’s very time consuming and I don’t think it’s particularly any kind of fun... I’ve realised it’s not particularly fun to play safe... Profitable play is letting your 4 suits, the 4 cards of the same suit, go if you’re not getting the right price to follow it...And I feel that if poker is not played as a game and as a relaxation, enjoyment thing then I think poker is the opposite of that.” Extract 10, Jason.

From a simplistic interpretation of this extract it is reasonable to conclude that gambling within a rigid set of instructions removes a significant amount of pleasure from the activity and essentially makes the activity less rewarding. Fundamentally, the admission that gambling in a strategic, profit orientated mode that has limited outcome control is not enjoyable, and is consuming to the point of forgoing other rewards activities and social roles, can be interpreted as a negative appraisal of this behaviour. Participants feel that the rewards achievable from controlled, strategic gambling are ultimately outweighed by the negative consequences of engaging in such behaviour.

5.3.2 Super-ordinate theme: **I’ve had my own epiphany**

Following on from the acknowledgement that although gambling can be profitable that it is outweighed by the requirements of gambling in a controlled pattern, participants also disclose that gradually through their gambling experiences they are beginning to realise that profit is not their primary objective when gambling.

5.3.2.1 There was some element fooling myself

Participants indicated that they had come to accept that the profit acquired from gambling is often a secondary product of gambling behaviour.

“Jason: I would consider that some of the more intelligent gamblers around the world at the minute agree that it’s more about fun. When I say intelligent I don’t mean professional I mean people who are aware. We don’t gamble to win money but because of the benefits you get out of it...There was a transition but it’s hard to pinpoint what that was. I mean you can stipulate that even right until recently I think there was some element of fooling yourself that goes on where you talk about, where you, where you convince yourself and other people that you are motivated by making profit and income.” Extract 11, Jason.

Moreover, the attempt to disguise the legitimate objective of gambling, as disclosed in extract 11, could be interpreted as an admission of the impractical, immature gratification that is achieved through gambling. Effectively, the behaviour would appear, superficially at least, to be more rational and legitimate if the objective was trying to obtain profit rather than obtaining stimulating gratification. Charlie, in extract 12, supports this admission by stating that gambling is entertainment rather than about attempting to win money.

“Charlie: You need to be honest with yourself there. It’s not about the money is it?”

Interviewer: What's it about then?

Charlie: Something else. It's about missing the bus and having to wait for an hour. It's about wanting to be out of the house for a while." Extract 12, Charlie

Further candid analysis of previous gambling behaviour was evident in participant's indicating that engagement in research, achieved primarily via IT processes, was in reality a charade to justify engagement in risk behaviour. By superficially operating in a functional manner in attempting to assert control in gambling outcomes by accumulating knowledge, the behaviour became significantly more rational and justifiable.

"Charlie: Like when I was off work for a week in November last year I was watching skysports news all day [cable television channel] everyday and in the end I put on about 100-150 on a game each night... All you heard all day was about the evening games, like training reports and stuff. If you are hearing all this stuff it makes the game seem callable [predictable]... End of the day I'm gambling to get the buzz. Granted you do get psyched up when [pundit] says he can't see how Barcelona [soccer team] are going to beat Chelsea [soccer team]... But at the end of the day, on the other hand I could tell you 15 reasons why Barcelona would bust Chelsea up. It's all about finding a side. Guess you're just looking for something to push you either way." Extract 13, Charlie.

It emerges from extract 13 that the objective of acquiring information about the outcome of a gambling event is 'to push you either way', therefore indicating that the outcome of the event is substantially uncertain because you open to betting on either team. This process could be interpreted as seeking justification for predicting the outcome of an event, and therefore make the process of staking money seem less risky and ungrounded. Charlie retrospectively acknowledges that in reality the outcome of the bet was largely uncertain because although there was reason to predict Chelsea to win, he admits that

there was a substantial amount of reason to predict Barcelona would that was disregarded in that instance.

5.3.2.2 Getting my monies worth

The admission and the personal acknowledgement of the real motivation to engage in gambling have been shown in the transcripts to influence gambling behaviour. The primary influence was on determining what affected bet selection or gambling activity selection. For example Tom, after admitting that time spent trying to obtain outcome control on sports betting ‘never really paid off’, he began to make betting selections that would provide the most entertainment rather than potentially provide the most winnings.

“Interviewer: Did you think that they were going to win or was it more that you just wanted them to win?”

Tom: I knew they weren’t the best team in the world but I think the main thing is I just got paid and wanted to bet. My bets usually don’t win so I thought if I’m going to risk £100 it needs to be on something I can get my money’s worth on. So I thought put it on them to win the whole thing [tournament] outright and I’ll get entertainment or excitement or interest in loads and loads of games... I must have had about 15 night’s entertainment on that hundred.

Interview: So would you say you began to bet more with your heart?

Tom: I stopped looking at the form and things because I know you probably disagree but I just never found it to pay off in reality.” Extract 14.

This admission of choosing to make bets that are more about receiving entertainment is in marked contrast to what participants propose to do in terms of making profits from gambling. The value placed on the potential outcomes of various betting selections is

contrasted, and the primary determinant of selection was based not on what appeared most probable to win, but what selection appeared to provide the most entertainment. Interpreted further this indicates that the participant receives reward when gambling via entertainment value, independent of whether the betting selection is profitable.

Jeff, in extract 15, proposes that while now seeing poker gambling for what it is, in future he intends to change his patterns of gambling behaviour in order to take this into account. Put simply, Jeff has admitted that the level of profit he can acquire through poker gambling is restricted by his lack of composure when faced with risk and also the residual chance parameters that remain in the game after control is maximised. Because of this realisation, Jeff suggests that if gambling outcome is ultimately determined to a substantial extent by chance, then in order to maximise the competing objective of gambling, i.e. entertainment, he will move into less interactive gambling activities.

“Interviewer: What about the future? Do you see your gambling behaviour changing much?”

Jeff: Think that I will gamble more on sports when I have the time to watch them but I will use the online technology as for the reasons I stated earlier. I think sports because it's more relaxing as you just have to sit in front of the TV. You have less to do and it is what it is in a sense meaning that in reality, gambling is chance orientated.” Extract 15, Jeff.

Gradually realising that gambling in reality is more about obtaining entertainment and leisure rather than making money will substantially alter one's perspective towards the behaviour. There is scope to suggest that there are parallel perspectives in which gambling behaviour is perceived, and such competing motivations can be used interchangeably in order to support various patterns of gambling behaviour.

5.3.2.3 When you can't afford to lose it, that's the ultimate gamble

Another sub-ordinate theme to emerge from the participant's 'enlightenment' about their true motivations for gambling is the distinction between social gambling and real gambling. According to the participants, unless there are significant negative consequences to losing money staked then it is not considered an act of gambling. As a result, exerting control over gambling outcomes and restricting the possibility of incurring loss is not really gambling.

“Jason: Granted, the promise of winning is central to enjoying the game but the threat of losing money makes it more of a pure game... The most exciting gambling is when there is risk. There is always risk involved because of opportunity cost but when it has real implications, when you can't afford to lose it, that's the ultimate gamble.” Extract 16, Jason.

In extract 16, Jason indicates that the most arousing form of gambling is when there is an immediate threat of punishment. Essentially, by gambling within one's affordable budget the behaviour remains devoid of an integral element of excitement. This statement could be interpreted to suggest that if we accept that the actually profiting from gambling is unlikely and even undesirable, the pleasure experienced when gambling could be putting oneself in danger and escaping punishment.

Further evidence of this interpretation is presented in extract 17 where Charlie describes how the experience of gambling has changed now that he is in a more financial stable position.

“Interviewer: Has the fun drained out of football betting for you then?”

Charlie: I wouldn't say it's gone. It's different though. It felt different then. It was about finding an edge and trusting your food money on this edge you earmarked... In uni [university] stakes were higher because you lose then your semester is spent eating 'best buy' soup and bread and watching TV at night.” Extract 17, Charlie

It is evident that the experience of gambling in terms of pleasure derived is largely determined by the level of punishment you expose yourself to. The act of minimising exposure potential punishment in betting patterns, through acquiring knowledge and achieving control, is the cardinal component of profitable gambling. From this, it understandable why this strategic, profitable style of gambling is not widely acclaimed by the participants. Fundamentally, by implementing control and minimising risk the pleasurable essence of gambling is removed.

5.3.3 Super-ordinate theme: **situational determinants of gambling behaviour**

Situational context is of pivotal relevance, when attempting to develop an understanding of individual motivation and experience of gambling behaviour. The experience will have varying significance and will be perceived in relation to the individual's personal circumstances. It is evident in the transcripts, that just as IT continues to influence gambling patterns and attitudes, other external factors have proved to be catalytic in changing behaviour and understandings of such behaviour.

5.3.3.1 It doesn't really affect my day

As the participants mature their economic situation is improving in parallel. To some extent it could be interpreted that the pleasure derived from gambling as a mature individual is limited because there are less immediate implications for losing. Effectively participants are indicating that previously, when access to funds was limited because they were at university or at an early stage in their career, winning was disproportionately more rewarding than it is now as they are more financially secure. Intuitively, it is logical that individuals would only need to increase the money at risk in proportion to their increase in wealth to achieve the previously experienced arousal. However, as demonstrated in extract 18, Trevor explains that as an adult they can ultimately avoid destitution even if they gamble considerably more.

“Interviewer: Is losing the same now as it was when you were in college, or even as an adolescent?”

Trevor: It was much more biting then. There were real problems associated with losing like not having money to take the girlfriend out, not having enough money to get the stuff everyone else had.

Interviewer: I would have thought there were more consequences associated with losing as an adult, simply because you have more responsibilities?

Trevor: That’s true but you’re forgetting that as a kid there where you can get money from is limited. When you blew your money that was that, there just was no more. But as an adult you have more responsibilities but you also have a beautiful thing called credit. Like say I spent 200 on poker today, what are the consequences? I owe about £65,000, do you think that another 200 on top of that is really going to be an issue? When I lose all I have to do is raise the limit on my credit card, and things go back to normal.” Extract 18, Trevor.

Trevor, as an adult, has accumulated substantial debt and this affects how he interprets and experiences losses from gambling. Although Trevor does not state the source of his debt (for e.g. mortgage borrowing, student loan etc.), it is common for adults to have acquired some form of structured debt. From Trevor’s perspective, losses incurred are devalued when contrasted to his accumulated debt, and therefore reduces the punishment experienced when losing. Furthermore, this perception of the effects of losing as an adult helps explain why participants cannot experience similar levels of arousal when gambling, as they did when access to money was restricted. Put simply, perceptually participants as they mature, experience less threat from losing as they believe there will be minimal consequences in terms of their lifestyle.

In extract 19, Charlie explains how the experience of winning has transformed as he has become wealthier since leaving university. Charlie describes how winning online lacks tangibility and how this has implications for pleasure derived from winning.

“Charlie: Now I’ve got money. I’m not the poor student anymore. The winning thing is different. If you won in uni say even something like £150, that was massive. You would go buy labelled clothes, buy nice stuff from Tesco’s, buy beer you like instead of white cider. There was something tangible there. Now, like I said I have the money. I buy labelled clothes, I buy nice food, I buy the beer I like instead of what’s on offer. I have savings and stuff, so I pretty much get what I want, so to me the thrill of winning is different. Don’t get me wrong I enjoy winning money but the point is, is that it doesn’t really affect my day. If I win now I don’t walk out of the bookies with a wad of twenties. It just goes into my online account.”

Extract 19, Charlie.

When funds are limited then both the positive and negative consequences of gambling are enhanced, making the game more rewarding not only in terms of winning but also in terms of experienced arousal. It is apparent that the nature of the experience of gambling for participants is related strongly to situational factors influencing access to money.

5.3.3.2 It livens up the week

Along with increases in wealth and access to credit, another transitional feature associated with maturity is an increase responsibility and a decrease in leisure time. As situational variables both increased responsibility and restricted ‘free’ time have an affect on motivation in gambling. In extract 19, Charlie states that his disposable income has increased since his time at university, and in extract 20 we see that in conjunction with this increase in wealth comes an increase in monotony stemming from having a full-time career.

“Charlie: Bottom line is I bet because I like it. I like watching football and I like betting on it. It livens up the week. Being honest your 9-5 is kind of boring and having something to break up the week is good. But it gives you something to talk about on Wednesday and Thursday. Beats talking about the weather or watching reality TV.” Extract 20, Charlie.

It is evident that the rigid structure of the working week does not create the desired stimulation for Charlie and he seeks arousal to break the repetitive and bland nature of having a 9-5 job. Clearly the alternative behaviours that are available to him such as impotent conversation and watching television are not appealing, an attitude echoed in by Tom in extract 21. Tom stipulates that his motivation to gamble is to avoid watching what he considers to be banal television programmes that his partner enjoys.

“Tom: I don’t plan to play every night, it just ends up that way. By the time I get back from work and help Theresa clean up a bit I go into the bedroom and look at emails and a few things on myspace and then when I go back into the living room it’s a soap fest so I just turn and go straight back out and load up [poker operator]... It’s not an expensive habit compared to most. £10 is a three man round in most pubs round here and I could play on £10 for about 3 or 4 hours, maybe more. That’s the way I look at it, it fills up your night.” Extract 21, Tom.

The reality of compromise and responsibility associated with a mature relationship means that Tom is limited in choice of mid-week leisure activities. In the transcript Tom expresses that his partner is satisfied with his lack of social interaction with her in the evenings as it enables both of them to engage in an activity that they find stimulating. Developing IT, and in particular the advent of online gambling, has provided what participants perceive to be an activity that is both practical and stimulating within the confines of responsible adult behaviour.

5.3.3.3 Social facilitation

Another key factor accounting for changes in gambling patterns of the participants was the structure of their social relationships. Social relationships were influential in both the introductory and present patterns of gambling behaviour. Caroline discloses that she did not gamble before beginning a romantic relationship with her current partner, because her previous social network, namely her family, did not endorse gambling.

“Interviewer: What was your first introduction into gambling?”

Caroline: My boyfriend. He um, he was playing all the time so I thought I’d have a look and see what it was like but I’d never played poker ever, not ever.

Interviewer: What was your perception of gambling before you met him?

Caroline: I didn’t gamble at all. The lottery sometimes but I don’t really class that as gambling anyway. I think probably because it was never really done in my family. It was kind of frowned upon... I was taught that it was a waste and not something you should put money in. So I never really was exposed to it.” Extract 22, Caroline.

It is evident from the transcripts that the participants’ interest and participation in gambling was a result of exposure and endorsement of the activity from a significant other, either family, friends or a romantic partner. Gambling for the participants is a primary way of integrating socially.

For Tom, gambling appeared to serve as a way of integrating with the elder males of his extended family, his flat-mate and also currently with his work colleagues.

“Tom: My mates in work play all the time and that’s all they talk about so I play for a bit myself now too. I get the attraction they have, it’s a fun

game... But it's like whoever wins when we play together has the bragging rights the next day in work. And if you emptied your mate's pockets at the table in front of all the others it's really good because he'll get it all day from the whole office." Extract 23, Tom.

Gambling is a prevalent activity and is seen to be as socially acceptable as existing alternative leisure activities and therefore is becoming more visible. In Tom's working environment gambling is evidently a competitive activity where colleagues try to triumph over each other. In gambling with social acquaintances, the experience appears to be enhanced because in addition to risking money participants are risking being ridiculed for their failure. As discussed earlier, for the participants the more at stake the higher the level of pleasurable arousal derived from the activity.

Furthermore, from the transcripts it is reasonable to conclude that the participants' perception of their gambling, particularly in relation to their level of involvement and expenditure, is evaluated by contrasting it to the gambling behaviour of significant others.

"Charlie: It's a bit of a cliché but my gambling has really changed in and around who were my friends at the time and where I was in life. When I went up to university there were no real slot gamblers which was good, but a few guys were into football betting. Most people did it for a laugh and to kill time but one bloke was a real fiend. He gambled like tomorrow would never come. I have to say my craziest gambling was with him. He was the devil on my shoulder making me think that what I was doing was normal." Extract 24, Charlie.

In extract 24, Charlie retrospectively interprets the effect of social influence on his gambling behaviour. The extent of his friend's gambling behaviour was conveyed lucidly with the metaphor of 'fiend', suggesting reckless engagement in a pernicious behaviour. Moreover, Charlie implicates his friend as being partially responsible for the

period of Charlie's most excessive gambling, by referring to him as 'the devil on his shoulder'. This metaphor indicates a corruptive influence that removed the ability to objectively evaluate whether his behaviour was excessive or not. However, evidently Charlie was aware that the majority of his friends were occasional gamblers who engaged in the activity as a leisure pursuit. As a result, this could be interpreted as a further example of manipulating flexible schemas and perceptions of gambling to meet the individual's specific aim. Put simply, unless Charlie's assertion was retrospective awareness, he may have chosen what he perceived to be a normal level of gambling to facilitate his desired involvement in gambling.

5.3.4 Super-ordinate theme: **Playing online made a lot more sense**

When evaluating previous gambling behaviour to gambling online and using IT participants admitted difficulty in trying to understand what the motivation to gamble was. Retrospectively the participants perceive their previous gambling behaviour to be irrational. It is probable that the effects of IT developments within the gambling market has influenced motivation to gamble, and therefore potentially shrouded what the initial motivation to gamble was.

“Jason: I think in reality the change has come from the advent of internet gambling. And I still look back and am amazed at how I didn't see, well obviously at the time you realise that it's not a great thing to be doing and you're losing more than you can afford. But it should more than that, it should be the blind senselessness of doing it. You look back, and it was only a couple of years ago, and you wonder what you were thinking.”

Extract 25, Jason.

In extract 25 Jason indicates that he has difficulty and understanding why he engaged in gambling before the advent of the internet, suggesting that there is a clearer rationality for engaging in online gambling. Jason states that it was the excessive expenditure in relation to available money that was 'blind senselessness', and this could be interpreted

to mean that gambling online is more financially viable. Participants throughout the transcripts contend that it is possible to consistently make profits while gambling online, however they also claimed that the opportunity cost of doing so outweighed the meagre financial reward. As a result, it is probable that the increase in rationale for engaging in gambling online was not solely the opportunity, through the structural changes in the activity, to consistently make profit. However, it is also plausible that this ability may have been used intermittently, as a deployable heuristic to enable justification of gambling.

5.3.4.1 All I have to do is sign off

The increase in rational motivation for engaging in gambling may stem from a reduction in the opportunity costs of gambling. [N.B. For purposes of clarity it is important to acknowledge that the opportunity cost of ‘gambling purely for profit’ is not the same as opportunity cost of ‘gambling as leisure’]. Changes in the environmental characteristics of gambling within the context of IT, means that participants can gamble remotely. Jeff, initially was reluctant to gamble because he perceived the activity to detract from one’s ability to fulfil familial responsibilities. However, since the availability of online gambling Jeff feels that gambling no longer is a threat in this respect because it can be carried out in the home.

“Jeff: Growing up in that [industrial] area you would see the men just drink and bet all the money at the weekend and then leave their family with nothing for the rest of the week. Nothing but selfish losers. I guess that’s why it didn’t appeal to me; certainly not to any regular extent... After online poker became popular playing online made a lot more sense to me. Don’t have to go out of the house to participate. That means I’m always on call for the family and work. I would feel terrible that if work called me in to do overtime and my wife told them I was out at the casino. It would make me feel like a low-life who wasn’t taking care of business... If stuff needs fixed

or my son needs help with his homework I'm right there and available. All I have to do is sign off." Extract 26, Jeff.

From the transcripts it is evident that gambling is a potential threat to one's identity. Gambling is a leisure activity; however through IT it can now be completed within the home reducing the opportunity cost in terms of fulfilling social roles that are important to the individual. In extract 26, Jeff indicates that he would be reluctant to gamble in an external environment because it may limit his ability to fulfil his perceived responsibilities.

Participants explain how as they mature their ability to engage in leisure activities is determined by the demands of their career and social roles (for e.g. parent, spouse). Developing IT has transformed gambling into a substantially more flexible and therefore more feasible leisure activity. In extract 27, Trevor admits that as adults it is unrealistic to arrange weekly poker games in a physical location with his friends.

"We always say we will [arrange a physical poker game] but there is always something in the way. One person can't go and then the other can't, then this guy doesn't show up. I must arrange a game once a week but it never happens. They say stuff like I don't fancy it this week but you know it's their missus that doesn't fancy him coming round to mine getting bladdered and going home broke. Instead we up end just playing a tournie online."
Extract 27, Trevor.

IT has enabled participants to gamble socially without detriment to competing responsibilities that appear to be important to their self concept.

5.3.4.2 It's like a game in itself

This component theme relates to the enhanced pleasure derived from gambling through IT in the participants' perception. A primary source of this enhanced enjoyment was the

increased availability of gambling activities with non random parameters, namely online poker.

“Jason: I always liked the idea of poker because there was skill involved. I would say it’s about 25% skill and 75% chance, which is still a significant edge if um you are using it appropriately. It’s why I play poker as opposed to other forms of gambling and its better than other forms of entertainment...Leaving all that aside, as a form of gambling you have more chance of winning and I think it makes it more enjoyable.” Extract 28, Jason.

Continuing the theme of taking more pleasure from gambling because activities are available that enable you determine your own success to a greater extent, participants described how it was also easier to accept losses in gambling when you are able to attribute the loss to your own mistakes rather than an external event that you have no control over.

“Tom: Listen it’s the best form of gambling because it’s actually you playing. It’s like when you bet on Liverpool or something and Crouch [soccer player] misses an open net and you lose. That’s really annoying and hard to forget. Or that Rangers guy Mols [soccer player] missing the penalty and costing me money. I can’t do anything about that, I don’t play for Rangers. But at least I can blame myself when I lose in poker and I can’t do that in other forms of betting.” Extract 29, Tom.

Clearly, playing an active role in determining the success in your gambling behaviour heightens the satisfaction and therefore increases one’s motivation to engage in the behaviour. Tom expresses that he finds it difficult to accept failure in gambling as a result of someone else’s error. Playing a more central role in determining success makes the activity more intangibly rewarding. Information technology has not only increased perceived control in gambling by increasing availability of poker, but IT is also perceived

to increase locus of control in more chance based activities such as interactive wagering i.e. online sports betting.

“Charlie: The internet is brilliant for stats and things. Think about it where would we be without it? We’d be left with the Sun [newspaper] info. I remember back in the late nineties the rag said that Bergkamp [soccer player] was definitely out of the game. So I got onboard Leicester. So who turns out from the kick-off, scores and sets up another? I was gutted. Such lazy journalism. But the internet is good. If nothing else it lets you pick your sources... Finding out tips was like a game in itself between me and my mate. You know like who could find the best tip.” Extract 30, Charlie.

Charlie shows dissatisfaction with the lack of accurate information that he used to make his betting selection. He states that because of the World Wide Web he no longer must rely on a limited selection of sources of information, because he is afforded extensive discernment in deciding which information to use in making betting selections. Furthermore, it is evident that this more integral role in determining his betting selection became a pleasurable, competitive activity independent of gambling. Fundamentally, participants acknowledge that their gambling behaviour is not primarily motivated by making consistent profit, but rather achieving pleasure in risking money. Information technology by altering the structural and situational characteristics has evidently reduced the opportunity costs of gambling, and enhanced the pleasure derived from the activity, therefore making justifying engaging in an activity with negative expected economic utility simpler.

5.4 Discussion

5.4.1 Summary

The objective of this research study was to explore possible effects on gambling attitudes and behaviour, in relation to the emergence of the construct ITP, through manipulation of

IT, gambling can now be controlled in a consistently profitable method. If participants perceived this construct to be valid, then motivation to gamble based on perceptions of outcome control, may no longer necessarily be irrational. Fundamentally, there is scope to consider gambling as rational economic activity. The findings of the study have demonstrated that for these participants, development in IT has changed gambling attitudes and behaviour. Equally, however, personal development and maturation, and the resultant increase in responsibility have also emerged as a powerful catalyst for change in participants' gambling attitudes and behaviour.

Taking the first higher order theme, 'there are much more lucrative and secure ways to make money with less effort', it is evident that the opportunity cost of engaging in profitable, controlled gambling is too much in relation to the small level of expected profit. Gambling as an activity does not provide several important sources of personal satisfaction such as being productive, fulfilling social roles and maximising one's abilities. Gambling, and profit from gambling, is a secondary consideration in relation to satisfying these needs and therefore rational motivation to gamble is persistently outweighed by other sources of pleasure and manifestations of one's identity. There also appears to be dissatisfaction with the level of obtainable control, when gambling in a controlled, profitable manner. Participants acknowledge that the system does not permit complete control, and that the influence of random chance is still too potent to adopt and apply this behavioural process ubiquitously. Furthermore, it is felt that the pleasure taken from gambling is removed once the activity becomes a repetitive, sterile process, where the individual has no outlet for spontaneity.

The second higher order theme, 'I've had my own epiphany', represents a genuine enlightenment and concession that the previously professed motivation to gamble to make profit was a façade. Acquiring profit was an adopted pretence that was illuminated as a rationalisation, when the opportunity to make consistent profit was made available through IT processes. Fundamentally, the participants admitted that the satisfaction they receive from gambling is not primarily sourced from making profit, and more about receiving entertainment. Gambling selections before and after this enlightenment were

based more on what activity would provide the most enjoyment, and such entertainment was received independent of betting outcomes. It is evident that the concept of control over outcomes, is a useful schema to deploy when rationalising involvement in a risk activity. In reality, for the participants, it is the uncertainty and risk that is pleasurable, and that by maintaining control the essence of gambling is detached.

The primary feature of the third super-ordinate theme 'situational determinants of gambling behaviour' is the effect that changes in personal circumstances have on gambling experiences. As participants mature in age, effectively the behavioural contingencies of gambling i.e. winning as positive reinforcement and losing as punishment, are muted to an extent because as mature individuals they have more income, more access to credit and more structured debt. The thrill of winning money is reduced because in comparison to structured debt the win appears negligible, and what they can spend independent of winning has substantially increased as they got older. Moreover, as the individuals mature their levels of responsibility increase, namely their time restrictions because of work and relationship commitments, restricting their ability to engage in alternative sources of leisure. Online gambling is perceived to be a practical solution. The perceived increase in gambling behaviour from people in their social environment makes gambling appear a more rational activity. For the participants, the gambling behaviour of individuals in their social network has significant effect on their own attitudes and behaviour to gambling.

Finally, 'Playing online made a lot more sense' relates to gambling as a leisure activity becoming more appealing because of the situational and structural changes that IT created in the gambling market. Many deterrents of gambling regularly, as a responsible adult, have now been removed because it is no longer necessary to be unavailable while gambling for important social roles such as being a parent or provider. Gambling in conjunction with the IT applications now available evidently increases the scope of reward taken from the activity increasing motivation to participate. The World Wide Web through the extensive provision and facilitation of skill based gambling activities and the available information to support betting selections, makes the activity more

interactive and therefore more intrinsically rewarding. IT has effectively increased the opportunities for reward and reinforcement in gambling.

5.4.2 Information technology, control and gambling motivation

The product of the IPA is not an explanation of behaviour rather a detailed representation of participant understandings and experiences of, in this case, gambling (Willig, 2001). One of the most pertinent findings is the multiple influences that IT has had on attitudes and understandings of gambling experience. From an expansive standpoint it is evident that for this cohort of gamblers that the expediency in gambling facilitated by IT has been instrumental in the consistent engagement of the activity, by diminishing restrictive barriers. Gambling via online technology reduces the opportunity cost of gambling by enabling the gambler to complete the behaviour remotely in a more efficient process, supporting findings of Studies 1 and 2 of the thesis. Gamblers no longer need to sacrifice important social roles that are intrinsically rewarding, such as being a parent, romantic partner or a valued employee, because through IT gambling can be completed less obtrusively. Furthermore, it is evident that IT has enabled gamblers in this study to increase the pleasure received from gambling by providing further elements of reinforcement within the process. Information technology has increased the availability of more interactive gambling activities, such as online poker, that facilitate social interaction, increased competition and other rewarding aspects of the gambling experience.

A key explanatory model for pathological gambling is the cognitive model (Sharpe & Tarrier, 1993; Ladouceur & Walker, 1996). The basic premise is that strong disordered cognitive schemas develop, such as beliefs of outcome control, and provide motivation to gamble despite persistent losses (Blaszczynski & Nower, 2002). From the findings from Study 1, 2 and 3 of this research thesis, a construct of profitable control in gambling emerged. This is a relatively new construct created by the existence of IT applications and processes that enable the gambler to increase their level of control in the outcome of

the wager. At least perceptually, claims of outcome control may no longer necessarily be delusory.

From the emergent findings, the effects of this new construct are not particularly significant in changing behaviour for this cohort of gamblers. Establishing control in gambling was seen as undermining the purpose of the activity. Gambling was clearly seen as a source of entertainment, and that although winning money was integral to the pleasure received when gambling, focusing on removing the unpredictability and risk from the activity was undesirable. For this group, gambling in a controlled manner removed the essence of the activity.

Motivation to gamble has been consistently linked to winning money (Dumont & Ladouceur, 1990; Walker, 1992). In this study, when faced with opportunity to win money on a consistent basis, the participants were reluctant to engage in the processes necessary to achieve this aim. It is possible that the participants were devoid of sufficient self-efficacy in maintaining profitable control. Effectively, although participants may be confident in outcome expectancy, they may not be sufficiently confident regarding efficacy expectancies and this reduces the intention to engage in the behaviour (Kraft, Rise, Sutton & Roysamb, 2005). However, this is a remote possibility as participants did not make such allusions when explaining their reasons for not gambling in a consistently profitable way. Alternatively, as suggested by the present findings, it is possible that the motivation to gamble to win money may be an erroneous cognition deployed. The lack of motivation to achieve this perceived aim led participants to concede that their primary motivation to gamble is to extract pleasure in various forms, independent of profit (for e.g. entertainment, arousal, escape). The implication of this increased awareness of intentionality will, by default, increase the objective rationality of the behaviour. Participants can engage in the behaviour more purposefully, in terms of adapting attitudes and gambling behaviour. Potentially, if gambling is recognised primarily as a source of leisure, expenditure in terms of both money and time may also be adapted to fit into this new understanding of the motivation to engage in the behaviour. Indeed there

was clear evidence that individuals were changing their approach to gambling behaviour in this respect (see extracts 7, 14 and 15).

5.4.3 Consistent profiting from gambling construct and implications for responsible gambling behaviour

Manipulating IT applications and processes to improve outcome control is evidently complex and requires substantial attention and cognitive processing of information sources such as PokerTracker (see Studies 1, 2 and 3 for description of processes). To be consistently profitable, the gambler must be mathematically proficient and have strong evaluation skills, as well as having an emotionally disciplined disposition. The immediate concern with the emergence of this construct was the expected increase in gamblers perceiving that when gambling, if persistent, eventually profit will be acquired. This emergent construct will logically affect the behavioural contingencies associated with gambling. For example, participants may not be as sensitive to punishment cues from gambling losses if they can rationalise that they are learning from their mistakes and developing skill as they lose. Although it has been documented that it is theoretically possible to profit consistently when gambling through IT, the cognitive bias of perceived control that is related to problem gambling could potentially remain a causal factor of persistent gambling. Put simply, the bias may transform from perceptions of outcome control to the erroneous belief that one is improving their own gambling skill and has the capacity to profit consistently from gambling using IT.

However, for this cohort of gamblers it was evident that the emergence of this construct actually aided the realisation of their true objectives when gambling. This perceived ability to be consistently profitable led the participants to become aware, through their reluctance to gamble in the required mode, that their objective in gambling was acquiring pleasurable experience. Research shows that problem gambling is associated with erroneous heuristics, which in turn influences their ability to make rational gambling choices (Moore & Ohtsuka, 1999; Griffiths, 1994). In other words, a gambler being fully aware of the true nature of their behaviour, including their motivation to complete the

behaviour, is a positive step towards responsible gambling. The more gambling behaviour is transparent to the individual, and they remain cognisant of the exact nature of their behaviour, devoid of any heuristic, the more rational gambling behaviour will become.

The ability to determine whether the findings of this study are applicable to the overall gambling population through traditional forms of quantitative and qualitative research design is questionable. The ability to penetrate and measure individuals' underlying motivation to gamble in the context of the situational and structural variables in the gambling environment may be reserved for idiographic methods of analysis. The relationship between the structural aspects of the gambling activity and situational factors in the gambling environment, and individual behavioural intentionality has been demonstrated in this study to be complex and multi-faceted. It is possible that this relationship might not be able to be reduced into quantitative variables comprehensively, and there is a substantial danger that structured interviewing may influence participant conceptualisations, reducing the validity of the potential findings. It is probable that the grounded knowledge emergent in the present study may not be validly applied to the wider gambling population because the lack of suitable research designs to achieve this objective, effectively limiting the impact these findings may have on gambling theory.

5.4.4 Epistemological limitations of IPA

The effect of IT on gambling behaviour has been researched through various methods in this thesis including grounded theory, virtual ethnography and quantitative designs. A construct to emerge was the belief that through manipulating IT applications and processes, it was possible to gamble and be consistently profitable. This construct has been uncovered, and indeed explored, through the aforementioned epistemological perspectives. However, in this IPA study, we are afforded an idiographic exploration of the significance of this construct on individual's attitudes and behaviour. To explore the influence of this construct through traditional nomothetic research methods would lose much of the detailed contextual relationships, leading to a restricted understanding of the

construct and its effect of gambling experiences. The commitment to engaging in semi-structured interviewing reduced the pre-determined biases held based on prior research, and enabled the participants to direct the focus of the study regarding areas of central concern.

However, IPA also has several criticisms limiting its effectiveness as a research tool. These criticisms are predominantly focused on the lack of acknowledgement that IPA places of constructive role of language in accessing participant experience (Willig, 2001). Effectively, because experience cannot be accessed directly, experience reported therefore becomes a representation that is constructed by language. The researcher therefore must also remain conscious of the contextual influence on the representational validity of the experience. Put simply, the researcher must be actively trying to interpret whether the experience being disclosed would be represented differently, if questioned in a different context. It is important to acknowledge that the disclosed experience is a version of the experience that has been constructed, when making conclusions from IPA research.

Furthermore, the objective of IPA is to obtain an understanding of lived experience regarding a specific phenomenon (Smith & Osborn, 2003). As a result, we are reliant upon the participants' ability to be introspective and reveal the significance of their experience. Therefore, a limitation of IPA is that its success is determined by the ability of its participants to articulate their introspective interpretations of their experience (Willig, 2001). The impact of this limitation on research success is determined by the researcher's ability to interview the participants from a critical perspective, continually requesting participants to consider their experience from competing perspectives. After careful inspection of the interview transcripts by both the researcher and research supervisor, it has been concluded that this recommendation has been achieved in this study.

In response to the epistemological limitations of IPA, it is felt that if the researcher remains reflexive in considering what way their own perspective influences their

interpretation of the phenomenon representation, and also maintains a level of epistemological reflexivity that questions how this research approach restricts and shapes what is found, then IPA makes a substantial contribution to knowledge generation. The application of IPA in this study enables us to procure ‘an insider’s perspective’ (Conrad, 1990) of how IT is influencing gambling behaviour, that we would not have been able to gather using alternative methods of analysis.

5.4.5 Conclusions

Despite the idiographic nature of the study, there was considerable consensus regarding gambling attitudes and behaviour in relation to the specified emergent construct. For this cohort of gamblers, pre-conceived concerns regarding the negative influence of this construct on rational gambling behaviour were essentially ungrounded. Fundamentally, for the gamblers in this study, there is minimal motivation to gamble in the prescribed process in order to make consistent profits using IT applications, because the opportunity costs of the time required are incommensurate with potential profits. Furthermore, through evaluating their reluctance to engage in profitable gambling, participants were provided with a clearer understanding of their motivation to gamble and therefore eliminating an erroneous cognition. For the participants, IT made gambling a more viable leisure activity which participants could rationalise engaging in because it had reduced the opportunity cost of gambling by becoming more expedient, and made the activity more intrinsically rewarding where participants could gain more pleasure independent of financial reward.

Although IT was shown to have substantial influence in changes in gambling perspectives and experience, personal development and maturation was also identified as a primary catalyst for behavioural change in gambling. As they became more mature participants’ ability to engage in leisure activities was constricted by occupational and social responsibilities, and as a result remote gambling from the home had increased rationality because it was perceived as a comparatively practical and unobtrusive activity in relation to competing sources of entertainment.

Chapter 6

Conclusions, Implications and Recommendations

6.1 Introductory Restatement

Raylu and Oei (2002) acknowledged a paucity of research in the psychological study of pathological gambling behaviour. It is widely accepted that the absence of an accurate conceptual model for pathological gambling has limited the development of effective treatments of the disorder. Recently, progress in unravelling the aetiological processes in the development and maintenance of pathological gambling has accelerated with the adoption of integrative biopsychosocial models of pathological gambling (e.g. Blaszczynski & Nower, 2002; Griffiths & Delfabbro, 2001). However, because of rapid developments in IT, the environmental and structural factors incumbent in available gambling activities has transformed the behaviour substantially. As a result, it is important to engage in explorative research to initiate conceptualisation of newly emerging IT-related gambling behaviours. Potentially, emergent IT-related gambling processes may have significant impact on the aetiological processes of pathological gambling. In order to assess the risk factors associated with online gambling, it is first necessary to document which cognitive and behavioural processes exist, and then to explore each emergent process with specific emphasis to evaluate their potential impact on the aetiology of pathological gambling.

The objective of this research programme was to commence explorative research into IT-related gambling behaviours for the purpose of providing emergent cognitive and behavioural processes to investigate in future research. Identifying valid risk factors within IT related gambling behaviour for pathological gambling was beyond the scope of this body of research. Because of the extensive lack of knowledge as a point of commencement, the theoretical proposition of risk factors within IT for pathological gambling will require a long process of integrating research, shaping knowledge from expansive exploratory research to hypothetico-deduction, through repeated

experimentation and direct observation. The objective of this thesis was to provide a platform to direct, and inform, future study of IT-related risk factors for pathological gambling by presenting a detailed, exhaustive conceptualisation of cognitive and behavioural processes involving IT that are used by gamblers. Effectively, by providing a detailed representation of cognitive and behavioural processes that are potentially risk factors, future researchers can develop theoretical propositions based on this explorative research.

6.2 Summary of Findings

6.2.1 Elevated Gambling Involvement as an outcome of IT use

Initial attempts to generate a theoretical substantive picture of the applications and effects of IT use within gambling behaviour clearly indicated an elevation in individual involvement in gambling and gambling-related behaviours. The grounded theory to emerge highlighted, through Theoretical Proposition 1, that IT had influenced motivation to gamble by creating opportunities to control outcomes while simultaneously reducing barriers to gambling such as time-constraints and low economic utility of available activities. Effectively, IT has, perceptually at least, transformed gambling into a potentially controllable, and therefore profitable, activity that has significantly less drawbacks than previously. The increase in motivation has been identified as the catalyst for increased participation in gambling, as well as an increase in gambling pre-occupation. Because gambling activities via IT can theoretically be controlled to become consistently profitable, there has been an increase in time spent by gamblers developing their ability to control gambling outcomes by acquiring objective and subjective knowledge.

The second theoretical proposition to emerge contends that IT substantially reduces the external costs of gambling meaning that the profit potential increases, effectively increasing the economic utility of risked funds. As a result, the perceived increase in potential rewards created through improved available odds, increased customer

promotions, and reduced ancillary costs makes gambling a more economically sound activity.

Table 6.1 – Summary of effects of developments in Information Technology on gambling behaviour	
Increased Outcome Control	Increased accessibility to gambling activities with non-random parameters
	Increased accessibility to objective gambling knowledge and strategy
	Increased accessibility to subjective gambling knowledge and strategy
Consumer Value	Increased promotional offers and customer rewards
	Improved economic utility of gambling (e.g. improved available odds)
	Removal of external costs
Reduced Discipline	Increased social acceptability
	Increased ability to gamble in asocial manner
	Provision of continuous gambling devoid of natural intermissions
	Instantaneous access to funds via electronic payment systems
Expediency	Increased efficiency reducing opportunity cost of gambling

Thirdly, IT has enabled gambling activities to be engaged in and completed by the individual in a more efficient manner. Essentially, gambling appears to the individual to be a more viable activity because less time is required to complete the behaviour and therefore prohibitive barriers to gambling such as time restrictions have reduced potency.

The final theoretical proposition deviates from motivation as the cause of elevated gambling involvement, and implicates a reduction in rational judgement. It is theorised that the situational and structural characteristics provided by online gambling activities such as the provision of continuous gambling opportunities without intermission, inhibits the individuals ability to make reasoned, calculated gambling decisions. Effectively, individuals gamble beyond the extent that they had initially intended prior to commencing.

A summary of IT-related cognitive and behavioural processes to emerge within the grounded theoretical framework is provided in Table 6.1.

6.2.2 The application of CMC to maximise potential reward from poker gambling

Study 2 specifically focused on a theoretical proposition to emerge from the grounded theoretical framework in the first study. At the core of the perception that IT has increased the ability to consistently control gambling outcomes is the increased accessibility of gambling activities that contain non-random parameters such as poker, and also the provision of objective probability and subjective reasoning gambling knowledge available via the World Wide Web. Study 2 concentrated on a solitary component of this theoretical proposition and attempted outline and assess the observed behaviours, and the motivation behind such behaviours, within web-communities designed to transfer knowledge about poker for the purposes of maximising profitability from poker gambling.

Three core behaviours were observed regarding the use of CMC via web-communities to gather objective probability and subjective reasoning knowledge of poker, and to

enhance the reward achieved when poker gambling. The first of the recorded behaviours was to report gambling experiences via CMC for the purposes of either, or a combination of, extricating frustration from an improbable loss, receiving social recognition and/or gauging their poker gambling ability in relation to peers. The structure of the reported experiences is dependent on the requirements necessary for the member to achieve their objective. For example, a simple notification of a tournament win is required to receive congratulatory sentiments, whereas extensive detail of game-play is required to critically evaluate the suitability of strategy employed by a member.

The second prevalent behaviour observed with the web-community was the transfer of objective probability and subjective reasoning poker gambling knowledge. Members provided, acquired and debated mathematical algorithms necessary to employ within poker variations, to inform strategy decisions. Furthermore, members disclosed and debated requisite skills of subjective reasoning and interpretational strategies necessary to inform decisions when poker gambling. Less successful members of the web-community requested knowledge of poker gambling strategies from more experienced and successful members of the community, and often disclosed detailed poker scenarios for experienced members to identify flaws in their behaviour. The motivation behind the knowledge transfer process was the objective of increasing, and maximising, their ability to profit from poker gambling.

The final observed behaviour was the provision and acquisition of knowledge regarding online poker operators, and online poker gambling in general. Experiential reporting and transfer of objective probability knowledge and subjective reasoning skills has application to physical poker gambling environments beyond online gambling. However, the transfer of knowledge regarding poker operators is not applicable to physical poker gambling operators because of the vast geographical divergence between members. The core information transferred was how maximise utility from available poker gambling software applications and from available operator reward schemes. The motivation behind transferring such knowledge is founded upon an expectancy of *quid*

pro quo reciprocity, and therefore the eventual acquisition of knowledge that will increase the ability to maximise profitability from online poker gambling.

Fundamentally, Study 2 has been instrumental in providing a detailed, contextualised description of the use of CMC via web-communities to increase reward and reinforcement available through poker gambling. A tabulate summary of observed behaviours has been provided in Table 6.2.

Table 6.2 Summary of CMC behaviour used to maximise reward from poker gambling	
Experiential Reporting	Direct and indirect social reinforcement for poker gambling success
	Extrication of frustration of improbable luck experienced
	Peer comparison to gauge poker gambling ability in relation to peers
Development of Poker Skill	Knowledge and application of strategy regarding objective probability
	Knowledge and application of subjective reasoning and interpretational skills
	Critical appraisal of play by advanced members to identify weaknesses
Structural Knowledge of Online Poker	Critical review of instructional tools and poker gambling software
	Knowledge of online poker operators

6.2.3 Empirical support for the IT use in Poker construct

Qualitative research in the first two studies suggested that many gamblers use various applications of IT in relation to poker gambling, with the objective of increasing reward derived from poker, and increasing outcome control when playing poker. After

exploration of the factorial structure of ITP, three underlying component behaviours emerged including World Wide Web use, Computer-Mediated Communication use and Software use. It appears that the emergent behaviours recorded in the preceding qualitative research cluster under these three factors, therefore providing an improved understanding of the proposed ITP construct.

Furthermore, Study 3 provided quantitative evidence, not only supporting the qualitative findings, but also provided data identifying the ITP processes that were most frequently engaged. Within the World Wide Web use factor, using the web to ascertain knowledge about online poker operators in terms of both promotions and the structure of games provided were engaged in frequently by at least a quarter of all participants. In contrast, using the World Wide Web to learn poker algorithms or the rules of poker variations was engaged in much less frequently. It could be interpreted that there is a dual layer of World Wide Web use behaviours that relate to achieving either short-term or long-term objectives. For example, online poker operator promotions change rapidly and therefore intuitively it would be logical to use the World Wide Web frequently to monitor changes, whereas as mathematical structure of existing poker variations will not change over the short-term so there is no need to monitor them frequently.

Regarding the Computer-mediated Communication use processes, 11% of the participants engaged in each behaviour frequently. The observed consistency of frequency levels across component behaviours of the factor would most likely be explained by the consistency of medium used to complete each process. For example, to use CMC to discuss strategy, request a behaviour critique and share information about poker operators, requires either engagement in a CMC portal such a web-community forum or an email account. Because each process is completed within a singular CMC portal it is probable that such processes would be completed during a single period, perhaps accounting for the similarity of frequency levels.

The frequency levels of engaging in the component processes of the Software use in Poker factor, were, like the preceding factors, determined by the whether the objective

was short-term or long-term. The most frequently engaged in process was using software to aid in probability calculation, which is a process that is likely to be engaged in every instance of online poker gambling. In contrast, participants used software such as databases to record and analyse behavioural patterns to identify weaknesses less frequently. It is probable that using database software is less frequently engaged in because it will require a period of data collection before further assessment is required. Between one in four, and one in six, participants engaged in each of the component behaviours of the factor, at least frequently.

6.2.4 Preliminary development of an instrument to measure IT use in Poker

After quantitative evidence demonstrated support for the existence of an ITP construct, it was necessary to attempt to develop an instrument to measure ITP in order to explore potential theoretical relationships. Scale development consisted of Exploratory Factor Analysis across data sets from two divergent samples, including both an online and offline sample. Ultimately, after item-analysis, a 14-item self-report ITP inventory was proposed. Assessment of its psychometric properties suggested that it had reasonable validity and internal reliability. Because of the originality of the construct to be measured, there were, and remain limitations in which a variety of validity properties can be assessed. Fundamentally, discriminant and convergent validity cannot be evaluated because there are no suitable measures currently available to contrast the ITP inventory against. However, there is cause for optimism regarding the instrument's psychometric properties based on current assessments of validity and internal reliability. If ITP emerges in future research to be related to specific gambling phenomena, or perhaps pathological gambling behaviour, development of a valid measure of ITP will be pivotal to the success of such research. The proposed ITP inventory instrument is in an embryonic stage, and must go through subsequent formative stages before it can be accepted with full confidence, but it is an established platform from which to progress.

6.2.5 Predictive value of ITP factors on online poker gambling frequency and acquired profit from poker

From the findings of Study 3 it is evident that World Wide Web use, and Software use, in Poker have predictive value on frequency of online poker gambling and acquired profit from both online and offline poker gambling. World Wide Web and Software use in Poker are likely to be predictors of online poker frequency because engagement of such processes is believed to increase outcome control and therefore increase motivation for poker gambling. In effect, it is probable that the more participants feel they increase outcome control in poker, the economic utility of money risked increases and as a result participants are likely to gamble on poker more frequently. The prediction model showed that World Wide Web, and Software use, in Poker combine to account nearly 50% of the variance in online poker gambling frequency. The directional nature of the relationship between online frequency and the two ITP factors is unclear because causation cannot be inferred. However, intuitively, it is probable that whether the processes of World Wide Web, and Software use, in Poker are effective in providing outcome control or not will determine the frequency of gambling. Motivation to engage in World Wide Web, and Software use, in Poker behaviours will decrease with frequency simultaneously if the prescribed ITP processes are not instrumental in achieving outcome control.

The prediction model for acquired profit from poker gambling was also comprised of World Wide Web and Software use in Poker. This prediction model accounted for 29.9% of the variance in profit acquired from poker gambling from the participants. Again, causation cannot be inferred here so it is not possible to determine whether these specific ITP factors were causing increased profits, or whether acquiring profit caused participants to seek methods such as ITP processes to continue making profit from poker gambling. Nevertheless, a strong positive relationship exists between World Wide Web, and Software, use in Poker and profit; and therefore it is possible that such ITP processes are instrumental in maintaining outcome control and increasing profit from engaging in the behaviour. If through future research studies, using designs that identify causal direction, show that engagement World Wide Web, and Software, use in Poker increases profit, then there are substantial ramifications for how pathological gambling disorder may be conceptualised. If consistent profit can be acquired through engaging in World

Wide Web, and Software, use in Poker then many of the DSM-IV criteria for pathological gambling, such as pre-occupation with gambling, will no longer be maladaptive.

6.2.6 Information technology, profit accumulation and changes in gambling motivation and behaviour

Study 4 retracted from focussing specifically on poker, and explored a variety of gambling activities in terms of changes in experiences and behaviour in relation developing information technology from a phenomenological epistemology. The emergence of the ITP construct in Study 3, and the theoretical proposition from Study 1, suggested that through manipulation of a variety of IT processes, there was potential for increased outcome control in gambling. Findings from Study 3 provided partial support for the claim that by engaging in ITP processes, participants could increase acquired profits through controlled gambling. This finding provides strong, rational motivation to engage in gambling. Gambling has been demonstrated to be substantially reinforcing, despite incurring consistent losses. As a result, it is reasonable to speculate that motivation to participate is likely to increase substantially if profit can be consistently provided simultaneously to the other reinforcing aspects of gambling (e.g. arousal, narrowed attention etc.)

In order to access participant attitudinal and behavioural responses to the construct of controlled, profitable gambling it was necessary to analyse idiographic data. It became clear that participants fundamentally rejected the ability to gamble in a consistently profitable manner, afforded by IT, because the amount of profit acquired was not commensurate with the requisite costs. Essentially, participants felt that gambling in a controlled, profitable manner removed the pleasure derived from gambling, because risk and uncertainty are at the essence of gambling behaviour. When explaining why they were reluctant to use ITP processes and other methods to control outcomes significantly, participants reached a realisation that their motivation to gamble is centred on deriving

pleasure from either the competitive and social component or the leisure component of gambling.

Superficially, concern regarding the impact the ability to control gambling outcomes in a consistently profitable manner, subsides somewhat when contemplating that gambling in such a format effectively makes gambling less enjoyable. However, the proposition that gambling can be a rational, economically viable behaviour is a powerful schema that is deployable when rationalising substantial incurred losses. Previously, before the emergence of potentially controllable gambling outcomes, gambling was acknowledged by most individuals as a behaviour associated with substantial risk, and therefore it is likely that this acknowledgement provided sufficient caution within the individual when gambling. Essentially, engaging in ITP processes and professing the ability to control gambling outcomes via IT, may simply be a demand characteristic, intermittently employed to justify risky behaviour.

Information technology was demonstrated to influence how participants understand and structure their gambling behaviour. However, another, more potent, cause for change in participant gambling attitudes and behaviour was individual development, and the situational factors that adapt in relation to such development. Attitudes to gambling and behaviour evolved in relation to situational changes in participants' lives. Information technology played an integral role in enabling the participant to continue to gamble despite increases in social and occupational responsibilities, without jeopardising accepted social roles. Effectively, from the idiographic data it is evident that the role of IT in changing gambling behaviour is more facilitative, in terms of helping individuals adapt to their new situational circumstances, rather providing direct motivation. However, it must be acknowledged such idiographic findings cannot be applied to the population, because the sample used was to an extent homogeneous. It is probable that the impact of the emergent construct of the feasibility of controlled, profitable gambling will be greatest on those that are either currently non-gamblers or inexperienced gamblers, and individuals who are less affluent and knowledgeable than the procured sample.

6.3 Mixed method approach to exploring effects of IT on gambling attitudes and behaviour

It is important to acknowledge the limitation in generating knowledge regarding the effects of IT on gambling behaviour and intentions, by triangulating data using multiple methodological designs. Fundamentally, it would be inaccurate to describe the research produced within this thesis, as a triangulation of research methods given the differing research aims and objectives within each study. It is more precise to describe the methodological structure of the thesis as the application of competing methods to achieve differing objectives. Method selection was determined by contrasting the strengths and limitations within each methodology, and evaluating which method would be most efficacious in achieving specific objectives. However, there is considerable overlap between concepts observed and new constructs to emerge, therefore the discussion of triangulation within this research body is relevant in order to contemplate the value of the proposed findings.

The ability to evaluate the attempt to triangulate research methods is compromised largely by the absence of a definition of what triangulation is. The lack of definition leaves room for misconceptions about what is being stated, regarding the comparison and juxtaposition of research findings. It is important to acknowledge that the production of comparable findings via methodological triangulation does not equate to an increase in the validity of findings. The process of triangulation originates from navigational procedure, where the location of a point could be established if the absolute point of two other reference points was known (Blaikie, 1991). Methodological triangulation in social science deviates from this theory because the reference points used in social science are not absolute as they are often socially constructed. The belief that it is possible to observe and measure a phenomenon using different methodologies demonstrates a naivety of realism, because there are multiple accounts of social phenomena and not a singular reference point. Effectively, methodological triangulation in social science is more accurately described as relative triangulation. Effectively, this means that although repetition of findings through application of multiple methodologies cannot provide a

measure of validity, because the inability to converge competing epistemologies, our findings can still be approached with increased confidence on the basis of such repetition.

The application of multiple methods to identify and explore emergent phenomena, regarding the role of IT in modern gambling, is beneficial without claiming that triangulation of findings has been achieved. Competing methodological designs used within the thesis produced different types of knowledge. It is not possible to converge findings and postulate a singular theory. However, the principal objective of the research was to provide a platform to direct future research into IT and gambling behaviour, and the aggregation of analysed data within the thesis enables the proposition of several hypotheses to explore in future research. Although repetition of concepts and emergent constructs were observed across the studies, providing confidence in the direction of future research, ultimately the findings of each study remain independent. For example, the repeated emergence of the construct of IT use in Poker within Studies 1 and 2 provides confidence in the empirical exploration of the factorial structure of IT use in Poker, the findings of Study 3 can also stand alone as valid, independent of data from Studies 1 or 2.

As mentioned previously, although convergent validity cannot be claimed from methodological triangulation, it is possible to develop theoretical hypotheses that emerge when contrasting data from multiple methodologies regarding a specific phenomenon. A construct of gambling outcome control through the manipulation of IT processes has emerged repeatedly from grounded theory, virtual ethnographic, phenomenological and quantitative survey design. Although the structure of the construct changes between studies (i.e. from being poker specific to non-specific), the repeated emergence of the construct despite the measurement error existing in each design, suggests that the construct exists and warrants further investigation.

6.4 Implications of IT use for responsible gambling

One of the motivations for the attempt of thesis to explore the role of IT use in gambling from a blank canvas was a reluctance to accept the theoretical propositions from speculative published articles (e.g. Griffiths, 1999; Griffiths & Parke, 2002) that existed in lieu of empirical research. Although, such theoretical propositions were sound and based on well developed arguments, it seemed inappropriate to make propositions without firstly identifying the core behaviours within the phenomenon. It is probable that many theoretical concepts within IT use in gambling, lay undiscovered and were therefore not addressed in such articles. The propositions made prior to researching IT use, primarily focused on how IT can exacerbate the criteria for pathological gambling, while neglecting the potential for IT to increase responsible gambling behaviour.

6.4.1 Reducing cognitive bias through observation of IT databases of gambling behaviour and expenditure

From analysis of the findings, several observed IT-related behaviours provide potential for increasing responsible gambling knowledge and behaviour. Firstly, the use of IT software such as *Microsoft Excel* and *PokerTracker* to explore and analyse gambling behaviour in order to identify weaknesses in strategy, and to assess the profitability of the activity, forces the individual to remain cognisant of their true gambling behaviour. Cognitive biases, in current aetiological models, play a significant role in the development and maintenance of pathological gambling (Rogers, 1998; Ladouceur & Walker, 1996). Being able to observe objectively, through IT software, accurate outcomes of one's gambling behaviour, is likely to be effective in minimising the development of erroneous heuristics that may precipitate excessive gambling. For example, the hindsight bias (Gilovich, 1983) is a cognitive process that enables the individual to maintain their illusion of control in gambling, by rationalising losses as simple lapses in concentration and retains their perception of control that motivates future gambling. If the individual periodically uses a database to observe their gambling behaviour, with direct information regarding success and failure, it is probable that the illusion of control may diminish. Furthermore, if the data within the software indicates that the individual persistently exceeds pre-determined spending limits while gambling,

they are informed of their inability to display self-control when gambling, potentially causing a re-evaluation of their engagement in gambling.

Fundamentally, the evaluation of one's gambling behaviour through IT software is likely to increase the rationality of the behaviour. Free from biases distorting the realities and consequences of their behaviour, individuals are in an improved position to make rational choices regarding their engagement with the risk behaviour. Even if the individual is reluctant to record gambling data, the majority of online gambling operators provide functions to explore gambling outcomes and spending patterns across long periods of time for periodical observation.

Hypothetical Proposition: Periodical analysis of gambling behaviour via IT software will reduce disordered gambling

This proposition could be relatively uncomplicatedly tested quasi-experimentally with random samples, to assess the effect of periodically analysing one's gambling behaviour. Gambling behaviour could be assessed via daily self-report quantitative data collection to establish a baseline level, prior to the experimental group being required to observe and analyse their gambling behaviour via IT software. Measurement of the dependent variable could vary from the level of gambling expenditure before and after the introduction of the stimulus, to measuring participant congruence and contentment with their gambling expenditure. Diary data could be collected simultaneously to indicate potentially confounding variables. If repeated investigation produced supporting evidence, it would be recommended that in an effort to reduce the effect of cognitive biases on customer's gambling patterns that operators should be instrumental in making customers aware of the reality of their gambling behaviour. This could be achieved through providing customers with monthly statements electronically of transactions, betting outcomes for each session, and percentages of success. Online gambling operators already record such data for auditing purposes, so it is expected that the provision of such information should be relatively cost free.

6.4.2 Educating poker gamblers about responsible gambling strategies via online web-communities

Another potential use of IT to increase responsible gambling behaviour, is to use CMC to disseminate educational information highlighting risk factors for pathological gambling and provide strategies for gambling responsibly. The research findings have illustrated the expediency of CMC systems in terms of knowledge acquisition, and participants' frequent engagement with them. For example, in Study 3, more than one in ten participants reported to use CMC frequently to share gambling-related information.

Furthermore, Study 2 demonstrated the utility of CMC in the form of web-community interaction, to develop poker gambling knowledge and skill and discuss gambling experiences. From analysing web-community member interaction and repeated engagement with the message-board it was evident that members placed significant value on information disseminated within the community. Novice poker gamblers with limited knowledge and skill, appeared to revere information disclosed by more experienced and successful members of the web-community, with motivation to learn from the experience of successful members to become successful themselves. This relationship positions experienced members of the poker gambling web-community as influential sources from whom to provide responsible gambling information. Moreover, the likelihood of acceptance of responsible gambling strategies is increased when considering that the canons to be followed to create success in poker gambling are for the most part identical to responsible gambling strategies. For example, the requirement of remaining emotionally detached from gambling decisions, essentially remaining in control and avoiding irrational and impetuous gambling behaviour.

The use of senior members of a community who are seen as figures with veracity on the specific behaviour, has successfully been used to educate novice members of a community of intravenous drug users about 'best-practice' (i.e. strategies for harm avoidance, Power et al, [1996]). Gambling, similar to the consumption of narcotics, is a behaviour with substantial associated risk. Like drug use, it may not be possible to

prohibit individuals from engaging in the activity, however, it is possible to educate members of the web-community about potential hazards to avoid and present strategies that enable the individual to gamble safely.

It is highly improbable that such members of the poker gambling web-communities are trained in responsible gambling techniques, or are motivated enough to fulfil such a role with any conviction or perseverance. Therefore, the responsibility to educate poker gambling customers about responsible gambling lies with the stakeholders (i.e. gambling operators, the state and mental health boards). The requisite CMC infrastructure to enable development of web-communities already exists in the majority of online poker operator's web-domains. Therefore, it is recommended that experienced clinicians work in cohesion with online poker operators to train dedicated customer service staff to disseminate responsible gambling information regarding risk factors to be aware of and strategies to employ to gamble safely. The effectiveness of this intervention could be measured in a multitude of ways. For example, customers of participating poker operator's website could be surveyed to measure the value they place on such disseminated information, and furthermore whether it influenced gambling intentions and behaviour. Fundamentally, poker gambling operators have a social obligation under corporate social responsibility to protect their customers from exploitation. By pro-actively educating their customers via this initiative, online poker operators would be reducing the exploitation of their customers who are currently unaware of pathological gambling risk factors and strategies to avoid maladaptive gambling behaviour.

6.4.3 Increased outcome control and reduction of monetary based negative consequences from persistent gambling

Repeatedly, throughout the body of research in this thesis, participants have professed that through application of various IT processes it is possible to increase the level of control they have over the determination of gambling outcomes. This concept has particular reference to poker gambling where the ITP construct, and its three component factors of World Wide Web use, Computer-mediated Communication use and Software

use in Poker, has strongly emerged. If IT applications afford individuals increased ability to control gambling outcomes, then such individuals will be more successful and therefore profitable over the long term.

Because of the implication of individuals becoming more profitable when gambling, it is probable that there will be a reduction in negative consequences of gambling experiences that are based on incurring financial losses. After examination of the DSM IV criteria for pathological gambling (APA, 1994), making consistent profit when gambling drastically reduces the probability of a gambler possessing three of the specified risk factors.

Effectively, if winning more than losing, the individual will be unlikely to chase losses (criteria 6), need to commit fraud, embezzlement or theft to finance gambling (criteria 8) or need a significant other to relieve a desperate financial situation (criteria 10).

Moreover, it is probable that if winning consistently the individual will, indirectly, be less likely to meet several other specified criteria such as needing to conceal the extent of one's gambling to significant others. However, such indirect effects on the individual engaging in the risk factors for pathological gambling are much harder to determine because little is known about how the ability to gamble with increased outcome control affects gambling behaviour.

Hypothetical Proposition: Successful implementation of requisite IT processes that increase outcome control will reduce monetary-related negative consequences of persistent gambling

Study 3 demonstrated that engaging in ITP processes was predictive of average profit acquired from poker gambling per month. The limitations of this finding were discussed at length, and ultimately, although there may be several mediating factors distorting the relationship between ITP process completion and acquired profit, the finding remains supportive of the construct. Furthermore, currently there is no empirical data to support hypothesis that IT processes can increase outcome control in gambling activities beyond poker. In terms of future research, it is recommended that the relationship between acquired profit and engagement in IT processes is measured through more robust and

valid research designs. Although the ability to complete a true experiment of the effects of IT processes that permit outcome control on profit is unfeasible, there are methods to improve the validity of any produced findings of this thesis. For example, it would be appropriate to increase the level of data collection from being a simple retrospective estimation to daily diary entries recording the amount of profit or loss incurred during each session. Although the diary entry method still relies on self-report which are open to distortion, the daily recording of data is likely to reduce error based on memory retention. Moreover, if the study looked solely at online gambling behaviour it may be possible either to supplement recorded diaries with account statements from online gambling operators, outlining profit and losses for the participant across the specified time-frame.

The diary method would also be effective in exploring the relationship between IT processes and acquired profit, because participants could record potentially confounding variables such as the participant gambling while inebriated, feeling stressed or tired. If data recorded during such anomalous periods of gambling significantly distorts an otherwise linear relationship, then such data could be removed from the data set. Regardless of the method of data collection, it is fundamental that data collection must be collected over an extended period of time because in spite of potential to control outcomes, gambling is still determined, to a significant extent, by random probability. Therefore, it is strongly recommended that any study measuring the relationship between IT processes that permit outcome control and gambling success, must be a longitudinal study to minimise error created from random probability.

6.5 Implications for Pathological Gambling

One of the research objectives of the thesis was to evaluate how emergent knowledge regarding IT use in gambling could affect current aetiological models used to understand pathological gambling. It is acknowledged that it is not possible to identify causal relationships between gambling-related IT use and pathological gambling from the findings within this body of research. However, given the detailed analysis of observed

behaviour in this regard it is reasonable to propose theoretical hypotheses based on integration of current findings with the aetiological understandings of pathological gambling. As a result, attempts will be made to evaluate the potential for observed processes of IT use in gambling to affect causes of pathological gambling and maintenance.

6.5.1 Reduced self-control when gambling online based on structural characteristics of online gambling

One of the hypotheses to emerge in the grounded theoretical framework underpinning the effect of IT developments in gambling was that participants found it difficult to regulate their gambling frequency and expenditure because of structural features that are unique to online gambling. Such structural factors include the unlimited accessibility of gambling, the substantially increased event frequency and the speed of electronic cash deposits. Participants indicated that in traditional physical gambling environments, there were forced cessations of gambling, such as needing to withdraw cash from an ATM and opening hours. These constraints afforded them an opportunity to ‘step back’ and contemplate their gambling behaviour from a non-aroused disposition. It was suggested that the removal of forced ‘time-outs’ in the online gambling structure led to a reduction in well-reasoned action, where participants gamble more frequently and risking more within session than they would have if they were able to pause and contemplate further gambling.

Hypothetical Proposition: The provision of continuous gambling via online technology will increase the probability of gambling beyond pre-determined parameters causing cognitive regret post-session

The ecological validity of experimental analyses of gambling behaviour within a laboratory setting has been repeatedly criticised (e.g., Anderson & Brown, 1984). The primary criticism is that a multitude of variables that characterise the essence of gambling cannot be completely transferred into the laboratory environment. As a result,

it will be difficult to determine with any validity within a laboratory setting whether the structural characteristics of online gambling reduce rational cognition causing an increase in expenditure beyond the pre-determined limit. A possible solution could be to investigate the hypothetical relationship through observational methods, where correlations are made between satisfaction with behaviour when gambling in an activity where continuous gambling is provided (e.g. online blackjack) and in activities where there are likely to be forced intermissions. However, in such a study the lack of experimental control would strongly reduce the validity of findings.

The study of impaired decision making while gambling continuously online without periodic intermissions for reflection may need to be abstracted to the study of risk decision making rather than being online gambling specific, to enable experimental analysis. For example, it is possible to measure deterioration in rational decision making, and therefore probable low satisfaction with decisions made (post-activity), by utilising a laboratory gambling activity such as the Iowa Gambling Task (Bechara, Damasio, Damasio & Anderson, 1994) with an enforced time limit on decision making. By transferring emphasis of the dependent variable from post-session satisfaction with gambling behaviour to post-activity satisfaction with performance in a decision making activity, the inability to claim ecological validity from a laboratory study is diminished, while permitting experimental research.

In the proposed study participants would be provided with funds to risk on a specific gambling task carried out within the laboratory, and participants would be provided the opportunity to cease participating in the activity at any time during the experiment and keep (if any) the remaining funds. The experimental hypothesis to test could be: The existence of forced intermissions during the gambling task increases satisfaction of decision making performance after cessation of the activity. In the proposed study participants would take part in several trials of two experimental conditions. In both conditions participants would be forced to make each gambling decision within 10 seconds, however in one condition the game would be stopped every three minutes for a period of one minute. In the other experimental condition there would be no enforced

breaks. During data analysis, the co-variation of success of decisions made and post-game satisfaction of decisions made must be analysed to control for the effect of success.

From the findings of such experimental studies, it would be possible to make inferences about the effects of having no forced intermissions in online gambling and the cognitive regret experienced based on exceeding pre-determined limits on expenditure and duration. Similar to the proposed experimental study, it is probable that gamblers will not experience satisfaction with gambling behaviour if they have experienced impaired ability to rationally consider the potential consequences of continuing to gambling during a specific session. The findings of such proposed research would provide empirical evidence from which to propose responsible gambling recommendations, if any, regarding the availability of uninterrupted continuous gambling online to socially responsible online gambling operators.

6.5.2 Increased participation and increased economic utility of gambling resulting from developments in IT

The findings of Studies 1 and 4 indicate that participants reported to gamble more frequently and for longer periods of time as a result of IT developments. Research has repeatedly demonstrated the positive relationship between gambling accessibility, participation and pathological gambling (Abbott & Volberg, 1996; Grun & McKeigue, 2000). The most frequently postulated reasons for the increase in participation include the reduced costs of gambling (e.g., improved value in available odds and the removal of ancillary costs such as parking) and increased outcome control which is professed to increase profits acquired from gambling. As a result, developments in IT in terms of the provided infrastructure of gambling activities and abilities to increase control gambling outcomes may have indirect implications for pathological gambling, based on increased participation.

Hypothetical Proposition: Gambling frequency will increase in proportion with increases in the economic utility of gambling

This hypothesis is general in nature and could be tested via a multitude of research designs. It may be pertinent to explore the correlational relationship between engagement in gambling-related IT use, participation levels in gambling and levels of pathological gambling via a large scale cross-sectional study. Ideally, data regarding gambling-related IT use could be collected alongside existing items on future national gambling prevalence surveys. Although such research would not provide an understanding of the causal relationship between gambling-related IT use and gambling participation, any positive correlational findings would provide support for the hypothetical proposition. If feasible, participants within the proposed extended version of a national gambling prevalence survey that used IT to increase outcome control in gambling, could be invited to participate in a longitudinal study that assessed participation over the long-term in relation to engagement in IT processes. The objective of such a longitudinal study would be to measure the long-term effect of the potential to achieve increased outcome control through IT processes on frequency of gambling, and identify any other potentially mediating variables.

It is also recommended that the hypothesis is tested experimentally. As discussed previously, the inability to achieve a viable level of ecological validity in laboratory gambling experiments means that the hypothesis may not be able to be tested directly. However, inferences can be made in relation the hypothesis from cognitive experiments within a laboratory setting that measure frequency of risking funds, or items of value, in a decision making activity. The experimental design would consist of a two-level within-groups design, where participants are provided with funds and are required to participate in a game of chance. There would be two experimental conditions; condition 1 would be an activity that has a 0.5 probability of success, whereas condition 2 would have a 0.2 probability of success. Participants are allowed to cease playing the game at any stage and keep any funds that they have remaining or have won. The dependent variable to be measured would be the frequency of money risked in each condition. It is hypothesised that participants will gamble more frequently in the condition with the

highest probability of success. The level of success achieved from taking part in the game of chance would be also measured, to assess its effect on the dependent variable.

It is reasonable to speculate that frequency of gambling participation will be determined to an extent by success or reward acquired. If the individual is successful not only do they have more funds to gamble with in future, but the more motivated they will be to gamble because the behaviour has been positively reinforced. However, the effect of increased economic utility of gambling activities is hypothesised to increase frequency of participation, independent of success, in comparison to activities with a lower probability of success. Put simply, improved probability of success will increase participation in gambling, because in spite of incurred losses the behaviour is still more economically viable.

6.5.3 Increased pre-occupation with increasing outcome control in gambling activities

A repeatedly observed behaviour in each of the studies in this thesis was the use of IT in a capacity to aid participants in increasing outcome control in gambling activities, either by the development of skill for activities with non-random parameters or the acquisition of knowledge that improved the economic utility of activities (e.g. available promotions from online operators). If engagement in such IT-related behaviours predicts financial success in gambling, as suggested by Study 3 that specifically focused on poker gambling, the behaviour will be positively reinforced and therefore will increase the likelihood of the behaviour being repeated in future. Pre-occupation with preparing future gambling has been identified as a risk factor for pathological gambling within the DSM IV criteria used to screen for the disorder (APA, 1994). Effectively, this suggests that excessively engaging in IT processes to increase one's ability to profit from gambling may have implications for pathological gambling. However, it is probable that this is only a risk factor based on the assumption that gambling has a negative economic utility, and that perceptions of control are illusory. Specifically, the argument for the ability to be consistently profitable when poker gambling by completing various IT processes appears logically sound. Fundamentally, it has yet to be proved that

perceptions of outcome control through IT processes are illusory. If evidence shows that spending time manipulating sources of IT does improve outcome control in gambling then pre-occupation with such pursuits would be no more dysfunctional than working excessively, if the objective is to acquire financial remuneration for the gambler's efforts.

It is probable, that pre-occupation with planning future gambling events through completing IT processes also has implications for pathological gambling through more indirect routes. It is evident from the DSM IV criteria for pathological gambling that not all risk factors are based on incurring repeated losses while gambling. Effectively, the proposed concept of theoretically being able to consistently profit from gambling, afforded by developments in IT, provides rational motivation to gamble. Previously, in general, participation in gambling is sustained despite incurring losses over the long-term because individuals receive other sources of reinforcement from engaging in the activity; such as social reinforcement, heightened arousal, narrowed attention, etc. If it is possible to win consistently, while simultaneously receiving non-monetary reinforcement, motivation to gamble is likely to increase significantly.

It is probable that individuals who are consistently profiting from gambling, and receiving non-monetary reinforcement, may have difficulty controlling their participation levels potentially, creating dysfunction in their lives. Gamblers who are consistently profitable, if gambling excessively, still have the propensity to fulfil several other criteria for pathological gambling; such as: needing to increase the amount of money staked, having an inability to reduce or cut down frequency, having withdrawal symptoms when attempting to stop, using gambling to achieve specific dispositional states, concealing the extent of their gambling to significant others, and jeopardising personal relationships or occupational opportunities.

Hypothetical Proposition: Being consistently successful when gambling via completion of IT processes can motivate gambling participation to excessive levels that can cause dysfunction independent of financial success.

It is recommended that to investigate this hypothesis that mental health clinicians need to screen for gambling-related dysfunction in clients' lives that are caused through excessive gambling rather than focusing on dysfunctional symptoms related to incurring repeated monetary losses. It is possible that a new sub-type of pathological gambler disorder will emerge, that is ultimately financially successful yet has a gambling disorder based on the dysfunction caused by an inability to balance persistent gambling with social or occupational commitments. It has yet to be proven empirically that through IT processes one can consistently profit from gambling. Therefore it may be premature to propose the expansion of the pathological gambling aetiology to include financially successful individuals. However, there is sufficient evidence within the thesis to recommend that mental health clinicians screen for dysfunctional symptoms of patients who gamble and are consistently successful.

6.5.4 Use of the emergent construct of IT use in Poker as a flexible schema to justify participation in poker gambling despite incurring repeated losses

As discussed previously, the potential to increase outcome control in poker gambling via IT processes hypothetically increases the economic utility of poker gambling. In addition to completing the prescribed IT processes, the individual must also possess several other key skills and knowledge in order to translate increased outcome control into increased profit. In addition to completing IT processes with efficiency and precision, the poker gambler must have sufficient mathematical ability to understand and calculate algorithms that inform gambling strategy and finally, they must have a stable temperament to resist emotionally charged decisions and remain detached and objective. It is probable that only a small proportion of poker gamblers will possess all of the requisite skills and knowledge to effectively employ ITP processes to be consistently profitable. The implication for pathological gambling is that individuals may believe that they have the requisite knowledge skills when they do not, effectively making the perception of ITP processes a cognitive bias that motivates persistent poker gambling in the face of repeated losses.

Hypothetical Proposition: Individuals who complete ITP behaviours to increase outcome control in poker gambling, will be more resistant to punishment cues in poker gambling than those who do not.

Similar to existing cognitive biases accepted within the current aetiological framework for pathological gambling, the completion of IT behaviours to increase the probability of success in poker gambling, can enable the individual to persist despite incurring repeated losses. Theoretically, they acknowledge that consistent profit from poker is possible, and similar to the hindsight bias (Gilovich, 1983) may contend that if only they concentrate harder in future they will ultimately be rewarded in the long-term. Furthermore, this bias could motivate, particularly novice poker gamblers, to accept incurred losses as part of a learning curve which will eventually be rewarded through developing their ability and profiting long-term. It is reasonable to speculate that this cognitive bias may have implications for individuals to seek credit to fund such a learning period in which they are temporarily losing. Moreover, the completion of ITP behaviours may simply be a demand characteristic that enables individuals to rationalise persistent participation in an activity that is consistently punishing through incurred financial losses. The impact of such punishment is likely to be substantially reduced if it can be rationalised as a short-term sacrifice.

There are several possible research designs to either test or explore the proposed hypothesis. As proposed earlier it is necessary, perhaps through expanding future national gambling prevalence surveys, to measure the relationship between completion of ITP behaviours and acquired profit from poker, in order to determine whether the construct is a cognitive bias or effective in increasing profit.

It is recommended that the most effective method to investigate the relationship between ITP process completion and behavioural resistance to punishment (i.e., incurring monetary loss) is to perform a large scale longitudinal observational study. Participants would be required to collect data daily regarding their frequency of ITP process completion, the frequency of poker gambling, and the financial outcome of poker

gambling. By analysing the relationship between financial loss incurred (i.e., punishment), frequency of ITP process completion and frequency of poker gambling, the effect of the hypothesis that ITP processes can increase outcome control on persistence may emerge. It is hypothesised that participants who engage less in ITP behaviours will gamble less frequently when incurring losses.

6.6 Summary of recommendations

1. To quantitatively analyse the effect of periodically observing data reports of gambling behaviour and success on gambling frequency and expenditure.
2. For online gambling operators to use existing methods of CMC to disseminate responsible gambling information to reduce ignorance of the potential dangers associated with gambling online.
3. For longitudinal observational research to focus on measuring the relationship between completion of IT processes to increase outcome control and the prevalence of monetary-related negative consequences of persistent gambling, determining its implication for reducing the prevalence of several pathological gambling criteria.
4. To experimentally investigate the level of post-gambling satisfaction of decisions made in activities where there are periodic breaks for reflection in comparison to activities devoid of intermissions. The level of success achieved must also be measured to control for the effect of success on satisfaction.
5. To expand the current version of the British Gambling Prevalence Survey to include items relating to IT processes used to increase outcome control in gambling, with the objective of investigating the relationship between IT use in gambling and gambling prevalence.

6. To experimentally measure in a controlled laboratory setting whether participants will risk funds more frequently in a chance activity that has a higher probability of success in comparison to an activity with a lower probability of success.
7. That mental health clinicians, when presented with an individual that has been referred because of a potential gambling disorder, actively screen for symptoms of dysfunction caused by excessive gambling that are not a result of incurred monetary loss.
8. To complete a long-term quantitative research study measuring whether completion of ITP behaviours influences the behavioural relationship between monetary loss and frequency of gambling.

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Appendix 2: Revised IT use in Poker inventory (14 items)

Please indicate the frequency you perform each of these activities by circling a number

Note – CMC refers to the use of computers and technology to communicate including: email, text messages, video phone, web-communities, internet relay chat etc.

1. How often do you use the World Wide Web to get information about playing features of online poker rooms? Never ___

1 2 3 4 5
Very Infrequently Very Frequently

2. How often do you use the World Wide Web to get information about available promotions of online poker rooms? Never ___

1 2 3 4 5
Very Infrequently Very Frequently

3. How often do you use the World Wide Web to learn how to calculate probability of various poker games? Never ___

1 2 3 4 5
Very Infrequently Very Frequently

4. How often do you use the World Wide Web to get information about strategy of various poker games? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

5. How often do you use the World Wide Web to get information about instructional poker tools (e.g. books)? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

6. How often do you use the World Wide Web to get information regarding poker software (e.g. PokerTracker)? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

7. How often do you use the World Wide Web to get information about the rules of various poker games? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

8. How often do you use IT applications to analyse personal poker gambling behaviour patterns? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

9. How often do you use IT applications to help calculate probability when poker gambling? Never ___

1 2 3 4 5

Very Infrequently

Very Frequently

10. How often do you use IT applications to review and evaluate poker profitability/success? Never __

1 2 3 4 5
Very Infrequently Very Frequently

11. How often do you use CMC (i.e. email, web-communities, internet relay chat) share information about online poker-rooms (e.g. credibility, promotions)?

Never __

1 2 3 4 5
Very Infrequently Very Frequently

12. How often do you use CMC to share information about offline poker-rooms (e.g. tournaments, clientele)?

Never __

1 2 3 4 5
Very Infrequently Very Frequently

13. How often do you use CMC to discuss strategy of various poker games?

Never __

1 2 3 4 5
Very Infrequently Very Frequently

14. How often do you use CMC to seek advice from advanced/experienced poker gamblers?

Never __

1 2 3 4 5

Very Infrequently

Very Frequently