An Investigation into the Role of Situational and Structural Characteristics of Fruit Machine Playing

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OUTPUTS FROM THIS THESIS

Publications

Parke, J. & Griffiths, M.D. (2002). Slot machine gamblers – Why are they so hard to study? *Journal of Gambling Issues,* 6. located at : http://www.camh.net/ egambling/issue6/opinion/index.html.

Griffiths, M.D. & Parke, J. (2003). The environmental psychology of gambling. In G. Reith (Ed.), *Gambling: Who wins? Who Loses?* pp. 277-292. New York : Prometheus Books.

Parke, J. & Griffiths, M.D. (2004). Gambling addiction and the evolution of the 'near miss'. *Addiction Theory and Research,* 12, 407-411.

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Parke, J., Griffiths, M.D. & Parke, A. (2007). Positive thinking among slot machine gamblers: A case of maladaptive coping? *International Journal of Mental Health and Addiction,* 5, 39-52.

Parke, J. & Griffiths, M.D. (2007). The structural characteristics of gambling. In G. Smith (Ed.), *Research in Gambling.* In press.

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STATEMENT OF ORIGINALITY

The findings in this thesis are original and independent. The work from this thesis has resulted in six key outputs which are all detailed below and a copy of each has been included in Appendix Four.

1. Parke, J. & Griffiths, M.D. (2002). Slot machine gamblers – Why are they so hard to study? *Journal of Gambling Issues,* 6. located at : http://www.camh.net/ egambling/issue6/opinion/index.html.

2. Griffiths, M.D. & Parke, J. (2003). The environmental psychology of gambling. In G. Reith (Ed.), *Gambling: Who wins? Who Loses?* pp. 277-292. New York : Prometheus Books.

3. Parke, J. & Griffiths, M.D. (2004). Gambling addiction and the evolution of the 'near miss'. *Addiction Theory and Research,* 12 (5). 407-411.

4. Griffiths, M.D. & Parke, J. (2005). The psychology of music in gambling environments: an observational research note. *Journal of Gambling Issues,* 13. located at : http://www.camh.net/egambling/archive/pdf/JGI-Issue13/JGI-Issue13-griffiths_2.pdf

5. Parke, J., Griffiths, M.D. (2006). The psychology of the fruit machine: the role of structural characteristics revisited. *International Journal of Mental Health and Addiction,* 4, 151-179.

6. Parke, J. & Griffiths, M.D. (2007). The structural characteristics of gambling. In G. Smith (Ed.), *Research in Gambling.* In press.

Although work and ideas for these papers were collaborative efforts by Parke and Griffiths, only the original and independent ideas of Parke have been claimed in the thesis. The works were originally written by Parke for the in partial fulfillment of the requirements of The Nottingham Trent University for the degree of Doctor of Philosophy and Griffiths made a contribution where appropriate for the purposes of publication. All other material has either been referenced or omitted. In addition, Griffiths has performed a role of general guidance and feedback consistent with expectations of PhD supervisor and director of studies.

6. Parke, J., Griffiths, M.D. & Parke, A. (2007). Positive thinking among slot machine gamblers: A case of maladaptive coping? *International Journal of Mental Health and Addiction,* 5, 39-52.

The work and ideas for this paper was <u>the original and independent work of Jonathan Parke which was</u> originally written in partial fulfillment of the requirements of The Nottingham Trent University for the degree of Doctor of Philosophy. Griffiths has performed a role of general guidance and feedback consistent with expectations of PhD supervisor and director of studies. Based on this chapter, the work was then submitted for publication. Recognition of the contribution of Adrian Parke as third author acknowledges his small contribution in peer debriefing as a researcher who also engaged in participant observation in a fruit machine environment with aim of investigating aggression and gambling. His role was to consider the findings and express any reason to question their validity given his own experience as a change attendant. Adrian Parke suggested no changes to the original work.

ABSTRACT

In the UK, 47% of all calls to GamCare (a primary source of counselling and advice for problem gamblers in the UK) were from fruit machine or fixed odds betting terminal players (Gamcare, 2005). Despite their popularity, there is a distinct lack of research investigating the psychology of fruit machine gambling in the UK, particularly in respect to adult gambling. Furthermore, little attention has been given the structural determinants of machine gambling in relation to player experience and appeal. This thesis explores the structural and situational factors of fruit machine gambling in the United Kingdom incorporating a range of demographics, sites and locations. The principal methods employed include participant observation, surveys, interviews and personal communications. Fruit machine gamblers reported high levels of pathological gambling and a high frequency of visits to gambling environments although over a third of the sample claimed to make a profit on a regular basis. Post-gambling cognitions were identified among fruit machine players in the form of positive thinking used as a coping strategy after losing. Unlike in other fields of health, in gambling such cognitive activity after losing is considered counterproductive to life adjustment. Most importantly, several new and developed situational and structural characteristics of fruit machine gambling were recorded which have several implications for player behaviour. 'Money-In-Money-Out (MIMO) ratio' and 'Skimming' were identified as two aspects critical in fruit machine play which have implications for the appeal and addictive nature of fruit machines. A typology was also created based on how individuals interact with such design features offering clear criteria for membership and suggesting valid implications for the understanding and management of machine gambling. Implications of all findings are considered in terms of player behaviour, and the prevention and treatment of pathological gambling. Recommendations for future research are discussed.

CHAPTER 1
GAMBLING BEHAVIOUR:
A REVIEW OF THE LITERATURE

1.1 The Nature of Pathological Gambling

1.1.1. History

Historians agree that gambling was prevalent in many diverse ancient cultures, and evidence suggests that the behaviour emerged independently across such cultures. However, providing a detailed account of the origins of gambling and how it has evolved throughout time is virtually impossible, as information has been "lost in obscurity" (Lesieur, 1985). Historians have traced gambling behaviour as far back as 5000 years ago, when ancient Egyptians used bones as primitive forms of dice, discovering writing on a stone tablet with specific reference to gambling in the Pyramid of Cheops (Jones, 1973).

Individuals have often demonstrated an inability to exercise control while gambling. This has been identified in Greek and Roman history, where Emperors such as Claudius gave into uncontrollable urges to wager excessive amounts while claiming that such action was in the pursuit of leisure (Dickerson, 1984). Secondly, this behaviour invariably had far reaching consequences for risk-takers and their social environment. For example, precautions were taken during the crusades, where out of fear that soldiers would lose control, dice playing games had been outlawed (Fleming, 1978). There is evidence to show that King Henry VIII of England prohibited gambling, because his soldiers were spending more time gambling than performing drills or improving marksmanship.

According to Reith (1999), the explosion in gambling, which is still persistent today, began in the mid 17th century. Gambling primarily consisted of private wagers on the outcome of various events, often including personal achievements, however sporting wagers were more prevalent (Chinn, 1991). Reith (1999) suggests that in Britain, the disintegration of traditional aristocratic and working class leisure activities during the Industrial Revolution was responsible for a marked shift in gambling attitudes. The Betting Act of 1853 was introduced, which prohibited lotteries and 'betting houses'. The

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main components of the act were in place for over one hundred years until the Betting and Gaming Act (1960) fully legalized betting shops. Chinn (1991) indicates that despite the Betting Act (1853), horse racing was resurgent, and by the end of the 19th century became the primary form of gambling in the UK. Chinn believes its growth in popularity was a reaction to better organization within the horse racing communities, working class families having more disposable income, and the introduction of the sporting press which provided gamblers with race information, odds and results. Furthermore, the improved organization of the English Football Association led to the popularity of weekly football pools with over ten million people in the UK playing every week (Clapson, 1992).

The advent of self-help groups such as Gamblers Anonymous in the late 1950s created a new dimension of research, where a more personal focus may have taken attention away from the economic and social explanations, to looking at how individual differences may provide some clarification on the pathogenesis of problem or excessive gambling. Implicit in the Gambler's Anonymous treatment program is the recognition that members have to achieve serious personal and spiritual changes before recovery (Gamblers Anonymous, 1997). Members are given 20 questions that precede membership to the organization, which were the first to delineate the boundaries between social and pathological gambling. Arguably, this helped form the basis for modern day classification systems like that of the Diagnostic and Statistical Manual (DSM-IV [APA, 1994]) which provides us with a contemporary understanding and diagnosis of pathological gambling.

Dixon (1991) suggests that society is never ambivalent towards gambling, and Reith (1999) dichotomises societal attitudes into either condonement or opposition. With current deregulation a hot topic in the UK, based on the recommendations of the Gambling Review Body (2001), gambling is undeniably undergoing a period of what Reith (1999) would describe as having a 'tradition of license', where gambling is perceived as a leisure activity. This 'tradition of license' can be applied internationally; "the last decade has witnessed an unprecedented deregulation of gambling in numerous jurisdictions throughout the world" (Fisher and Griffiths, 1995, p.239). Bellringer (1999) comments on how gambling the UK has transformed from an activity that once had to be

sought out by those who wanted to partake, into an activity available on every high street. A report indicating the amount wagered in the UK in 1998 showed that £8.4 billion was spent on horse racing, £6.3 billion was spent on slot machine gambling and £5.3 billion being wagered on the National Lottery (KPMG, 2000), which serves to show the huge amounts of money now involved in various forms of gambling.

1.1.2. Definition

Devereux (1979) maintained that contemporary gambling could be described as "wagering money or other personal resources on the outcomes of situations determined by chance". This definition of gambling pertaining to adopting risk in the pursuit of achieving rewards is largely accurate; arguably though there is scope to suggest an element of skill. Certain gambling activities permit manipulation of the outcome such as poker. Moreover, it is conceivable that application of sporting knowledge to selections in gambling can be referred to as being skill-based. Critique of Devereux' attempt at a universal definition of gambling highlights the need to define gambling by the structural components of each activity.

Perkins (1958) was among to first to classify the gambling forms (See Table 1.1). it must be noted that speculation has not been unanimously accepted as a bona fide form of gambling and that some theorists reject it on the grounds that it is structurally different, due to the fact that gambling is a secondary activity, based on the performance of shares, whereas in other forms, gambling is the primary purpose of leisure. There is also a perceived difference in these forms of gambling as speculation is afforded higher status than the other forms.

Table 1.1 Perkins' Classification of Gambling Activities

Category	Explanation	Example
Gaming	*exchange of money in a game*	slot machine
Betting	*staking money on a future event*	sports betting
Lottery	*distribution of money by lot*	National lottery
Speculation	*gambling on the stock market*	buying and selling shares

Part One: Introduction

'Pathological', 'compulsive' and 'problem' are terms which have all been used interchangeably when describing excessive and persistent gambling that gives rise to social, psychological and economic difficulties. Intuitively, this lack of uniformity in the definition of a gambling pathology creates hindrance when aiming to synthesize the growing body of research which uses such nomenclature intermittently.

Moran (1970) indicates that the term 'compulsive' gambling is essentially a misnomer as it proposes 'ego-dystonic' behaviour. Put simply, such a definition does not encompass scope for the pathological gambler to be reluctant to cease, despite the negative consequences incurred. The term 'pathological' first emerged in the Diagnostic and Statistical Manual -III (American Psychiatric Association, 1980), and is justified as the appropriate label for the pathology regarding precision and also the omittance of any pejorative connotations (Lesieur & Rosenthal, 1991). A trend has developed to differentiate the severity of gambling pathology based on the number of symptoms the individual has from the DSM-IV (APA, 1994) criteria for pathological gambling. This leads to the emergence of an intermediate term between pathological and social, namely 'problem' gambling. Blaszczynski, Steel, and McConaghy (1997) describe problem gambling as a repeated pattern of behaviour that leads to the emergence of actual problems beyond mere financial strain, infringing on the social and vocational functioning of the individual.

Walker (1998) criticises the term 'problem gambling' because of the probable false positives to arise from it. With 'problem gambling' being determined by harm caused, opportunity is created for subjective interpretation. Walker (1998) provides the example of an individual who gambles £1 per week, but experiences great marital conflict because the relatively harmless wager is directly opposed to the spouse's fundamentalist religious beliefs.

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1.1.3. DSM-IV

The medicalisation of pathological or excessive gambling as a disorder commenced when it was considered as a clinical disorder and therefore included in the DSM-III (1980) as the emphasis of the manual became systematic diagnosis. In the last twenty years since pathological gambling's inclusion in the manual, there have been significant amendments to the criteria used for classification. A compromise was reached between the DSM-III and the DSM-III-R to bring the present criteria into existence as conceived from a critical analysis originating from dissatisfied treatment professionals (Rosenthal, 1989). The shift from DSM-III to the criteria included in DSM-IV is reflective of the acknowledgement of the similarities between pathological gambling and other addictive disorders, eventually culminating in pathological gambling being classified as an impulse control disorder. The final criteria represents ten dimensions of pathological gambling including: 1) preoccupation 2) progression, 3) tolerance, 4) withdrawal and loss of control, 5) escape, 6) chasing, 7) deception 8) crime 9) disruption of personal life and finally 10) financial bailout added in the fourth edition (Lesieur & Rosenthal, 1991). The diagnostic tool produced is presented in Table 1.2.

TABLE 1.2: DSM-IV criteria for pathological gambling

Five or more of the following criteria indicates pathological gambling:
As involvement in gambling progressed the individual:

1	became more and more preoccupied with reliving past gambling experiences, studying a gambling system, planning the next gambling venture, or thinking of ways to get money
2	needed to gamble with more and more money in order to achieve the desired excitement
3	made repeated unsuccessful attempts to control, cut back or stop gambling
4	became restless or irritable when attempting to cut down or stop gambling
5	gambled as a way of escaping problems or intolerable feeling states
6	after losing money gambling, would often return another day to get even (chasing one's loses)
7	lied to family, employer or therapist to protect or conceal the extent of involvement with gambling
8	committed illegal acts such as forgery, fraud, theft or embezzlement, in order to finance gambling
9	jeopardized or lost a significant relationship, marriage, education, job or career because of compulsive gambling
10	needed another individual to provide money to relieve a desperate financial situation produced by gambling (a "bailout")

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Similar to the lack of agreement regarding a definition of the concept of pathological gambling, there is also a lack of agreement regarding how many of the DSM IV criteria the individual needs to meet to be diagnosed as a pathological gambler. The established cut-off point was proposed to be five items according to the American Psychological Association (1994), and is widely accepted by most clinicians. However, Lesieur and Rosenthal (1998) contend that four items is a valid cut-off point, based on their discriminant analysis. Volberg (1997) performed an extensive psychometric evaluation of the diagnostic tool and concluded that it had high internal reliability, discriminant validity and construct validity.

1.1.4. Typologies of Gambling

Creating a dichotomy of pathological and non-pathological gamblers would not appear accurately to represent the true picture encompassing all gamblers. Non-pathological gamblers are often referred to as social gamblers. Sproston et al (2000) revealed that in the UK, in a period of 12 months, 72% of the population aged 16 years and over participated in a gambling activity. It was revealed that only 0.8% of the population were deemed to suffer from pathological gambling. Deductive reasoning suggests that the remaining 71.3% gamble without experiencing a range of persistent negative effects. Social gamblers exhibit none or very few of the criteria outlined in the DSM-IV. However, as Blaszczynski et al (1997) contend, there is an interim gambling classification; those who despite not adhering to the necessary five items on the DSM IV, still experience considerable disruption to their vocational, marital and social functioning from gambling. It is understood that a pathological gambler will initially be classified as a problem gambler, before the pathology has fully developed.

There are no available estimates concerning the prevalance of professional gambling. Professionals rely on forms of gambling that involve the most skill and the estimated 4% profit margin requires frequent betting in large amounts in order to be able to make a living (Dickerson, 1984). Certain intellectual abilities are required, including mathematical ability, self-discipline and good cognitive functioning in areas such as memory and concentration (Kusyszyn, 1972).

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More specific typologies of gambling behaviour exist, however, most include considerable overlap across classification, questioning the predictive value of such typologies. For example, Moran (1970) identifies five sub-types of gambler, based on a series of fifty interviews with pathological gamblers who were receiving treatment. From his clinical work, he described the following varieties; a) subcultural, b) neurotic, c) impulsive, d) psychopathic and e) symptomatic. Griffiths (1995) argues that while these divisions can be useful for some treatment approaches, there are no apparent boundaries between varieties and evidence suggests that patients often display gambling behaviour from a variety of the subtypes. In addition to these sub-types, based on clinical evidence and experience researchers have often identified similarities in the development of pathological gambling amongst players, which will be discussed below.

1.1.5. Career Phases

Custer and Milt (1985) proposed the three developmental stages of pathological gambling, described as the winning phase, the losing phase and the desperation phase. These stages have since been revised based on further clinical findings (Rosenthal, 1989; Lesieur & Rosenthal, 1991) and amended to accommodate the research on the careers of female pathological gamblers.

1.1.5.1. The Winning Phase

During the winning phase, the new gambler is introduced to arousal, increased self-esteem and financial rewards through experiencing a sequence of wins. The winning phase is usually characterised by a substantial win, which Lesieur and Rosenthal (1991) believe is equivalent to approximately one year's salary. The early experienced success in gambling gives the new gambler an unrealistic view of gambling creating cognitive distortions, which may lead the gambler to develop a sense of false optimism that they have the skills and ability to make money where others cannot.

When assessing the careers of female pathological gamblers, Lesieur (1988), found that over half of his sample reported that they were initially drawn towards gambling because it was a way of escaping the negative issues in their lives. This finding gave rise to a

dichotomous classification for motivation to gamble; the action seeker and escape seeker (Lesieur, 1988). This gambling activity produced what Jacobs (1988) referred to as dissociative states in many gamblers. Lesieur and Rosenthal (1991) comment that such states of dissociation, combined with the euphoria of winning, are very reinforcing for the new gambler. The laws of probability dictate that such periods of good fortune do not last, and the novice gambler accounts for the experienced losing streak by external attributions, such as bad luck, poor conditions or misleading information (Rosecrance, 1985). The gambler becomes obsessed with chasing their losses to escape unanticipated negative affectivity, as these incurred losses decrease the gamblers' self esteem.

1.1.5.2. The Losing Phase

Custer and Milt suggest that the transition from the winning to the losing phase marks a significant milestone in the development of the pathological gambler. It signifies the beginning of a downward financial spiral, perpetuated by the need to regain money lost from previous gambling sessions. Gambling with the aim to win in this stage is considered to be instrumental in repairing their self-esteem and more importantly their financial situation. Careers are seen merely as ways of financing gambling with the pathological gambler showing decreasing amounts of professionalism in work. Money allocated for bills and family provision is seized to finance gambling and therefore a need to be deceitful emerges to hide the extent of gambling involvement. As a result of such deception and preoccupation, familial relationships deteriorate significantly.

Financial assistance from family and friends serve to aggravate rather ameliorate the pathology. This 'bailout' is basically a signal reinforcing their behaviour and is ultimately self-defeating because it creates "an upsurge in omnipotence," (p.14 Lesieur & Rosenthal, 1991). As the financial bailout removes the projected punishment from the abnormal behaviour, the pathology progresses with the gambler showing less self-control when gambling, believing they will be able to reprise any incurred losses just as before.

1.1.5.3. Desperation Phase

In this stage, panic overrides whatever remaining logic that is left, as they rationalise criminal activity (e.g.fraud, theft etc.) as temporary but necessary factor to return to normality. The advent of the 'overdue' win is believed to be enough to pay back more than what was usurped by gambling. With increasing preoccupation with regaining losses, the pathological gambler experiences deterioration in mental and physical health. Tension causes short-temperedness and potentially abusive tendencies to family members. The gambler experiences irregular sleeping patterns and poor nutrition. Rosenthal (1989) suggests that in the desperation stage, many pathological gamblers experience suicidal ideation or fantasise about adopting a new identity. As promises of future abstinence lose value, family or even the law may force them into some kind treatment. With this in mind, it is not surprising that hospitalization is inevitable in some cases.

1.1.5.4. Hopelessness Phase

Rosenthal (1989) crucially added this further 'giving up' phase, attempting to explain gambling persistence in the face such high costs. With treatment having been undertaken and failed, abnormal gambling behaviour continues. This final phase is characterised by the recognition that the 'big win' is not around the corner, and moreover, even if it is, losses will never be accounted for. Such a disposition is succinctly summarized by Lesieur and Rosenthal (1991) where

> "like laboratory animals with electrodes implanted in their pleasure centre,
> they gamble to the point of exhaustion" (pp. 14-15).

1.1.5.5. Mediating Factors

Researchers have identified several factors that are contested to mediate the course of the aforementioned phases. (See Table 1.3). Despite offering little insight into the selective nature of pathological gambling, such a description of the development of pathological gambling can be applied as a tool in treatment to gauge the state of progression of the gambler's pathology. Additionally, this descriptive breakdown of gambling pathology into distinct phases may instigate further research in this area.

Table 1.3 Factors affecting phases in the development of pathological gambling

Factor	Description	Researcher
A big win	Intrinsic	Custer (1982)
Chasing	Intrinsic	Lesieur (1979; 1984)
Bailout	Intrinsic	Custer (1982)
Going on 'tilt'	Intrinsic	Browne (1989)
Alcohol/drugs	Extrinsic	Lesieur and Rosenthal (1991)
A death	Extrinsic	Lesieur and Rosenthal (1991)
Divorce	Extrinsic	Lesieur and Rosenthal (1991)
Birth of a child	Extrinsic	Lesieur and Rosenthal (1991)
Physical illness	Extrinsic	Lesieur and Rosenthal (1991)
Career disappointment	Extrinsic	Lesieur and Rosenthal (1991)
Success	Extrinsic	Bolen and Boyd (1968)
Relationship difficulties	Extrinsic	Lesieur and Blume (1989)

Source: Lesieur and Rosenthal, 1991

1.2. Who Gambles?

1.2.1. Prevalence of Problem Gambling

The British Gambling Prevalence Survey (Sproston, Erens and Orford, 2000) was the first comprehensive research to be undertaken regarding national gambling behaviour and prevalence. In the UK, over the past 12 months, 1.3% of men over the age of 16 years have been classified as problem gamblers according to the South Oaks Gambling Screen (SOGS, Lesieur and Blume, 1987). Using the same screening instrument prevalence was nearly three times lower for women at a rate of just 0.5%. This translates into 0.8% of the overall population being classified as pathological gamblers.

By comparing UK prevalence rates across five other countries, using a similar measurement tool, these figures are put into perspective (See Table 1.4). It is evident that the UK has a relatively low prevalence of pathological gambling in comparison to the US, New Zealand and Spain. In fact the Australian prevalence rate was approximately three times greater than in the UK. The only country enjoying a lower prevalence rate was Sweden with a level of 0.6%.

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Table 1.4 Summary of international problem gambling prevalence

Country	%
Sweden (1999)	0.6
Britain (2000)	0.8
United States (Meta Analysis 1977-1997)	1.1
New Zealand (1992)	1.2
Spain (1996)	1.4
Australia (1999)	2.3

Source: Sproston et al. 2000

The study replicated using the DSM-IV criteria, provided similar results albeit slightly lower with an overall rate of about 0.6%. Once more, the study recorded males (0.9%) experiencing problem gambling three times as much as females (0.3%). Replicating the study increased the validity of findings because both the DSM IV criteria and the SOGS carry scepticism about their psychometric properties outside the clinical setting (National Gambling Impact Study Commission, 1999).

1.2.2. Prevalence of Gambling

In defining gambling, it has been previously noted that individuals can gamble without experiencing any significant disruption to any aspects of their lives. Social gamblers make up the overwhelming majority of the UK's gambling contingent with approximately three quarters of the British population having participated at least once in a gambling activity of some description over the past 12 months, and 53% in the past week. Comparisons among other countries resemble a similar pattern to the problem gambling population. Participation rates in Sweden (Rönnberg, Volberg, Abbott, et al, 1999) and in New Zealand (Reid & Searle, 1996) were both documented to be approximately 25% higher than UK gambling participation rates. The only country to observe a lower gambling participation rate was the US (63%).

As social gambling is often characterised by its low stakes and infrequent visits, it is not surprising to find that participation in the National Lottery is overwhelmingly the most popular form of gambling. As shown by Table 1.5, 90% of the gambling population had bought a National Lottery ticket in the past year.

Table 1.5 Gambling Activities in the past 12 months in the United Kingdom

Type of Gambling Activity	Whole Population %	Past Year Gamblers %
National Lottery	65	90
Another Lottery	8	11
Scratchcards	22	30
Football Pools	9	12
Bingo	7	10
Slot Machines	14	19
Horse Races	13	18
Dog Races	4	5
Other Betting with a Bookmaker	3	4
Table Casino Games	3	4
Private Bets	11	16
Any Gambling Activity in the Past 12 months	72	100

Source: Sproston et al. (2000)

National Lottery scratch-cards are the second most popular wager, with 30% of past year gamblers buying at least one in the past twelve months. Gaming machines and pari-mutuel betting are shown to be the most popular of the remaining types with participation rates of nearly 20%. The British Gambling Prevalence Survey (Sproston et al, 2000) does however show that 'past week gamblers' were more likely to make pari-mutuel wagers or gamble on slot machines, than 'past year gamblers'.

Researchers conceive that gambling involvement may operate on a spectrum with those who abstain or place isolated bets at one end and those partaking in heavy, multi-dimensional gambling at the other. The British Gambling Prevalence Survey (Sproston et al, 2000) distinguishes four broad groups;

      a) Non-gamblers - 28% (no interest)

      b) Lottery and/or Scratchcards - 33% (minimal interest)

      c) Lottery and/or Scratchcards with one or two others - 32% (moderate interest)

      d) Multiple and wide-ranging gambling preferences - 7% (multiple interest)

1.2.3 Populations at Risk

There are certain sub-populations that have been identified as being most 'at risk' to developing a gambling disorder; although admittedly there is a paucity of research regarding this topic. Adolescence has received a substantial amount of attention but

research about other at risk groups is, to date, inconclusive. In the US, the National Research Council (1999) has carried out a meta-analysis of studies placing particular emphasis on establishing a research literature regarding 'at risk' groups. These 'at risk' groups are identified below.

1.2.3.1. Men

Recent prevalence rates in the UK have made precise conclusions concerning the male-female ratio of problem gamblers. Using both the DSM-IV classification and the SOGS, it has already been noted that three times as many men are pathological gamblers when compared to women. It is widely accepted that certain forms of gambling appeal more to a particular sex. For example, women seem to be over-represented in gambling activities such as bingo. The British Gambling Prevalence Survey (Sproston et al, 2000) reports that women are twice as likely to play bingo and are seen to share comparable gambling behaviour with males when playing the National Lottery.

1.2.3.2. Low Income Groups

Participation in gambling seems to increase with income until the £30,000 threshold, and then rates only slightly decrease (Sproston et al, 2000). When this data is 'weighted' it is evident that the lowest income group gambled the most in terms of amount staked in relation to proportion of income. Similarly in the US, the National Research Council (1999) identified an over-representation of low-income individuals in problem and pathological gambling from their meta-analysis of 17 studies. Specifically, the rate of pathological gambling for those earning less than $25,000 per annum was higher (a median rate of 33% compared to 27% of the non-problem gamblers).

Table 1.6 Participation in gambling by education in the last 12 months (%)

Type of Gambling Activity	Highest Educational qualification				
	Degree or higher	Professional below degree	A-levels	GCSE	None
National Lottery	57	68	63	69	66
Another Lottery	6	8	8	9	8
Scratchcards	17	21	29	29	18
Football Pools	6	8	7	8	11
Bingo	3	5	6	8	11
Slot Machines	12	14	2	22	8
Horse Races	14	13	18	14	11
Dog Races	4	4	7	4	3
Other Betting with a Bookmaker	3	2	6	3	2
Table Casino Games	5	3	5	2	1
Private Bets	15	11	17	15	6
Any Gambling Activity in the Past 12 months	67	73	72	76	71
Mean Number fo Gambling Activities	1.4	1.6	1.9	1.8	1.6

Source: Sproston et al., 2000

1.2.3.3. Education and Intelligence

In the UK pathological gamblers are likely to leave school with fewer qualifications, with the level of qualifications appearing to be inversely related to gambling participation and moreover the number of gambling activities engaged in (See Table 1.6). Only 67% of those educated to degree level had participated in some kind of gambling activity over the past twelve months, compared with as many as 76% of participants with a General Certificate of Secondary Education (GCSE) standard education. Supporting evidence can also be found from the US. The National Research Council (1999) also concluded that those who attained a lower level of education were more at risk for developing a gambling disorder. Significantly more pathological gamblers left school at 18 years or younger compared to those who pursued a higher level of education.

1.2.3.4 Ethnic Minorities

Evidence from the National Research Council (1999) strongly suggests that ethnic minorities are significantly more likely to become problem gamblers than those from a Caucasian background. In review of the 17 studies regarding ethnicity, there was a

greater percentage of ethnic minorities that were problem and pathological gamblers than non-problem gamblers. Median percentage rates showed that ethnic minorities (31%) were more than twice as likely to be problem gamblers than Caucasians (15%).

1.2.3.5 Adolescents

Research in the US has suggested that adolescents are at particular risk of developing gambling disorders (Derevensky, Gupta and Winters, 2003). This may seem counterintuitive because in most cases it is illegal for adolescents to gamble under age. However, Jacobs, Marston, Singer, et al (1989) reveals that in the US, adolescents easily circumvent age any restrictions with use of fake age verifications. Rosenstein and Reutter (1980) examined the responses of eighty male and eighty-four female high school students in their senior year, focusing on attitudes and participation in gambling activities. Involvement in gambling was lower overall for the students than for adults, yet 61% of males and 38% of females had experienced gambling. Furthermore, more than 20% of males reported to have lost over $100 in one session. Lesieur and Klein (1987) found as much as 91% of high school students questioned revealed that they have gambled at some point in their lifetime (82% of which gambling in the past year and 36% gambling as recently as in the last week). Correlations were found with: a) gender (with nearly five times as many males were pathological gamblers), b) parental gambling problems, c) poor grade average, d) frequency and duration of gambling, and e) social class.

As Orford, Sproston, Erens et al (2003) point out, gambling in the UK is significantly more accessible to youths, particularly slot machine gambling. Griffiths (1990) provides evidence that in the UK many current pathological gamblers admit to playing slot machines while being 11 years old, with many claiming they were addicted to gambling by 13 years old. The British Gambling Prevalence Survey (Sproston et al, 2000) identified a strong, negative relationship between age and prevalence of problem gamblers. The age sub-group 16-24 years had the highest prevalence of pathological gambling by as outlined in both the DSM-IV and the SOGS. The rate of 1.7% as diagnosed by the DSM-IV was more than twice that of any other age group and is likely

to have been four times the rate of all other age groups combined (See Table 1.7). It is interesting to note that while problem gambling rates are highest in the lowest age category, this certainly is not the case for participation in gambling in general. In fact participation in the 16-24 year age group was the second lowest category over all. This is a noteworthy observation since it demonstrates that levels of problem gambling are not simply proportional to overall rates of participation.

Table 1.7 Problem gambling prevalence across age groups

Age Group	SOGS Problem Gamblers (%)	DSM IV Problem Gamblers (%)	Participation in any gambling activity in the past year (%)
16 - 24	1.7	1.7	66
25 - 34	1.2	0.7	78
35 - 44	0.8	0.6	77
45 - 54	0.7	0.4	78
55 - 64	0.5	0.2	74
Over 65	0.1	0.1	59

Source: Sproston et al 2000

Shaffer and Hall (1996) performed a meta-analysis on studies looking at pathological gambling prevalence in North America, finding that between 4.4% and 7.4% of adolescents aged between 13 and 20 years old met the criteria for pathological gambling. The National Research Council (1999) found similar a similar prevalence rate (6.7%), and more recently Derevensky and Gupta (2000) found that a median range of 5% of high school students was diagnosed as problem gamblers.

1.3. Causes of Pathological Gambling

The following section describes the potential intrinsic determinants of gambling behaviour. Ecological factors such as the impact of environment, site and game design will be reviewed in chapter 2.

1.3.1. Neurochemical and Genetic Causes

Orford et al (2003) admits that neurochemical explanations of pathological gambling behaviour are in their infancy, and that there is an inability at present to identify the specific biological systems believed to be involved in development and maintenance of

the pathology. Orford et al (2003) also believes that research to be produced in future will be much more influential by benefiting from improvements in methodological tools available, namely the use of Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI). Blaszczynski and Nower (2002) outline that preliminary evidence which currently exists highlighting serotonin, norepinephrine and dopamine as the integral factors in impulsivity and mood control.

1.3.1.1 Noradrenaline

Roy, Adinoff, Roehrich. et al (1988) and Roy, DeJong, Ferraro, et al (1989) reported that pathological gamblers had greater levels of norepiniphrine, and higher centrally produced fraction of cerebrospinal fluid levels of 3-methoxy-4-hydroxyphenylgycol (implicated in impulsive behaviour) than control subjects. Such findings suggest that this irregular functioning in noradrenergic systems may itself be a risk factor. Zuckerman (1979; 1984) suggested that such a system is connected to sensation seeking, a trait he readily puts forward as significant in the development of pathological gambling.

1.3.1.2 Serotonergic (5-HT; hydroxyl triptamine) Neurotransmitter System

Evidence for the involvement of serotonin has been varied. Several studies have found low serotonin levels to have associations with mood, impulsivity and other disorders (Commings, Rosenthal, Lesieur et al, 1994). When considering the high co-morbidity rates between such disorders and pathological gambling, through deductive reasoning it is probable that low serotonin is a gambling risk factor.

Studies show pathological gamblers have lower platelet monoamine oxidase (MAO) levels when compared to non-gamblers (Carrasco Saiz-Ruiz, Hollander et al., 1994; Blanco, Orensanz-Munoz, Blanco-Jerez, & Suiz-Ruiz, 1996). Monoamine oxidase is a peripheral marker of the 5-HT function. However, such conclusions must be made with caution as similar patterns exist in individuals who smoke, and the results were not controlled for the high level of comorbidity between smoking and pathological gambling. Moreover, conflicting research findings that have failed to make such an association have also been reported (Roy et al., 1988; 1989; Bergh, Eklund, Sodersten, & Nordin, 1997).

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1.3.1.3 Plasma Endorphin Levels

Endorphins, also referred to as endogenous opioids, are peptides which simulate the effect of opiates in the body. Blaszczynski, Winter and McConaghy, (1986) suggest that pathological gamblers whose primary gambling activity is pari-mutuel betting have lower beta-endorphin levels than controls. Interestingly though, this finding was not replicated in the sample of 'video poker' pathological gamblers. Blaszczynski et al (1986) argued that such an observation reflected alternative motivations for gambling. It was postulated that pari-mutuel betting served to elevate mood (by raising the endorphins) in contrast to video poker gambling which is related to creating dissociative states. This interpretation appears to gain support from Lesieur (1988) who proposed that before pathological gamblers converge on a behavioural pattern there are two distinct motivations for gambling: arousal increase (those seeking action) and dissociation creation (those seeking escape from negative affectivity).

Griffiths (1995) responds by highlighting the implication of this interpretation; if opioids induce pathological gambling, it is logical to assume that their antagonists could be utilised in pharmacological treatment. Kim (1998) lends some support to this assertion by revealing that naltrexone (an opioid antagonist) reduced urge-related symptoms and decreases problematic behaviours in patients suffering from impulse control disorder.

1.3.1.4 Hemisphere Dysregulation

Goldstein and colleagues reported that lower levels of hemisphere differentiation in the brain were found in Gambler's Anonymous (G.A.) members when compared to control groups (Goldstein, Manowitz, Nora et al, 1985; Goldstein & Carlton, 1988; Carlton & Goldstein, 1987). Deficits in electroencephelogram (EEG) activation were found when completing simple verbal exercises compared to non-verbal exercises. This suggests a propensity to engage in behaviour repetitively and a difficulty in disengaging with behaviours, therefore having obvious implications for continuous gambling. This finding provides a link between attention deficit disorder (ADD) and pathological gambling. since comparable patterns were found in children with ADD. Support for this association

emerges from research indicating that pathological gamblers showed more signs of ADD than control subjects (Carlton and Goldstein, 1987; Carlton, Manowitz, McBride et al., 1987).

1.3.1.5 Physiological Arousal

Boyd (1982) claimed that pathological gamblers were addicted to the arousal experienced when gambling. Earlier studies that did not find supporting empirical data for this hypothesis (Rule & Fischer, 1970; Rule, Nutter & Fischer, 1971), were performed in laboratory conditions and lacked ecological validity. Anderson and Brown (1984) reported that in a gambling environment individuals did experience an increase in heart rates, and that this finding was not replicated in the laboratory. This has also been replicated in other ecologically valid settings (e.g. Griffiths, 1993; Hodgins, 2003). Brown (1987) maintained that individuals found arousal more reinforcing than the possibility of winning money.

1.3.1.6 Dopaminergic Dysfunction

Commings, Rosenthal, Lesiuer et al (1994) reported that a variant of the human dopamine D_2 receptor gene (DRD_2) was associated with addictive disorders and impulsivity disorders (e.g. pathological gambling and substance abuse). Genetic researchers have postulated that similar genes are responsible for upsetting biochemical reward mechanisms, thereby helping to explain the irrational behaviour often exhibited by pathological gamblers. This hypothesis was directly tested among 171 pathological gamblers, and a correlation was found between the severity of pathological gambling and the presence D_2A1 allele gene type (Commings et al., 1994). The National Research Council (1999) challenges the validity of such interpretation by suggesting that self-report measures used to diagnose pathological gamblers may not be entirely reliable. Furthermore, the NRC (1999) contend that more detailed interpretation is required, specifying the predictive value of the aforementioned findings. However, Blum, Sheridan, Wood et al (1996) claim that a lack of D_2 receptors motivate individuals to seek out rewarding, pleasurable activities, and ultimately is a strong risk factor for impulsive and compulsive behaviours. This leads Blaszczynski and Nower (2002) to suggest that

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D_2 agonists such as bromocryptine, would be an effective treatment for pathological gamblers who genetically predisposed to have few D_2 receptors.

1.3.1.7 Twin Studies

Convincing evidence from twin studies demonstrates the importance of hereditary factors. In a study involving 3,359 sets of twins, Eisen, Lin, Lyons et al (1998) found that genetic factors accounted for between 46%-55% of variance in pathological gambling items, depending on which measure was used. Winters and Rich (1998) examined gender and type of gambling involvement in relation to genetic influence. In their analysis of 155 pairs of adult twins they concluded that heritability varies across gender, as only a genetic component was recorded for males. Furthermore, they conclude that such findings are only relevant for "high action" forms of gambling.

Orford (2003) emphasises that such genetic studies are not providing evidence of a specific pathological gambling genetic predisposition, but rather a generic propensity for an impulse control disorder. Moreover, it is unlikely that only one genetic factor is responsible, rather a genetic propensity is a result of polygenetic inheritance. In simple terms, it is probable that a range of genetic factors are interacting to create such a disposition.

1.3.2 Psychoanalytic/Psychodynamic Perspective

Pathological gambling behaviour is certainly not rational, therefore it is important to look to psychoanalytic and psychodynamic theory to try and understand unconscious motivations for excessive, destructive gambling. Rosenthal (1987) suggests that the action of gambling is symbolic, and unconscious meaning is attributed to the behaviour, essentially making gambling an actualisation of a fantasy.

Von Hattingberg (1914) was first to examine gambling from a psychoanalytic perspective, suggesting that gambling was sexual in origin, specifically from guilt in anal gratification. Simmel (1920) proposed that all addictions were instrumental ways to actualise narcissistic fantasies. Simmel saw gambling as a method of false creativity,

where the individual can experience emancipation from their parents by being self-providing.

Rosenthal (1987) stresses that Freud's work on pathological gambling is over emphasised by critics. He points to Freud's response to Reik's criticism, when Freud referred to his work on gambling as trivial; this from a man who normally was notoriously defiant of his own theory. Nevertheless Freud in his essay 'Dostoevsky and Parricide' (1928) made several important contributions to pathological gambling literature. Firstly, he highlighted that a pathological gambler is not primarily motivated to gamble for financial gains, and that this explanation was only an attempted rationalisation of the behaviour. Instead, the gambler is drawn to the behaviour itself, or the action, in which meaningful actualisation of fantasy occurs. Freud explained gambling in terms of a mechanism of 'moral masochism'. In his analysis of Dostoevsky's gambling problems, he viewed losing in gambling as a means of self-punishment for feelings of hate experienced towards the gambler's father, stemming from the Oedipus complex. Gambling is, at an unconscious level, an instrumental method of reducing guilt.

Bergler (1957) agreed with Freud that the act of gambling was a method of expiating guilt through masochism. However, he believed that the source of guilt was not Oedipal but based on a rejection of reality principle instilled by parental figures. The rejection of the reality principle is essentially an act of rebellion against one's parents and society. Bergler (1957) elaborated that this 'psychic masochism' effectively turned gambling adversaries into 'refusing parents'. He believed that this allowed the gambler to take an adversarial position against society and be comforted in the belief that the gambler is underprivileged and therefore worthy of pity and acceptance. It is the ability to actualise this fantasy of being a 'victim' in which the gambler draws pleasure from defeat and punishment. Lesieur and Custer (1984) question whether true masochists would continue to gamble following winning streaks or a 'big win'. Rosenthal and Rugle (1994) contest this criticism by highlighting it is normal for masochists to accept positive experiences, although the impetus to self-destruct is temporarily postponed.

Part One: Introduction

Bolen and Boyd (1968) proposed that pathological gambling behaviour could be an attempt at parental identification. The young male's ambivalence to his father is characterised by the feelings of aggression and the desire to replace him, and conversely by feelings of admiration and the desire to emulate him. Bolen and Boyd (1968) disclose that several patients found gambling a primary way of relating to their father, and also a form of internalising their father's character. Rosenthal (1987) extends this theory by outlining the possible hazards of authority figures supporting gambling or its deregulation. Rosenthal (1987) believed that authority figures such as politicians are essentially parental substitutes, and that individuals will seek to 'identify' with such figures and their beliefs.

Ultimately, the validity of this perspective of pathological gambling is questionable, because there is little scope to empirically substantiate the claims made. Fundamentally, psychoanalysis cannot be disregarded completely when our understanding of pathological gambling from other psychological perspectives is so porous. Moreover, many concepts proposed in the psychoanalytical literature emerge in other theoretical explanations, such as narcissistic tendencies effecting cognitive heuristics, therefore indirectly providing support.

1.3.3. Sociological Perspective
Sociological theories use analogous arguments to describe gambling behaviour as a product of existing social structures in which individuals live. Such theories represent a shift from economic explanations and underline the 'expressive need' for social beings. Currently there are three primary sociological theories which attempt to explain pathological gambling behaviour; namely Strain Theory (Agnew, 1992), Deprivation-Compensation Theory and Functional Analysis of Game Involvement. These are explained in turn below.

1.3.3.1 Strain Theory
Strain theory is a sociological theory which attempts to explain individual motivation for crime and deviance. Durkheim (1897) was the first theorist to suggest that society's

structural inability to regulate behaviour and reward causes internal frustration when aspirations are not met. Merton (1938) develops Durkheim's (1897) anomie explanation into Strain Theory, where cultural forces drive an individual to aspire to economic wealth and the structure of society is unable to meet such aspirations, then the individual turns to crime to and deviance as 'a means to an end'. Agnew (1992) extends strain theory by introducing an emotional element, relating to this frustration at the lack of upward mobility for the lower classes because of structural barriers to success. Cornish (1978) applied the strain theory of deviance as a cause of pathological gambling. Cornish (1978) believes that the friction and frustration caused by lack of legitimate opportunity to progress economically causes gambling to be considered as an instrumental strategy to achieving an individual's economic aspirations. Evidence for this theory is contrasting, with some studies showing mild support (e.g. Tec, 1964; Newman, 1972). However others suggest that such a relationship is non-existent (Downes, Davies, David & Stone, 1976).

1.3.3.2 Deprivation-compensation

The 'deprivation-compensation' hypothesis does not venture far from the propositions in strain theory. The deprivation-compensation theory premise is that the working class will experience pressure from material and psychological deprivation that emerge from social structures and cultural context, and that gambling executes a purging effect that is instrumental in expressing their lack of fulfillment.

Devereux provides a thorough account of an interaction mechanism between the gambler and their social environment (Downes et al, 1976). Devereux (1979) saw gambling as a representation of existing social structures. The benefit of gambling is borne out of its cathartic functions, where disappointment created by social structures in which individuals live are absorbed. In addition to its cathartic functions, Devereux (1979) recognizes an equally important application for gambling behaviour, arguing that expressive needs that cannot be directly nurtured by society can be addressed through gambling (Cornish, 1978). Downes et al (1976) indicate the following list as needs which individuals in society must meet in order to achieve actualisation: rationality and

ethics, competition, problem-solving, thrill-seeking, and testing fate or chance. In addressing such needs, gambling is perceived as having the ability to temporarily arrest whatever 'social inertia' may be inhibiting individuals to actualise their full potential.

Another way to assess sociological implications for gambling is examining the idea of incompatibility. A negative correlation is shown to exist between level of commitment to other activities and the probability of gambling (Downes et al., 1976; Cornish, 1978). According to Cornish (1978), lack of disposable time for gambling is reflective of the demands of particular social roles, which in turn are products of social structure. An individual's belief system created by variables such as age, qualifications, socio-economic and marital status, may simply cause individuals to accommodate other priorities before gambling. This does not imply an opposition to gambling, it is just a reflection of an individuals overriding priorities. In reaction, Cornish (1978) proposes that the introduction to gambling might transpire through changes in social roles. He concludes, that such changes will create

> "temporary leisure-vacuums during which, unless the sorts of moral objections mentioned by Devereux operate, gambling may be tried" (p.119).

1.3.3.3. *Functional Analysis of Game Involvement*

Sutton-Smith et al (1963) add a cross-cultural element to the sociological perspective, in a theory which closely paralleled to the deprivation compensation theory. Sutton-Smith et al (1963) argue that preferences for particular types of games represent the psychological conflicts that arise during the various methods of socialisation among different cultures. This explanation views gambling as means of dealing with stress and expressing unresolved psychological issues. As does the deprivation-compensation theory. In addition to this cathartic function, Sutton-Smith et al (1963) propose that by participating in games, competencies critical to the player's own social structure were developed also. Roberts, Arth and Bush (as cited by Cornish, 1978) identified that in certain deterministic cultures, games of chance that tested fate were notoriously popular. This theory is further supported by some findings in the US, demonstrating that occupation can be related to choices of gambling activity (Cornish, 1978). Cornish

argued that such an explanation underlines that the effect of culture and social structure on gambling preferences is not coincidental but is distinct.

Cornish (1978) concludes that the greatest criticism of sociological theory in understanding pathological gambling behaviour is the inability to provide a platform for formulating precise, falsifiable hypotheses, because of their descriptive nature. However, Cornish (1978) conceded that sociological theory is primarily accepted because of its 'elegant internal consistency' and the logical theoretical argument developed. The primary assistance of sociological gambling theory is the explanation provided, regarding the social distribution of gambling and interpersonal interaction in gambling behaviour. Cornish (1978) affirms that these "accounts do offer the important recognition that gambling behaviour does not take place in a social vacuum" (p.126).

1.3.4. Economic motivation

Cornish (1978) described the economic perspective of gambling succinctly: "since money constitutes one of the most potent rewards at any socio-economic level of society, gambling is frequently (and plausibly) regarded as being primarily instrumental behaviour governed by economic motives" (p.91). Research in this area is focused on normative models that aim to assess the extent to which gamblers engage in economically rational behaviour. The purpose of such models is to appraise betting value. Put simply, these models evaluate the probability of a win and economic value of a win. Such models aim to highlight gambling motives for rational gamblers, who subjectively balance the probable positive and negative consequences of the wager.

There are several derivatives of the 'rational choice' model that balance the concept of objective value with subjective utility. Wagenaar's (1988) discussion of 'normative decision theory' is probably the most lucid representation of economic rational choice gambling models. The model is explained through the following example: One set of a 100 scratchcards (red ones) costing £10 has one chance of winning a £2000 prize. Another set of 100 scratchcards (yellow ones) costing £1 offers 10 chances of £5.

Part One: Introduction

Wagenaar (1988) proposed that the expected utility (EU) of a wager can be calculated by using the following formula:

Economic Utility = (winning probability x expected profit) – (losing probability x stake)

By placing the data from the above example into the formula the economic utility of each of the possible wagers are revealed:

Red Scratchcards = (1/100 x (£2000-£10) – (99/100 x £10) = (19.9) – (9.9) = +10

Yellow Scratchcards = (10/100 x (£5 - £1) – (90/100 x £1) = (0.4) – (0.9) = -0.5

The economic utility of the red scratchcards is found to be 10, whereas the economic utility of the yellow scratchcards is found to be -0.5; therefore it is reasonable to hypothesise that the rational economically motivated gambler will choose the red scratchcards. More importantly, it is also probable that the economically motivated gambler will choose not to buy the yellow variety of scratchcard, even in the absence of a red type. In this scenario, it can be concluded that not wagering (EU = 0) has more economic value than wagering with the yellow scratchcards (EU = -0.5). The normative decision theory fundamentally states rational gamblers will take opportunities to gamble where there is a positive expected utility, because there is an increased probability of profiting over extended play. Furthermore, rational gamblers would avoid gambling in activities with a negative expected utility, because there is decreased probability of profiting over an extended period of play.

The above example, although demonstrating the concept of economic utility in gambling, fails to represent a realistic view of the actual dynamics of decision making in gambling. Wagenaar (1988) indicates that the model becomes more elaborate when considering that absolute monetary values are interpreted subjectively. Even on an individual basis it is probable that the subjective value of money will be interpreted differentially based on affective disposition and environmental factors. Put simply, utility does not always

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equate to monetary value. By this reasoning, Wagenaar (1988) extends the intricacy of the economic utility formula, primarily with the inclusion of a subjective element:

$$EU = (\text{winning probability} \times (\,u\,(\text{expected profit}) - (\text{losing probability} \times \text{stake}) \times u\,(- (\text{stake}))$$

If the individual places a higher utility on the expected profit, than on the stake, then potentially buying the yellow scratchcards can be considered a rational wager. The negative expected utility of the yellow scratchcard now becomes positive based on the subjective value placed on the potential profit and stake.

The rationality for gambling in this scenario becomes even more understandable if the marginal utility of income is considered. It was argued that the marginal utility of income could actually increase in response to social circumstances (Friedman & Savage, 1948; Rubner, 1966; Weinstein & Deitch, 1974. If the "means of acquiring extra capital are negligible, and in relation to forms of gambling, such as lotteries or pools, where the subjective (and, indeed, objective) utility of the payoff is high the unsound decision to gambler begins make more sense," (p.94, Cornish, 1978). For lower socio-economic groups, a small stake could potentially mean relatively little in comparison to the possibility of winning a substantial amount that could be life altering.

Cornish (1978) believed that economic theories provide impetus for research, describing economic theory as a "preliminary framework within which hypothesis-building, experimentation and discussion could proceed" (p.96). Realistically, however, it is unlikely that pathological gamblers will follow models of rational appropriation, especially when classified as an impulse control disorder (DSM-IV, APA, 1994). Nevertheless, researchers have the opportunity to contrast irrational pathological gambling behaviour against a standard and rational economic model. Deviations from proposed guidelines in gambling decision making could potentially be an indicator of other psychological processes used in determining gambling behaviour.

1.3.5. Personality

Research investigating salient personality traits among pathological gamblers has been relatively inconsistent, and furthermore the validity of such studies is strongly questioned because of the wealth of methodological flaws in their research design (National Research Council, 1999). Nevertheless, it is certainly worthwhile to review which studies have shown the most promise. This becomes particularly important in the light of Blaszczynski and Steel (1998) which found that 93% of a clinical sample of pathological gamblers showed evidence a personality disorder. Blaszczynski and Steel do however concede that this prevalence rate may be inflated due to the use of questionnaires, rather than clinical interviews. Orford (2003) importantly addresses that looking towards personality disorders for explanations of pathological gambling behaviour is dangerous because of the amount of assumptions required. For example, it is believed that the gambling disorder is a manifestation of the personality disorder rather than a consequence. However, it also makes intuitive sense that development of a gambling pathology may have considerable effects on an individual's personality framework.

1.3.5.1. Sensation-seeking

Sensation seeking is "the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of experience." (p.10, Zuckerman, 1979). Zuckerman (1979) outlines sensation seeking as a trait comprising of four factors: Seeking Thrills, Experience Seeking, Disinhibition and Boredom Susceptibility. Zuckerman (1979) subsequently postulated that sensation seeking had predictive value in identifying pathological gamblers. The hypothesis advocates that in addition to experiencing anxiety when perceiving a situation to be 'risky' individuals who have elevated sensation seeking levels will experience an 'approach' state. This is where the novelty of the situation creates a 'surgency elation effect' in which the sensation seeker derives pleasurable sensations. More importantly sensation-seekers are believed to evaluate situations as being 'less risky' compared to individuals with low levels of sensation seeking. It is the accumulation of less anxiety experienced in situations of risk, and the surgency elation effect that motivates individuals to seek risk-laden activities more frequently than low sensation seekers.

However, research into sensation seeking as predictor of pathological gambling provides conflicting findings (Parke, Griffiths & Irwing, 2004). Some studies provide support (Kuley & Jacobs, 1988), some studies show no difference between pathological and non-pathological gamblers sensation seeking levels (Parke, Griffiths & Irwing, 2004; Ladouceur & Mayrand, 1986), and some studies actually demonstrate pathological gamblers as having lower levels of sensation seeking (Dickerson, Hinchy, & Fabre, 1987). The conflicting findings of such studies, is perhaps accounted for by Coventry and Brown (1993) who assert that different types of gambler have different levels of sensation seeking. For example, using Lesieur's (1988) dichotomy of gambling types (the action seeker and the escape seeker), it makes intuitive sense that the action seeker would score higher on the sensation seeking scale than the escape seeker who is motivated to gambling to achieve a dissociative state.

1.3.5.2. Locus of Control

Locus of control refers to the extent to which individuals interpret outcomes as being determined by their own efforts or determined independently of personal influence. An individual who attributes outcomes primarily to external factors is considered to have an external locus of control, whereas an individual who believes they have power to influence outcomes is considered to have an internal locus of control. Research, as with most personality trait studies, show marked variations across studies. Some studies provide evidence for gamblers with an external locus of control being more at risk of developing pathological gambling behaviour (Walker, 1992; Moran, 1970). Others have demonstrated that those with an internal locus of control are more at risk of developing pathological gambling behaviour (Dickerson, 1984; Carroll & Huxley, 1994).

This variation amongst findings regarding locus of control could potentially be explained by dichotomising gambling activities into games of skill and games that are determined by chance. It makes intuitive sense that gamblers with an internal locus of control would be less motivated to participate in games of chance such as lottery gambling because there is little opportunity to exercise any control over the outcome of the activity. In

contrast, Carroll and Huxley (1994) found that UK slot machine gamblers tended to have an internal locus of control. This finding may seem perplexing given that in most countries slot machines are operated under random number generations. However, in the UK the profitability of slot machine gambling can be influenced by skilful play, therefore it is understandable why a gambler with an internal locus of control would be strongly motivated to gamble continuously.

1.3.5.3. Depression

There is a consistent correlation between pathological gambling and depression (Beaudoin & Cox 1999; Vitaro, Arseneult, & Tremblay, 1999). However, it is difficult to outline the causal nature of the relationship. Lesieur's (1979) explanation of chasing behaviour suggests that gamblers experience increasing negative consequences, and suffer depressive symptoms as a result of such consequences. Blaszczynski and Nower (2002) also contend that a subgroup of gamblers exist who are motivated to gamble to elevate mood and overcome dysphoria. Relating to depression, it appears that there is a systematic difference between male and female pathological gamblers (Marks & Lesieur, 1992). Getty, Watson and Frisch (2000) found that female members of GA reported significantly more depressive symptoms than male GA members. Furthermore, Gupta and Derevensky (1998) reported that depression and stimulant use were the strongest predictors of adolescent female problem gambling.

1.3.5.4 Other Personality Traits

There has been mixed evidence regarding the extent to which being extroverted or introverted in personality may have on gambling behaviour. It makes intuitive sense that a positive correlation exits between extroversion and gambling since, as extraverts experience pleasure when aroused by stimulating activities and environments. Again, in review of extraversion studies, Walker (1992) found vastly conflicting findings in the studies. There has been support for extraversion as a predictor of pathological gambling (Seager, 1970). On the other hand there is also strong support suggesting that problem gamblers possess similar or lower levels of extraversion than control samples (Blaszczynski et al, 1986; McConaghy et al, 1983).

Finally, other personality traits which have found significant predictive value for pathological gambling include Competitiveness and Deferment of Gratification (Parke, Griffiths & Irwing, 2004). Parke et al (2004) interpreted the strong predictive value of competitiveness as being reflective of the motivation for the highly competitive gambler to chance losses and have a propensity to go on 'tilt'. Furthermore, Parke et al (2004) conclude that the strong negative predictive value of deferment of gratification trait is also a reflection of a propensity of chasing losses, because the gambler seeks instantaneous financial retribution and to immediately escape negative affectivity created by losses. Nevertheless, despite such promising early findings, the traits of competitiveness and deferment of gratification require considerable empirical replication and validation as predictor variables.

Support for a 'gambling personality' is not consistent and it is this inconsistency that ultimately weakens the position of this approach to understanding gambling pathology. It is understandable that configuration of a personality predisposition of pathological gambling behaviour is a valued objective. However, to reiterate Orford's (2003) contention, personality research consists of substantial assumptions which are not irrefutably validated. Mischel (1968) advocates that consistent behaviour is not the norm (rejecting the value of the concept of personality traits), and that personality trait and behavioural correlations, are not strong, rarely existing beyond 0.3. Orford (2003) concludes that it is probable that differing traits are have varied importance during different stages of the pathology development, and therefore suggests research might be more successful if methodological designs consisted of parallel samples in terms of demographic variables.

1.3.6. Behavioural Perspective

Skinner (1953) perceived gambling simply as an operant behaviour, which could yield a high response rate in the presence of intermittent reinforcement. Laboratory studies show that variable ratio schedule of reinforcement (namely providing reinforcement in a nonlinear mode) is less sensitive to extinction (Cornish, 1978). Furthermore, Lewis and

Duncan (1958) assert that the gambler would respond more persistently the lower the level of reinforcement in the 'acquisition phase.' Lewis and Duncan (1958) concluded that persistence in response was determined by the ability of the gambler to differentiate between various levels of reinforcement. Lewis and Duncan (1958) used highly distinguishable reinforcement levels (33%, 66% and 100%). However, in commercial gambling, reinforcement will be considerably more erratic and diminutive. Therefore, it would be virtually impossible for a gambler to distinguish various patterns of reinforcement. Bijou (1957) described this phenomenon as the partial reinforcement extinction effect (PREE). It was reported that in the eventual absence of the reward, intermittent schedules invoked a higher response rate in gambling situations than schedules distributing a constant and dependable rate of rewards. Moreover, Capaldi (1966) noted that principle of PREE is that often enduring gambling losses are actually reinforced by a win. It is probable that certain gamblers might construe this as having to 'work hard' to get the reward and therefore motivating persistence in the gambling activity.

Levitz (1971) performed a laboratory study investigating the effect that the level of reinforcement during the acquisition has on response extinction. Participants were required to gamble on a gambling task, which was determined purely by chance, after participating in practice trials. The level of reinforcement in the introductory trials was either 14% or 36%. It was recorded that the participants who (during practice trials) received a reinforcement ratio of 36%, were less sensitive to extinction during the actual gambling trials.

This finding highlights the importance of the acquisition phase in gambling. Firstly, Lesieur and Rosenthal (1991) when describing the development of pathological gambling, outline that the problem gambler initially experiences success when gambling. The 'winning phase' is seen as a pre-requisite for development of pathological gambling behaviour because it not only reinforces the individual financially, but allows the gambler adopt unrealistic beliefs about the profitability of gambling. The ability of technology to create a winning phase for new customers is also concerning - and the internet has strong

potential to do so. New customers are identified when they initially register to the gaming site, and therefore it possible to manipulate the outcome of the initial first wagers, to create a temporary winning phase. Furthermore, it makes intuitive sense that new customers will take advantage of the practice modes made available to customers in the majority of gaming sites. Sevigny, Cloutier, Pelletier, & Ladouceur (2004) revealed 37% of online gaming websites investigated provided a practice mode which operated at a reinforcement level over 100%, therefore (similar to Levitz's [1971] study) a winning phase is created.

Cornish (1978) was critical of the generalisability of laboratory studies to natural gambling environments because laboratory settings do not accurately encapsulate all of the situational and structural characteristics prevalent in gambling environments. This is reflective of the fact that early behaviour analysts, looking into gambling behaviour, failed to recognise that other forms of reinforcement existed in gambling activities than simply monetary rewards. Dickerson (1974) investigated other reinforcing stimuli prevalent in UK betting shops beyond financial reward. Dickerson (1974) outlined that other reinforcement such as arousal and social interaction existed. Moreover, he revealed that such extraneous reinforcement operated a fixed ratio of reinforcement, and that this fixed ratio of reinforcement was equally as important factor in pathological gambling development. Dickerson (1974) concluded that it was necessary for gamblers in the acquisition phase to experience enough monetary reinforcement to allow them to continue gambling long enough for the ancillary stimuli to become classically conditioned. In effect, the ancillary reinforcement, such as arousal and social interaction, makes gambling rewarding even during periods where the gambler is experiencing punishment in the form of monetary losses.

1.3.7. Cognitive theories

1.3.7.1 The illusion of control

Langer (1975) describes the illusion of control as "an expectancy of a personal success inappropriately higher than the objective probability would warrant." (p.316). A plethora of studies show that gamblers have a tendency to gamble more when there is greater

active involvement, suggesting that they believe that they have the potential to manipulate the outcome of the wager. Strickland, Lewicki, & Katz (1966) revealed from their study of gamblers using dice, that across events with equal probabilities of success, gamblers preferred to bet less on games where someone else threw the dice in their stead. Also, Henslin (1967) recorded that dice-players believed that they could use skill to manipulate the outcome of the throw of the dice. Henslin showed that gamblers would throw the dice forcefully to obtain a high number, and conversely a soft throw would yield a lower number. Langer (1975) was among the first to test the hypothesis that some gamblers perceived that they had greater control over a chance event, and that it involved a greater amount of skill, than the structural characteristics of the game suggested. Langer (1975) demonstrated that individuals who could pick their own numbers for a lottery ticket were prepared to pay more than when the numbers were selected by another party. This study is shown to still have contemporary relevance, as Rogers (1998) showed that UK lottery players were very reluctant to select numbers randomly using the 'lucky dip' system.

Langer (1975), and more recently Ladouceur and Walker (1996), concluded that the degree of personal involvement, the level of competition the game involved and familiarity of the task would all contribute to a greater level of perceived skill, and this would increase the illusion of control. Ladouceur and Mayrand (1987) showed that roulette players that were permitted to release the marble onto the wheel themselves would take more gambling risks, suggesting that the increase in activity involvement increased the illusion of control. Ladouceur and Mayrand (1986) also recorded that the amount staked at roulette would increase incrementally with each session of gambling. Ladouceur and Walker (1996) concluded in retrospect:

> "Since the outcomes in roulette are unpredictable, it is amazing to find that subjects report a feeling of mastering the game" (p.97)

1.3.7.2. Heuristics and Biases

Wagenaar (1988) carried out an in-depth analysis of two explanatory theories central to pathological gambling. Normative decision theory (previously evaluated in economic motivations for gambling), proposes that gambling decisions are 'modelled' as a

cognitive choice and is grounded in the assumption that gamblers always behave rationally. Wagenaar (1988) concluded that gamblers consistently make irrational betting decisions, negating normative decision theory.

Wagenaar (1988) maintained that gamblers are "motivated by a way of reasoning, not by defects of personality, education or social environment" (p.30), and that application of cognitive biases is responsible for irrational gambling decisions. Gamblers develop and selectively use a variety of heuristics and biases to assist them in making gambling decisions. Therefore, such decisions appear to be superficially rational. Wagenaar (1988) identifies sixteen biases and heuristics which gamblers base wagering decisions on (see Table 1.8).

The most prevalent and salient heuristics appear to be the flexible attribution bias, 'representativeness' (gambler's fallacy), fixation on absolute frequency and the availability bias. Gilovich (1983) found evidence for hindsight bias and flexible attribution bias in his studies of gambling behaviour in football betting. Across three studies it was evident that participants accounted for losses through bad luck and unforeseen circumstances, yet conversely they claimed personal responsibility for accurate predictions.

The representative bias relates to gamblers who adjust their gambling decisions according to their own erroneous statistical evaluations (Tversky & Kahneman, 1971). The gamblers who employ the representativeness bias primarily have deficient understanding of probability and the nature of random events. For example, Tune (1964) demonstrated this phenomenon as participants estimated that a short series of coin tosses would yield an equal amount of heads and tails (a probability of 0.5 for each alternative). Although probability does indicate that over an extended period time that an equal number of outcomes will be recorded, application of long-term probability to a short sequence of events is highly inaccurate. Furthermore, Coups, Haddock, and Webley (1998) recorded that 39% of gamblers believed that it was less probable that the numbers drawn last week

on the lottery would actually be drawn in the subsequent draw, when in reality any sequence of numbers share the same probability of being drawn.

Table 1.8 Summary of cognitive biases used in gambling

Bias	Definition
Availability	The ease with which specific instances can be recalled from memory, thus affecting probability judgments
Problem framing	When the context in which the problem is framed determines the choice of strategy
Confirmation bias	Seeking information that is consistent with one's own views and discounting discomforting information
Fixation on absolute frequency	Using absolute rather than relative frequency as measure of success
Concrete information bias	When concrete information such as that based on vivid memories or conspicuous incidents dominates abstract information such as computations or statistical data.
Illusionary correlation	Variables that seem to co-vary when in fact they do not
Inconsistency of processing	The inability to apply a consistent judgemental strategy over a series of cases
Non-linear extrapolation	The difficulty in estimating joint probabilities of simple events
Reliance on habits	The choosing of alternatives because it is customary to do so
Representativeness	The judgment of the likelihood of an event made by estimating its similarity to the class of which the event is supposed to be an exemplar
Justifiability	When the justifiable rule is preferred over the rule for which no justification can be given
Reduction of complexity	When complete decision problems are reduced to simple ones before a decision can be made
Illusion of control	When an uncerain outcome of an activity can by itself induce in a person feelings of control over the uncertain outcome
Biased learning structures	When observed outcomes yield incomplete information concerning predictive relationships
Flexible attribution	The tendancy to attribute successes to one's own skill and failures to other influences
Hindsight bias	When retrospectively people are not surprised about what has happened and even believe they predicted the outcome

Source: Wagenaar (1988)

'Fixation on the absolute frequency' is a cognitive distortion that affects high frequency gamblers. They win significantly more than the average individual, leaving them with the feeling that they are in profitable situation. However, because they bet higher stakes and more frequently, they also tend to lose significant amounts. Finally, the availability

bias refers to elevated success expectancy in relation to objective probability. This heuristic is stems from manipulation of environmental factors to give the impression that winning is very prevalent. For example, weekly National Lottery winners are identified by the media. Also, it is evident from the structural characteristics of slot machines that they are designed to give the impression of being profitable by signalling wins dramatically and concealing loss.

1.3.8. Psychologically-based addiction theories

Several pathological gambling studies have demonstrated the similarities shared between pathological gambling and other addictions. Wray and Dickerson (1981) revealed that in absence of gambling, individuals can suffer withdrawal symptoms. Custer (1982) has shown that pathological gamblers in treatment suffered physiological withdrawal symptoms such as headaches, diarrhoea and cold sweats. Moran (1970) advocated that pathological gamblers feel dependent on their activities just like other addicts. Gamblers have even been reported to develop a tolerance to a level of gambling behaviour (Dickerson, 1984) and this has also been demonstrated in empirical experiments (Griffiths, 1993). However, despite such similarities, considerable debate continues regarding the classification of gambling as an addiction; particularly if we consider that there is no consumption of psychoactive substances (Walker, 1989).

Hickey Haertzen, and Henningfield (1986) compared the subjective 'highs' of gambling with those experienced in drug abuse. Findings indicated that simulating winning produced the same subjective effects in gamblers, as the effects experienced when using psychomotor stimulants. Blaszczynski et al (1985) investigated the similarities in psychological profiles between pathological gamblers and other addiction patients using a 32-item derivative of the EPQ (Gossop & Eysenck, 1980). The study reported that pathological gamblers and addicts of other behaviours shared similar psychological attributes, such as higher levels of psychoticism than control subjects.

The commonality existing across addictive disorders is the principle concept behind general addiction theory (Jacobs, 1986). Indicators of depression and anxiety have strong

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correlational relationships across 'addict' patient groups including pathological gamblers (Bolen et al., 1975; Blaszczynski et al., 1985). Pathological gambling can be considered a bona fide addiction because of similarities with other addictions, and could potentially be explained by a common underlying factors, or by a manifestation of a pre-existing disorder. This evidence suggests that addictions are driven by long term psychological disturbances. Furthermore, in addition to an affective deficit, a general dissociative state has also been reported to be prevalent across addictions (Jacobs, 1988; Kuley & Jacobs, 1988).

1.4. Summary and Conclusions

Gambling is a behaviour which is difficult to define, conceptualise and measure. Gambling spans many areas of academic interest including addictions, leisure studies and consumer behaviour, each of which view gambling in a different way. However, there is general agreement that it involves risking something of value for some kind of gain on activities decided by chance, skill or a combination of the two. However, defining gambling and conceptualizing its different forms may become increasingly difficult as more activities become the focus of gambling (e.g., video games and quiz shows) and new mediums are being used to make it accessible (e.g., television and mobile phone).

Based on clinical experience, researchers (e.g., Moran, 1970; Custer and Milt, 1985; Lesieur & Rosenthal, 1991) have described types of gambler and the developmental phases in their careers. These have contributed to our understanding of gambling and problem gambling. In addition to acting as a framework for future research, they have identified key aspects of experience (e.g., chasing) and motivation (e.g., action and escape) that provide the underpinning for the basis of our understanding problem gambling today.

The rates of gambling participation and problem gambling in the UK are quite low (e.g. 72% and 0.8% respectively; Sproston et al., 2000) in relation to other jurisdictions. However, it should be noted that the last prevalence study was published seven years ago (data collected in 1999) before the following had taken place in the UK:

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1. The growth in popularity of Internet poker and casinos;
2. The introduction of person-to-person (P2P) betting such as *BetFair*;
3. The increased media coverage of gambling related activities (e.g., at least 12 different channels on UK cable television show gambling related programmes, some of which entirely devoted to this kind of programming);
4. The growth in sponsorship (e.g. television programmes, sports teams, horse races etc) by gambling operators (e.g. *888, BetFair, 32Red* etc) and;
5. The proposed large-scale deregulation in gambling the UK affecting the size and number of casinos; advertising and the regulation and policies on Internet gambling.

The next UK prevalence study is expected to be published at the end of 2007, and considering these changes, it will probably be case that prevalence rates of gambling and problem gambling will be up from the last UK prevalence study (Sproston et al., 2000).

There have been various contributions towards understanding the etiology of gambling and problem gambling behaviour from a wide variety of disciplines and perspectives. Economists suggest that gamblers will usually seek the best value from a gamble and that they will ultimately act as "rational" agents. However, given the fact that most forms of gambling have a negative expected utility (i.e., have a long run negative financial outcome since operators need to make a profit) this would mean that rational agents would choose not to gamble at all. Economists then recognized gamblers will view the value of a gamble based on their own interpretation of the stake and of the jackpot and make decisions based on this assessment.

From the psychoanalytic perspective, various unconscious motives such as moral masochism (i.e. punishing the self to resolve guilt) and expressions of internal conflicts and neurosis (e.g., poor relationship with parents, frustrated sex drives) drive gambling behaviour. However, such positions were difficult to empirically test, and this explanation is based on the assumption that gamblers are motivated by the loss (even though gambling often involves losing).

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From a learning perspective it is hypothesized that we gamble because we are reinforced by a variety of rewards (e.g., money, praise, or social acceptance) or because of a need to "escape" (e.g., from reality, a difficult home life, stress or anxiety). Additionally, a poor understanding of games and their probability combined with faulty reasoning were some of the cognitive reasons reported to be contributing to developing gambling problems. Such cognitive biases may affect a gambler's ability to objectively interpret their chances of winning. Such heuristics may also mean that players are at risk of selectively recalling more wins and fewer losses. As a consequence, gamblers may persevere even in losing or damaging situations.

Research into biological factors such as the role of neurotransmitters, genetics and arousal has also been gathering momentum. One of the benefits of such an approach is the degree of empiricism that can be implemented into research in problem gambling and the potential implications for biological treatments to counter suspected biological risk factors. However, findings currently lack consistency and there is difficulty in establishing causality or direction in links between biological mechanisms and problem gambling.

Sociological, anthropological and evolutionary perspectives have also made a significant contribution to understanding the causes of gambling behaviour. Gambling has been considered as being a "functional device" through which transitions in social class can be made or by which human certain needs can be realised (e.g. problem solving or testing one's character). Gambling has also been part of various cultures in one form or another (in some cases for thousands of years) and, therefore, it may not be surprising that wagering seems entrenched in human nature and that it has proved so difficult to eradicate with various attempts at prohibition. Some argue that even from an evolutionary perspective, we are "designed" to take risks to maximize resources and to increase our social and reproductive standing.

There is potential for confusion with so many explanations for gambling and problem gambling, some of which are competing and contradictory. However, at a basic level, the

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existing research and literature is useful since it identifies potential "risk factors" and "protective factors" which academics, clinicians and even gamblers can use to understand gambling behaviour and player motivations. They can also be used to identify mechanisms for prevention, management and treatment of problem gambling. It is suggested that using one theory over another is not the best way to explain gambling or problem gambling but rather a biopsychosocial approach may be preferable. Using evidence and information from a collection of sources and perspectives. As Griffiths and Delfabbro (2001) argue:

> *"...gambling is a multifaceted behaviour, strongly influenced by contextual factors that cannot be encompassed by any single theoretical perspective. Such contextual factors include variations in gambling involvement and motivation across different demographic groups, the structural characteristics of activities and the developmental or temporal nature of gambling behaviour"* (p.1).

Such an approach has useful implications for how we research gambling and how we approach treatment. However, it could be criticised for failing to organize its various components in a more organised and meaningful way. In other words, more commentary on how the various perspectives link together and compliment each other is required in order for the biopsychosocial model to be more prescriptive in research, treatment and prevention.

One such example of integrating the various perspectives is suggested through using a "pathway approach" (Blaszczynski & Nower, 2002). Such a model, based on clinical evidence, successfully combines the key determinants in the acquisition, development and maintenance of gambling behaviour into a single conceptual framework. It is proposed that gambling initiates and develops along a general pathway which is influenced by ecological factors (accessibility and availability), reinforcement (arousal in particular), irrational cognition and skill orientations, and subsequent chasing behaviour. The three classes of pathway which are proposed each consist of the "basic pathway" described. However, they are then distinguished according to the levels of emotional and biological vulnerability (e.g., personality, mood disturbance, neurotransmitter dysfunction) and impulsivist traits (e.g., ADD or anti-social personality).

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There are clear implications from this model for understanding phases of gambling behaviour including acquisition, development and maintenance. There are also useful applications for the management and intervention of problem gambling. For example, gamblers operating on the basic pathway may experience problems as a result of conditioning and faulty reasoning. Hence, through cognitive restructuring, if these are corrected and controlled for, then individuals have a better prognosis and may have the option for controlled gambling in the future. However, pathway 2 and 3 gamblers with a more complex etiology may require psychotherapy or pharmacological intervention in addition to cognitive restructuring. Consequently, they will have a poorer prognosis for recovery where complete abstinence may be the only effective way to manage the disorder.

The model is open to empirical testing but it largely ignores the role of some important factors (e.g. structure of games). Nevertheless, to date, it is the most convincing, coherent and useful way to conceptualise the role of the various determinants in gambling and problem gambling behaviour. Consideration will now be given to research specifically dealing with Electronic Gaming Machines (EGMs) and ecological factors in gambling.

CHAPTER 2
FRUIT MACHINES, ELECTRONIC GAMING MACHINES
AND ECOLOGICAL FACTORS: A REVIEW OF THE LITERATURE

2.1. Fruit Machines and Other Electronic Gaming Machines

2.1.1. Forms of Slot Machine Gambling

A slot machine is a technological innovation, either mechanical or electronic, where players may stake money in an attempt to win cash or other rewards. The outcome of three or more spinning reels set in motion by the player would determine if and how they would be rewarded: this was usually dependent on matching at least two symbols from the reels on the pay-line. Slot machines account for 90% of casino revenue (Eadington, 2003) and this is reflected in their continually growing stature within the gaming industry. Their profitability reflects the speed (i.e. event frequency) of the games, the small amount of floor space required and the limited level of staff supervision required. The popularity of slot machines also extends to the United Kingdom. KPMG (2000) reported that in the UK in 1998, £6.3 billion was spent on slot machine gambling compared to £5.3 billion being wagered on the National Lottery. In addition to being profitable, they may also be potentially addictive, and often referred as "hard gambling" (Griffiths, 1999). Slot machines include a wider collective term for machine-related gaming: Electronic Gaming Machines include variations of the traditional slot machine such as Video Lottery Terminals (VLTs) and Poker Machines (Pokies). Table 2.1., summarises some of these variations in relation to jurisdiction.

TABLE 2.1.
Variations in Terminology for Electronic Gaming Machines

Term	Jurisdiction
Fruit Machines	United Kingdom
AWPs (Amusement with Prize)	United Kingdom and Europe
Slot Machines	Various
Poker Machines (Pokies)	Australia, New Zealand
VLTs (Video Lottery Terminals)	Canada

Note: References to EGMs may include the above terms throughout this thesis based on location of research study under discussion..

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2.1.2. Overview of EGM Research

This section will review EGM research from jurisdictions beyond the United Kingdom and the following section (2.1.3) will review EGM research (i.e., fruit machines) conducted in the United Kingdom.

2.1.2.1. Demographic Differences

Buhringer and Konstanty (2004) undertook research aimed at estimating the prevalence of slot machine gambling amongst adults who were registered to vote in Germany. A representative sample of 7643 registered voters were asked questions about slot machine play and related behaviours. It was found that 10.2% of the population were estimated to be active slot machine gamblers, and these were more likely to be male (17.3% of males compared to 4.2% females). Furthermore, of these active gamblers, men were three times more likely to be occasional or intensive players. They were also more likely to be younger, working class or unemployed. Slot machine players were more likely to be single as opposed to married. However it is important to note that this due to the sampling method used, the authors excluded both adolescents, a subgroup of the population which has frequently been shown to have a high rate of gambling participation (e.g., Griffiths, 1990, Fisher 1992, Coventry & Hudson, 2001), and those not registered to vote, (e.g., foreign nationals). This may well have lead to an underestimation in the prevalence of slot machine play.

Research has also examined the differences between those whose primary form of gambling is slot machines and those participating in other forms (Kroeber, 1992, O'Connor & Dickerson, 2003). In Germany it has been suggested that excessive slot machine gamblers tend to begin gambling at an earlier age than excessive roulette gamblers, and that they also tend to be from backgrounds of lower socio-economic status (Kroeber, 1992). The author suggested that the family backgrounds of those who gamble excessively on slot machines were more likely to be such that the father was missing or suffering addiction problems themselves. However, it was found that slot machine players had 'less disturbed personalities' and were more likely to undergo therapy for their excessive gambling than roulette gamblers. O'Connor and Dickerson (2003) aimed

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to identify differences amongst slot machine gamblers and those gambling on off-course Totalizer Agency Board (TAB) horse and dog racing in Southern Australia in terms of impaired control in betting. They found that there was little difference between the two groups, and interestingly, little difference between genders. The authors raised a query over the representativeness of their data as the sample were recruited at the same time of day, and no female TAB gamblers were recruited.

Hing and Breen (2002) examined the behaviour of a large sample of gamblers from clubs in New South Wales, Australia. They were asked questions relating to leisure activities and patronage of clubs, participation in club activities, gambling preferences, poker machine playing behaviours, and socio-demographic characteristics. The SOGS was also administered to collect information on problem gambling. Eighty-one percent of club members reported taking part in some gambling activity, which is consistent with the percentage of gamblers in the NSW population (80%), and most of these gambled on poker machines (67% overall). Very few respondents gambled on lotteries alone. Of the 1,879 poker machine players, the vast majority only played in the club (98%). Around two-thirds played the machines with their spouse or friends, while 26% played them alone. Sixty-eight percent played for entertainment, and 21% played for financial reasons. The vast majority (69%) played 5 or 10 cent machines. Poker machine players were more likely than non-poker machine players to be aged between 18 and 34 years, to have never been married, to have no children over six years and be first or second generation migrants. There were no significant differences in gender, annual income or language spoken at home. It was reported that 2.4% of all respondents to the survey scored within the probable pathological gambling category on the SOGS. These probable pathological gamblers were more likely than non-pathological poker machine players to have significant personal relationships (e.g., married, de facto relationships), have been born in Asia or Europe, and to speak Asian or European languages in stead of or as well as English at home. However, there were no significant differences between probable pathological gamblers and non-pathological gamblers in terms of gender, age, or educational level.

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In terms of problem gambling amongst slot machine players, Breen and Zimmerman (2002) examined the speed of onset of pathological gambling amongst 44 adult treatment seeking pathological gamblers. They found that those whose primary form of gambling was slot machines had a significantly shorter period between commencing gambling behaviour and the onset of pathological gambling than those whose primary forms of gambling were classed as traditional, (e.g., card or sports betting). In a replication of this study, Breen (2004) found further support for this trend. However, it should be noted that the samples for both of these studies were taken from a treatment seeking group of pathological gamblers and therefore the results may not be generalisable to all slot machine gamblers.

Ohtsuka, Bruton, DeLuca & Borg (1997) aimed to identify gender differences in pathological gambling amongst slot machine players in Australia. They used a modified version of the SOGS to identify symptoms of pathological gambling, levels of guilt associated with gambling and their subjective mood states. There were no significant gender differences found, and unsurprisingly unhappiness was a significant predictor for pathological gambling.

2.1.2.2. Cognitive Factors, Coping and Dissociation
Research into cognitive aspects of slot machine play was undertaken by Walker (1992) who examined the beliefs of regular players who used slot machines, video draw poker machines and video amusement games in order to identify which players and which games elicited the most irrational thinking. Those who regularly gambled on slot machines were found to make significantly more irrational verbalisations, both on video draw poker machines and video amusement games, as well as on their preferred slot machines. It was also found that all players made significantly more irrational verbalisations on slot machines regardless of their preferred type of game. It could be criticised for using verbalisations as a measure of actual cognitions. However, Ladouceur et al (1991) showed that these verbalisations had no significant differences when studied in laboratory or ecologically valid settings. This method has been used in a number of studies and appears to be one of the most useful ways of accessing a gambler's thought

processes during gambling. Delfabbro and Winefield (1999) followed on from Walker's (1992) research to examine gender differences in irrational cognitions. They found that 70% of gambling-related cognitions were found to be irrational, and that women were much more likely than men to 'personify' slot machines.

Ladouceur and Sevigny (2003) undertook research looking at the impact of messages displayed on the gambling screen during slot machine play on the behaviour of gamblers. The content of the messages were aimed at reminding players that the games outcome was determined by chance factors. Results suggest that these messaged machines did cause gamblers to play significantly fewer games than those in the control condition. However the content of the message does not appear important, as a very similar result was found for participants which were presented with a message at the same interval during play which said 'break'. Ladouceur and Sevigny conclude that the cognitive breaks required to read the content of a message displayed on the screen may be responsible for the reduction in the number of gambles taken. This report further highlighted the need for research into the cognitive-structural aspects of slot machine design and the impact of these on gambling behaviour.

Scannell, Quirk, Smith, et al (2000) examined women's coping styles and levels of control over slot machine gambling. They found that there was an inverse relationship between impaired control over gambling and the use of emotion-focused coping strategies. The authors suggest that women may be more likely to use gambling as an avoidance strategy.

Further to this research on impaired control, Diskin and Hodgins (2001) examined VLT players dissociative experiences during play. They took a sample of 20 problem and 22 occasional players, and compared their reaction times on a light stimuli task and their feelings of dissociation whilst gambling and general dissociative experiences. They found that problem VLT gamblers responded to the light stimuli during play at rate almost twice as slow as occasional gamblers, as long as they had not been primed by the light stimuli only task previously. The authors suggested this may be due to problem VLT

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gamblers having a narrower focus on the gambling experience. However, this research did not take place in an ecologically valid setting, and no money was used during the gambling task therefore participants may not have responded in the same way had they actually been gambling on a real site with their own money.

2.1.3. Overview of EGM research from the United Kingdom: fruit machines

2.1.3.1. Guidelines and Legislation on Fruit Machines in the UK

Legislation and codes of conduct pertaining to fruit machines are currently overseen by the Gambling Commission which, as part of its statutory role is given its power by the Gambling Act 2005. The Gambling Act 2005 classifies fruit machines into four categories (with additional sub-categories) as presented in Table 2.2.

Table 2.2.: Gambling Machine Information on Regulation

Machine Category	Maximum Stake	Maximum Prize	Permitted Locations	Outcome Determination
A	Unlimited	Unlimited	Regional Casinos	Random Number Generators (RNGs)
B1	£2	£4,000	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos	Random Number Generators (RNGs)
B2	Maximum multiple stake £100 per game	£500	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos; Licensed Betting Premises	Random Number Generators (RNGs)
B3	£1	£500	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos; Licensed Betting Premises; Licensed Bingo Premises; Licensed Adult Gaming Centre (Amusement Arcade)	Option of Compensators or Random Number Generators (RNGs)
B4	£1	£250	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos; Licensed Betting Premises; Licensed Bingo Premises; Licensed Adult Gaming Centres (Amusement Arcade); Licensed Clubs	Option of Compensators or Random Number Generators (RNGs)
C	50p	£35	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos; Licensed Betting Premises; Licensed Bingo Premises; Licensed Adult Gaming Centres (Amusement Arcade); Licensed Clubs; Premises with an Alcohol Licence; Licensed Family Entertainment Centres	Option of Compensators or Random Number Generators (RNGs)
D	10p if monetary prize is available or 30p if non-monetary prize is available	£5 money prize or £8 non-monetary prize	Regional Casino; Large Casino; Small Casino; Existing "1968" Casinos; Licensed Betting Premises; Licensed Bingo Premises; Licensed Adult Gaming Centres (Amusement Arcade); Licensed Clubs; Premises with an Alcohol Licence; Licensed Family Entertainment Centres; Unlicensed Family Entertainment Centres; Travelling Fairs	Option of Compensators or Random Number Generators (RNGs)

Note: Under the Gambling Act 2005, Taxi Offices and Takeaway Premises are no longer able to offer Category D machines.

Currently, the largest stake and jackpot permitted on UK machines is £2 and £4000 respectively (there are no Category A machines currently in operation). However, as demonstrated in Table 2.2, Category C and D machines are the most widely available

form of gaming machine and constitute what is commonly referred to as a "fruit machine" or an AWP (Amusement with Prize Machine). Category A and B machines are less widely available and are more frequently referred to as slot machines (or as Fixed Odds Betting Terminals [FOBT] for Category B2 machines). Research in the UK has primarily focused on Category C and D machines.

It should be noted that the research presented in this thesis began January 2001 and many of the current guidelines only came into operation as a consequence of the Gambling Act 2005. The most notable changes (either implemented or anticipated) include:

a) The Gambling Commission replacing the Gaming Board for Great Britain;

b) The possibility of unlimited jackpot machines (Category A) in a regional casino;

c) The removal of fruit machines (Category D) from taxi offices and takeaway restaurants;

d) The introduction of Fixed Odds Betting Terminals (Category B2) into Licensed Betting Offices (LBOs) which in the majority of sites have replaced fruit machines.

Therefore, the present research reflects fruit machine behaviour in the context of guidelines in operation before the Gambling Act 2005. Where appropriate, commentary is offered which considers the current findings in relation to any changes (either implemented or anticipated) as set out in the Gambling Act 2005.

It should also be noted that the level of transparency and organisation in regulatory matters relating to gaming machines in the UK has substantially improved since the Gambling Commission has taken over from the Gaming Board for Great Britain (GBGB). As shall be demonstrated in Chapter 6, there was significant resistance and difficulty experienced when trying to ascertain how the outcomes of fruit machines were determined (i.e., randomness) when the GBGB were first approached. A series of personal communications between the author and a representative from the GBGB ultimately contributed very little to the eventual confirmation of the true nature of outcome determination (see Money-In-Money-Out Ratio in Chapter 6). As demonstrated

in Table 2.2, the Gambling Act 2005 and the Gambling Commission (2006) clearly identify the game requirements of fruit machines in relation to randomness.

On the issue of determining the outcome of the game the Gambling Commission stipulates:

> *"The proposed standards require that categories A, B1 and B2 machines determine the result of the game in a random manner, without use of compensators or regulators. Category B3, B4, C and D machines will be permitted to be random or compensated. For both types of machine (random and compensated) we have set a requirement for the game to be random in terms of the prize distribution. For compensated machines, we require that the types of games offered are fair, non-predictable and transparent to players."* [p. 19]

Research findings in Chapter 7 discussing the role of compensator and the Money-In-Money-Out (MIMO) ratio were produced before such information was verified by the Gambling Commission in 2006 and may, to some extent, have been informed by the author's involvement in consultation meetings and documents where the author's understanding and initial research findings were made available.

2.1.3.2. Prevalence of adult fruit machine playing

According to the British Gambling Prevalence Survey (Sproston et al, 2000) at least 14% of the UK population (20% of males and 8% of females) participated in fruit machine gambling over a 12-month period. The survey also reported that 6% of the population participated on at least on a weekly basis. Respondents under 24 years accounted for nearly one third of all fruit machine players, whereas only 10% were aged older than 55 years. Fruit machine gambling appeared to be equally attractive across those in paid work, those who were unemployed, and those in full-time education, with participation rates of 18%, 17% and 22% respectively. The survey also reported that 2.6% of individuals gambled on fruit machines in the past twelve months (and 4.2% who gambled in the past week) were pathological gamblers according to DSM-IV criteria.

2.1.3.3. Griffiths' Key Studies on Adolescent Fruit Machine Gambling
Griffiths (1990) provides an analysis of underlying trends found in adolescent fruit machine gambling in the United Kingdom in a study of 50 semi-structured interviews. Results support previous research on fruit machine gambling in that it was primarily a male-orientated activity and that the majority of gamblers can control the amount they spend gambling (82% of the sample were recorded as 'social gamblers'). Although 6% of the sample admitting to gambling on fruit machines at least once a day, 68% of the sample played at least once a week. Griffiths also reported that 70% spent less than £5 per week but 16% spent more than £10 per week. Over one-third of respondents (36%) reported spending less than £1 a week. However, it must be remembered that data collection for this study began in 1988, therefore any monetary values must allow for inflation.

The mean starting age for beginning to play fruit machines was eleven years old, and the vast majority of the sample began gambling for *fun* (90%) and to *win money* (70%). Very few individuals began playing fruit machines on their own (8%), and most became involved with fruit machines either through peers or relatives (70%). It is interesting to note that when questioned regarding motivation for play only 48% of participants reported winning as a reason for playing compared to 70% reporting it as a reason for starting to play fruit machines. Although the majority of the sample did not report problems, 18% met the DSM-III-R criteria for pathological gambling (APA, 1987). The most notable findings of this study came from differences acquisition and maintenance variables between pathological and social gamblers. In terms of acquisition factors, there were few striking differences except that pathological gamblers were found to begin at an earlier age (group mean age of 9.22 years instead of group mean age 11 years) Pathological gamblers were also more likely to report having experienced a big win, a finding consistent previous research (e.g. Custer & Milt, 1982; Lesieur & Rosenthal, 1991).

Griffiths proposes that pathological gamblers are less motivated to gamble because of financial reasons, but are more drawn to the 'aura' of the machines. Significant group

difference were recorded with pathological gamblers being found to experience more excitement during play, and to be significantly more attracted by the stimulating flashing light and music of the machine. Griffiths acknowledges that this contradicts Blaszczynski, et al's (1986) assertion that fruit machine gambling is motivated in pathological gamblers by the need to dissociate.

Furthermore, pathological gamblers were more likely to report that more skill was involved in fruit machine gambling than social gamblers. For example, there was evidence of pathological gamblers using flexible attributions (Wagenaar, 1988) to explain big losses. Griffiths also indicates that pathological fruit machine gamblers were less inclined to make gambling decisions based on objective probability

In a longitudinal observation study Griffiths (1991) observed adolescent fruit machine gamblers and their behaviour in order to identify typical characteristics and motivations for play. Thirty-three UK amusement arcades were monitored on a regular basis and both participant and non-participant observation techniques were used. It was found that the summer season was the most popular time to frequent arcades, and that coastal arcades were more popular than inland. Arcades were typically male-dominated and used as social venues, and those observed tended to play with friends more regularly than by themselves. Griffiths reports that the heaviest users of machines were males aged 16-25 years who tended to play solitary, and on higher stakes.

In an experimental study carried out in an arcade Griffiths (1994) examined differences between groups of regular and non-regular gamblers, in terms of playing behaviour, levels of skill, and exhibition of cognitive biases. No significant differences were found between the two groups in terms of financial performance or length of time staying on the machine from the same stake. However, there was a potential flaw in the design of this study which may have contributed to these findings. Machines were selected for the players by the experimenter and therefore, this limited the observed skill to machine operation only and not to machine selection. Other research (Fisher, 1993) has suggested that both machine selection and previous play can affect later outcomes, although there

was no empirical basis for such claims. Therefore, the conclusion argued by Griffiths that experienced gamblers are not actually as skilful in playing machines as they think they might be, is not fully justified as only operation skill was measured and not selection skill. Even in terms of operation skills the exact role that skill plays in determining outcome is not exactly clear. Griffiths identified twenty skills used by fruit machine players to try to influence the outcomes of play. However, Griffiths concludes that such skills will more than likely be pseudo-skills (i.e. functions that give the illusion of skill where it does not actually exist) or "idiot skills" (i.e. basic operations within most players' capabilities) but acknowledged this needed to be explored by further empirical research.

Griffiths' participants were also asked to think aloud, and consistent with findings by Delfabbro and Winefield, (2000) regular gamblers made significantly more verbalizations which personified the machines. Non-regular gamblers were significantly more likely to verbalize confusion and miscellaneous utterances. Non-regular gamblers were more likely to report that they had nothing to say during the trial, although some very regular players appeared to play on 'autopilot' which produced little in the way of verbalisations.

In another study, Griffiths (1995) reported out of a total 60 fruit machine players who were interviewed, 18% of this sample were found to be pathological gamblers. It was found that regular and pathological gamblers were significantly more likely to report feelings of depression before, during and after play than non-regular gamblers. In a further experimental study Griffiths (1994) found no differences in heart rates during fruit machine play between in regular and non-regular gamblers. However, such findings should be treated with caution, since players were (a) given money to use and therefore they were not losing their own money, and (b) the stake chosen by the investigator may have been too low relative to amounts usually staked by experienced players. Both regular and non-regular gamblers had higher levels of arousal during play. However, it is acknowledged that this may be accounted for by the movement involved during play. One interesting finding was that regular gamblers heart rates dropped straight away at the cease of the task, which may show a link between physiological arousal and feeling a

need to play again. Griffiths claimed that this demonstrated an objective measure of 'tolerance' in gambling.

Griffiths (1993) also outlined the importance of structural factors in fruit machine playing and this paper is discussed later in this chapter when reviewing structural factors (see Section 2.2.3). Griffiths has also carried out a number of studies examining the relationship between slot machines and other behaviours such as crime (Yeoman & Griffiths, 1996), solvent abuse, (1994) and video games (1991).

2.1.3.4. Fisher's Studies on Adolescent Fruit Machine Gambling

Fisher (1991) offered a review of the Home Office Report (Graham, 1988) on children's fruit machine playing in the light of research both prior and subsequent to its publication. The main finding of the Home Office Report was that there is no link between adolescent gambling on fruit machines and dependency or delinquency. However, this is contrary to most other research findings (Fisher 1991). Fisher shows that fruit machine gambling was the most common form of gambling amongst school aged children in the U.K. and that this was particularly true amongst those adolescents residing in seaside areas, with ready access to amusement arcades. In terms of whether adolescents are dependent on fruit machines. Fisher highlighted a number of flaws in the research methods employed by the Home Office Report. Of particular concern was the lack of anonymity afforded to participants in the research and an inappropriate reliance on data on money and time spent on machines as indicators of dependence. Fisher highlighted a number of directions appropriate for future research initiatives, including a systematic exploration of video and fruit machine use which would then allow for an assessment of motivations to play amongst youth and further clarification of what it means to be 'addicted' to fruit machines in adolescence.

In an attempt to address some of the points she raised in her 1991 paper, Fisher (1992) undertook a survey of 460 children attending a school in a small seaside town. The children were asked questions relating to a modified version of the DSM-IV criteria, as well as questions on aspects of behaviour commonly associated with dependency. Nine

percent of the sample were defined as probable pathological gamblers. Although attempts were made to impact upon the children used in this study the confidential and anonymous nature of the research, the study may have suffered from an under-reporting of antisocial or illegal behaviours. This study did however demonstrate that a significant number of children who had access to fruit machines were likely to exhibit pathological gambling behaviour and that a link potentially exists between fruit machine play and delinquency. This was contrary to results from the Home Office Report, on which legislation allowing children to gamble on fruit machines in the UK is based (Graham, 1988).

2.1.3.5. Fisher's (1993) Typology of Adolescent Fruit Machine Gambling

Fisher (1993) was the first to categorize adolescent fruit machine gamblers in the United Kingdom. Her classification system identified six categories comprising of both social gambler Arcade Kings and their Apprentices; Rent-a-spacers and Action Seekers and problem gamblers; Machine Beaters and Escape Artists. These are summarized in Table 2.3. and are described below in more detail.

Arcade Kings are described as being at the top of the social hierarchy in fruit machine culture. They are usually those players with most skills and who claim to make the highest profits. They are the oldest of the adolescent group usually aged in their late teens to early twenties. These players are recognized as semi-professionals who use self-control and skill to maximize winnings and minimise losses and typically score low on the DSM-IV-J index for problem gambling. In addition, they also employ other strategies in an attempt to win a potentially greater reward, that of ego support. For example, Kings may play several machines at one time or may demonstrate little or no emotion when they win a jackpot – these behaviours are believed to reflect a cool and composed exterior which the King feels necessary to win the respect from his peers. "Kings" are usually accompanied by some younger players who hope to learn some "tricks of the trade" from the masters – these keen novices are referred to as "apprentices".

Table 2.3. Summary of Fisher's adolescent fruit machine player typology (1993)

Type	Summary of Characteristics
Arcade Kings	Highly skilled operators, often in late teens or early 20s, in control of emotional reactions, score low on DSM IV-J.
Apprentices	Loyal assistants to Kings and learn 'skills' from Kings in exchange.
Rent-a-Spacers	Limited knowledge and skill of fruit machines, early teens, use social benefits of arcade rather than gamble.
Action Seekers	Seek arousal, enjoy liberation of gambling and absence of authority, experiments with soft drugs and alcohol.
Escape Artists	Loners in need of escape of life problems, enjoys 'controlling' the machine.
Machine Beater	Highly skilled with little of self control, prone to chasing losses.

Apprentices will be loyal assistants to the Kings by getting change from the kiosk or getting refreshments from a local café or shop. In return, they discover useful playing skills and become semi-adopted by a King.

Machine Beaters exhibit similar levels of skill and technical knowledge as the Kings but lack the necessary self-control needed to maximize winnings and to avoid exhibiting chasing behaviour. Resources are usually exhausted in an attempt to beat the machine rather than make a profit or have fun.

Rent-a-spacers are typically females in their early teens displaying low skill levels and limited knowledge of fruit machines. They are socially motivated and use the amusement arcade to develop their own "social and cultural space" Fisher, 1993, p.466). For this group, fruit machine activity is minimal, typically they gamble only to satisfy gatekeepers by proving they are playing rather than loitering.

The fifth classification identified *Action Seekers, who* are motivated by seeking arousal from both the short event frequency of fruit gambling ("where the cycle of wagering, anticipation and outcome are recharged every few seconds" [Fisher, 1993, p.467]) and the liberalization of participating in an activity that is deemed by many as "unrespectable". These Action Seekers are also attracted to the absence of authority

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within the gambling setting where they can experiment with other potentially risky behaviours such as smoking, drinking alcohol and using soft drugs.

Escape Artists constituted the final classification. These players were described as 'loners' with a need to temporarily lose touch from their reality. This need for escape would be achieved through high levels of interaction with the fruit machine where they claimed to be in control (unlike many areas in their life).

Fisher also identifies three areas of skill which players consider relevant in determining the outcome of a game. These were

1) Knowing the reels of machines - this may give the player an advantage. It is considered important to know where different symbols are located when moving reels to align a win through symbol matching.
2) Knowing which machine to select - different machines are considered to have different potential for payout.
3) Knowing how to gamble winnings further by using a dedicated gamble button.

However, Fisher did not elaborate on how these skills work or on the validity of these player's claims. These are areas, together with role of Griffiths' (1994) "idiot skills" or "pseudo-skills", that require further research as they may have important implications for player behaviour.

Fisher's typology is one of the first contributions to our understanding fruit machine gambling among adolescents in the United Kingdom. From her observations, Fisher makes clear, that gambling (even in adolescence), is a behaviour that is neither performed consistently nor in a uniformed manner. Second, she makes useful distinctions between types of adolescent gambler. In particular, she highlights the fine difference between the Arcade King and the Machine Beater. In this distinction, a fundamental yet subtle point was clarified. Essentially, this distinction argues that skill and knowledge will not always lead to profit maximizing behaviour in the absence of control. Where the Machine Beater's lack of personal discipline creates problems, these are navigated more successfully by the Arcade Kings as result of the caution they exercise in their play. This

distinction forms one of most important criteria for classification used in the typology developed later in this thesis.

Furthermore, Fisher is successful in identifying fundamental idiosyncrasies in fruit machine gambling behaviour that help explain its associated complex social behaviour. Take for the example the following observation:

> "This [group cohesion] is vital because fruit machines are rotated from site to site so that skills (particularly memorising the reels) learned on one machine, soon become redundant" (p.459).

The review offers useful information throughout giving the reader an insight into the specifics of adolescent fruit machine playing. However, Fisher herself recognizes that some degree of flexibility exists where classifications are not rigid but players will most likely move between stages. In some respects, this classification might better represent the longitudinal development of a young person's gambling career rather than a cross-section of gambling types. For example, she acknowledges that an Apprentice may develop into an Arcade King or a Machine Beater. In this respect, it is more difficult to understand such a typology. Does an adolescent fall into a specific category as result of their stage in adolescent development or as a result of more stable factors that have already developed? Behaviour which is typically exhibited by an Arcade King, such as maturity, better game play and control of emotional reactions might simply reflect factors related to his age such as experience and having a higher disposable income. An £8 win means significantly more to a 9-year-old than an 18-year-old, despite the fact both (in theory) are in a domain where each are equally likely to win that amount.

It could be males follow a set pattern whereas early as the age of nine they may be an apprentice, and then grow to be an Action Seeker, and finish their young gambling career as an Arcade King or a Machine Beater. The fact is that identifying such factors not simple. Despite the rich contribution of Fisher's typology, there are certain dimensions that need to be developed further. Moreover, due to the specific nature of Fisher's

account there were some important considerations that have received no attention. A new typology needs to consider the following points;

Adults - Fisher's typology does not consider adult players. Currently, we do not have any evidence regarding whether the motivations and consequences for gambling change considerably when the gambler moves from adolescence to adulthood, so it might follow that gambling types change also. A typology needs to be established that considers players over the age of eighteen years.

Variety of Gambling Environments - Fisher's observations were done exclusively in a seaside arcade environment. Fruit machine gamblers operate in several different locations including LBOs, pubs and clubs, casinos, take away restaurants (prior to Gambling Act 2005) and motorway service stations. A comprehensive typology should not be limited to players from just one site.

Changes in technology and gambling legislation - As detailed in later in this thesis, the structural and situational determinants of gambling have changed significantly over the last ten to fifteen years. Therefore, as form of gambling evolves, each gambler in their own respective form may change also.

2.1.3.6 Other UK research

Bentall, Fisher, Kelly, et al (1989) undertook a survey of 213 fruit machine players (76.2% of which male) recruited from amusement arcades in an urban area. The majority of participants (59.6%) were under the age of 21 years – of which players were more likely to be male. Older participants were more likely to be female. Participants were asked 41 questions relating to socio-demographic information and machine use. There was no support for a 'typical' arcade user in terms of demographics based on this sample. Over 80% of participants had been going to arcades for over a year. In total, 41.3% of those who responded to the item on frequency of play said they played more than once a week, whereas 22% visited every two weeks or less. In terms of time spent per session, 69.5% of the sample usually spent an hour or less there and a small minority stayed for

over 3 hours. Younger players were significantly more likely to stay longer in the arcade. In relation to unplanned gambling, 72.6% reported that they never spent money at the arcade that was intended for other things, although younger males were more likely to overspend. While the majority of players claimed that their families were aware of their fruit machine playing, 34.3% reported that their involvement was met with disapproval. Male or younger players were more likely to be machine dependent as defined by the level of spending and the frequency of visits. The above results should be consider with caution since:

a) There was a high rate of refusal to take part in the study;

b) The research was funded by the slot machine trade association;

c) There were no measures of problem gambling included.

Huxley and Carroll (1992) administered questionnaires to 1,332 secondary school children residing in an urban area about their fruit machine use and video game use. In terms of incidence of fruit machine gambling, 62% of the sample had played on fruit machines and video games, with 8.3% having played only on fruit machines. It was reported that 17.4% of the sample predominantly played on fruit machines. In terms of play frequency, 39.6% played frequently (at least once a week), with 15.7% playing four times a week or more. Fruit machine use in other venues showed a similar pattern, with 53.9% playing once a week or more. Older children (45.5% of 14-15 year olds) were significantly more likely to use fruit machines than younger players (35.4% of 11-12 year olds). Furthermore, although there was no difference between males in females in terms fruit machine use, males were more likely to play more frequently. The more frequent visitors to arcades were also more likely to spend more money per visit. Of the fruit machine players who play more than once a week, 70.6% spent more than three quarters of their weekly spending money on fruit machines. Most participants (73.3%) played on fruit machines with friends or siblings. Frequency of fruit machine play showed a highly significant positive relationship with 'problem behaviours' (such as truancy, borrowing money and overspending, stealing from parents and outside the family, and selling theirs and other people's possessions in order to fund gambling). Huxley and Carroll found that a greater percentage of children were gambling on fruit machine than the Home Office

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report suggests (i.e. Graham, 1988). Also, given the large number of adolescents playing with friends, this also implies that fruit machine gambling is a social activity for young people.

In order to assess the role of physiological arousal in fruit machine gambling amongst females, Coventry and Constable (1999) studied 32 female fruit machine gamblers before, during and after play. They took baseline measures of gambling behaviour, loss of control over gambling, sensation seeking behaviour, a self report measure of arousal during gambling and frequency of gambling. Participants were randomly recruited in a bingo hall and a snooker hall (which had fruit machines) and were asked to use their own money to gamble. In terms of frequency of play, 56% of participants gambled on fruit machines at least once a week, 34% of players reported chasing behaviour and 6% reported having difficulties in controlling gambling. Gamblers who won money had an increased heart rate during play and after gambling than those who lost. This was one of the earliest studies of arousal during fruit machine play and was significant in that it identifies winning can be an important factor in increasing arousal. Coventry and Hudson (2001) examined the role of winning in arousal during fruit machine play. They administered a battery of questionnaires to 42 participants (52% of which were male) exploring DSM-IV criteria for pathological gambling, items related to chasing, a state-anxiety measure (whereby participants where asked to rate how they would feel on certain statements whilst imagining they were waiting for the wheels of a fruit machine to stop) and the Sensation Seeking Scale (Zuckerman, 1979). The also had their heart rates monitored whilst playing with their own money on a fruit machine selected by the experimenter. They reported 48% of the sample were regular players, 31% chased losses and 7% said they had a problem controlling their gambling. Consistent with Coventry and Constable (1999) heart rate was found to significantly increase during gambling, more so for those who won than those who lost. Furthermore, heart rates remained high after discontinuation of play for winners. There were no gender differences in levels of arousal. There was also a positive correlation between the sensation seeking scores and arousal during gambling, which suggests a link between the two. There were limitations to this study, in that there was no differentiation made between those who gambled

regularly and those who gambled less frequently. This may have had an effect on levels of arousal experienced.

More recently, Moodie and Finnigan (2005) compared arousal between those who gambled regularly and those who gambled infrequently or not at all. Each group was matched for age and gender (although only three in each group were female). All participants completed the SOGS. Particularly in the frequent gambler group were obtained within an arcade, whilst participants in the other two groups were recruited via an advertising campaign in and around a university. Participants were allocated to groups on the basis of their SOGS screening scores and a further interview to ascertain how often they played. The study was carried out in an arcade rather than a laboratory, and participants were given money with which to bet but were told they could keep their winnings. The largest increase in arousal was shown by frequent gamblers, followed by infrequent then non-gamblers. Increased arousal was also related to winning. The frequent gamblers actually showed an increase in arousal after play, something which was not apparent in the other two groups, which is markedly different to the results from previous research (Griffiths, 1993b; Coventry & Constable, 1999; Coventry & Hudson, 2001). Certain characteristics of the machines were also linked to increased arousal - nudges, bonuses and features. An important implication was that this was the first study to examine the effects of features on arousal during game play – information which may be useful when considering the role of skill orientation and bettor involvement in arousal and risk-taking. The authors suggest that perhaps an introduction of a limit on entrance to arcades to the over 25s may be in order, although it is difficult to tell how or why this age limit has been suggested based on the data in hand.

2.2. Ecological Factors in Electronic Gaming Machines

2.2.1 Ecological factors

Ecological determinants include any potential factor that may influence gambling behaviour which operate "outside of the individual". In other words, they are separate from (although may interact with) factors such as individual differences, biological make-up, unconscious motivations, behavioural learning and cognitive biases. Ecological

factors include social and physical features that exist on a wide spectrum, ranging from the broad impact from society and the wider environment at one end and the local impact of how a specific game is designed at the other. Figure 2.1 presents the place of situation and structural factors within an "ecological" framework.

Figure 2.1 Ecological Factors in Affecting Gambling Behaviour

Level 3: Wider ecological factors (e.g., social norms; advertising; legislation; access and number of venues)

Level 2: Situational factors (e.g., venue size; number of games; clocks; ATM availability)

Level 1: Structural factors: (e.g., game speed; player involvement; stake levels; payout ratio; win probability; payment method)
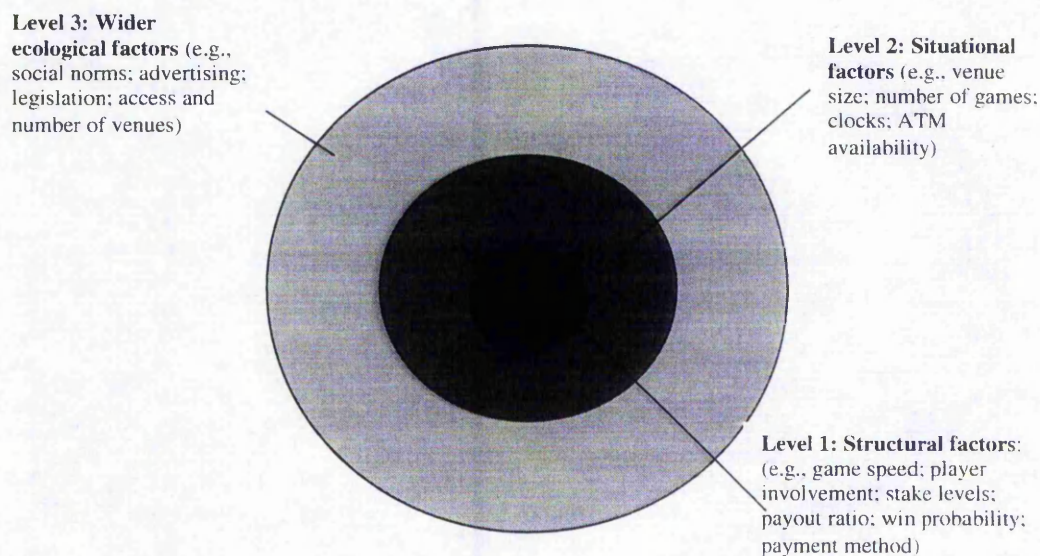
At the broadest level (Level 3) are the wider ecological factors such as social norms, legislation that may govern other level factors such as advertising, accessibility (including medium, e.g., internet; mobile, TV, shop, destination resort), and the number of venues. These factors can also include the influence of family and friends. At another level there are the situational factors that include the role of a 'site environment'. Therefore, to distinguish between Levels 2 and 3, Level 3 factors apply outside the gambling environment, whereas Level 2 do not. Examples of such factors include the size of the venue, the number of games available, access to more funds, or betting opportunities within a site. Then at a micro-level, there are Level 1 factors that apply to the game itself rather than the environment. Examples of such factors include design features the speed of a game, the chances of winning (i.e. win probability and payout ratio) and cost of playing (i.e. stake). This thesis will be focus only on Levels 1 and 2 in

relation to fruit machines. Consideration of Level 3 is beyond the remit of the current research.

2.2.2 Wider Ecological Influences

Cornish (1978) proposed that research on problem gambling has focused more on person-centred factors and therefore neglected the effect of ecological opportunity. In support of this claim, Orford (2003) suggested that supply of gambling opportunity contributes to putting individuals at risk of developing a gambling problem. Cornish (1978) highlighted that the presence of gambling institutions alone have the potential to act as a subtle form of advertising in two ways. Firstly, the potential gambler has visual access to the establishment and co-existing 'spectacles' that may draw attention to individuals in the vicinity. Additionally, their existence creates an atmosphere where winning appears common and easy (as agencies will be inclined to minimise the cues of losing). Gradually through this process, a community may become willing to accept gambling as a valid leisure activity. Therefore, the existence of gambling alone can perpetuate change within social norms, creating new trends which were not popular or even acceptable before the introduction of new gambling opportunities.

There is empirical research which supports Cornish's (1978) assertions. Volberg (1994), in a study of five US states, found that prevalence of pathological gambling increased after significant increase in gambling accessibility. Furthermore, Volberg (1997) indicated that problem gambling prevalence was proportional to the length of time elapsed since the new gambling opportunities had been available to the public. The National Research Council (1999) performed a meta-analysis of prevalence studies across different periods of time regarding gambling accessibility. They found results similar to Volberg (1994, 1997), and concluded that increased opportunity to gamble was correlated with increased problem gambling prevalence. In a UK Family Expenditure Survey, Grun and McKeigue (2000) found that the percentage of families spending more than £20 per week on gambling increased from 0.8 to 2.5, following the introduction of the National Lottery. Moreover, it was revealed that the percentage of families spending more than

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10% of their income on gambling activities increased from 0.4 to 1.7, following the introduction of the National Lottery.

Another indirect indicator of the potential link between increased gambling accessibility and increased prevalence of problem gambling could also include the incidence of individuals seeking help for problem gambling. Mintel (1995) reported that attendance at Gamblers Anonymous meeting increased by 17% following the introduction of the National Lottery. Lester (1994) similarly concludes that Gamblers Anonymous membership is highest in communities where indices of gambling availability are highest.

However, another important environmental influence, is that of family and peers. Gambino, Fitzgerald, Shaffer, et al (1993) noted that problem gamblers are three to eight times more likely to have a parent with gambling problems than non-problem gamblers. In a series of studies, Jacobs, Marston, Singer et al (1989) reported that problem gamblers who began their careers in adolescence or earlier, are usually introduced by a peer or a member of the family. In fact, family settings where card and board games are popular are often the first point of contact of gambling for individuals (National Research Council, 1999). Studies have also recorded positive correlation between adolescent gambling involvement and gambling involvement rates of peers (Griffiths, 1995; Gupta & Deverensky, 1998; Jacobs 1989; Wood & Griffiths, 1998, 2004).

2.2.3 Situational Factors

2.2.3.1 Macro-environments

In terms of casino design, there have been two macro-design principles proposed that aim to create environments which gamblers will be more likely to find relaxing and in which they will be more likely to spend their money and time. The first is referred to as the 'playground' design (Kranes, 1995) in which the aim is to create a feeling of "restoration" and comfort by including elements of moving water, green spaces and natural light. In contrast, Friedman (2000) proposed that effective casino design was based on focussing a gambler's attention on the gambling machines by using low ceilings, compact gaming areas and minimising distractions, in order to make the machines themselves the foremost characteristic of the décor. Maze-like walkways are suggested to create a personal space where continuous gambling may be encouraged. Finlay, Kanetkar, Londerville and Marmurek (2006) found in a laboratory-based study that the "playground" design created the higher levels of pleasure and lower intentions to gamble. In contrast, the Friedman design created lower levels of pleasure and a higher intention to gamble. However, these findings should be treated with caution as it is difficult to ascertain whether this effect would apply to the acquisition of gambling behaviour in addition to its maintenance. Furthermore, the authors measured intention to gamble after viewing a video-recording of the environment, rather than actual gambling behaviour within a live environment. Given that the clear distinction between gambling intention and actually gambling behaviour, these findings are open to further empirical testing.

2.2.3.2 Arrangement of EGMs

Ladouceur, Jacques, Sevigny and Cantinotti (2005) tested three different types of arrangement of EGM: machines set in private cubicles; machines placed against the wall and machines which were placed on a counter. The latter two arrangements were in open view of other customers and the cubicle arrangement was out of direct view. According to self-report measures there was support for the claim that cubicle arrangement (affording more privacy) was more likely to foster a loss of control and encourage excessive gambling as a result of the increased levels of privacy and absence of other

potential distraction. Although, these claims were not supported by the behavioural data from the same research, Ladouceur et al, conclude that a responsible gaming approach may involve choosing EGM arrangements that offer high levels of visibility and/or social interaction so to minimise the high levels isolation that may facilitate problem gambling.

2.2.3.3 Access to additional funds

Options for gamblers to get access to further gambling funds by using an ATM (Automatic Teller Machine) have been associated with excessive gambling, particularly in the context of chasing and unplanned gambling. McMillen, Marshall and Murphy (2004) suggest a link between problem gambling behaviour and access to ATMs. They found that 60% of problem gamblers visited ATMs compared to only 13% of recreational gamblers and 5% of non-gamblers. They also reported that problem gamblers were more likely to withdraw larger amounts from ATMs and were more likely to spend cash withdrawals while at the gaming site. Although, respondents were reluctant to support the removal of ATMs for practical reasons, the majority were in favour of placing an upper limit on ATM withdrawals as a protective factor.

2.2.3.4 Alcohol

Despite a paucity of research regarding the impact of alcohol in gaming environments, there have several authors who have made a link between alcohol use and gambling problems (Corless & Dickerson, 1989; Kyngdon & Dickerson, 1999; Baron & Dickerson, 1999). In an experimental setting, Ellery, Stewart and Loba (2005) found that following the consumption of a moderate intake of alcohol, players would spend more time playing VLTs, make riskier bets, and more losing hands (among probable pathological gamblers). There were no significant differences between the alcohol and control groups in terms of money spent. However, the authors conclude that the impact of spending more time can cause significant problems in relation to family, personal hygiene and other commitments. Furthermore, in the long run, making riskier bets (on games with a payout ratio lower than 100%) and playing losing hands, will ultimately lead to poorer financial outcomes.

2.2.3.5 Light and Colour

Few researchers have explored the role that colour and lighting can have on gambling. The impact of colour was first assessed using blue and red lighting (Stark, Saunders and Wookey, 1982). They found that gambling behaviour (including risk levels, frequency and stake) increased significantly more under the red lighting than under the blue lighting. They concluded that this effect was the result of an increased level of arousal. Despite their general explanation it was not made clear (a) how red increased levels of arousal or (b) why such an increase in arousal would have the observed impact on gambling. Griffiths and Swift (1992), based on observations across amusement arcades in south-west England, reported that the lighting and décor were primarily red in colour. The chances that this is a coincidence are unlikely. However, it is not yet clear whether such a tactic has a real impact as there is a distinct lack of ecologically valid evidence supporting the use colour in this way. However, a laboratory-based attempt to replicate Stark et al.'s findings in the context of internet gambling was unsuccessful (Davis, 2006). Participants were exposed to red, blue and yellow background lighting while playing Internet roulette for small prizes, and no significant differences were reported between conditions on risk, speed of play, level of stake or number of bets.

2.2.3.6 Olfaction

Olfaction has also been investigated experimentally in a gambling environment. Hirsh (1995) investigated the effect of ambient aromas on gambling behaviour in a Las Vegas casino at two slot machine areas odourised with pleasant but distinct aromas and at an unodourised control slot-machine area. The amounts of money gambled in the three areas were compared for the weekend of the odourisation and for the weekends before and after. The amount of money gambled in the slot machines surrounding the first odourant during the experimental weekend was significantly greater than the amount gambled in the same area during the weekends before and after the experiment, possibly due to olfactory evoked recall. The increase appeared greater on Saturday, when the concentration of odourant was higher. The amounts of money gambled in the slot machines surrounding the second odourant and in the control area did not change significantly compared to the weekends before or after the odourisation. Again, although research in the area of

olfaction and gambling is limited, it does suggest that smell may influence gambling behaviour.

2.2.3.7 *Association with sport*

Association with sport could be interpreted at any of the three level of ecological influence. The association between gambling and sport also has implications, primarily the ability to class gambling as a subtype of sport which in turn leads to the attribution of social respectability (Cornish, 1978). Furthermore, Cornish (1978) argued that sporting interests can often act as a pathway to gambling. Individuals can be introduced to gambling in attempt to make the sporting experience more entertaining and enjoyable. Gradually, the enjoyment from betting at sporting events can transfer to into more familiar environments and to other types of betting. Sport is another way that gambling can expose itself, and provide the potential gambler with another opportunity to gamble if one did not previously exist or appeal. Therefore, in addition to be potentially being a pathway to gambling, association with sport is also a mechanism through which gambling can be made socially acceptable.

2.2.4 *Structural Factors*

A review of the literature on the structural factors will be presented in the form of an original taxonomy of structural factors:

- Factors that make gambling fun, interactive and/or engaging (which for the purposes of parsimony which will refer to as "playability");
- Factors which relate to how one pays to gamble (payment);
- Factors relating to how one receives financial rewards or winnings (reward);
- Factors relating to the frequency, duration and expediency of the game or reward (speed and frequency);
- Those protective features which educate or provide information to players (educational) and finally;
- Ambient features which may influence the immediate situation of the game or may contribute to other factors already mentioned (e.g. the use of colour and sound).

Part One: Introduction

The following categories and factors presented in this chapter are summarised in Table 2.4. It should be noted that like most classifications of social phenomena, some factors could arguably be included under a different heading and therefore, each set are not entirely mutually exclusive. Each of these factors will be discussed in more detail below with particular consideration being given those factors receiving limited attention elsewhere.

2.2.4.1 Payment Characteristics

Usually, the first interaction a player has with an EGM is the purchase of credit to begin play. Several factors contribute to the changing face of "payment" including industry profitability, technology and pressure from various groups to make EGMs more socially responsible. Each structural aspect of payment is discussed below.

Suspension of judgment and cashless gaming: The suspension of judgment refers to a structural characteristic that

> "*temporarily disrupts the gambler's financial value system*" (Griffiths, 1995, p.207).

Older fruit machines often used tokens instead of coins (rather like casino's use of chips) which "disguised" the money's true value (i.e., decreased the psychological value of the money to be gambled). Tokens are put straight back into the machine without hesitation because they cannot be exchanged back into money by the machine operator). In a series of focus groups examining issues relating Internet poker and casino gambling, participants in one study said that they often spent more money when playing with e-cash in an online environment as opposed to real money offline (Parke et al, 2007). However, these findings are open to further empirical testing. It should be noted that tokens have been phased out of EGM gambling in the UK, although many casinos around the world have started to use smart cards that are also representational forms of money and have the capacity to psychologically lower the real value of the money (Griffiths & Parke, 2002). UK fruit machines have also recently started to use note acceptors at most sites. Amusement arcades have been reluctant to introduce note acceptors due to fears of increased levels of fraud. Arcade operators prefer change to come directly from change attendants.

Table 2.4: Taxonomy of structural factors in gambling games and related research

Category	Characteristics	Authors
Payment	*Cashless Gaming*	Griffiths, 1993; 1995; Nisbet, 2005
	Bill Acceptors	Blaszczynski, Sharpe & Walker, 2001; Schellineck & Schrans, 2002 ; Brodie, Honeyfield & Whitehead 2003
	Spending Limits	Blaszczynski, Sharpe, Walker, Shannon & Coughlan 2005
	Betting Lines	Walker, 2004; Delfabbro 2006
	Credit versus Cash Display	Loba, Stewart, Klein & Blackburn 2002
	Smart Card Technology: Precommitment	Nisbet, 2005
Playability	*Near Miss*	Strickland & Grote, 1967; Moran, 1979; Reid, 1986; Griffiths, 1991; 1994; 1997a, 1997b,1999a, 1999b; Chantal, Vallerand, Ladouceur, & Ferland, 1995; 1999; Kassinove & Schare, 2001; Griffiths & Wood, 2001; Ladouceur & Sevigny, 2002;
	Familiarity	Dunbar & Griffiths, 1997
	Specialist Play Features (e.g. Nudges, shuffles etc)	Griffiths, 1990a; 1994; 1995
	Stop Buttons	Loba, Stewart, Klein & Blackburn 2002; Ladouceur & Sevigny 2005
	Gamble Buttons	Griffiths, 1990, 1994, 1995; Walker, 2004
	Originality/Novelty (new)	Schellineck and Schrans, 2002
Speed	*Event duration and frequency*	Griffiths, 1993, 1995, 1997a; 1997b, 1999a;; Blaszczynski, Sharpe & Walker, 2001, Griffiths & Wood, 2001; Loba, Stewart, Klein & Blackburn 2002; Blaszczynski, Sharpe, Walker, Shannon, Coughlan 2005; Delfabbro 2006;
Educational	*Clocks/Time Awareness*	Schellineck & Schrans, 2002; Blaszczynski, Sharpe & Walker (2003)
	Player information	Loba, Stewart, Klein & Blackburn 2002
	Transparency of expenditure	Loba, Stewart, Klein & Blackburn 2002
	Warning	Steenbergh, Whelan, Meyers, May & Floyd 2004
	Limit setting information	Steenbergh, Whelan, Meyers, May & Floyd 2004
Ambient	*Light*	Caldwell, 1974; Griffiths & Swift, 1992; Griffiths, 1993; Delfabbro 2006
	Colour	Stark, Saunders, & Wookey, 1982; Griffiths & Swift, 1992; Griffiths, 1993
	Sound	Hess & Diller, 1969; White, 1989; Griffiths, 1993; Loba, Stewart, Klein & Blackburn 2002; Delfabbro 2006
Reward	*Jackpot Size*	Cornish, 1978; Dickerson, 1993; Griffiths, 1993, 1997a, 1997b; Delfabbro & Winefield, 1999; Griffiths & Wood, 2001; Delfabbro, 2006
	Payout Ratio	Cornish, 1978; Griffiths, 1993, Griffiths, 1997a; 1997b; Griffiths & Wood, 2001
	Win Probability/Multiplier/ Betting Lines	Royal Commission, 1951; Weinstein & Deitch, 1974; Cornish, 1978; Griffiths, 1993, 1997a, 1997b; Griffiths & Wood, 2001;Walker, 2004; Delfabbro, 2006
	Schedules of Reinforcement	Dickerson, 1991; 1992; 1993; Delfabbro & Winfield, 1999; Delfabbro 2006
	Immediacy	Delfabbro, 2006
	Mandatory Cashouts	Blaszczynski, Sharpe & Walker, 2003

Smart cards, spending limits and cashless gaming: Nisbet (2005) acknowledges some of the negative aspects of cashless gaming such as isolated and uninterrupted play. However, she also emphasizes that cashless payment can be used to promote responsible gambling. In particular, she suggests that card-based cashless systems can be used to encourage players to limit how they much they spend in a given period of time and to inform players of their spending habits through regular statements of their transactions. It is worth pointing out that Nisbet also found that despite supply side informants (i.e., operators, manufacturers, etc.) suggesting that a $200 spend limit would restrict player acceptance, approximately three-quarters of players who were interviewed (n = 134) agreed that the limit was sufficient for their needs. This is an area that requires more empirical investigation although acceptance of cashless systems still appears to be low with less than 5% of New South Wales' EGMs employing this technology.

Maximum bet size and bill acceptors: An Australian study carried out in ecologically valid setting (hotels and clubs housing EGMs) reported that changing maximum bet sizes from $10 to $1 had no significant effect on perceived enjoyment for either recreational or problem gamblers (Blaszczynski, Sharpe & Walker, 2001; Blaszczynski, Sharpe, Walker, Shannon & Coughlan 2005). The authors concluded that if modifications promoted harm minimisation then this could be enjoyed with limited impact on player satisfaction. Blaszczynski et al (2001) found that only 7.5% of the 20% whom were problem gamblers bet above the $1 limit, and therefore, limits on bet size may be an effective harm minimisation measure for these individuals, despite them making up a small proportion of the overall sample. However, the authors warn that since most bets are under $1, that:

> *"problems caused by gambling losses result not so much from excessive bet size over shorter periods, but relatively standard bet sizes for longer periods of time in play"* (p.76).

Therefore, limits to maximum bet size may be more useful as a harm minimisation tool for a minority of gamblers either playing with higher stakes or playing with time constraints within a shorter session. Therefore, given the limited impact of such a feature on player

satisfaction, it may be useful in a comprehensive social responsibility programme. Blaszczynski et al (2001) suggested that bill acceptors may increase spending in a number of ways such as:

- Suspending judgment (see suspension of judgement above) whereby more cash is transferred to credit at once;
- Minimising breaks (and thereby allowing more time to consider expenditure) as players do not need to leave the machine need to get change;
- Increasing privacy (e.g., avoid the potential embarrassment of letting gaming staff, friends, family or even other customers know how much they are spending).

Shellinck and Schrans (2002) found supporting empirical evidence for this claim whereby the amount initially put into an EGM was twice as high on machines that included bill acceptors. Consistent with this, Blaszczynski et al (2001) found that limiting bill acceptors to $20 denominations reduced overall revenue on modified EGMS by 42%. However, they also concluded that limiting bill acceptors are: *"likely to be an inconvenience that has no impact on length of time spent playing"* (p.76) because players may simply move along to an unmodified machine. Further research needs to be carried out in environments where there are no alternative machines with higher bill acceptors.

Brodie, Honeyfield and Whitehead (2003) interviewed 359 individuals following an introduction of an upper limit of $20 to bill acceptors in EGMs operating in Queensland. Although the majority reported no change to their gambling behaviour, a minority of players (15-20%) reported reductions in number and duration of visits, size of bet and overall expenditure with the greatest changes coming from the problem gambling group. However, such reductions were not corroborated by their empirical enquiry revealing that EGM metered win or consumer net loss remained unchanged overall in the affected jurisdiction following the change in note acceptors. Although such findings may be explained by an increase in number of people of gambling, more empirical evidence is needed to support this claim.

Betting lines and credits per play (i.e. multipliers): This will be discussed in a later section on 'Reward' as they interlinked with payout and reward.

Cash versus credit display: In a laboratory experiment, Loba, Stewart, Klein and Blackburn (2002) reported that when a visual display counter showed money won or lost in dollars rather than credits, pathological gamblers found it easier to stop playing. This result was not found among non-pathological gamblers. However, this is only one experiment and needs replicating and generalizing to other forms of EGM gambling.

2.2.4.2 Playability Characteristics

By definition, electronic "gaming" machines (EGMs) need to provide a game that is "playable." A game needs to some extent be interactive, engaging and fun. Although, EGMs traditionally achieved this through matching symbols on reels, these games are evolving to be more exciting and interactive through using more features, more ploys (e.g. near miss) and better marketing. These factors are discussed in more detail below.

Specialist Play Features: It has been noted by a number of authors (Langer, 1975; Cornish, 1978; Griffiths, 1993) that the degree of personal participation (i.e., bettor involvement) and the exercise of skill are interrelated. The gradual introduction of specialist play features such as 'nudge', 'hold', and 'gamble' buttons on fruit machines increased the level of player interaction and skill orientation among players (Griffiths 1990). These play features were aimed at giving players the belief that by using a variety of buttons and making decisions about collecting or gambling wins, they could alter the outcome of a game. Griffiths (1994) concludes that such skills may in fact be "pseudo-skills" or "idiot" skills, in that they do not effect the eventual long term payout or in that they too obvious to be referred to as 'skill'. However, Griffiths does point out that further research is needed to further validate these claims.

Stop buttons: Another factor that may affect player interaction and playability is the option or requirement to "stop" a reel spin. In other words, by pressing a button or the equivalent one may be able to stop the reels or symbols thereby further involving the

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player in the outcome of the game. In effect, the player makes the decision when the reels or symbols come to a halt. This function might foster an illusion of control among players and in some situations, might reduce event duration or reel spin speed. This function is not currently available on fruit machines but is available on EGMs in other jurisdictions as discussed below.

Loba, Stewart, Klein and Blackburn (2002) found support for the claim that players had a stronger desire to play machines with a stop function regardless of status as a pathological gambler. However, it is questionable whether the presence of this function is vitally important as players did not notice any significant difference when moving from machines without this function to play machines with this function. This might suggest that although a stop function is considered more fun or enjoyable, the absence of a stop button may not be enough for players to lose interest and inhibit further play. In another laboratory study, Ladouceur and Sevigny (2005) found that a stopping device increased illusions of control and cognitive biases, and also increased actual gambling persistence when playing a video lottery terminal (a VLT being a specific form of EGM).

Gamble Buttons: Arguably, all buttons found on an EGM could, by definition be referred to as a "gamble button" as they facilitate gambling behaviour. However, the term "gamble button" is unique in that it refers to a mechanism that allows players the opportunity to risk winnings by gambling it further. There are several variations of this feature differing in terms of risk (double or nothing; increase or lose a small percentage), in terms of randomness (some are random; some are not), and in terms of form (some gambles relate to going higher or lower on a numbered reel; some result from a simple press of a button). What they all have in common is that they give the gambler more interaction, more risk, chance of winning a greater prize, more opportunities to experience a near miss, and in some cases, it could be argued more illusion of control.

Griffiths (1993) was among the first to acknowledge the presence of the gamble button in UK fruit machines claiming that this was a "pseudo-skill" feature which allowed players to be believe they have more skill over the outcome of game than they did in actuality.

Part One: Introduction

Fruit machines have the widest variety of forms of gamble buttons and options owing to their current pseudo-random technology and relatively flexible legislation. Walker (2004) examined the use of a gamble button at a large Australian club in Sydney, and found that less than 5% were willing to use the gamble button and reluctance to use this feature increased as the initial win size increased. As Walker pointed out, this is further evidence of irrational player behaviour as machines in this jurisdiction offer a payback ratio of 100% (i.e. a 50/50 chance of winning or losing) when using the gamble button. This is, of course, higher than the payout ratio of EGMs generally (70-95%). This would indicate that using the gamble button would be more profitable in the long run than regular play on the EGM. This finding could also be used to support the claim that gamblers play for time rather than money (Griffiths, 1990; 1995). In other words, here the gamble button represents better value, albeit with more risk, which may ultimately lead to shorter gambling sessions.

Walker (2004) postulated that the lack of popularity of the gamble button could be explained by the fact that only problem gamblers tended to use this facility. Walker subsequently reported that this was not the case, having surveyed gamblers (n = 120) in a large Sydney club and found that there was no correlation between number of hours of play each week and reported use of the gamble button. Future research should focus on other indicators of problematic play such as stake and bet levels, expenditure, chasing, affordability and/or perhaps scores on SOGS or DSM-IV criteria.

The near miss: The definition of a near miss is any non-winning outcome of a gamble that is "perceived" as being almost successful. The notion of player perception is important to this definition since "near misses" are the same as other losing outcomes in that they do not payout any winnings and they do not affect the payout ratio (see reward section below). The difference exists only in how the visual representation is perceived on screen or through play. A near miss (e.g., two matching symbols on a win line with the third matching symbol just off the win line), may still be reinforcing and fun even though it may not cost the operator anything (Griffiths, 1993). Essentially, players perceive that they frequently nearly winning, as opposed to frequently losing (Griffiths, 1994).

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Strickland and Grote (1967) found empirical support for this effect whereby having more winning symbols appearing more frequently on the first two reels relative to the third reel induced longer gambling sessions. Reid (1986) argues that the consequential negative affect of nearly winning could induce further gambling in players who want rectify the situation. Griffiths (1993) also demonstrated that almost nearly winning did in fact increase arousal in players demonstrating that gamblers needs can be met even in the absence of a win.

Familiar Themes: Griffiths and Dunbar (1997) reported that if themes of fruit machines are "familiar" which relate to television programmes, films or board games (e.g., *Pink Panther, Only Fools and Horses, Cluedo,* etc) players will be more likely to initiate play and may even feel that prior knowledge may give them an advantage.

2.2.4.3 Speed and Frequency

When considering speed and frequency of gambling, concepts such as event frequency and payout interval can often be misunderstood and applied in the wrong context. Often, these are mistaken for having the same meaning. Furthermore, concepts such bet frequency and event duration are often ignored despite their importance of their role in the speed and frequency of betting. All of these terms refer to slightly different aspects of gambling although they are all implicated factors that affect speed and frequency.

Bet frequency and event frequency: *Event frequency* refers to the number of events that are available for betting in any given time period. For example, a lottery draw may occur twice a week but an electronic keno lottery draw may occur 100 times per hour. In this example, a keno lottery draw has a higher event frequency. *Bet frequency*, on the other hand, refers to the number of bets or gambles placed in any given time period. Using lottery again as an example, multiple tickets (e.g., 10 tickets) can usually be purchased as frequently as desired before any single lottery draw. So here bet frequency would be equal to 10 but event frequency would be equal to 1. Therefore, bet frequency can often be higher than event frequency and hence, it is possible to spend more than one can afford

even with a low event frequency. Upward limits on the number of bets or the absence of multipliers (e.g. when playing an EGM, players may be limited on how many bets place and how much they stake - see 'Rewards' below) will influence the relationship between bet frequency and event frequency.

The relationship between bet frequency and event frequency needs further empirical investigation. As researchers and clinicians, it is often assumed the two have a strong relationship: the higher number of betting events – the higher the frequency of betting. Until more research is forthcoming it may useful to comment on this relationship further here. Although, players can place many bets on just one gambling event, the outcome of this event can influence future betting activity. By outcomes, we are essentially referring to winning or losing. Losing can often create financial and emotional motivation to continue betting (i.e., chasing - for detailed exposition of chasing, see Lesieur [1994]). It could be speculated that the satisfaction from winning may reduce motivation for further betting in the short-term, or it may increase betting as a result of increased bankroll, illusions of control and/or cognitive biases. Therefore, a higher event frequency not only offers more opportunity and choice for betting, but also affects motivation for betting through revealing consequential wins and losses at the end of each event.

Event duration: This essentially refers to how fast the "event" is (e.g., a reel spin might last 2.3 seconds). It is important to acknowledge that duration of the betting event is different from event frequency. However, they may be inextricably linked in so much as the length of a betting event will obviously limit the frequency with they can take place. For example, a betting event lasting two hours (e.g., a sports game) could not have an event frequency greater than one in any 2-hour period, but a roulette spin (lasting approximately 5-6 seconds) may have an event frequency of several hundred in the same two-hour period. Furthermore, as a result of the introduction of in-running betting (see next section), this relationship is even less clear.

In-Running Betting: This refers to the relatively new betting option of wagering on an event that has started but has not yet finished – what bookmakers commonly refer to as

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"in-play." This means players can continue to bet on an event and perhaps more importantly, adapt their bets according to how the event is progressing. For example, when betting on a sporting event, gamblers who initially bet that Team A would win could theoretically place subsequent bets with different predictions (i.e., the game could be tied or Team B will win) based on their interpretations of the game thus far. Of course, gamblers could also maintain their original predictions but place further bets if they are encouraged or further convinced by the backed team's performance. Given that this is a relatively new betting concept it certainly requires further empirical research. It could be speculated that in-running betting may contribute to excessive, prolonged or unplanned betting as a result of:

- Within-session chasing (i.e., on the same event or series of events). For example, an individual may make an incorrect bet selection, but then choose to recoup past losses by placing more bets on the same game;
- An increase in perceived skill (through watching, analysing or even attending a betting event);
- Simply making sporting events more exciting and/or interesting.

Bet frequency is therefore not a structural factor but is determined to some extent by pay out interval and event frequency that are indeed structural factors.

Payout Interval: This is the time between the end of the betting event (i.e., the outcome) and the winning payment. This is beginning to change with cashless systems (see Nisbet, 2005) and online betting accounts as money can gambled from a designated account where can be instantly credited or deboted even though it does not physically change hands. Cornish (1978) outlined three reasons which explain how the payout interval can influence gambling behaviour. Firstly, the contingencies of reinforcement operate most effectively when the reinforcer is immediate. Secondly, when losses are incurred rapidly the need to chase losses (by increasing the frequency and size of bets) also increases. Finally, the faster the winnings are made available to the gambler, the more opportunity the individual has to gamble further. Therefore, as Griffiths (1995) points out, a high event frequency and short event duration mean that:

> *"the loss period is brief with little time given over to financial considerations and, more importantly, winnings can be re-gambled almost immediately"* [p. 200].

2.2.4.4 Educational Characteristics

Educational structural characteristics are a category of characteristics that exists purely for the purposes of harm minimisation. Ambient features and features relating to payment, playability, speed and reward can contribute to both *engagement* (making games more fun, enjoyable and interesting) and to *harm minimisation*. Educational or information features are included to provide information regarding the player's behaviour and how the EGM actually works in an attempt to ensure more responsible play.

Clocks: As one would expect, the use of clocks as a feature is aimed assisting the player in keeping track of time.   In their evaluation of an introduction of new EGMs using responsible gaming features, Schellineck and Schrans (2002) found that clocks had no measurable impact on time or expenditure but it did improve players' ability to keep track of time and play within set limits.

Transparency of expenditure and statements: As discussed above, Loba et al (2002) found that when pathological gamblers played EGMs using counters showing money won (or spent) rather than credits, they found it easier to stop gambling overall. This suggests that factors improving awareness of expenditure may be useful in harm minimisation. Such a finding makes intuitive sense, gamblers may operate using cognitive processes that may distort their awareness or recollection of how much money has been won or lost. For example, Wagenaar (1988) identified heuristics that gamblers may use that might contribute a biased interpretation of expenditure such as *fixation on absolute frequency*. Fixation on absolute frequency refers to when gamblers focus on how much they are winning, and ignore the levels of expenditure needed to get those wins. In other words, they do not take into consideration the overall financial outcome (e.g., wins minus losses), they simply refer to win frequency and amount but, to some extent, may ignore the level of expenditure needed to secure such wins.

With such cognitive processes in mind, features that facilitate accurate recall of expenditure may have positive implications for harm minimisation and for keeping the gambler informed. Therefore, in addition to cash displays as opposed to credit display, it is suggested that future research is needed on the impact of regular statements of expenditure (wins and losses), either within session (i.e., during play) which tend to be onscreen or between session (e.g., weekly or monthly statements) which tend be received via account membership either through the post in hard copy or through e-mail.

Warnings/pop-up messages: In the same way that alcohol- and nicotine-related products carry mandatory warnings in various jurisdictions, warning messages have been recommended on gambling products to warn and inform players of the risks involved with, and time spent gambling. These are often referred to as pop-up messages given the nature of how they are introduced to players on-screen during play. Schellinck and Schrans (2002) reported that exposure to a 60-minute pop-up message (informing players of time spent) resulted in a small but significant decrease in length of session and in expenditure of problem gamblers.

Limit setting information: In another study examining the impact of brief intervention messages and information on limit setting, Steenbergh, Whelan, Meyers, May and Floyd (2004) reported that the provision of messages to college-age gamblers significantly improved gamblers' knowledge in relation to risks and rewards in relation to gambling. However, although these findings may support the use of intervention messages and limit-setting information in manifesting cognitive change, they reported that this intervention did not significantly affect actual gambling behaviour. Therefore, more research is needed to examine the link between gambling-related knowledge and problematic play, particularly in relation to higher-risk players whose base-line behaviour has more scope for being influenced by the experimental manipulations.

2.2.4.5 Ambient Characteristics

Light and colour effects: A number of authors (i.e., Stark, Saunders and Wookey, 1982; Griffiths & Swift, 1992; Davis 2006) have examined the role of light and colour on gambling and these were discussed above under sensory factors in the situational characteristics section.

Sound Effects: The use of sound effects in gambling (which mainly affects EGMs) has long been used although there is very little empirical evidence assessing exactly what impact the use of sound has on gambling behaviour. This section briefly assesses the role of (i) general sound, (ii) verbal interaction, and (iii) music.

General sound: Loba et al (2003) found that a pairing of decreased reel speed and no sound effects reduced ratings of enjoyment, tension and excitement for pathological gamblers in their study. They also found that pathological gamblers found it more difficult to stop gambling when no sound was paired with faster reel speed and a stopping device. However, it is difficult to tease out the extent to which sound accounts for these findings as this manipulation was paired with other variables. Delfabbro (2006) found empirical evidence suggesting that players preferred machines where sound was used to indicate wins and rated these machines as significantly more attractive. Further empirical research investigating sound as a structural factor in betting must focus on the role that sound may play in a particular game. As outlined previously, sound which is used to reinforce a win will facilitate gaming behaviour while sounds reinforcing a loss will have an inhibiting effect.

2.2.4.6 Reward Characteristics

Multiplier potential and betting lines: Griffiths (1995) defines multiplier potential as a structural characteristic that refers to the:

> *"range of odds and stakes that the form of gambling offers and can be*
> *viewed as a primary inducement to play"* [p. 201].

Cornish (1978) suggested that the option of multiplying stakes is risky (particularly when combined with a high event frequency) as this provides players with appropriate

conditions for chasing losses. Bettor involvement and choice may be increased as a result of variable staking options but the effect is likely to be marginal in relation to other options for increasing player interaction. However, players may be more motivated to select a higher or a maximum multiplier as they may perceive such play to represent better value. For example, higher staking levels on some EGMs often imply:

- Greater than proportional increases in potential wins;
- Being eligible to win a progressive jackpot;
- Being eligible to play certain feature games win bonuses;
- Being eligible to play certain win bonuses.

However, it is important to note, that the overall percentage return on investment is ultimately determined by the payback ratio (e.g., 80% of credits paid back) that is the same regardless of how many coins/credits are played. Therefore, over the long run, both methods should yield the same return on investment. However, it may be that the more engaging options potentially afforded by a higher multiplied stake (such as feature games, progressive jackpots, etc.) influence the player's decision to multiply their stake.

Furthermore, with the introduction of video screens in the place of the traditional reel sequence displays, there are now more options of betting on more than one line. Video screens can now allow a variety of betting options up to as much as 30 lines per play. Where most reel-based EGMs offered prizes on the "horizontal matching" of symbols, video screens now have the option to reward matching of symbols on various horizontal, diagonal, vertical and even 'zig-zag' configurations. This combined with the option to multiply credits per play significantly increases the stake size and potentially the size and/or frequency of rewards/prizes. For example, if you choose to play 20 lines at 9 credits per line on a 10 cents EGM then each spin or play will cost $18 per spin (e.g., 10 cents x 20 x 9 = $18). However, you will also have 20 times as many opportunities to win a prize at rate nine times higher than if the gambler played one credit and one line per spin.

Walker (2004) refers to the behavioural interaction between multiplying stake and betting lines. The strategy whereby a player bets on one line for the minimum bet per line is

referred to as the "minimin" strategy. In contrast, a "maximin" strategy refers to betting on the maximum amount of lines available but only betting the minimum amount per line. The utility in making this distinction is that players who may fear "missing out" on potential wins may prefer the maximin strategy whereas players who wish to play for a longer period of time may prefer to use the "minimin" strategy. From their observational study, Williamson and Walker (2000, as cited in Walker [2004]) reported a preference for the maximin strategy and suggested that maximin players were motivated to bet on the maximum number of lines so that no winning combination was missed.

Although further research is needed, it would seem that the option to bet on more than one line per spin and more than one credit per line may increase the likelihood of spending more within a given timeframe. Furthermore, since neither affects the percentage return on investment in the long term, such strategies of play may be initiated and perpetuated as a result of biased reasoning or by the motivation to take more risk in their betting in a shorter period of time. EGMs offering multiple stakes and multiple betting lines may increase excitement and minimise the chance of a missing a winning combination or a feature game, but will inevitably increase expenditure within a given period of time. There is no evidence to date that confirms if strategies requiring higher expenditure simply mean that players spend the same amount of money in a shorter period of time or that they spend more money over a similar period of time. More empirical research is needed to determine the likely effects of overall expenditure and how this links to the development and maintenance of problem gambling.

Payout ratio: The *payout ratio* is the ratio of the winnings paid out to players in relation to the money taken in the form of stakes. As Griffiths (1995) suggests, payout ratios for EGMs are usually in the region of 70-90% (i.e., on average 70-90% of the original stake is paid back to the gambler over the long run). Cornish (1978) proposes gamblers have an 'equilibrium' point regarding the where betting is most attractive. Put simply, existence of a point where the probability of winning and the size of the win are both at acceptable levels. Cornish contends that gambling on activities which operate at an equilibrium state is where gamblers are particularly vulnerable and at risk for

development of problem gambling. It should be noted that payout ratio refers to chances of winning in the long term only. The payout ratio is essentially expressed of a percentage whereby the house edge or rake (i.e., the cut or advantage for the operator) is subtracted from the initial stake. For example, when playing single zero roulette the house edge would be 2.7% which would mean the payout ratio would be 97.3% ([stake at 100%] – [edge at 2.7%] = [payout ratio at 97.3%])

Jackpots: While it is acknowledged that there is currently little research exploring structural factors generally, it is perhaps most surprising that there is a paucity empirical research into the effect of jackpot size on gambling behaviour. There is some evidence to suggest that a higher jackpot will attract more participation in that gambling activity. For example, Griffiths and Wood (2001) reported that more lottery tickets are bought when there is the promise of particularly high jackpot (e.g., rollover jackpots where the top prize has not been claimed in previous weeks). However, what is less clear is the motivation behind such a trend. Although, this might be explained by the obvious appeal of getting "more money", other more subtle factors may be at work. It could be the case the higher jackpots attribute higher status to gambling activity and that higher jackpots offer more opportunity for chasing losses. Like many of the other structural factors discussed here, more empirical research is desperately needed to learn about the impact of jackpot and win sizes on gambling.

Reward schedules and reinforcers: These refer to more than monetary reinforcement and may include other reinforcers such as social reinforcement, escape, or even classically conditioned stimuli such as auditory cues in a betting shop (Dickerson, 1984). Although, monetary reinforcement is traditionally considered to operate under a variable ratio schedule of reinforcement, some reinforcers are argued to operate under other schedules such as fixed interval schedules (Dickerson 1979; 1993; Delfabbro & Winefield, 1999).

Mandatory cashouts: A mandatory cashout refers to a forced withdrawal of all remaining credits or banked winnings on an EGM. The aim of such a feature is to "interrupt" play in an attempt to either discontinue a dissociative state caused by excessive play or to create a

short timeout that may facilitate players to take stock of their expenditure. There is, to date, no evidence to support their effectiveness in harm minimisation. Shellinck and Schrans (2002) reported from their Nova Scotia study that a mandatory cashout feature had no effect on either duration of play or on actual expenditure regardless of participants' status as a pathological gambler. However, the conclusion of this research is inconclusive since the mandatory cashout in the Nova Scotia study occurred after 150 minutes and as Blaszczynski, Sharpe and Walker (2003) point out:

> *"Since session length for problem players is 144.5 minutes and since problem players report cashing out of one machine and continuing to play on another machine 65% of the time, the actual occurrences of mandatory cash out must be quite rare"* (p. 30).

2.3. Fruit Machine Players: A Difficult to Reach Population

2.3.1. Background

During the initial stages of this research, a number of options were reviewed as to how to plan and carry out a series of research initiatives that would eventually constitute a research programme examining fruit machine gambling. At a vary early stage, it was clear that participant recruitment was going to prove difficult, not only in terms of identifying and locating participants, but also in terms of recruiting participants for the survey and focus group stages of this research.

Griffiths (1995) outlines a series of restrictive factors which operate when trying to carry out observational research on fruit machine players, and these are summarized in Table 2.5.

Based on evidence from initial pilot research and the subsequent research studies presented as part of this thesis, it is clear that the above list is incomplete. Most notably, factors relating to the players themselves have largely been ignored, and these may potentially be the most restrictive factors that a researcher may have to overcome to collect data from this population.

TABLE 2.5 Restrictive factors in carrying out observational research on fruit machine players (source: Griffiths, 1995)

Problem	Reference	Brief Explanation
Blending in	*Researcher Issues*	Fruit machine gamblers, in particular, are sensitive to being watched since most spectators profit from their losses. This tends to be difficult for researchers who do not fit the typical demographic (e.g., young male or older female)
Subjective sampling and lack of gambling knowledge	*Researcher Issues*	Important to avoid recording of irrelevant data and/or an idiosyncratic interpretation of something that is widely known amongst gamblers. Again this difficult for researchers who are new to this area. Pilot work is normally advised to avoid this problem
"Gatekeeper" issues and bureaucratic obstacles	*Site Issues*	Getting permission to carry out research in a gambling establishment can be very difficult

What follows is a brief review of potential inhibitory factors which may affect sampling and recruiting fruit machine players for research, particularly those players operating within their natural environment which are not accessible through treatment contacts, student recruitment or participants lists (e.g., marketing or university research databases).

2.3.2. Restrictive factors in data collection

There are a number of player-specific factors that can impede the collection of reliable and valid data. These include factors such as activity engrossment, dishonesty/social desirability, motivational distortion, fear of ignorance, guilt/embarrassment, infringement of player anonymity, unconscious motivation/lack of self-understanding, chasing, and lack of incentive. There are also further site-specific factors such as gaming establishment design, management concerns and industry perceptions. Each of these are summarised in Table 2.6., and are explained in detail below:

2.3.2.1. Activity engrossment

Blaszczynski et al. (1986) conclude that the primary motivation for fruit machine gambling is the induction of dissociative states. This is where gamblers can become fixated on their playing almost to the point where they tune out everything else around them. During initial piloting of this research, it was observed that many gamblers will

often miss meals and/or utilise devices (such as catheters) so they do not have to interrupt gambling sessions. Given these observations, it is unlikely that we as researchers can easily persuade them to participate in research studies while gambling on the fruit machine.

TABLE 2.6 Restrictive factors in collecting data from fruit machine playing populations
(These are newly identified based on pilot research)

Problem	Reference	Brief Explanation
Activity engrossment	*Player issues*	Gamblers too immersed in play to participant or share information.
Dishonesty/guilt	*Player issues*	Need to lie by gamblers to conceal gambling problems.
Social desirability	*Player issues*	With low self-esteem this is common - may provide ego-boosting responses.
Infringement of player anonymity	*Player issues*	Researchers who approach gamblers may be viewed as people who are infringing on their anonymity.
Unconscious motivation and lack of self-understanding	*Player issues*	Gamblers may have real problems articulating why they gamble. This is different from deception.
Chasing	*Player issues*	Gamblers are often preoccupied trying to win back losses and skimming (see Chapter 7).
Lack of incentive	*Player issues*	Like most forms of research participation, gamblers have to perceive value in taking part. Fruit machine players tended to prefer material incentive rather than other potential benefits (e.g., information sharing).
Gaming establishment design	*Site Issues*	Some premises (e.g., arcades) are not ideally designed for doing covert research. Covert research often difficult in small or empty establishments.
Management concerns	*Site Issues*	Gaming management discourage researchers distracting customers, removing them the establishment and making them feel guilty. They may prohibit research on their premises.
Industry perceptions	*Site Issues*	Research has typically been considered to be "anti-industry" (e.g., not giving contacts, not sharing technical information) and usually they are unhelpful (as a result).

2.3.2.2. Dishonesty/Social desirability

It is well-known that some gamblers can be dishonest about the extent of their gambling behaviour and related consequences. Social and problem gamblers alike are subject to social desirability factors and may be dishonest about the extent of their gambling

activities to researchers (in addition to significant others). This obviously has implications for the reliability and validity of any data collected.

2.3.2.3. Fear of ignorance

It was observed that many fruit machine gamblers report to understand how the fruit machine works when in fact they lack veracity. This appears to be a face-saving mechanism to disguise ignorance regarding fruit machines to the researchers.

2.3.2.4. Guilt/Embarrassment

Fruit machine gamblers can often feel guilty and/or embarrassed to be in the gambling environment in the first place. They probably convince themselves that they are not "gamblers" but simply "social players" who visit gambling environments infrequently. It may be the case that gamblers cite their infrequency of gambling as a reason or excuse not to participate in an interview or fill out a questionnaire. Moreover, some gamblers just simply do not want to acknowledge the fact that they gamble.

2.3.2.5. Infringement of player anonymity

Several fruit machine gamblers clearly play on machines as a means of escape (Lesieur, 1988; Lesieur & Rosenthal, 1991). Many gamblers will perceive the gaming establishment in which they are gambling as a 'private' (rather than public) arena. As such, researchers who approach them may be viewed as people who are infringing on their anonymity.

2.3.2.6. Unconscious motivation and lack of self-understanding

Unfortunately, many fruit machine gamblers do not understand why they gamble themselves. Therefore, disclosing reasons for gambling, articulately and accurately, to researchers can be very difficult. Furthermore, many gamblers experience the pull of the fruit machine, whereby they feel compelled to play despite their better judgment but cannot articulate why.

2.3.2.7. Chasing

When trying to carry out research in the playing environments (e.g., arcades, casinos etc.), many regular gamblers do not want to leave 'their' fruit machine in case someone else tries to play their machine while they are elsewhere. Primarily, gamblers will be concerned with chasing losses, rather than participating in an interview or filling out a questionnaire for a researcher.

2.3.2.8. Lack of incentive

Some fruit machine gamblers simply refuse to take part in research because they lack an incentive. In other words, gamblers perceive that there is nothing to gain from participating in such research.

2.3.2.9. Gaming establishment design

It is clear from many of the arcades and casinos that many are not ideally designed for doing covert research in. Non-participant observation is often very difficult in small establishments or in places where the clientele numbers are low.

2.3.2.10. Management concerns

Understandably, arcade and casino managers are often reluctant to allow researchers to disturb gamblers (i.e., their customers), by asking them to take part in research and taking them away from their gambling and/or out of the establishment. Furthermore, they do not want us to give their customers any chance to reflect and feel 'guilty' about their gambling. In this author's experience, this is something that researchers are perceived by management to do. This obviously impacts whether permission to carry out research is initially provided.

2.3.2.11. Industry perceptions

From the many years spent researching (and gambling on) fruit machines, it has become evident that there are some people in the gaming industry that view researchers as having an anti-gambling perspective, and that any research will represent their clientele or

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establishment negatively. This again impacts on whether permission to carry out research is given in the first place.

2.3.3. Steps in overcoming restrictions in data collection in fruit machine gambling

Griffths (1995) suggests that some of these factors can be overcome by (1) using a flexible and critically reflective approach in the field; (2) collecting relevant data where possible by using a systematic and exhaustive approach; and (3) becoming a gambler and subsequently learning how to blend in and identify the most salient factors for the researcher's focus.

Further approaches might include:

2.3.3.1. Networking with the gaming industry

Since gaining formal access to gambling establishments is difficult, it is sensible to network with the 'gatekeepers' in order to facilitate securing researcher access. The more information disclosed about the researchers and their objectives, the more likely they can make a decision based on informed choice. For example, interesting updates in gaming technology and new stories that were accessible to the researcher could be provided as incentives to 'gatekeepers'.

2.3.3.2. Introduce incentives to take part in research

To get participants involved, it may be useful to give the participants material incentives for taking part. There are, of course, ethical issues concerning giving potential problem gamblers more money which can be gambled, but such ethical evaluations need to be made on an individual basis and based on the structure of the reward (e.g. structurally speaking a prize draw may be less potentially problematic than giving players further credits on a fruit machine).

2.3.3.3. Utilise pre-existing 'data'

For observational purposes it may be possible to get hold of observational behavioural data through CCTV footage. Such data could be obtained from a premises' security cameras. This approach has the obvious advantage of being stored a hard copy that can be

used either as definitive empirical evidence or as a navigable resource (e.g., rewind, fast forward, pause, etc.) to assist in the data analysis.

2.3.3.4. Get employed in a gaming establishment

One way to collect data is to work on a fruit machine site. This has been performed by prominent researchers in this field (e.g., Fisher [1993] collected all of her observational data while employed behind the change counter at a local amusement arcade). Fruit machine gamblers are usually unaffected by a staff presence as they expect to be under observation for security reasons, to identify needs (e.g., change, bonus distribution or refreshments) and to regulate player etiquette. Furthermore, while submerged in such a social world, large amounts of relevant information can be gathered indirectly through participation in general conservations on the premises. Chatting to players is considered part of the job; it makes them feel more comfortable according to management. Finally, valuable information may also gained from staff and suppliers through informal conversation, more direct questions and 'on-the-job' training (e.g., learning tricks to get players to spend more money).

2.3.4. Implications

In addition to guiding the research methods employed in this thesis, it is hoped that these proposed explanations might enhance future research in this area by adding to the existing literature, and providing researchers with a better understanding of the inherent difficulties involved in data collection, as well as offering some practical advice on what can be done to facilitate the data collection process (and thus improving validity and reliability). Unfortunately, identification of fruit machine gamblers is often limited to a 'search and seek' method of trawling premises that house fruit machines (e.g., arcades, pubs, LBOs). Therefore, researchers are often limited to recruiting players during fruit machine play rather than outside of it. Players may be more inclined to participate in research (e.g., surveys, focus groups, interviews) if they were not gambling (or just finished gambling) when they are approached by the researcher.

2.4. Aims of Thesis

Based on the literature reviewed in this chapter, there are some clear gaps in the literature that need to be addressed:

1. There is to date little research exploring adult fruit machine gambling – most has focused children or adolescents (e.g. Fisher 1992; 1993a; 1993b; 1996; 1998; Griffiths 1990; 1991; 1993; 1994; 1995; Huxley & Carroll, 1992; Ashworth et al, 2000; MORI, 2006);

2. Given that technology plays a role in how appealing gambling may be, particularly in the context of fruit machine gambling, and given that most of the research is ten to fifteen years out of date, this research needs to be updated to reflect any changes and developments;

3. Much of the recent research on structural and situational characteristics of EGMs has focused on responsible gambling features such as warnings, clocks or limit setting information (e.g., Loba, Stewart, Klein & Blackburn 2002; Schellineck ans Schrans, 2002; Blaszczynski, Sharpe and Walker, 2003; Steenbergh, Whelan, Meyers, May & Floyd 2004) or factors relating to payment such as bill acceptors, smart cards and betting lines (e.g., Griffiths, 1993; 1999; Blaszczynski, Sharpe & Walker, 2001; Brodie, Honeyfield, Whitehead 2003; Schellineck & Schrans, 2002;) and reward such as jackpot size and mandatory cashouts (e.g., Royal Commission, 1951; Weinstein & Deitch, 1974; Cornish, 1978; Dickerson, 1993; Griffiths, 1993, 1997a). There has been a limited amount of research focusing on factors relating to game play and appeal;

4. Much of the recent research focusing situational and structural factors in EGMs, although making significant contributions to our understanding of these factors, lacks ecological validity (e.g., Diskin and Hodgins, 1999; Ladouceur and Sevigny, 2002; Loba, Stewart, Klein & Blackburn 2002).

Furthermore, there are ambiguities in the research that has already been carried out in the area of fruit machine gambling, for example:

Part One: Introduction

1. In terms of references to skills in fruit machine playing (Fisher, 1993; Griffiths, 1994), it is not clear which skills have an actual impact on outcomes and which are illusionary.

2. Themes relating to machine selection were prominent in key research studies (Fisher, 1993; Griffiths, 1993; 1994; 1995). However, no real conclusion has been reached regarding how machines are selected or what implications this has for determining the outcome of play.

Based on the gaps in research identified above, the aims of this thesis are as follows:

1. To establish more in depth information regarding adult fruit machine gamblers from natural gambling environments regarding demographics, frequency of play, spending patterns, possible pathological gambling and variety of other potentially relevant variables;

2. To explore the situational and structural characteristics of fruit machine gambling in an ecologically valid setting, with a particular focus on game play and player interaction;

3. To examine the role of skill in fruit machine playing as it relates to structural and situational factors (e.g., specialist play features; machine selection, etc.);

4. To integrate findings relating to the above aims in order to devise a typology of fruit machine players in United Kingdom. This typology will build on Fisher's (1993) work on adolescent fruit machine players. This typology should not only be used as a tool for improving understanding of this population but it should also have commercial and/or clinical applications.

2.5 Format of Thesis

In chapters 1 and 2, an overview of the literature on situational and structural characteristics, electronic gaming devices and the gambling behaviour more generally is given. This thesis employs a multi-method approach including survey research, participant and non-participant observation and a qualitative focus group method.

Part One: Introduction

Chapters 3 and 4 are based on an exploratory survey on regular fruit machine players. The aim of chapter 3 is to explore key variables relating to adult fruit machine gambling in the United Kingdom, since to date, key research on this topic focuses primarily on adolescents or may be out of date as a result of the technological change in fruit machines. The aims of chapter 4 arose out of the broader exploratory aims of chapter 3. These were to determine whether after gambling, gamblers compensate and reduce negative affect by identifying positive consequences from experiencing a loss. This chapter also aims to identify types of strategies which gamblers employ and consider how these should be classified

Chapters 6, 7 and 8 are informed by participant and non-participant observation (which is explained and justified in detail in chapter 5). The aim of chapter 6 is to systematically examine the validity of claims regarding structural characteristics made by the previous authors in relation to fruit machines and to explore new structural factors relating to fruit machines which may have arisen from technological advancement or changes in legislation. In chapter 7, research builds on work by Cornish (1978), Fisher (1993) and Griffiths (1993) by identifying new situational characteristics and developing information on previously identified characteristics. This research systematically explores potential factors which operate in the situation and site of fruit machine gambling in order to assess the impact that these may have on the acquisition, and perhaps more importantly, the development and maintenance of fruit machine playing. Chapter 8 proposes a typology of fruit machine players which develops and updates Fisher's existing framework to provide an updated "ethnographic roadmap" (Rosecrance, 1984; Fisher 1993) for those seeking to develop a critical understanding of fruit machine behaviour in the United Kingdom. It does so by extending its focus to include: adults, rather than adolescents; a variety of gambling environments; not just one amusement arcade in one location; changes in technology and legislation; exclusivity of player category membership and the development of clear criteria for player category membership.

A qualitative focus group forms the basis of chapter 9. The aims of this study are to corroborate findings and conclusions reached in chapters 6, 7 and 8 in this thesis and to

build on the level of understanding of the situational and structural factors in fruit machine playing. A final conclusion is presented in chapter 10. A summary of the format of this thesis and the relevant methodology employed is highlighted in Table 2.7.

TABLE 2.7 Format of thesis and research method employed

Chapter	Part	Brief Explanation	Research Method
1		Review of general gambling literature	*N/A*
2	*1*	Review of literature on EGMs and situational and structural factors in gambling	
3		Examines variables in relation to fruit machine play among regular fruit machine gamblers	*Exploratory Survey – Self-Report Method*
4	*2*	Consider positive thinking as a maladaptive coping mechanism among fruit machine players	
5		Discusses how participant and non-participant observation was employed in this thesis	
6		Identifies and examines the structural factors influencing fruit machine play	*Participant and Non-Participant Observation*
7	*3*	Identifies and examines the situational factors influencing fruit machine play	
8		Develops a typology of fruit machine players and considers implications for play and clinical implications for treatment and prevention	
9	*4*	Builds on the work in the previous chapters by triangulating findings from survey and observations with data from players attending focus groups	*Qualitative Focus Groups*
10	*5*	Conclusion	*N/A*

CHAPTER 3
ADULT FRUIT MACHINE GAMBLING IN THE UK:
AN EXPLORATORY SURVEY

3.1 Background and Aims

The aim of this chapter is to explore key variables relating to adult fruit machine gambling in the United Kingdom. To date key research on this topic focuses primarily on adolescents (e.g. Bentall et al, 1989; Fisher 1992; 1993a; 1993b; Griffiths 1990; 1991; 1993; 1994; 1995; Huxley and Carroll, 1992 or may be out of date as a result of the technological change in fruit machines (Fisher 1993; Griffiths, 1990, 1993). With the absence of basic information such as play frequency, problem gambling behaviour and amounts being spent by adult gamblers, this chapter aims to investigate these factors with regard to gamblers across a wide cross-section of ages who were found in a natural gambling environment. Where many studies utilise non-representative (and potentially biased) samples such undergraduate students, those in or currently seeking treatment, or even those in from health clinics (e.g., Ladd and Petry, 2002) this sample consists of "real" gamblers from a variety of settings housing fruit machines including arcades, casinos, betting offices and pubs.

In addition to collecting general information related to fruit machine gambling, this chapter aims to investigate other issues such as skill and luck orientations, the role friends and family, and player preferences in various aspects of fruit machine gambling. This chapter will also investigate variations in gender and age within this sample.

3.2. Method

3.2.1. Participants

Eighty-one adult fruit machine gamblers recruited from gambling environments in Nottingham, Belfast, Cornwall and Lincolnshire all located in the United Kingdom took part in the study. These locations were chosen because they represented a combination of inland and coastal locations but also because these were geographically diverse which should improve confidence that such findings were not specific to any one location in the United Kingdom. Recruitment took place in a variety of environments including amusement arcades (coastal and inland), public houses, betting offices and any other establishment housing a fruit machine (e.g.,

transport terminals, night clubs etc). Ages of participants ranged from eighteen to sixty-nine years old, see Table 3.1 for a breakdown of categories for gender and age.

Table 3.1 Participant information for United Kingdom Sample

Age	18-25	26-35	36-45	46-60	over 60	Total
Male	36	19	6	4	2	67
Female	2	3	4	1	4	14
Total	38	22	10	5	6	81

3.2.2. Measures

The survey contained a range of items given the exploratory nature of this survey. Items investigated included motivation, gambling attitudes and preferences, demographic variables, physiological and cognitive experience, familial impact, specialist knowledge and interest in other activities. The DSM-IV criteria for pathological gambling were also included. The survey took between 20 and 40 minutes to complete (see Appendix 1).

3.2.3. Procedure

Fruit machine gamblers were approached to take part in the survey based on reasonable evidence that they were a fruit machine player. This included those who were actually playing a fruit machine when approached or those seen to be leaving or entering a gambling establishment deemed to be a fruit machine player. Participants were informed of the nature of the survey and the general aims of the research. Participants were also informed that participation was voluntary, that they could omit any questions where they choose, and that they could withdraw from the study at any point and were assured that data would be anonymised.

3.3. Results

3.3.1. First Gambling Experience

There were some gender differences in terms of the first form of gambling participants experienced. Male fruit machine players were more likely to start gambling through informal betting (30%) or through fruit machines (46%) whereas female players were more likely to start playing through the lottery (29%) or bingo

(21%)[1]. It should be noted however that there were a very low number of females generally. See Table 3.2 for a full breakdown of first gambling experiences according to gender.

Table 3.2 First Gambling Experience According to Gender

Gender	VLT	Informal betting	Scratch Cards	Lottery	Black Jack	Roulette	Poker	Craps	Fruit Machine	Bingo	Sports Betting
Male	1	21	0	3	2	1	1	0	32	1	7
Female	0	2	1	4	1	0	0	0	2	3	0

3.3.2. Frequency of Play

The majority of gamblers in this survey gambled on fruit machines frequently throughout the year. Eighty-two percent of gamblers claimed that they gambled at least on a weekly basis (18% of the total sample reported gambling every day). An exact breakdown of the frequency of fruit machine play is presented in Table 3.3. Approximately, 18% of respondents gambled 2- to 3-times per month or less.

Table 3.3 Frequency of Fruit Machine Gambling According to Gender

Gender	Daily	Weekly	2-3/Month	Monthly	2-3/Year	Annually	Never
Male	13	43	5	2	2	0	1
Female	1	7	2	1	0	1	0

No significant association was found between the frequency of fruit machine play (daily compared to weekly players[2]) and gender (χ^2 (1) = .47, p = 0.67). There was also no significant association was found between the frequency of fruit machine play (weekly players compared to those playing less frequently [2- to 3-times per month or less]) and gender (χ^2 (1) = 2.79, p = 0.13).

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[1] Cell counts were too low to test this gender association statistically (Chi-Square or Fisher Exact tests).
[2] In order to analyze statistically, frequency categories were collapsed into a 2 x 2 cell as some cells had a frequency count lower than 5 and a Fisher Exact test was done where there were still cells with an expected frequency lower than 5 .

There was a significant association between play frequency (daily players compared to weekly players) and whether players reported making a profit on average per session (χ^2 = 5.18 (1), p < 0.05). More daily players (60%) reported making a profit compared to weekly players (21.9%). However, there was no significant relationship between play frequency (daily players compared to weekly players) and pathological gambling (χ^2 (1) = 2.21, p = 0.202). There was no significant relationship between play frequency (weekly players compared to those playing less frequently [2- to 3-times per month or less]) and whether players profit on average (χ^2 (1) = 2.13, p = 0.181); or between play frequency and pathological gambling (χ^2 (1) = .139, p = 0.742.).

3.3.3. Role of Friends and Family

Only 2 out of the 81 respondents claimed that none of their friends or family gambled. Males were more likely to have "a lot" of friends and family who gambled. However, the vast majority of players (regardless of sex) had "a few" friends or family that gambled (see Table 3.4). It is also notable that approximately half of the players (both male and female) had friends or family who disapproved of their betting.

Table 3.4 The Role of Friends and Family in Gambling According to Gender

	Do Any Friends or Family Gamble?			Do Any Friends or Family Disapprove of Your Gambling?		
	None	A Few	A Lot	None	A Few	A Lot
Male	1	47	22	35	30	5
Female	1	12	0	6	7	0

3.3.4. The Role of Skill and Luck

The descriptive data presented in Figure 3.1 demonstrates that there was no general agreement among fruit machine players regarding the role of skill and luck in fruit machine playing. However, there was a trend for males to perceive it as a more skilful activity than the female players. Also, there was a multi-modal distribution among women in terms of how important they regarded skill to be in the outcome of their fruit machine gambling. In other words, there seems to be two distinct groups of female fruit machine players in terms of their skill orientation: those who perceived it to be skilful and those who did not.

Figure 3.1 The Perceived Role of Skill and Luck According to Gender

Extent to which player perceives slot outcome based on luck
(1 = nothing to with luck and 10 = everything to do with luck)

Extent to which player perceives slot outcome based on skill
(1 = nothing to with skill and 10 = everything to do with skill)
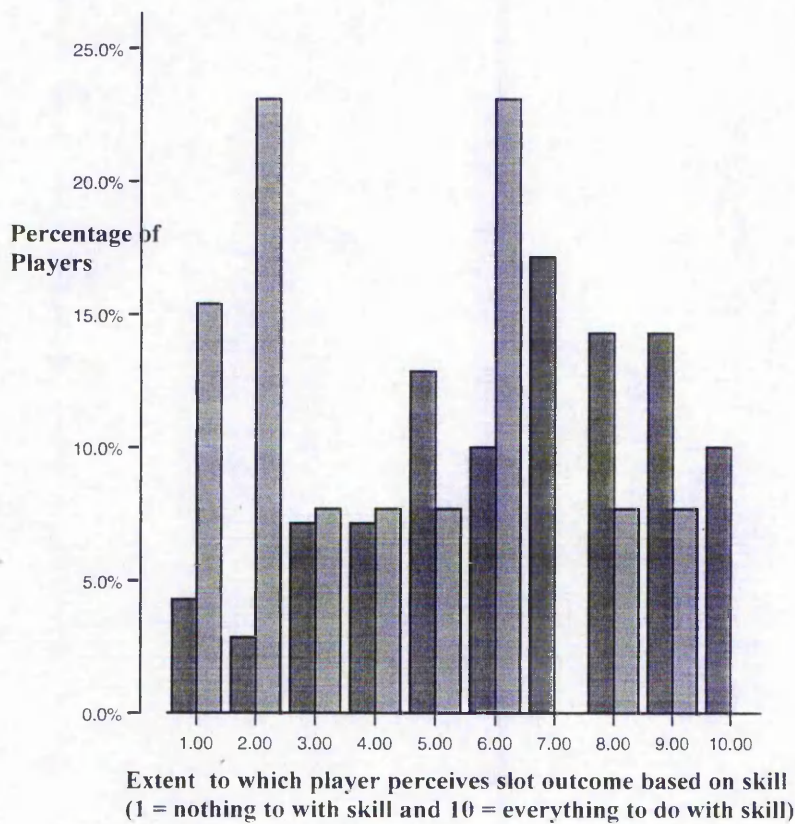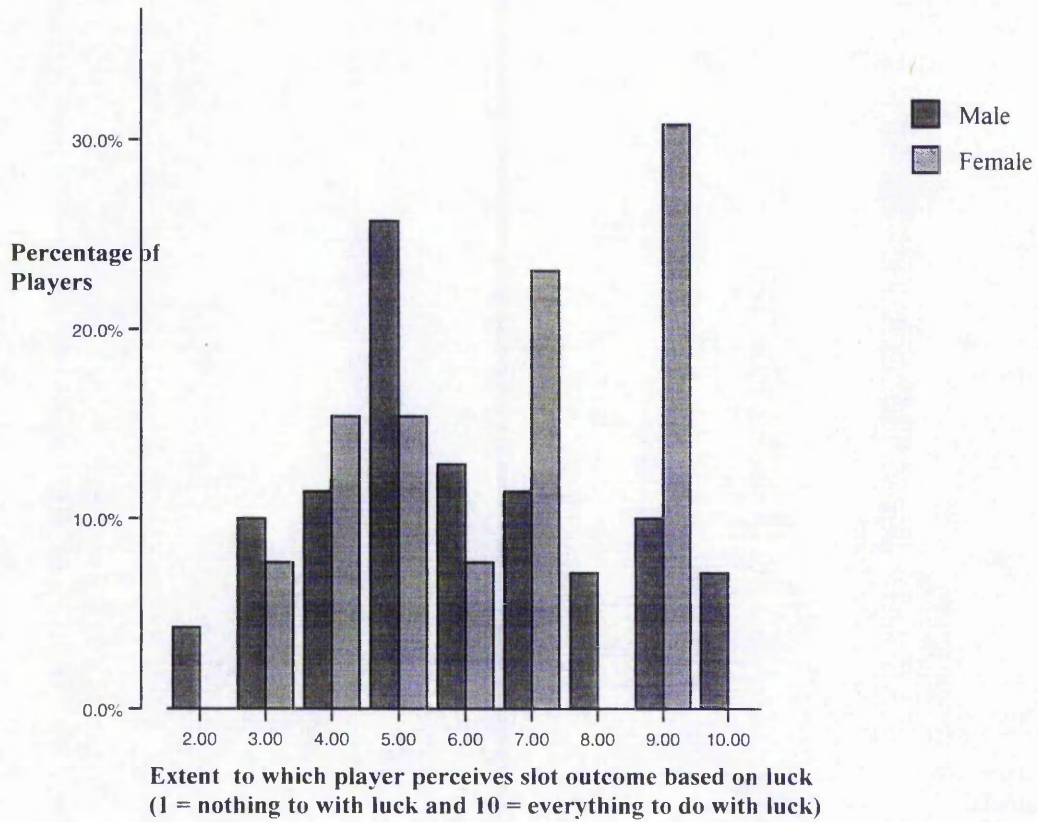
However, in terms of mean ratings, there was no significant difference between males (M = 5.89, SD = 2.19) and females (M = 6.47, SD = 2.17) in terms of how luck orientated they were in fruit machine play (t (81) = -.873, p. = 0.385). There was a significant difference in the context of skill orientation whereby males (M = 6.47, SD = 2.47) felt the outcome of their play was more related to skill (t (81) = 2.97, p. < 0.005) in comparison to female players (M =- 4.23, SD = 2.65).

Luck orientations in fruit machine playing was negatively correlated with score on DSM–IV criteria (r (64)= -.322, p. < 0.01) and reported financial outcome (r (45) = -.345, p. < 0.01) whereas skill orientations were positively correlated with reported financial outcome (r (45) = .472, p. < 0.005) and were unrelated to DSM-IV criteria (r (66) = 0.242, p. = 0.05).

3.3.5. DSM-IV Criteria for Pathological Gambling

Nearly half of those answering this question (N = 29; 43.9%) met DSM-IV criteria for diagnosis of "probable pathological gambling" (scoring 5 or more on the DSM-IV criteria for pathological gambling). Just over a third of those responding, were "at risk" (N = 24; 36.4%) and only thirteen respondents (19.7%) were classified as "social" or "recreational" gamblers. A breakdown of frequencies for the number of criteria met for pathological gambling is summarised in Table 3.5.

Table 3.5 Reported Financial Outcome per Session According to DSM-IV Classification (N = 76)

Financial Outcome	"Recreational"	"At Risk"	"Probable Pathological"	Total
Reported Profit	1 (12.5%)	6 (37.5%)	5 (35.7%)	12 (31.6%)
Reported Loss	7 (87.5%)	10 (62.5%)	9 (63.7%)	28 (68.4%)
Total	8	16	14	40

Despite "at risk" and "probable pathological" gamblers reporting a better financial performance on average per session compared to recreational gamblers, this difference failed to reach significance (χ^2 (1) = 1.7, p = 0.242). Furthermore, no significant relationship was observed between gender and pathological gambling according DSM-IV criteria (χ^2 (1) = .1.13, p = 0.35) whereby 50% of female gamblers meeting DSM-IV criteria for "probable pathological" gambling compared to 42.9% of their male counterparts.

3.3.6. Factors Predicting Scores on DSM-IV Criteria for Pathological Gambling

A multiple linear regression was performed in order to determine the variables which best predict score on DSM-IV criteria for pathological gambling for fruit machine players. The regression was a moderate[3] fit (R^2adj = 35.5%) and the overall relationship was significant: $F_{(6, 36)}$ = 4.31, p < .005. Significant predictors are listed below in Table 3.6. The best predictors of players scoring higher on the DSM IV criteria for pathological gambling were, in order of influence; being younger (Beta = -4.28); being less likely to believe that it is important to persevere to collect a big win (Beta = -2.76); and being female (Beta = 2.46).

Table 3.6 Factors Predicting Score on DSM IVR Criteria for Pathological Gambling

Predictor Variable	Standardized Co-efficients (Beta)	t-value	Sig.
Gender	**0.378**	**2.46**	**p < .05**
Age	**-0.731**	**-4.28**	**p < 0.001**
Belief that winning is result of skill	-0.115	-0.57	0.573
Believe it is important to persist as you eventually collect a big win	**-0.396**	**-2.76**	**p < .01**
Average time spent per gambling session	-0.204	1.46	0.153
Financial outcome	-0.125	-0.714	0.481

3.3.7. Amount Spent and Financial Outcome

Respondents were asked to estimate how much they spent (amount 'invested' regardless of winnings) during each session. Money invested per session ranged from £2 to £300, with approximately one-third of those surveyed claiming they invested less than £15 per session, but 27% claiming they invested more than £100 per session (see Table 4.7. for an exact breakdown of the data). There was a wide variation in spending patterns across males and females, whereby males (M = £81.3, SD = £90.1) on average spent twice as much as women (M = 42.1, SD = 42.6), this failed to reach significance (t (46) = 1.33, p = .189). Participants were also asked how much money they had left at the end of each session so that the financial outcome could be estimated. A financial success index was created whereby money won was divided by

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[3] An adjusted R squared of < 15 is generally said to be weak, 16-30 is weak to moderate, 31 – 50 is moderate and >50 is said to be good.

money invested. For example, a financial index of 1.5 implied that an individual gambling £10 per session would finish with £15 (a profit of £5).

By contrast, an individual with a financial index of 0.05 investing the same amount would finish with £5 (a loss of £5). A breakdown of frequencies of fruit machine players into four financial index categories is presented in Figure 3.2. Average mean spend per session was not correlated with DSM-IV criteria for pathological gambling (r (36) = 0.291, p. = 0.076) nor was it correlated with reported financial outcome (r (46) = 0.218, p. = 0.137)

Table 3.7 Average Amount Spent per Fruit Machine Session (N = 48)

Average Amount Spent	N	(%)
£10 or less	13	27%
£11 - £50	16	33%
£51 - £100	8	17%
£101- £200	8	17%
Over £200	3	6%

Figure 3.2 Frequency of Gamblers According to Reported Profitability
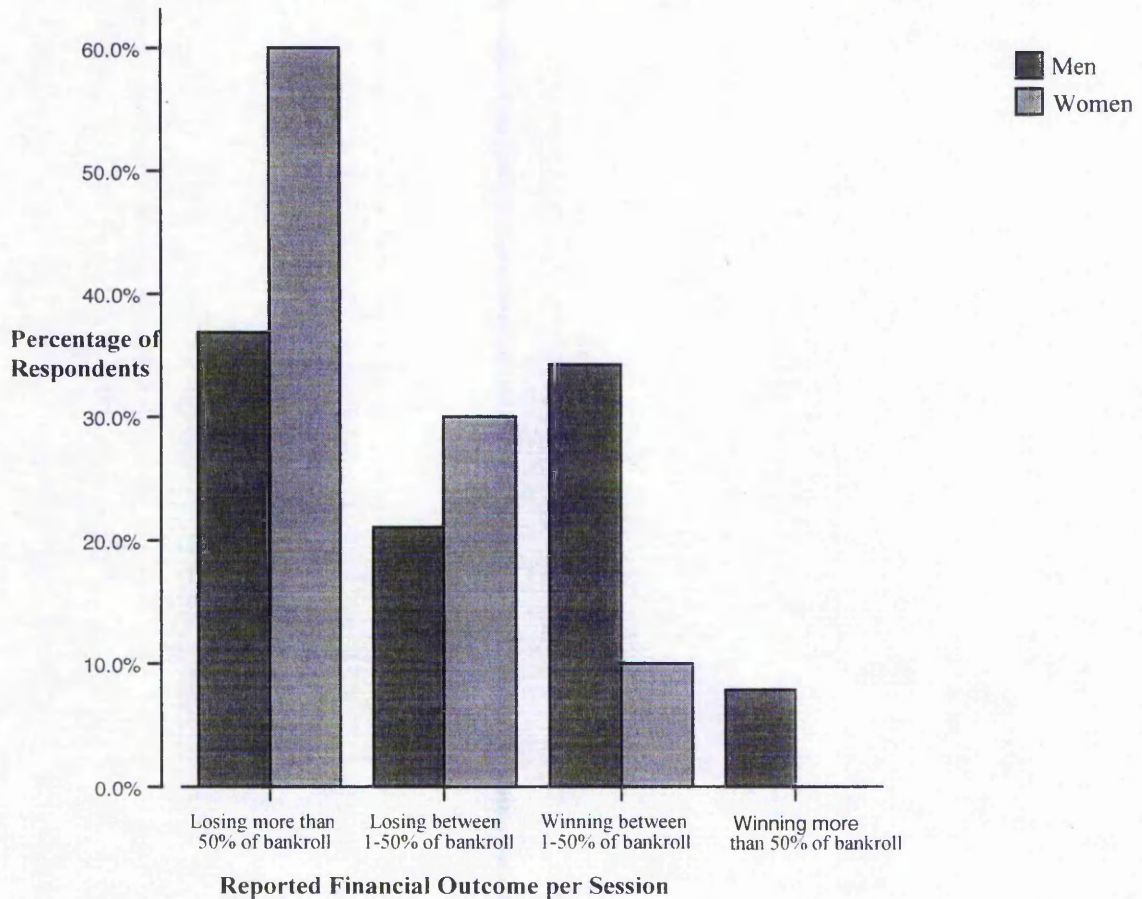
Out of the 48 gamblers who discussed financial matters, 22 of the 38 males (58%) claimed to make a profit compared with one female out of ten (10%). However, this difference just failed to reach significance (χ^2 (1) = 3.568, p = .056).

3.3.8. Factors Predicting Reported Mean Average Financial Outcome per Session

A multiple linear regression was performed in order to determine the variables which best predict reported average financial outcome per session for fruit machine players. The regression was a moderate fit (R^2adj = 33.2%) and the overall relationship was significant: F (4, 45) = 6.59, p < .001. Significant predictors are listed below in Table 3.8.

Table 3.8 Factors Predicting Reported Mean Average Financial Outcome per Session

Predictor Variable	Standardized Co-efficients (Beta)	t-value	Sig.
Gender	0.144	1.01	0.319
Belief that winning is result of skill	**0.341**	**2.51**	**p < .05**
Believe it is important to persist as you eventually collect a big win	-0.045	-0.364	0.718
Prefer their gambling environment to be busy	**0.488**	**3.504**	**p < .01**

The best predictors of players reporting a higher average financial outcome per session were, in order of influence; preferring their gambling environment to be busy (Beta = .488) and believing that winning is result of skill (Beta = .341). Non-significant predictors included trying to predict score on DSM-IV criteria for pathological gambling, being less likely to believe that it is important to persevere to collect a big win (Beta = -.045); being female (Beta = 0.144) were not significant predictors of reported average financial outcome.

3.3.9. Situational Preferences

According to Figure 3.3, there seems to be a multi-modal distribution of preferences for how "busy" the gambling environment is when playing fruit machines. Essentially, there seem to be three groups overall: those who preferred a busy environment, those who preferred an empty an environment, and those who did not have a preference. Overall, males prefer the environment to be busier than female players.

Figure 3.3 Preference for a busy environment among fruit machine players
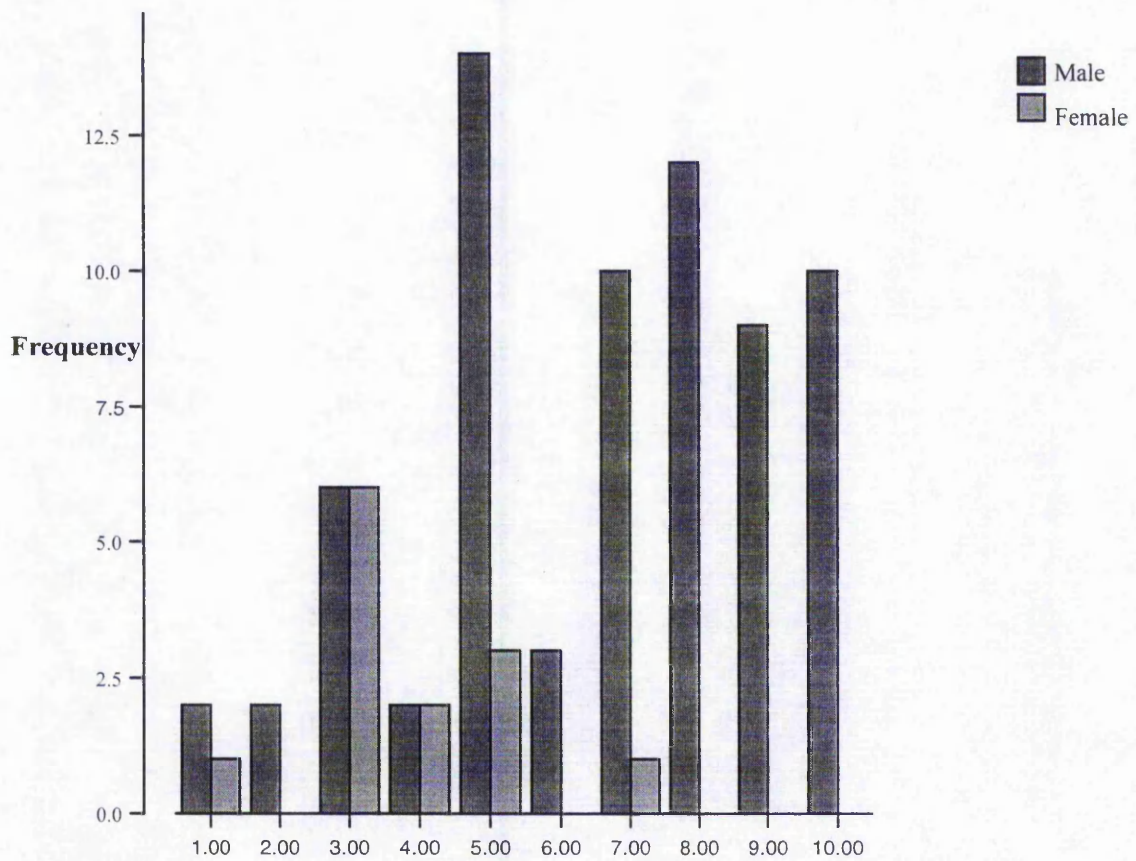
Preference for a "busy" environment whereby 1 = very empty and 10 = very busy

Male gamblers (M = 6.67, SD = 2.48) on average expressed a preference (preferences were from 1 to 10; whereby 1 = very empty and 10 = very busy) for the gambling environment to be busier (t (81) = 4.206, p < 0.0001) in comparison to the female players (M = 3.77; SD = 1.48). Preference for a busy environment was positively correlated with reported profitability (r (64) = 0.459, p = < 0.01) but was unrelated to score on DSM-IV-R criteria for pathological gambling (r (45) = 0.13, p. = 0.916).

Although male fruit machine players report spending approximately 50% longer in the gambling environment (M = 150.7 minutes per session; SD = 91.8) compared to females (M = 103.5 minutes per session, SD = 46.07) this difference failed to reach statistical significance (t (46) = 2.88, p = 0.108).

There was no significant difference between men (M = 5.45 , SD = 3.1) and women (M = 4.76, SD = 3.7) in terms of their preference for having access to an Automatic Telling Machine (ATM) in the playing environment (measured on likert scale where 1= Never and 10 = Always; t (64) = .711, p = 0.479). However, on inspection of Figure 3.4, there seems to be two distinct groups of female players based on this criterion: those who regularly preferred having access to an ATM and those that rarely wanted access to an ATM.

Figure 3.4 Preference for Having Access to ATMs in the Environment

Preference for having access to an ATM when playing
(Likert scale response whereby 1 = Never and 10 = Always)
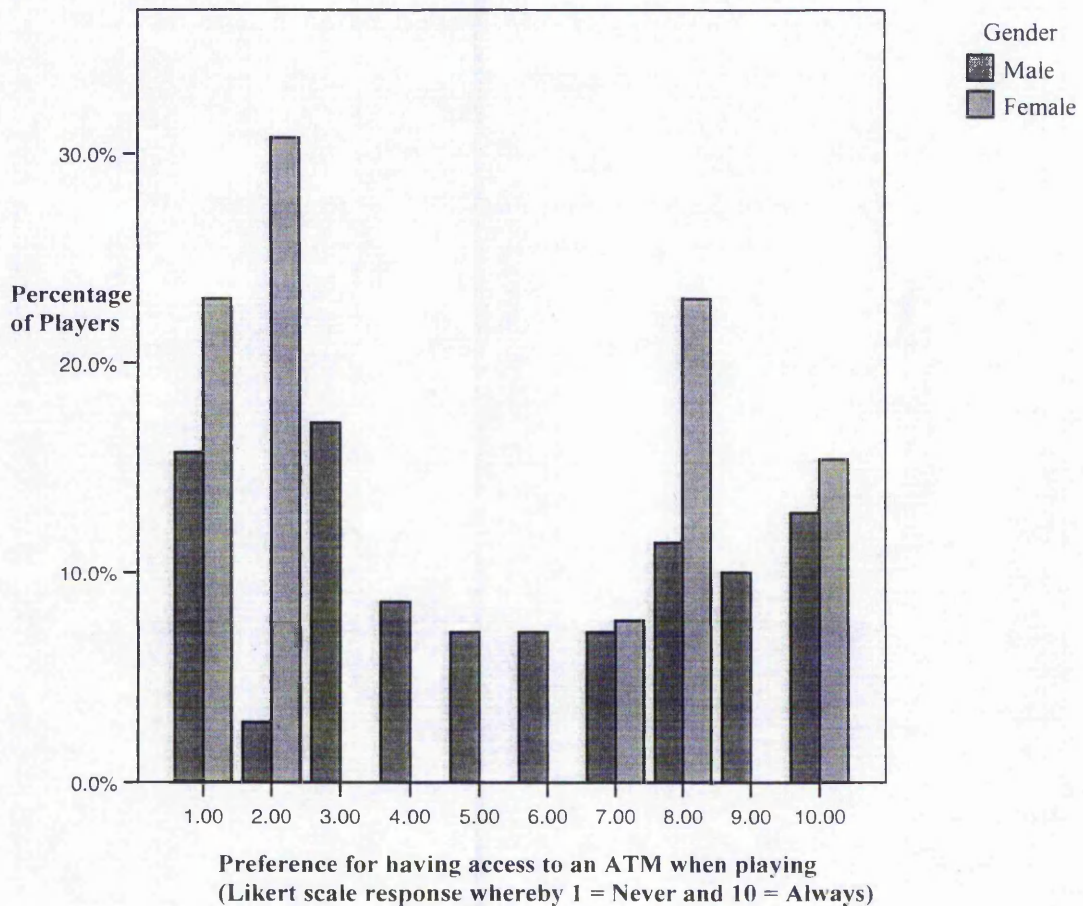
A preference for having access to an ATM was not correlated either with score on DSM-IV criteria for pathological gambling (r (64) = 0.181, P = 0.146) nor was it correlated with reported financial success (r (45) = 0.028, p. = 0.854).

3.4. Summary and Discussion

Research investigating fruit machine gambling among adults in the UK has been limited. The present survey establishes more-in depth information than previously collected relating general and specific behavioural trends and attitudes among adult fruit machine players.

Nearly half of all participants met the DSM-IV criteria for probable pathological gambling. This figure is substantially higher than other previous research in this area. For example, 9% of adolescents were probable pathological gamblers according to Fisher (1992). Griffiths (1990a) report a rate of 18% among adolescents. And according to Coventry and Hudson (2001) 21% of their sample scored over 5 in a loss of control scale. However, it should be noted that this survey was not a prevalence study among the general population but rather gamblers were recruited direct from gambling environments. By virtue of being 'present' at the venue during the time of data collection, this sampling method was biased to some extent since it will be likely to catch those players who play more frequently or for longer periods of time. Infrequent players or those playing for shorter periods of time were less likely to around to participate. While this was an intentional tactic to sample among the more regular players, the high rate of probable pathological gambling should be considered in this context.

The best predictors of problem gambling were being younger, being less likely to believe that it is important to persevere to collect a big win and being female. Interpreting the role of gender in predicting pathological gambling in fruit machine playing may be potentially complex. Furthermore, Coventry and Hudson (2001) failed to find any gender differences in terms of physiological arousal when playing fruit machines. Initially, one might conclude that males are engaging in more profitable play particularly as they reported being more skill orientated than women. However, profitable play was not a significant predictor of problem gambling. One possible explanation is that more of the DSM criteria applied to women than to men. For example, women may be more likely to respond yes to receiving a "financial bailout" as a result of differences in income. Furthermore, the fact that younger players are more likely to experience more problems than older players is, in some ways, counterintuitive. It might be expected that given that older players usually have more

responsibilities (e.g. family and work responsibilities) they might be more likely to experience problems. This finding may reflect potential differences in motivation. For example, if younger players are more motivated by financial reasons or escape, they may more inclined to experience problems than players who are motivated by amusement or having fun. This is mere speculation but given that players in this survey were not asked question related to motivation this would be an ideal starting point for future research in this area.

Perhaps the most counterintuitive finding was that the stronger a players belief in the necessity to persevere in order to collect a big win, the less likely they were to score highly on the DSM-IV criteria. However, this result makes more sense when considered in the context of findings from chapter six and seven regarding the money-in-money-out (MIMO) ratio and skimming. There is evidence suggesting that persistence can improve chances of winning which might help in explaining why "persistence" may be rewarded more than in other forms of gambling. However, further clarification regarding what, such persistence involves is needed and this will be explored further in part three of the thesis.

However, it is interesting to note however, that eleven out of the twelve players claiming that they make a profit may have been experiencing gambling problems (6 of which were considered "at risk" and 5 of which were considered "probable pathological"). Furthermore, financial outcome was not a significant predictor of DSM-IV criteria suggesting that gambling on fruit machines may present difficulties other than financial hardship. If some of the players report making a profit but experiencing gambling-related problems then perhaps these problems relate directly to time and other impacts their fruit machine playing has on work, family and relationships. For example, even if players are making money players may be being dishonest with friends or family members regarding issues such as whereabouts, movement of joint funds and the kinds of people that they associate with at fruit machine sites. Alternatively, it could be that players were over-reporting levels of profitability and underreporting how much they are losing. After all, 31.6% of respondents claimed to make a profit on average each session.

Participants reported playing frequently with more than four out of five players playing on fruit machines at least on a weekly basis. This figure is higher than that of other previous research: 41.3% (Bentall et al., 1989); 39.6% (Huxley & Carroll, 1992) and 56% (Coventry and Constable, 1999). It may be the case that, despite the high event frequency and the associated potential to lose money, players have the opportunity to play frequently given that sessions can potentially be brief particularly in sites such as pubs, Licenced Betting Offices (LBOs) and casinos where they are not under as much pressure to play continuously. It is interesting that gender and problem gambling were unrelated to play frequency. This was only partially consistent with findings from Huxley and Carroll's (1992) survey of adolescent fruit machine players who found no age differences in terms of regularity of play but did observe that males gambled more frequently. Male dominance in fruit machine playing has also been recorded in other research (Griffiths 1995; Fisher 1993, Ide-Smith & Lea, 1988). However, in terms of time spent per session male gamblers spent 50% more time per visit although the difference between male and female just failed to reach significance. Therefore, gender differences do exist to some extent, but they potentially exist in terms of play duration rather than frequency of sessions.

In terms of the role of family and friends in fruit machine gambling, all but two of the respondents to this item reported having at least a few family or friends that also gamble. As in other forms of gambling, the participation of friends and family may serve three functions: a) introduction to the form of gambling; b) attributing some level of social acceptance to that form of gambling; and c) permitting gambling to be a social conduit (i.e. gambling is more likely to have a social function is it can be done with family and friends). Approximately, half of players in this study reported having family or friends who disapprove of their betting. This is slightly higher than Bentall et al's (1999) finding that 34.3% of players reported having family members who disapproved of their fruit machine gambling and this finding might be explained in a number of ways. Firstly, almost sixty percent of Bentall et al's sample were under the age of 21 years; younger players may be expected to meet with a lower level of disapproval because they generally tend to have less responsibilities and commitments and they tend to play with lower stakes (the latter being explained by differences in income and legal restrictions on which machines they play). Secondly there is a methodological issue to consider in that items in this survey were slightly different.

with Bentall et al only asking about family disapproval rather that the disapproval of a combination of family and friends.

Preferences for having close access to an ATMs was neither associated with problem gambling as measured by the DSM-IV, or with financial performance. Therefore, these findings do not appear to lend support to previous research (Productivity Commission, 1999; McMillan et al, 2004; Caraniche, 2005) which reported a link between ATM access and problem gambling. However, the apparent discrepancy in findings can be explained by considering the unplanned nature of gamblers reliance on an ATM. In other words, gamblers may not plan ahead or consider access to an ATM as a requisite for gambling. This may be because either they do not expect to lose or because they anticipate terminating play once the money originally set aside for gambling has been exhausted. For this reason, self-report measures for gambling intention may not be ideal for researching implications of ATMs in gambling environments. This may be better investigated through more empirical investigations, particularly in ecologically valid environments. These findings do suggest, at least in fruit machine gambling, probable pathological gamblers do not have a preference for access to ATMs over other players even though it may be the case they use or rely on ATMs more than other players. This discrepancy in findings might suggest further support for the role of ATMs in unplanned gambling.

One of the limitations of this study was that data regarding the specific site (arcades, casinos, pubs, LBOs) or location from which players were recruited were not collected. Comparisons on the variables studied in this research across the participants playing at different sites may have been interesting. Furthermore, it would have been useful to establish to what extent players played at various types of sites. Finally, this study did not consider bingo halls as a source for recruiting participants, and given that players in bingo halls represents a significant proportion of fruit machine players more generally, it is important that this group is also considered. Future research on fruit machine should consider collecting data on such information.

Another limitation of this study was that it would have been useful to record more information about the recruitment process (e.g. number of potential respondents approached and ratio of those accepting to those declining) and about any

geographical differences (e.g. demographic variation between locations and cities). However, while there were some imbalances in participant representation according to age and gender, to some extent this was reflected in the biases in preferences to play fruit machines (e.g. young males and older females are more likely play machines and therefore, the problem of having an under-representation of older male and younger female participants is difficult to resolve). Furthermore, ethnicity was not considered in the survey yet this may have potentially yielded some interesting information.

One of the most interesting findings from this research was that players who were more likely to feel that luck played a significant role in determining the financial outcome of fruit machine play were more likely to report a poorer mean financial performance than the skill orientated players. These findings challenge previous claims (Langer, 1975; Cornish, 1978; Griffiths, 1993) that a high level of player involvement can lead to excessive gambling as gamblers often feel they can control the outcome of a gamble and will persevere in losing situations. However, such findings do provide an interesting adjunct to Fisher's (1993) observation that skill is highly rated among some players (e.g. "Arcade Kings" exchange knowledge and skill development with "Apprentices" in exchange for services such as getting change or going to the shop). Furthermore, skill orientation and preference for a busy gambling environment were both significant predictors of successful financial performance. To date, there has been no research which clarifies the actual impact of perceived skill on fruit machine playing nor which can explain why, as in this study, skill seems to be linked to reported profitability despite findings to the contrary in previous research. Part three of the thesis will examine the role of skill and control in fruit machine playing in more detail.

CHAPTER 4
POSITIVE THINKING AMONG FRUIT MACHINE GAMBLERS:
A CASE OF MALADAPTIVE COPING?

4.1. Background and Aims

As identified in Chapter 2, there have been several research studies (Walker, 1992; Griffiths 1994; Delfabbro & Winefield, 2000) investigating cognitive processes that may perpetuate gambling behaviour on fruit machines. Furthermore, other research has pointed to fruit machine gambling itself being an emotionally focused coping strategy (Browne, 1989; Corless and Dickerson, 1989; Lesieur and Rosenthal, 1991). McCormick (1994) also suggests that pathological gamblers adapt poor coping skills during times of stress. If gamblers use inappropriate coping strategies and they use gambling as a way to cope with negative affect, it could also be the case that gamblers may use defective coping strategies to actually manage negative consequences associated with losing from fruit machine play.

Previous research in health and clinical settings has shown that individuals may employ particular cognitive strategies in the face of adversity or while experiencing negative affect (Collins, Taylor & Skokan, 1990; Steele, 1988; Taylor, 1983, 1989; Taylor & Brown, 1988; Tesser, 1998; Wagener & Taylor, 1986). Such health related studies (Taylor, 1983, 1989; Taylor & Brown, 1988) have found that cognitive experience was involved in compensating for a negative emotional state. Furthermore, self-aggrandizement, an exaggerated sense of optimism and over-estimating personal control were found to be key responses to threatening information. Taylor (1991) also found that negative experiences elicit more cognitive activity than positive or neutral occurrences. One of the first empirical examinations of these ideas (Taylor, Lichtman & Wood, 1984) found that patients with breast cancer expressed that they had witnessed constructive changes in their daily functioning as a result of their illness. Furthermore, despite some incongruence with reality, these beliefs were correlated with good (rather than poor) adjustment to the illness. Further evidence for the existence using positive thinking strategies as a coping resource has also been found in AIDS patients (Taylor, Kemeny, Reed & Aspinwall, 1991) and heart patients (Helgeson & Taylor. 1993).

Discrepancies between cognitions and overt behaviour can lead to a negative psychological state (Festinger, 1957). Festinger argued for a need to compensate for such negative affect through taking particular approaches to dissonance reduction. The first two methods involve manipulating the inconsistent beliefs or behaviours through either altering these to make them more consistent or trivializing these so that they are less important in the dissonance paradigm (Simon, Greenberg & Brehm, 1995). The third option of adding new, more consistent beliefs, is of particular relevance to the current investigation and appears to bear some similarities to the aforementioned cognitive strategies. Through considering new information that is congruent with our behaviour, dissonance may be reduced.

Evidence examining the involvement of such motivated reasoning appears to be more limited when considered from an addictions perspective, and in particular to gambling addiction. However, while research regarding positive illusions maybe lacking, the cognitive psychology of gambling is an area which has received growing interest in the last few decades. Research has found that gambling behaviour is facilitated when players believe they have control over the event (Strickland, Lewicki & Katz, 1966; Henslin, 1967; Langer, 1975; Langer & Roth, 1975) and when they feel that they are "nearly winning" even in the event of a losing outcome (Kahneman & Tversky, 1982; Loftus & Loftus, 1983; Reid, 1986; Griffiths, 1991; 1999).

Wagenaar (1988) argued that gamblers are "motivated by a way of reasoning, not by defects of personality, education or social environment" (p.30). The use of these cognitive biases is responsible for such reasoned motivation. Wagenaar argued that gamblers develop, and selectively use, a variety of heuristics and biases to assist them in making gambling decisions. The use of these cognitive distortions make decision-making appear to be rational. Wagenaar outlined sixteen biases and heuristics (summarised in Table 1.8, Chapter 1). In the same way that Wagenaar (1988) argued that heuristics have the effect of reducing uncertainty, it is hypothesized in this study that "positive thinking" has the effect of reducing guilt, frustration, anger and feeling cheated for the problem gambler. Wagenaar's heuristics were in operation to remove doubt, and not negative affect brought about by losing.

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Therefore, as gamblers lose money, the gambler will usually experience some form of negative affect, as they face realisations that their gambling behaviour will have some repercussions for their relationships, career, finances, credit rating and their self-esteem. Time lost through gambling can lead to serious intrusion on other vital areas of the gamblers life (Dickerson, 1974), and losses from gambling can lead to serious crime (Blaszczynski & Silove, 1997; Custer & Milt, 1985; Yeoman & Griffiths, 1996).

Furthermore, they can experience maladaptive reactions including depression, anxiety, substance abuse, personality disorders and poor academic performance (Maurer, 1994). Vitaro, Ferland, Jacques and Ladouceur (1998) also reported that gambling behaviour is associated with depression, unemployment, divorce, suicide and substance abuse. Despite the history of positive thinking styles in the health and clinical arena more generally, there has been no research in relation to gambling behaviour more generally.

The aims of the following study arose out of the broader exploratory aims of Chapter 3. These were to (1) determine whether after gambling, gamblers compensate and reduce negative affect by identifying positive consequences from experiencing a loss, and (2) identify types of strategies which gamblers employ and consider how these should be classified.

4.2. Method

It should be noted that following sample forms part but not the entire sample used in Chapter 3 (as it also includes players under 18 years of age). Therefore, additional information regarding participants and procedure has been presented below. After commencing the initial survey as discussed in Chapter 3 (see Appendix 1) two additional questions were added: a) were there any positive aspects arising from losing when playing slot machines and b) if yes, participants were asked to explain their nature. The discrepancy in the number of participants between chapters 3 and 4 arises from the fact that 16 participants had already responded to the survey before the above two questions were added and this chapter also included responses from players aged under 18 years old. Based on the responses from participants, data was analyzed using basic thematic analysis.

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4.2.1. Participants

The sample consisted of 87 regular gamblers who were recruited in their natural gambling environments in locations throughout the UK. Participants were considered to be a regular gambler if they said that they gambled at least once per month. There were six times as many males as females interviewed (see Table 4.1) and although ages ranged from 12 years to 64 years, the sample was predominantly young (the most common age group was 18-to-25 years, followed by the under-18 years of age group). Thirty-three percent of gamblers reported to having been educated to degree level or higher. The majority of participants were either unemployed or in full-time education (61%) and nearly three-quarters (73%) of respondents reported that they had sufficient time to gamble.

Table 4.1 Age Groups of Regular Gamblers by Thinking Style

		Positive thinkers		Non-positive thinkers		
		men	*women*	*men*	*Women*	Total
Age	under18	13	0	7	2	22
	18-25	17	0	12	0	29
	26-35	11	1	6	2	20
	36-45	2	0	3	3	8
	46-60	1	0	1	1	3
	over 60	2	1	0	2	5
Total		46	2	29	10	87

4.2.2. Materials

The materials and procedure employed in this chapter were the same survey items presented in Chapter 3.

4.2.3. Procedure

Participants were approached in locations housing fruit machines across the UK. Such locations included arcades, betting shops, bars and casinos. Despite extensive difficulties in researching gamblers in ecologically valid settings, this was considered necessary in order to obtain reliable and valid information regarding positive thinking among gamblers. When questioned as to whether there were positive benefits from gambling, participants were divided into two categories of "gamblers reporting at least one positive benefit" (positive thinkers) and gamblers reporting "no positive benefit" (non-positive thinkers). In total, 48 of the 87 participants (55%) were

classified as positive thinkers by such a definition. Anonymity was assured to participants in each circumstance and all who participated were debriefed.

4.3. Results and Initial Discussion

4.3.1. Types of Positive Thinking

The surveys generated a list of nine positive beliefs about losing which were reported by gamblers. These are: *Comparative thinking, Prophylactic thinking, Biased frequency thinking, Chasing Validation, Responsibility avoidance, Prioritization, Resourcefulness, Thoughtfulness, and Fear Reduction.* These are briefly summarized in Table 4.2 and are explained in more detail below.

Table 4.2 Summary of Positive Thinking Among Gamblers During or Immediately After a Loss

Thought	Brief Explanation
Comparative thinking (opportunity cost)	thinking losses are disposable income that would have otherwise been spent without the chance of winning money
Comparative thinking (addictions)	thinking that other potentially addictive behaviours have been replaced by gambling
Prophylactic thinking	thinking that large losses could prevent gambling in the future
Biased frequency thinking	thinking that winning occurs more often than losing
Chasing Validation	thinking persistence in trying to win back past losses is rewarded in the long run
Responsibility avoidance	thinking other negative events in gambler's life allow them to temporarily escape responsibility leading to irresponsible gambling behaviour
Prioritization	prioritizing one's life after experiencing gambling losses
Resourcefulness	thinking creatively in negative situations (usually financial)
Thoughtfulness	thinking more about others
Fear reduction	bolstering of self-esteem and personal improvement as result of risk-taking ability

4.3.1.1 Comparative Thinking

This type of belief refers to a relative preference for the consequences of gambling compared to other less attractive or more destructive behaviours. There are at least two types of comparative evaluations; (1) the opportunity cost of gambling and (2) comparisons to other addictions. The opportunity cost is referred to by players who believed that gambling disposable income is a more efficient way to spend since there is a chance to make a profit. For example, once money has been spent on a concert

ticket or on tenpin bowling, there will be a negligible chance of such a transaction making a return or profit.

> *"If I didn't gamble the money, it would have just been wasted on rubbish anyway."* [R., male, age] 54

In the context of addictions, this belief refers to the way in which gamblers reduce perceived risk through inaccurate comparisons with other social vices such as using alcohol and drugs. Gamblers who adopted this thinking style, expressed that gambling was less harmful than these "other" forms of addictions. For instance:

> "Losing money from gambling might stop me from having drug or alcohol problems." *[E., male, age 21]*

Here the gambler believes that if they were not spending their time and money gambling, they would be engaging in other potentially addictive behaviours (such as alcohol and drug use) where they consider the consequences to be more severe. By maintaining this belief there appears to be a personal acknowledgement that they have an "addictive personality" or a set of traits that predispose them to engage in certain excessive behaviours. The gambler believes the needs of such a personality or trait must be satisfied. The gambler needs to justify that the consequences of gambling are potentially less harmful than other potential addictions, particularly those which involve the ingestion of psychoactive substances.

4.3.1.2 Prophylactic Thinking

This type of belief refers to gamblers who rationalize that a sizable loss so early in their playing career will discourage them from future gambling. If losing large amounts of money is among their first gambling experiences, these players might indeed stop gambling. These individuals will have avoided the "winning phase" – typical in the early phase of a gambler's career (Lesieur & Custer, 1984) - and might therefore experience schedules of reinforcement different to those experiencing big wins early in their gambling career. Without ever experiencing large wins, these gamblers may have little motivation to chase loses since they have no past history of winning. For instance,

> "It is actually better that I lost as it means I will lose less in the long run. I think £200 is cheap to know that you will never gamble again." *[F., male, age 29]*

In this example, the gambler put a £200 loss into context of how much money they would lose if they continued gambling. Essentially, the result is that the gambler will perceive the loss as a positive outcome since they believe that they will benefit from not gambling again. This evaluation of the loss is accurate if it means the gambler is sufficiently punished or negatively reinforced to abstain from gambling. However, this may not always be the case. Therefore, there would be a significant chance that the individual will gamble again. Furthermore, such a belief is accurate if gamblers are only motivated by winning.

4.3.1.3 Biased Frequency Thinking

In simple terms, these types of belief occur when the gambler recalls an unrealistically large number of wins and an unrealistically small number of losses. This belief parallels Wagenaar's (1988) 'availability heuristic' and his explanation of 'fixation on absolute frequency'. By doing this, the gambler simply interprets losses as a decrease in profits. For instance:

> *"The money I lost by gambling was just money that I had previously won from gambling"* [N., male, age 27]
> *"I'm just glad that I win more than I lose"* [D., male, age 21]

In these examples, gamblers appear to recall their wins more easily than their losses since winning is the initial motivation of the behaviour. Experienced gamblers reported that they often operated a "mental account" of gambling outcomes similar to a balance sheet, where they add wins and subtract losses to the total sum as they occur. However, through employing this positive thinking bias, the balance may be inaccurate as losses may be discounted.

4.3.1.4 Chasing Validation

This type of belief appears to be similar to a representative bias, i.e. gamblers believe the laws of probability apply in the short run (Wagenaar, 1988). Gamblers report that they are reluctant to quit until they win. In essence, they believe that each loss brings them one step closer to winning. To some extent, this is necessarily true. If the gambler persists they will eventually win. However, these individuals appear to ignore how these transactions balance out in the long run. After a while, the gambler may develop 'chasing' characteristics because they may find themselves in a position

of eventually achieving their win but turns out to be less than the initial outlay. What is being described here is 'chasing' behaviour (Lesieur, 1984). However, it is worth noting that some gamblers view gambling as functional only in obtaining a win. By believing that sustaining losses is the only way to eventually win, the gambler may be successful in reducing dissonance and negative affect.

4.3.1.5 Responsibility Avoidance

This particular type of belief is not strictly a positive interpretation of their loss, but instead serves to alleviate negative affect through permitting the gambler to avoid responsibility. As environmental stressors (e.g. redundancy) induce the need to gamble, participants argue that in the event of losing, their situation is unlikely worsen. For instance:

> "Sometimes, it doesn't make much difference. Things are messed
> up even before you lose any money." [O., male, age 26]

This implies an attractive benefit to the gambler. They can reap the perceived benefits of gambling such as arousal, escapism, ego-enhancement etc., and avoid the usual concern about the financial implications of losing. If an individual had suddenly been made redundant, there is a strong likelihood that they would be under impending financial pressure. They might eventually argue that losing a few hundred pounds gambling will not deteriorate their circumstances any further.

4.3.1.6 Prioritisation

This type of belief primarily serves a motivational function. Gamblers may claim that losing gives them a new sense of clarity, similar to the breast cancer patients (Taylor et al., 1984). As the gambler tries to recover from the loss, life's priorities become more crystallised. In evaluating their losses, these gamblers expressed a desire to return to the period before the loss and were motivated to address new priorities. Participants alluding to better prioritization reported a greater satisfaction from this ability to think clearly. However, they were unable to verbalize why they needed to lose money gambling in order to achieve this. For example:

> "I guess its kinda like that line the movie 'Fight Club', 'It's only after
> you've lost everything that you're free to do anything'. Its kinda like that.
> You wish you could go back to the time before you gambled when you
> thought you had it bad. You feel maybe now that the gambling is out of the
> way maybe you can focus on the important stuff," [X., male, age 31]

4.3.1.7 Resourcefulness

This type of belief is where the gambler thinks that by losing they still acquire something valuable for their money. Here, the gambler argues that only through dealing with difficult situations can they develop their ability to be resourceful.

> "Gambling has taught me a lot of valuable skills that I would not have learned without experiencing losses. It particularly helps me be more resourceful," *[H., male, age 29]*

> "If I didn't gamble I would be rollin' in it! I think it does that to you, you know makes you more creative so that you know how to get money and make it stretch," *[N., male, age 27]*

Obviously having experience of trying to avoid negative consequences of their actions develops their coping skills and ability to be adaptive. However, it is inaccurate to assume that such skills can only be developed through experiencing gambling losses. These skills can be learned in a wide variety of contexts and are quite often involuntary. Interestingly, other individuals claimed that losing on fruit machines was not necessarily a bad thing since it provoked more care with their budgeting. Take the following case as an example.

> "I know it seems wasteful to gamble on the machines but in a way it actually makes me better with money. I see how easy it is to waste money so makes me be more careful with my wages when I am buying other things. I guess the extra that I save I can set aside for leisure gambling. People are always telling me that I get good bargains." [P., male, age 28]

The belief is that his gambling behaviour will lead to personal development through increased financial prudence. The case for self-deception is probably strongest here since there is a strong contradiction in the reasoning. Gambling does not constitute financial prudence in any way.

4.3.1.8 Thoughtfulness

This type of belief is where the gambler believes that gambling will make them more thoughtful to others for others. For example:

> "The guilt sometimes makes me spend more on my girlfriend. Knowing that I have spent so much of our money on gambling, I feel that maybe I should treat her now and again." *[B., male, age 20]*

The gambler in the above example openly acknowledged that his behaviour was probably an attempt to reduce feelings of guilt caused by his gambling. Like other forms of positive thinking it is a mechanism for guilt reduction. Obviously other

benefits come out of this particular behaviour. His actions deliver other positive benefits in his personal life. The guilt-reducing behaviour of pampering his girlfriend is positively reinforcing if she responds with gratitude and affection.

4.3.1.9 Fear Reduction

The final type of belief involves those gamblers who believe that losing money that they cannot afford is a character-building experience (i.e. some kind of fear reduction strategy). When individuals were questioned why this was the case, they alluded to the development of particular desirable traits. Participants expressed that taking risks and losing (like in the gambling experience) enhanced boldness and masculinity.

> "I think its important for blokes to be able to deal with disappointment – and gambling sensitises the player to this feeling repeatedly". [M., male, age 32]

> "...the measure of man is in the size of his balls". [E., male, age 21]

However, this is not a new idea. Over 30 years ago, Goffman (1969) described the development of "character" as stemming from peer approval and argued it to had a positive effect which might address the effects of financial loss. Character development has also been addressed in other qualitative accounts (e.g. Campbell, 1976; Herman, 1976; Saunders & Turner, 1987).

4.3.2. Positive thinking: general information and associated traits

Further analysis was also done examining the differences between positive and non-positive thinkers. Men were more likely to employ positive thinking styles (61%) than women (17%) (χ^2 (1) = 8.35, p < 0.005). However, positive thinking styles did not vary significantly with age (χ^2 (5) = 4.05, p = 0.57). Table 4.3 shows a number of significant differences between positive thinking and non-positive thinking gamblers. Positive thinkers reported starting gambling at an earlier age, having more leisure time for gambling, preferring busier gambling environments, gambling twice as often and devoting almost twice as much time to each gambling session. Although, positive thinkers spent nearly three times as much money during a gambling session than non-positive thinkers, they claimed that on average that they made a profit (mean profit =

1%) compared to non-positive thinkers who claimed that they made a loss (mean loss = 30%).

Particular behaviours seem to characterize gamblers reporting positive benefits from gambling. Positive thinkers claimed they took more risks, were more enterprising and more competitive than non-positive thinkers. However, non-positive thinkers claimed to be more responsible when dealing with any negative consequences from their behaviour.

Table 4.3

Significant differences between positive thinkers and non-positive thinkers in gambling behavior

	Positive Thinkers Mean	Non-positive Thinkers Mean	T-value	Significance
Group starting age (years)	12.52	15.07	-2.29	0.025*
Available leisure time**	7.89	6.84	2.04	0.044*
Preference for busy gambling environment**	7.37	5.84	2.66	0.009
Time per session (minutes)	217.57	126.71	3.47	0.001
Money spent (not lost) per session	90.04	36.84	2.9	0.005
Financial outcome (index)	1.01	0.7	3.11	0.003
Risk-taking **	7.43	5.84	3.553	0.001
Responsibility for negative events **	5.27	6.87	-2.93	0.004
Enterprise**	7.12	6.02	2.61	0.011
Competitiveness**	7.66	6.52	3.07	0.003

*Significant at 0.05 level only;
**Denotes a self-report score (10-point Likert scale) whereby they extremely agree or disagree with the related statement.

4.3.3. Positive thinking and negative affect after losing

On a ten-point scale (scores denote a self-report score in terms of frequency of their feelings after gambling sessions whereby 1 = never; 10 = always), participants reported means of 6.9 for feeling angry, 7.08 for feeling frustrated and 6.65 for feeling cheated. These were higher than mean ratings (4.87) for feeling guilty after losing (see Table 4.4).

Table 4.4.

Differences Between Positive Thinkers and Non-Positive Thinkers in feelings after losing at Gambling

	Total Means	Positive Thinkers Mean	Non-positive Thinkers Mean	T-value	Significance
Feeling angry	6.9	7.2	6.53	1.17	0.25
Feeling guilty	4.87	4.2	5.69	2.61	0.01*
Feeling frustrated	7.08	7.27	6.84	0.8	0.42
Feeling cheated	6.65	6.85	6.41	0.76	0.45

*Significant at the 0.01 level; scores denote a self-report score (10-point Likert scale) in terms of frequency of their feelings after gambling sessions whereby 1 = never; 10 = always.

There were no significant differences between positive thinkers and non-positive thinkers regarding feelings of anger (t (85) = 1.17, p > .05), frustration (t (85) = .804, p > 0.05), or a sense of feeling cheated (t (85) = .759, p > 0.05). However, there was a significant difference between positive thinkers and non-positive thinkers in terms of the levels of guilt experienced after making a loss (t (85) = -2.61, p = 0.011).

4.4. Discussion

The main purpose of this chapter was to determine whether after gambling, gamblers compensate and reduce negative affect by identifying positive consequences from experiencing a loss. The results demonstrate that 55% reported at least one positive thinking style. Results indicated that gamblers who report benefits from losing start gambling younger, have more time to gamble, gamble twice as often for twice as long, spend more money, and claim to win more than gamblers who do not report benefits. Such characteristics closely resemble those found in problem gamblers (Griffiths, 1995). Many research studies have concluded that regular gamblers do lose more than non-regular gamblers. In this study, gambling occupied substantially more time and attention of positive thinkers compared to non-positive thinkers. Therefore, while temporarily ignoring any financial considerations, further gambling may create more problems for positive thinkers. This suggests a greater need for employing cognitive mechanisms to compensate in times of adversity. Positive thinkers expressed significantly less levels of guilt. It could be argued that positive thinkers are able reduce guilt levels through thinking positively after losing. These results also support the theory that gamblers only seek to reduce negative affect caused by guilt.

since the cause of such guilt can be attributed to gamblers themselves. Arguably, the cause of anger, frustration and feeling cheated might be more attributable to a third party (e.g. machine manufacturers, machine operators etc.). Therefore, positive thinking will have less of an impact on these sources of negative affect.

Despite such a range of positive beliefs, only one of the gamblers reported using more than two of these. Although, there was no evidence to suggest that gamblers experienced several of these beliefs this may be a result of the limitations of the methodology used. It may simply be that participants were simply not able to recall more than one or two at the time of interview. This is clearly an issue which should be addressed by further research. Distinctions can also be made between the categories of positive beliefs. While most can be considered as tangible benefits from gambling, *biased frequency thinking, chasing validation* and *responsibility avoidance* more closely resemble Wagenaar's (1988) cognitive heuristics since these are positive cognitive processes rather than positive benefits. However, these are distinguished by the fundamental difference that Wagenaar's heuristics were, in most cases, in operation to remove doubt, and not usually negative affect as created by the adverse consequences of gambling. Clearly any positive thinking considered to be more than simply self-deception should not be discounted, since some knowledge of genuine benefits has a subtle importance in gaining a comprehensive understanding of gambling. However, after careful consideration, few of the identified aspects of positive thinking could be considered as legitimate.

Comparative thinking involving opportunity cost can be criticised since gambling can have a much higher financial cost than most other forms of leisure pursuits. *Comparative thinking* involving addictions presumes the existence of an 'addictive personality' – something which, depending on how 'addictive personality' is defined, has received limited support from the literature (Griffiths, 1995). Furthermore, if such a disposition did exist, there is no reliable evidence that one potential addiction would be enough to act as a complete outlet for such a personality. Furthermore, there would be difficulty in trying estimate which addiction could be considered more "destructive". *Biased frequency thinking* and *chasing validation* are cognitive distortions which simply do not reflect reality. Furthermore, while there may be some value in speculating some possibility for *prophylactic thinking* for those not

experiencing wins at an early stage in their career, evidence suggesting that losing is functional for many gamblers would contradict that.

The effects of *responsibility avoidance* might also be feasible in removing barriers to gambling behaviour, but it will still carry with it the usually negative consequences regardless of other situational characteristics experienced by the gambler at that time. Finally, it is accepted that gambling might facilitate *prioritization* and positive skills such as, *resourcefulness, thoughtfulness* and *fear reduction*. However, such skills can be developed through less potentially destructive means. For example, *fear reduction* might be honed and challenged through extreme sports or entering into some kind of enterprising venture, *prioritization* through simple reflection and *budgeting* through careful planning and research. These are only a few examples but essentially one wonders whether to attach any importance to the so called "positive thinking" described by gamblers in this study.

Fundamentally, the modes of positive thinking discussed in this account appear to be maladaptive for a problem gambler. One of the first steps to recovery for the problem gambler is to accept that such gambling behaviour has had a negative impact on their life, and even in the event of any positive consequences, these are usually more than offset by the negative consequences. As noted previously, these potential benefits of losing money can be experienced through engaging in other less potentially destructive behaviours. The purpose of behavioural therapy is to readjust clients' belief systems and aid the gambler in pursuing a functional life. Perhaps illustrating alternative behaviours where the gamblers may gain the same positive reinforcements could be a fundamental stage of recovery from problem gambling. If these gamblers fail to attach the appropriate importance to each individual consequence, there is the potential for these perceived positive benefits to actually perpetuate gambling. In other words, based on the reasoning and evidence outlined in this study, the identification of gains and the compensation for negative affect may facilitate problem gambling and counter therapeutic efforts for those in or seeking treatment.

There are clear steps that need to be taken to develop these ideas and find stronger empirical support for the positive thinking styles introduced. Future research should address which kind of gambler uses which forms of positive thinking and/or how

many do they employ. When investigating cognitive mechanisms and coping strategies, there will be some level of methodological difficulty since many of these processes may not operate consciously and therefore, gamblers may not be able to verbalise or recall all beliefs at any one time. However, the present identification of a subset of mechanisms may facilitate more research in the future. Furthermore, it is argued that these findings may be generalised to gamblers participating in other forms of gambling. Essentially, the use of positive thinking will depend on the level of negative affect which is argued to reflect the level of personal and financial involvement. Such involvement will inevitably vary among forms of gambling. Of course, form depends on different structural characteristics (Griffiths, 1993), and thereby gamblers may lose more on one form of gambling than another. Fruit machines have, among other persuasive structural characteristics, a high event frequency (e.g. a gambler may bet 12 times minute on a fruit machine compared to once or twice a week on the lottery). Consequently, gamblers may lose more on fruit machines than other forms of gambling, and as such, they may experience higher and more frequent levels of negative affect. Therefore, the use of positive thinking is most probably determined by how much is lost (in terms of frequency and value) rather than by what means. What is clear, however, is that regardless of which form gambling takes, positive thinking is maladaptive unlike in the health contexts outlined above. By overestimating benefits and reducing guilt, positive thinking disrupts the naturally occurring contingencies of reinforcement that might otherwise prevent excessive gambling.

CHAPTER 5
PARTICIPANT AND NON-PARTICIPANT OBSERVATION

5.1 Participant and Non-Participant Observation

5.1.1 A Framework for Participant and Non-Participant Observation

One of the things that eventually becomes clear when learning how to carry out, analyze and write-up participant observation research is that there is limited consensus on best practice. Many authors (e.g. Crabtree & Miller, 1992; Spradley 1980; Jorgensen, 1989) subscribe to a basic central tenet, namely that a "unit" of data is collected by watching, chatting, experiencing, comparing and contrasting (i.e., observation and participation) in a reflective and critical cycle of enquiry for the scene in question. However, the exact procedure for doing so in a rigorous way in order to distinguish a 'layman's commentary' from the valid and reliable findings of a competent social scientist is not obvious or straightforward. In fact, the distinction may be, at first glance, a subtle one, whereby the latter is expected to:

1) Be an 'ex ante', pre-meditated and focused act rather than an 'off the cuff' procedure done on an ad hoc or post hoc basis;

2) Use a broad, open focus rather than a narrow, inflexible one;

3) Be characterised by a desire to absorb and learn in an objective fashion, and;

4) Impose a scientific framework wherever possible in order to identify the most useful and revealing components in a scene and maximize understanding of that scene.

Furthermore, the exact form in which the findings should be reported is equally unclear. For example, Spradley (1980) identifies Hayano (1978) and Agar (1973) as key pieces of ethnographic research in the gambling and drug taking fields respectively, where both report their findings in a clear, informative and interesting way. However, these findings are reported descriptively without making it clear how the author arrived from their observations to their eventual findings and conclusions. This is approach has also been taken by other observational work in the gambling field such as Fisher (1990); Cotte (1997); Rosecrance (1986a; 1986b); Neal (1998) and Bennis (2004).

Based on the above rationale, findings from studies 2a, 2b and 2c were derived from using a theoretical framework as a starting point for observation. This framework was

based on techniques as described by Spradley (1980; discussed below). For consistency and parsimony, findings have been reported in the same way that participant observation has been done previously in this field by the vast majority of authors (as cited above).

Spradley (1980) details an extensive 'research toolkit' for carrying out participant observation which consists of a variety techniques to gather data from observation. He referred to this as the 'developmental research sequence'. Such techniques can be used for research for various levels of scope from micro-ethnography (looking at a single social situation or social institution) to macro-ethnography (looking at a complex society or multiple communities making up a culture). The research under investigation here (i.e. the social institution of fruit machine gambling) falls more towards the micro-ethnographic end of the spectrum.

Spradley's 'toolkit' comprises of techniques that give consideration to both the whole scene but also to making more selective and focused observations. Spradley acknowledges that ethnographic research will eventually gravitate to in-depth analysis of certain agents or activities, but does suggest that at an early stage, the researcher should give consideration to the wider scene, at least at a superficial level. The reason for this is to ensure that basic characteristics of the overall environment are noted that might facilitate more focused and selective observations. For example, in order to understand how a customer interacts with a conductor on Nottingham's new tram system, it may be important to give initial consideration to the wider travel experience of tram riders which may include getting on, finding a seat, interactions with other customers and getting off.

The following aspects of Spradley's developmental research sequence were used as a framework in this research initiative for gathering information on situational and structural factors in the context of fruit machine playing:

1. *Domain Analysis*: This involves a systematic identification of components of the observed scene and possible sub-categories. This process familiarizes the researcher with the scene and offers a systematic method for identifying components and activities worthy of further, more in-depth observation and

analysis. An example of a domain analysis would be: persons in a fruit machine arcade (see Figure 5.1);

Figure 5.1: Example of a Domain Analysis for a Fruit Machine Arcade

PERSON in a Fruit Machine Arcade
Are a kind of
a) Players; b) Spectators c) Change attendants d) Technicians; e) Managers f) Sales staff from fruit machine manufacturers g) Security staff
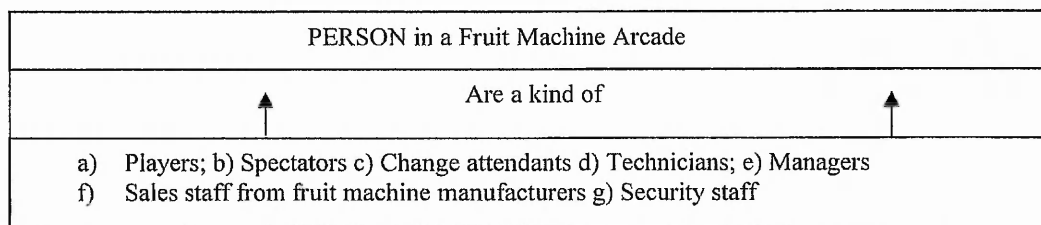
This domain analysis would only be one possible example of a variety of potential domains within this scene. Other domains might include: spaces, feelings, events, goals and objects that exist in the scene. Consideration of such domains and their sub-components ensures that data are collected in a systematic way, with a wide research focus.

2. *Taxonomical Analysis*: This is a way of organising components in a scene but is usually done after more focused observations have been carried out. A taxonomy organises sub-categories in a more meaningful way (see Figure 5.2).

Figure 5.2: Example of Taxonomical Analysis

PERSON in a Fruit Machine Arcade		
Customers	**Staff**	**Visitors**
Players Spectators	Change attendants Machine technicians Managers Security	Suppliers

Through taxonomical analysis, the researcher can then begin to add meaning and develop understanding to the hitherto list of descriptive components in the scene.

3. *Componential Analysis*: This is a more sophisticated way to gather and organise data and involves asking questions of contrast (i.e., what are the similarities and differences between categories?). For example, what are the key ways in which players are different (e.g. this could be (i) the amount of money staked (ii) exhibiting aggressive or non-aggressive behaviour (iii) spending substantial time or limited time)? It is by considering key areas of contrast that depth of understanding and some causal meaning can begin to

develop (e.g., what are the conditions under which an "escape artist" [Fisher 1990] will spend more than they can afford? This may have implications for understanding prevention, treatment or marketing among these players).

The techniques mentioned offer a systematic framework for gathering and analysing data when using a relatively underused research method about many scholars have different opinions on best practice.

The fundamental principle underlying this methodology is the use of a circular rather than linear process of discovery. Spradley (1980) suggests that this 'cycle' should begin with a series of questions, followed by the collection of data, then by analysis and reflection, and then by a decision to revisit the start of the cycle, whereby the researcher asks more questions, or reformulates past questions to get to an accurate description and understanding of the situation in question. Using a cyclical approach to research is particularly important to cases such as this one, where data are considered in a large variety of locations. Ideas from one location may be revisited in another location without having to start the whole process from the beginning. Answers to questions either become reinforced or throw up different answers which will lead the researcher to identify nuances in the environments and to consider aspects of the behaviour that may not have been evident or obvious in other locations.

5.1.2 Settings and Procedure

Based on an initial scoping exercise and guidance from preliminary informants, four key types of setting were selected for observation. A fifth category included less common and less popular settings where fruit machines can also be played (see Figure 5.3). Sites according to these settings were pre-selected based on a variety of factors many of which identified as important by Spradley (1980):

1. *Accessibility*: How easy it was access the scene

2. *Unobtrusiveness*: The degree to which the researcher could blend into the scene;

3. *Personal Participation*: The extent to which the researcher could personally participate where appropriate and;

4. Experience of broad range of settings: Perhaps most importantly, it was necessary to *experience and examine the broadest range of environments and locations* to

ensure that: a) all dimensions of the social situation (i.e. fruit machine playing) were covered and b) to consider possible differences between locations and environments.

Figure 5.3 – Scenes Selected for Observation of Fruit Machine Playing
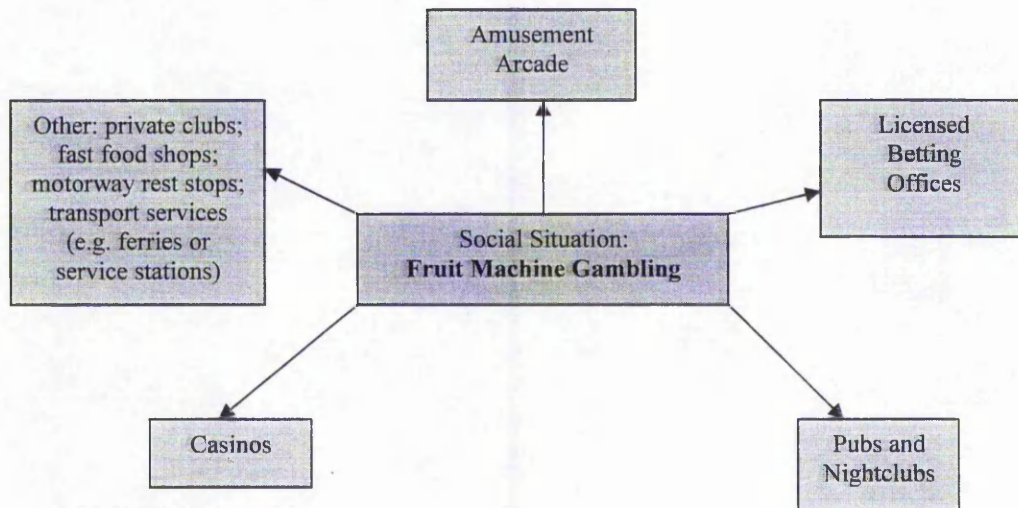
A breakdown of time spent in each location and environment according to date is summarized in Table 5.1 for England and Table 5.2 for Northern Ireland. Security and supervision had a stronger presence in the casinos and amusement arcades compared to pubs, licensed betting offices and other environments. Therefore, more time had to be spent playing machines or engaged in other consumer activities (playing pool, playing video games, eating or drinking) in supervised areas to avoid accusations of loitering. In less supervised areas it was occasionally possible to record responses from informants in situ. However, in order to conceal researcher status and remain inconspicuous in many environments, field notes and quotes were primarily written up after the exchange.

Table 5.1: Participant Observation in England According to Type, Location and Date

Observation Type	Hours	Examples of Key Venues	Dates
As a Change Attendant	180	Namco Station Amuesement Arcade, Market Square, Nottingham	August 2001; September 2001; October 2001; November 2001
As a Patron (pubs)	120	Weatherspoons, Market Square, Nottingham; Bensons, Milton Street, Nottingham; Larwood and Voce Tavern, Fox Road, West Bridgford	January 2001; February 2001; March 2001; May 2001; June 2001; August 2001; September 2001; October 2001; November 200; May 2004; June 2004; July 2004; August 2004; July 2006; October 2006; February 2007
As a Patron (casinos)	50	Gala Casino, Maid Marion Way and Bridlesmith Gate, Nottingham	January 2001; February 2001; March 2001; May 2001; June 2001; August 2001; September 2001; October 2001; November 2001; July 2006
As a Patron (arcades)	550	Sun Valley (Trinity Sqaure; Clumber Street; Upper Parliament Street) ; Skegness (Lincolnshire); Falmouth (Cornwall)	October 2000; November 2000; December 2000; January 2001; February 2001; March 2001; May 2001; June 2001; August 2001; September 2001; October 2001; November 2001; December 2001; April 2002; May 2002; June 2002; July 2002; August 2002; May 2004; June 2004; July 2004; August 2004; July 2006; January 2007; February, 2007
As a Patron (licensed betting offices)	90	Ladbrokes, Radcliffe Road West Bridgford; Ladbrokes, Pelham Street, Nottingham; William Hill, Clumber Street	January 2001; February 2001; March 2001; May 2001; June 2001; August 2001; September 2001; October 2001; November 2001;
As a Patron (other)	35	Stranraer - Belfast ferry; Irish Club; Nottingham; Mister Pizza, Musters Road, West Bridgford; Watford Gap Service Station, M1	December 2000; July 2001; September 2002; October 2002; October 2006
Total	**1025**		

Table 5.2: Participant Observation in Northern Ireland According to Type, Location and Date

Observation Type	Hours	Examples of Key Venues	Dates
As a Patron (pubs)	20	Lavery's Bar, Botanic Avenue, Belfast; The Anchor, Portstewart, Co. Londonderry; The Windsor, Bangor Co. Down;	December 2000; April 2001; December 2001
As a Patron (arcades)	95	Ocean Beach, Portstewart, Co. Londonderry; Sportsland Portrush, Co. Antrim; The Palladium, Quay Street, Bangor, Co. Down; Trunps, The Promenade, Bangor, Co. Down	December 2000; April, 2001; August 2006; December 2006
As a Patron (other)	15	Stranraer - Belfast Ferry; Befast International Airport; Europa Bus Station, Belfast;	December 2000; April, 2001; August 2006; December 2006
Total	**130**		

Similar data collection patterns were employed when observing as a change attendant. Although every effort was made to ensure accuracy when recording data, it should be noted that some of the excerpts in this account are not verbatim.

Although all agents (including staff, visitors and management) in the gambling environment were included in the analysis (at least at a superficial level), the foci of the observations were the fruit machine gamblers and their interactions with the machines and with their social and physical environment. Observations included all gamblers regardless of frequency, amount spent or possible pathologies that may have been present.

Observational work was undertaken in two forms; as a change attendant in an amusement arcade (180 hours) and as a 'patron' in slot machine environments (975 hours). Both were vital to the ethnographic process since both offered different perspectives. As a staff member, full attention could be given to observation when no patrons required change. Being a staff member also entitled the researcher to substantial information (through dialogue and questions) from other members of staff and management, primarily occurring during less busy periods. Conversing with other staff members proved to be inherently more difficult when observing as a patron. This would have been discouraged and considered divulging 'trade secrets'. Although, the management, staff and the players were aware of the authors' status as a researcher, the novelty subsided almost immediately (in fact, many players and staff had disbelieved the researcher's true identity and questioned whether the researcher was even a researcher at all.) As a player, there is an expectation that you play the machines since loitering is prohibited. However, there are distinct advantages to observing as a fruit machine player. Firstly, it provided an opportunity to observe all venues and locations rather than remaining in one environment in one location. Secondly, as a fellow player, the researcher was afforded more respect than as a change attendant. Respect in this sense removed social barriers that were present as a change attendant, and reflected in a greater willingness to discuss their behaviour and knowledge of gambling.

The setting for research as a change attendant was a large amusement arcade (*Namco Station*) situated in the town centre of Nottingham, England. The shifts were eight hours in duration, varying across days of the week and across shifts (early = 8am to 4:30pm; day = 11am to 7:30pm; evening = 1:30pm to 10pm and night = 3:30pm to midnight). Change attendants were permitted a series of 15 to 30 minutes breaks

throughout the day. Brief notes were written during the shift. However, critical reflection and most field notes were written during these rest breaks and immediately following the shift. A useful method for recording details across all scenes (but working as a change attendant in particular) was using a licensed betting office (LBO) betting slip (see figure 5.4). These were useful as players and other staff, including management, would use these during the shift to place sporting bets usually in the LBO located next door to Namco Station. Given that such paper slips did not raise any particular interest or concern, condensed notes could be taken during the observation session to aid memory to develop expanded notes post-session.

Figure 5.4: A "Note-Taking Device" for the Field - Example of a Betting Slip from an LBO

While observing as a patron, the status as a researcher was concealed in the majority but not all cases. There are two reasons for concealment, both of which have been referred to earlier in this chapter. Firstly, it was important to avoid problems relating to gatekeeper issues and management concerns (namely, that they do not want their customer disturbed in the name of research). Secondly, in cases where researcher status was revealed, natural dialogue appeared inhibited in comparison to sessions where researcher status was concealed. This researcher effect appeared to encourage more socially desirable answers and inadvertently made the verbal exchange more

formal leading the informants to contrive responses more than they would in a casual conversation with a peer.

This methodology is not intended to provide evidence for causal relationships between the variables under investigation, nor is it intended to offer an exhaustive set of findings on the topic under investigation. It aims to explore a relatively unresearched area in the hope of establishing useful information that will: a) serve as a basic (even temporary) source information regarding fruit machine gambling in the UK and more importantly, b) shall provide an agenda for further empirical research.

Ethical Considerations

Ethics is also a concern when doing participant observation. The BPS guidelines on ethics and participant observation state:

> "Studies based upon observation must respect the privacy and psychological well-being of the individuals studied. Unless those observed give their consent to being observed, observational research is only acceptable in situations where those observed would expect to be observed by strangers. Additionally, particular account should be taken of local cultural values and of the possibility of intruding upon the privacy of individuals who, even while in a normally public space, may believe they are unobserved."

It is argued that in these kinds of environments, it will be unfeasible to get informed consent from all customers who may be potentially observed. However, players are under substantial scrutiny in the form of observation for reasons relating to security (not damaging a machine or stealing from other customers) or player edicate (players not loitering or offending other players). Therefore, observation may be deemed "permissable" in this environment as described above. Observation did not involve any recording (audio or visual) except for recording field notes ad hoc and post hoc.

5.1.3 Validity and Reliability

Although this method can yield rich and informative data it could be criticised for its subjectivity. Such subjectivity may compromise the validity and reliability of data of the data being collected. For this reason, several precautions were taken to minimize these risks. Firstly, triangulation was employed by assessing and comparing information being collected by a variety of means: (1) observations, (2) dialogue with

population, (3) informal interviews and (4) researcher participation within the environment. Formal interviews and recordings were not permitted as part of the agreement between the researcher and management regarding working as a change attendant to collect data. Furthermore, as Hayano (1978) points out in his own ethnographic research, formal interviews are not well received in the gambling context nor could we be confident regarding the voracity of their formal comments in the gambling environment:

> "...formal interviews or questionnaires were not used, nor could they be considered to be practical due to the desire of many players to remain anonymous or secretive regarding their personal gambling lives" (p. 477).

However, checks on validity were further employed by comparing information across a variety of respondents including patrons, staff, management and even technicians who were called in for repairs. However, it should be noted that triangulation across researchers was not possible since data collection was carried out by a single researcher. In lieu of inter-observer corroboration, peer debriefing (informally sharing experiences of the same social situation and scene) was used to assess, evaluate and develop ideas as they emerged from the observation. Ideas were discussed with two other academics with considerable expertise in this area: (a) a researcher who also engaged in participant observation in a fruit machine environment with aim of investigating aggression and gambling and (b) a prominent researcher in the field of fruit machine gambling in the UK.

In a further effort to enhance validity and reliability, *negative case analysis* complimented the observation process. Essentially, as new themes emerged, further analysis continually involved identifying cases that ran in opposition to these emergent themes. If such cases were identified, current conclusions would be reassessed in light of new information. Through incorporating this technique, data can continually be filtered through a cycle of enquiry, whereby ideas are reviewed until sufficient evidence may permit tentative confirmation. This approach is particularly useful for examining the same social situation across a variety of social scenes.

Furthermore, this kind of methodology serves as a useful tool for establishing literature in neglected research areas. While limited inferences may be drawn by such qualitative analysis, such observations aim to develop a framework by which more

empirically sound investigations may be propagated. Research of this kind has also witnessed several successful applications both in the gambling field (e.g. Hayano, 1978, 1982, 1984; Rosecrance 1986; Fisher, 1993; Bennis, 2004) and also in other leisure research (e.g. Belk, Sherry & Wallendorf, 1988; Celsi, Rose & Leigh, 1993; Holt, 1995).

CHAPTER 6

STRUCTURAL FACTORS IN FRUIT MACHINE GAMBLING

6.1. Background and Aims

Using Cornish's (1978) seminal work on structural characteristics as a starting point, and building on Griffiths (1993) paper on structural characteristics of fruit machines, the aim of this chapter is to systematically examine (a) the validity of claims regarding structural characteristics made by the previous authors in relation to fruit machines, (b) identify potential structural factors that have been ignored by previous authors and, (c) explore new structural factors relating to fruit machines which may have arisen from technological advancement or changes in legislation.

There seems to be significant confusion regarding structural factors and the role of skill in playing fruit machines. Although Fisher (1993) and Griffiths (1993; 1994) attempted to identify factors that may influence players and that may ultimately make machines more addictive or problem-inducing, the role that structural factors play is not exactly clear. For example, Fisher identifies three sets of skills which are considered important in playing fruit machines:

1. Knowing which machine to select;

2. Knowing the reels of machines (where different symbols are located when performing a nudge);

3. How to further gamble winnings using a gamble button. Although these receive passing commentary it is not made exactly clear how or why this knowledge is utilised and if they have any actual effect on the short-term or long-term outcome of a gamble.

Griffiths (1994) identified twenty skills used by fruit machine players to influence the outcomes of play (e.g. using nudges, holds and specialist knowledge in feature and number systems). However, he also highlights the ambiguity involved in deciding which skills may actually have a real effect and which are "illusions of skill". He concludes that such skills will more than likely be the latter in that they are probably pseudo-skills (e.g., using a nudge button) or "idiot skills" (e.g., knowing to hold

winning symbols) but acknowledged that this needed to be explored by further empirical research.

A key aim of this study, given its prominence in player accounts of skilful play (Fisher 1993; Griffiths, 1994) is knowing if machine selection has a real or an illusionary impact on fruit machine playing outcomes. For example, Fisher (1993) states:

> '... knowledge of how much money has already been fed into a particular machine, and how much it has paid out, can inform whether or not it is worth playing. Players who are 'sussed' will move from machine to machine according to their assessment of how the machines are playing'. (Fisher, 1993;, p. 455).

Griffiths (1994) also gives consideration to the same point:

> '...Other players may argue that intuitive feelings like 'knowing when the machine is going to pay out' or 'putting 10p in the machine to tests its money bank' are genuine skills and that only certain players have these abilities, but these seem unlikely to be the sorts that can be learned by everyone if they can be learned at all. Skill perceptions such as these are rooted in superstitious behaviour or involve heuristics such as 'illusionary correlations' (see Wagenaar, 1988), although such behaviour would make an interesting research topic.'

At present, only speculation exists regarding the role that machine selection has fruit machine playing and therefore, in addition to the primary aims of this participant observation (i.e., exploring and identifying structural factors relating to fruit machine gambling), this chapter (Part A) aims to explore the ambiguity of the role of skill in machine selection and its relationship to game design in a systematic and conclusive manner.

6.2. Results and Initial Discussion

What follows is a presentation of the findings from this research study regarding structural factors in fruit machine gambling. These will be presented in two sections: (1) factors that have been ignored or previously misunderstood, and (2) developments in factors as a result of new opportunities or new technology:

6.2.1. Factors previously ignored or misunderstood

6.2.1.1. Money-In-to-Money-Out (MIMO)Ratio

It became very clear at an early stage that players in all environments studied claimed that machines were predictable, to a certain extent, according to two factors: (a) the amount of money deposited into the machine and (b) the amount of money that the machine has paid out. Such a claim is consistent with findings from previous studies (Fisher 1993; Griffiths 1994). Having confirmed this in participant observation, further clarification and confirmation was sought by using secondary sources (e.g., patents) and informal and anonymous interviews with contacts from the gambling industry and from regulatory bodies. This factor will be referred to as the 'money-in-to-money-out' ratio.

Where electronic gaming machines (EGMs) in most other jurisdictions are governed by a Random Number Generator (RNG) which ensures that the outcome of each play is completely random and independent from previous spins, the outcome of play of a fruit machine is not strictly determined by an RNG. A contact from the Gaming Board for Great Britain replied to an initial enquiry regarding the randomness of fruit machines and disclosed that outcomes are ultimately decided by what is commonly referred to as a "compensator" or "negative feedback control" which monitors the amount money going into the machine in relation to the amount of money going out of a machine.

To understand how this works it is useful to consider the history and evolution of such a device. In the UK, both breweries and retailers compose a substantial segment of the market which purchases and operates fruit machines and consequently, their input in design matters for UK machines has always been deemed to be important. It was suggested that it was the preferences of these operators that contributed to the introduction of the "compensator" (Personal Communication, Industry Contact 1)

Machines operating on a 100% random schedule of reinforcement such as the one offered by the RNG was considered to be volatile by retailers and breweries. They argued that if fruit machine payouts were truly random, some weeks they would make a loss if the machine awarded a series of high wins even though they would make a profit in the long run. For this reason, they preferred machines to satisfy legally

imposed payout ratios in the short-term, ensuring that each week they made a small profit rather than sporadic profits over the financial year. Therefore, in an attempt to ensure that fruit machines made a profit each week, software was used to "compensate" or re-distribute revenue to players in accordance to the payout ratio over 10,000 gambles compared to typically over 100,000 gambles in machines using an RNG. However, other industry contacts disputed this a reason and stated that such technology was there for the player's benefit to ensure that they receive value for money:

> "....this form of technology is not there to benefit the operators but is there to benefit the players in two main ways: 1. to ensure players have some experience of winning in the short term and 2. to ensure that they are getting exciting and fun games for their money."
> [Personal Communication, Industry Contact 2]

Across all locations and sites observed, the payout ratio was usually between 70% and 92% depending on location and machine type. Firstly, machines in locations such as seaside arcades and pubs/bars usually have lower payout ratio because players are typically motivated by leisure and players are perhaps less concerned about value for money compared with players in environments such as casinos and arcades where gambling is the primary motivation of patrons. Secondly, games without bonus games and feature games (reel order machines or "lo-tech" machines) are quicker, hence the player should get more value for money, and consequently these usually offer a higher payout percentage. The following is an extract from personal communication with a key employee of a UK fruit machine manufacturer:

> "....low-payout gaming machines have a relatively low stake:prize ratio and often incorporate a high degree of entertainment by way of attraction as the prize is not usually sufficiently attractive on its own unless the game is designed to pay a substantial win over a number of games. However, designing a complex game to achieve a specific payout percentage and activity profile is almost impossible if the game elements are to be truly and naturally random.
>
> Such low-payout machines are invariably random in nature, but negative feedback controls are used to modify the outcome of the random number generator to reduce the volatility. In reality, the effect of such control systems have to be subtle and cannot conflict with the player's expectation if s/he is not to become aware of them and cease playing the game." [Personal Communication, Industry Contact 3]

It would also seem that in addition to reducing the volitality of fruit machine incomes for small operators, 'negative feedback control' allows machines otherwise limited by small jackpots to be more entertaining, through incorporating bonus games that would be impossible to control using random technology. The same contact from the gaming industry summarises this point as follows:

> *"The behaviour of simple high payout machines may be quite simple to calculate and have high wins to attract the player. Machines with lower wins need to offer the player other benefits, such as entertainment & time etc, and so their designs are often much more complex with features etc. The calculations for the behaviour of feature-based games can be incredibly complicated, and in order to ensure that the machine does not lose money whilst delivering a consistent level of enjoyment and wins, it is necessary to introduce some form of negative feedback control."*
> [Personal Communication, Industry Contact 3]

This information supports the technical information from the relevant UK Patent *GB 2 165 386 A* which states:

> *Fruit machines are usually designed to give overall a preselected payout i.e. a preselected ratio of the coins (or tokens) paid out in winning games to the coins (or tokens) inserted into the machine and credited for the playing of games. With the aim of ensuring a relatively even distribution of payouts (e.g. to avoid long runs of winning games followed by long runs losing games) it is known to provide a <u>compensator which monitors the payout ratio game by game and initiates action, as necessary to, to influence the random selection of wins</u> and thereby attempt to hold the ratio at all times close to the preselected level.*

> ***GB Patent GB 2 165 386A [P1:L9-L24]***

It was noted that there was a sense of nervousness among contacts from the industry and regulatory bodies when discussing randomness, "compensation" or "negative feedback control", and implications for play in monitoring the MIMO ratio. Contacts were reluctant to be definitive in their responses or to be identified. The following exchange took place between the researcher and a contact from the Gaming Board for Great Britain (date of exchange April 2002) and despite clear evidence of the existence of "compensation" in (a) the contact's responses during a telephone call (b) in the GB Patent identified above and (c) even in the e-mail itself (as shown below), the contact was not comfortable being responsible for giving a definitive testimony:

> *Dear Mr Parke,*
>
> *Your statement that ["the Gaming Board for Great Britain (2002) has disclosed that outcomes are ultimately decided by a what is commonly referred to as a "compensator"] is incorrect, I did not say that. You asked what was the difference between UK machines and those used in the USA for example, I said they were "random" machines and most of the AWPs*
> *here were of the "reflexive" type designed to ensure that the percentage return to the public will be very close to the stated percentage return, as opposed to the more volatile "random" machine, and this has been the case since the early 70's when the percentage payout "control"(some use the word compensator)was introduced, provided strict guidelines were complied with. The outcome of the games still has to be a random action by means of the machine. The minimum percentage payout of 70% agreed*

> *with the industry, is achieved over a large number of games. The Machine Guidelines can be viewed on our website www.gbgb.org.uk where in particular' section 4 refers to linkages and randomness, and 5.1*

> *I am not an expert in this field as the Gaming Board do not have access to software programmes, and we do not carry out tests on machines, therefore I am not in a position to give a definitive description of exactly how these machines work. I did advise that you go through BACTA and the industry for a more detailed description.*

> *You also state that machines are "rarely tested", that is not strictly true. There is no requirement in legislation for these machines to be tested and approved before they are sited. However, there is a BACTA Machine Compliance test program introduced in 1996, that manufacturers carry out on machines that are "launched". The program is used to test run 10000 plays and the data produced, sent to the Gaming Board for analysis. The machine manufacturers have agreed to produce machines that comply with the law and current guidelines in accordance with the BACTA Code of Practice.*

Furthermore, what was also confirmed was that at the time of the exchange, (a) a key contact from the regulatory body overseeing gaming machines was not clear on how they actually work and (b) that there was no legal requirement for machines to be tested.

Therefore, considering all of this information, based on the principle of "compensation" or "negative feedback control", knowledge regarding the MIMO ratio could potentially have significant and actual implications for machine selection. This evidence would imply that players wishing to improve their chances of winning should play machines where substantially more money has been deposited in relation to money paid out and that they should avoid playing machines where more money has been paid out in relation to money paid in. This is not only consistent in claims made by experienced players in this study, but also by players in previous studies on fruit machines (Fisher, 1993; Griffiths 1994).

6.2.1.2. Skill and developments in structural characteristics

One of the contentions consistently put forward by Griffiths (1993; 1994; 1995) is that 'skill' (or the perception of skill) appears to be a critical component in the maintenance of fruit machine playing. Griffiths argued that there was very little skill involved in playing fruit machines and his experimental research (Griffiths, 1994) showed that there was little or no difference between regular players and non-regular players in

how long they can stay on fruit machines in terms of both time and money. Knowing what we now know about the MIMO ratio, it could be argued that skill has always been required to select a "suitable" machine. Since the early 1990s, changes in fruit machine design suggests there does appear to be some genuine skills involved in operating fruit machines in addition to the many "idiot skills" outlined by Griffiths (1994). These are outlined below under the categories of selecting and operating fruit machines.

6.2.1.2.1. Selecting a fruit machine

Experienced gamblers claim to have more "insider knowledge" in working out which fruit machines are most likely to pay out in the short-term. The skill comes from knowledge of the MIMO ratio and how this permits players to profit from predatory playing. They claim to use a variety of techniques to help them ascertain the MIMO ratio.

'Boxing'- Experienced fruit machine players often check whether the machine they are about to play is 'boxing'. Boxing refers to an auditory cue made when a coin falls into the cash box (where profits are stored). Players test for this cue by examining if an inserted coin bypasses the 'tubes' or 'hopper' (used to pay winnings to the gambler) and goes straight down to the 'box' or 'tray' where the proprietors take their profit. If the tubes or hopper are full, the player reasons that the machine has not paid out recently.

Part Three: Observational Research

Figure 6.1 :Explanation of the "Boxing" Machine
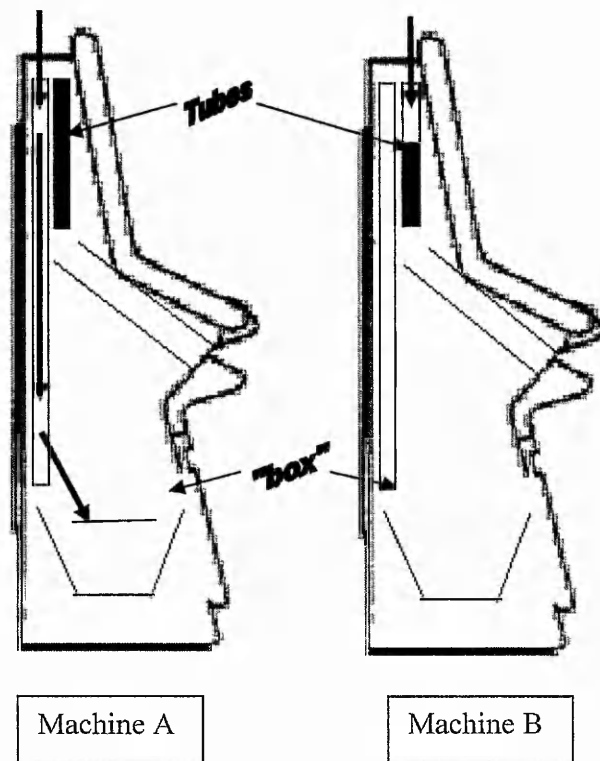
Machine A   Machine B

From the point of view of the experienced fruit machine player, Machine A is more profitable since it makes the boxing noise as the coins bypass the tubes and fall down into the profit tray or "box". This noise signals that the machine has taken in more money that it has paid out (a high MIMO ratio) suggesting a favourable probability of a future payout.

Following this logic, many experienced fruit machine players believe that this increases their chance of a win in the near future. Figure 6.1 illustrates how the 'boxing' sound is made. Machine A represents the machine which is 'boxing'. This machine has full tubes (of money) or a full hopper, which causes inserted coins to be redirected to the profit tray (i.e., the 'box'). The drop that the coin makes to the bottom of this 'box' makes a noise and acts as the auditory cue. However, Machine B makes no such noise as the tubes or hopper are not yet full, and therefore the inserted coins go straight into the tubes or hopper. Machine A is therefore the 'boxing' machine that experienced gamblers will play.

When interviewed, some operators have reported that they sometimes fill the tubes to "trick professional and regular gamblers". Therefore, they hear their stake hitting the 'box' suggesting a full machine that has not paid out. They would therefore be "tricked" into playing a machine that they would not normally play. Some machines have also had an artificial "boxing" sound installed for the same purpose. Neither

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measure seems to have been met with much success according to experienced players as most claim to be aware of the artificial sound mechanisms. Furthermore, although considered to be a potential risk, players and staff reason that operators are usually too busy for staff to openly fill the tubes or hopper on a regular basis.

Skimming – This process appears to be central to most aspects of fruit machine gambling (and is a situational variable which is dealt with more thoroughly in Part B, Chapter 7). The practice involves waiting to play a machine that someone else has played and has put a substantial amount of money in without winning very much back – thereby giving reliable information regarding a high MIMO ratio. This can be done in two ways. Firstly, through simple observation. This is often disliked by other regular fruit machine gamblers as they know that the spectator is aiming to skim (exceptions may be friends who are spectating). Secondly, and probably the preferred method is to play something else which is cheaper (such as a videogame or a low stake fruit machine) until the other player leaves. Attention must be paid to particular auditory cues (e.g., cash hitting metal or plastic trays, or certain musical cues indicating money wins or jackpots) to give further information regarding the MIMO ratio. The skilful player can then move to play the target fruit machine when the other player leaves.

The 'empty chair' – Some fruit machine players will often look to see if there is an empty chair in front of the fruit machine. If there is, this usually means someone has been playing the machine recently and then left either because they had no money left and/or they were bored. If they had won money and/or the jackpot and went to play another machine, they will usually take the chair with them, as most UK arcades have limited numbers of chairs. This technique is not used at sites other than the arcade. The risk associated with this technique is that there is no guarantee that someone had won and left the arcade or won and moved on to another machine without taking the chair. This technique is considered to be a risky strategy by some players.

Feeling for 'hot' machines – Some players also feel the 'face' of the fruit machine to see if it is 'hot'. This tells the player whether someone else has been playing the machine recently as the electronic mechanisms will still be warm. This may give some insight into whether the machine is ready to pay out. This is not an ideal method as player could have played this machine and then subsequently won. Nevertheless, it

is often used with other indicators in order to form a general impression. For example, a hot machine that is 'boxing' with a chair in front of it might give a lot of information regarding the MIMO ratio and hence be a more profitable machine to play.

Visual inspection of the 'tubes' – Finally, it is worth mentioning that some players were observed to visually inspect the fruit machine to see if the tubes are full by looking through the glass of the fruit machine. However, this is often difficult because of dim lighting and poor visual access. More importantly, most machines now use 'hoppers' for storing coins and this is reflected in the fact that this technique is rarely used. However, some inexperienced players can still be seen using this strategy, even on machines that use tubes which render this approach meaningless.

6.2.1.2.2. Operating a fruit machine

The increasing numbers of feature games and other specialist skill features on many fruit machines now mean that newer machines are potentially more complicated and detailed than ever. This means that the level of skill and knowledge needed to operate them has subsequently increased. What was once referred to as "idiot skill" (Griffiths, 1994; 1995) has now developed into something where practice and co-ordination are considered by players to be important. Instead of simply 'holding' or 'nudging' winning symbols, players report that they must now know how to:

a) play 'features' and know the potential cash value of such features;

b) identify the 'bonuses', 'secrets' and 'gambles' and how to play them (see section below on player interaction, choice and secret functions);

c) perform some skill related tasks in a feature game (many of which involve 'skill stops' where speed and hand-eye co-ordination are considered to be very important).

Skill in fruit machine operation is also important for another reason. There are now many aspects of feature plays that have time limits imposed. Therefore, the player must know what they have to do immediately as they face time constraints when operating the feature. Experience and good hand-eye co-ordination appear to improve players' chances on such features. More importantly, this means that players need to

have prior knowledge of a feature game to make full use of the time allowed, as the imposed time limits do not allow players to learn 'on the hoof'.

If fruit machines perform according to a MIMO ratio, then it could be argued that it should not matter what the player does as the machine will eventually pay out regardless of the player's gaming decisions. However, during participant observation, the researcher attempted to lose on purpose (e.g. perform poorly on features; choose not to hold winning symbols) to see if wins would be presented anyway. It appears that in the long run, unskillful play is eventually rewarded by wins that require little or no skill. However, in the short term, a higher level of skill and experience in terms of machine operation may give a real advantage. For example, given that most players often play with limited funds (although some very experienced players claim to carry around a large bankroll sometimes as much as £500-£600) and are not willing or able to risk playing long-term (which may involve hundreds of pounds) they will need to realize a win as soon as it presents itself rather than wait until it is presented via symbol matching. A machine might be expected to pay out because of a favourable MIMO ratio, but the player might not know whether that means investing £20, £50 or £150. For this reason, experienced players claim that they have to take the role of operation skill seriously, as mistakes might mean that they have lost their chance to win in the short run and a further chance to win will mean continued investment.

6.2.2. Developments in factors as a result of increased opportunities or new technology

6.2.2.1. Feature games

One the biggest changes in the format of the fruit machine over the last decade has been increase of machines including a play 'feature' or bonus game, with a gradual move away from wins dependent on 'symbol matching' to wins on dependent feature games.

'Symbol matching' refers to winning money through the order of symbols on the 'win line' (e.g., three melons in a row). 'Wins dependent upon the feature game' simply refer to winning money via the machine's play feature (as opposed to 'symbol matching'). The 'feature' is a more interactive extension of the *specialist play*

features (Griffiths, 1993) associated with earlier machines such as the 'nudge', 'gamble' and 'hold' buttons (features which have traditionally been viewed as promoting 'idiot skill'; see Griffiths, 1994; 1995). Features vary extensively among machine and manufacturer but typically include a core variety of different types. For instance;

1) *The "lapper"* – this is a feature where prizes are won by doing circuits (i.e., laps) on the game board

2) *The "trail"* – this is a feature where prizes are won by progressing up the "trail" in the hope of winning the jackpot or top feature

3) *The "hi-lo ladder"* – this is a feature where prizes are won by advancing up the prize ladders by successful gambles (i.e., gamblers having to guess whether the next number on the game board will be higher or lower). Top of such ladders usually represent jackpot wins or above

4) *The "grid"* – this feature is another variation of the 'hi-lo' game where progression is made by successful (higher or lower) gambles. The jackpot can be obtained by reaching the corners of the grid

Figure 6.2 shows a fruit machine that has a number of smaller features linked to a main principle feature. The 'feature game' could be described as a game where cash prizes increase throughout the duration of the game.

Figure 6.2: The 'features' of the fruit machine and the psychology of the near miss

Ultimate Feature

Main Feature

The Near Miss
might stop the
feature here

Sub-feature

Sub-feature

Feature Entry
Trail

Feature Entry Trail Near
Miss might stop here

Hidden Features
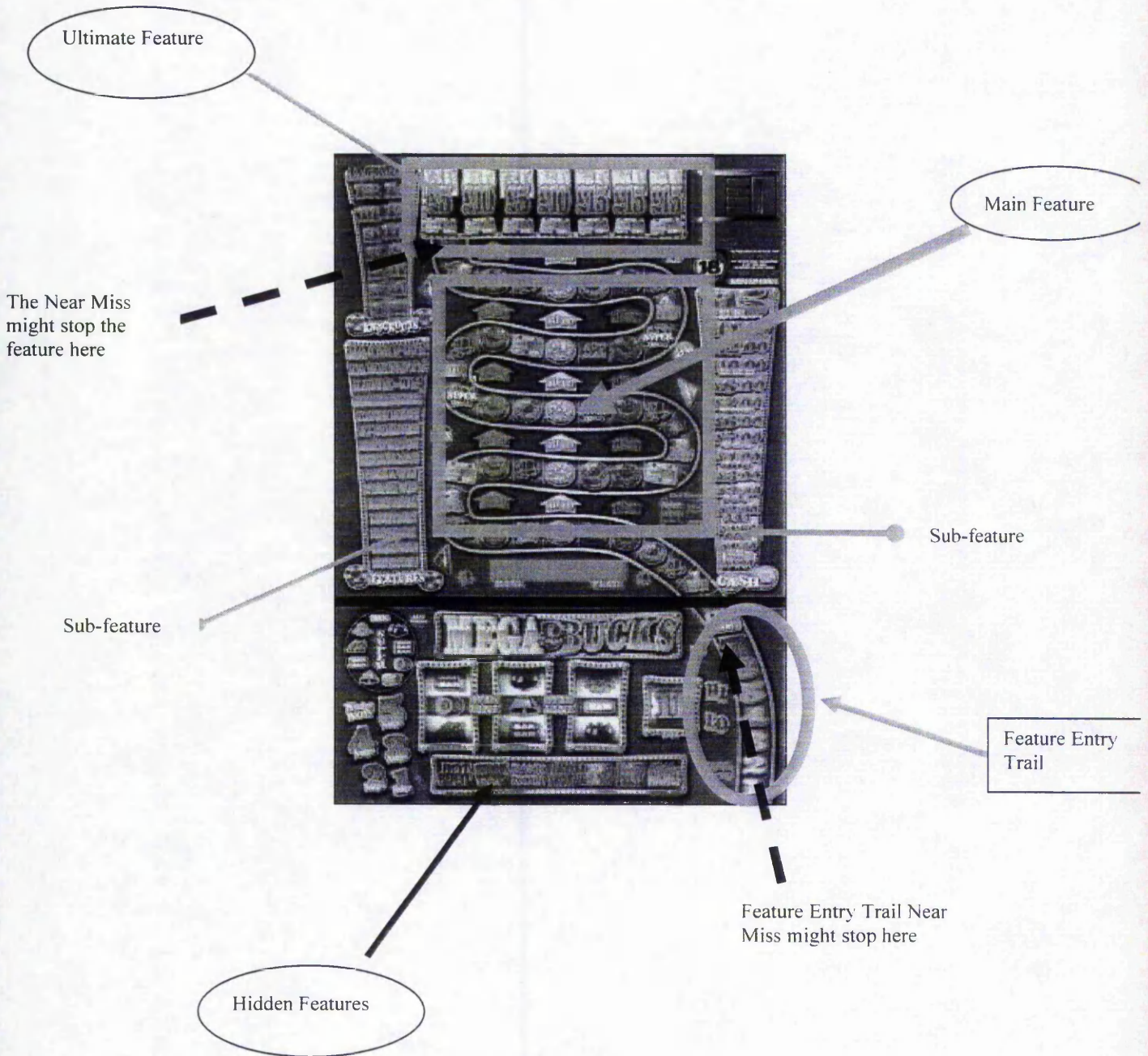
Exit from the feature is usually without a cash prize. For example, on *The Simpsons*
fruit machine, the character *Homer* gets fired, and the player leaves the feature with no
money; in *Dracula*, the character gets a stake driven through their heart. The aim of
most current games is to collect a 'secondary feature' or a cash prize before such an
exit or, as many gamblers seem to do, continue until the end to obtain the jackpot or

the ultimate feature which pays the equivalent of the jackpot (see Figure 6.2). The easiest way to conceptualize the 'feature' is to imagine a basic game board such as *Monopoly, Cluedo,* or *Snakes and Ladders* (which are, in fact, all types of UK fruit machine). Essentially, the player 'rolls' the electronic dice (usually 12-sided instead of 6-sided) by pushing a button, and plays against the machine instead of another player.

The level of skill needed, and the level of bettor involvement seems to significantly increase the psychological involvement for the gambler. There has been substantial development to the basic *specialist play features* associated with earlier machines, as identified by Griffiths (1993), such as the 'nudge', 'gamble' and 'hold' buttons. It also appears to be the case that for the regular gambler at least, participating in the 'feature' of the machine is the primary aim of the gamble. It is also worth noting that many of the following structural characteristics discussed in this paper are integrated and linked with the 'feature' element (e.g., the near miss, secret functions). In addition to increased skill and bettor involvement, it could be speculated that such a characteristic would be more exciting and fun than the limited features of previous models, and may therefore have more of an influence on maintenance of habitual play.

6.2.2.2. Player interaction and choice

Choice and level of interaction for fruit machine players seems to play an important role in how appealing a fruit machine and its feature games are perceived to be. Figure 6.3 is a hypothetical example of how players on modern fruit machines have more options for deciding the course of their play. This increase in choice could affect how gambling-inducing the machine is by:

1. increasing the level of bettor involvement;
2. enhancing the players perception of the skill involved;
3. making the fruit machine more exciting and fun.

For example, at any one time when playing a feature game, players have the choice to persevere to try to win more money, or they can collect what they have (or are able to exchange) to play a variety of other feature games. There have also been some other significant specialist play features which appear to exploit the illusion of control (i.e., the bonus, secret functions).

Figure 6.3 Bettor Involvement and Choice
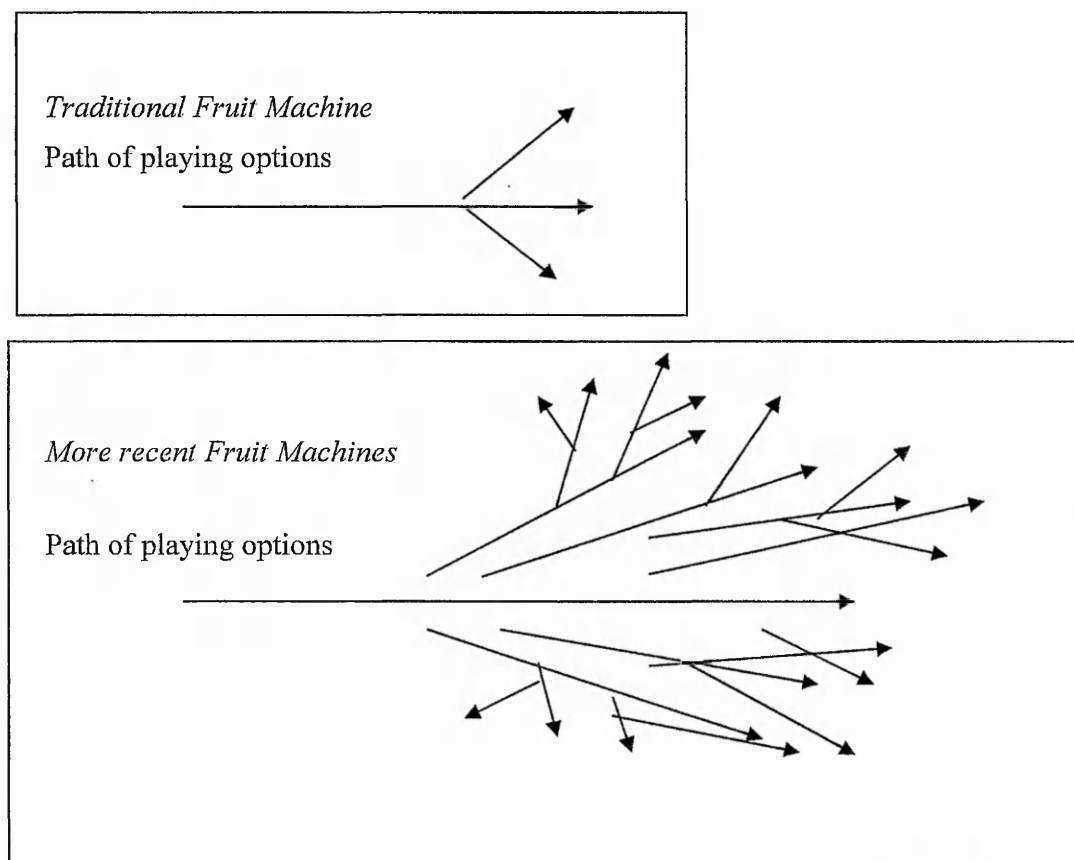
The reason that increased choice may be more appealing and may facilitate excessive or problematic play is that players often take some responsibility for losing since they made the decision and they also forsook the previous opportunity to collect money while it was on offer. For instance, one gambler said:

> *Respondent*: [male in early twenties] "damn, I knew I shoulda collected, knew it was gonna kill me"

6.2.2.2.1. The Bonus

The bonus is a specialist play feature that usually results from symbol matching or may be randomly awarded. It is primarily used by players to improve their chance of a win or playing the 'feature'. There are many different types of bonus. These include the 'skill stop', the 'shuffle', the 'superhold', the 'trail boost', the 'feature hit', the 'reel skill', the 'win spin', the 'selector', the 'respin', and the 'stopper'. These are summarized in table 6.1.

Table 6.1. Types of bonus games and their explanation

Bonus	Explanation
Skill Stop	The player has the opportunity to use hand-eye coordination to stop the trail at a point where they can gain access to a feature game
Shuffle/Respin	The reels respin again revealing a different random combination of symbols and numbers or letters
Superhold	Reels will move up or down by one place giving the player more opportunities to win and the player can hold the reels in a winning sequence using the hold button
Trail boost	The feature trail boosted by a random number of letters or numbers
Feature Hit	The player gets awarded a chance to randomly select a feature game in which to participate
Reel Skill	All reels spin together slowly and the player is permitted to stop reels in an advantageous position
Win spin	A winning combination of symbols is presented by respinning the reels
Selector	The player is allowed to use skill to select the length of the feature trail (usually giving access to the feature game) or select the number of nudges available
Stopper	The player is allowed to randomly select the length of the feature trail (usually giving access to the feature game) or select the number of nudges available

Players usually prefer bonuses that are more likely to offer a higher win or a better chance of feature game participation (e.g., selector; win spin or feature hit) and acknowledge that some bonuses are less rewarding (e.g., stopper, trail boost or respin) but exist only so that bonuses can be offered while the machine is in a raking period (i.e., allowing the player some interaction with limited opportunity to win cash prizes).

6.2.2.2.2. Secret functions

Fruit machines often have in-built 'secret functions' that experienced gamblers eventually learn about. Player's knowledge of these features seem to contribute to the respect they receive in the gambling environment. In much the same way that Fisher (1993) argued that 'information' is traded among Arcade Kings – such information is selectively shared among experienced adult players. The main aim of such a characteristic appears to be to increase the illusion of control (i.e., to make the player think they have more control than they actually do). However, such "secrets" are an extremely innovative way to achieve such an aim and the illusion of control appears to have been taken to a different level. For example, in *The Simpsons* series, a verbal cue indicates that a secret play is on offer is *Krusty the Clown* saying *"Here's a clue for ya Jack!"*. Some of the most common "secret" functions are outlined below.

a) *The cancel button* - One of the most common 'secrets' is the use of the 'cancel button'. At certain times, the cancel button can be pressed down and will give hints or will slow down tasks that are skill-related. For example, sometimes when playing 'hi-lo' (i.e., gambling higher or lower on a number to win a gamble), the player will press the cancel button when it is lit up, and the machine will indicate which way to gamble (higher or lower). In these instances, the machine's instructions are always correct. It should also be noted that some fruit machines have a designated button for these kinds of cheats. Instead of using the cancel button, this is sometimes marked with their logo (e.g., *Barcrest* have their logo of *Mr. PoundCoin* on the button). From this, a secondary marketing function might reinforce gamblers by giving the impression that their particular brand of fruit machines are generous and helpful, thus encouraging future play.

b) *The three holds rule*

Another secret is the 'three holds rule'. This feature is linked specifically to symbol matching on reels. When holding two winning symbols waiting for the third matching symbol to obtain a win, the third symbol will always be a match if they have already been held in the previous two attempts. For example, if on the first credit, a player obtains two cherries and a melon on the win line, an opportunity to hold the reels may arise. Players will then hold the two cherries, and the third reel spins alone on the second credit. If the third reel is again different (e.g., a pear) but another chance to hold is given, the player will be guaranteed a winning match (i.e., a cherry) on the third credit spin. This also applies to symbol matching for feature games. Across all locations and sites, there was only one machine that was noted not to apply such rules.

c) *Guaranteed win after holds following a nudge*

A third "secret" is the guaranteed win after holds following a nudge. If nudges are awarded and two matching symbols finish on the win line, followed by a hold option, this signals a guaranteed win on the next credit provided nothing is held. Although the player might be tempted to hold the two matching symbols, they will obtain all three matching symbols if they let all three reels spin.

In all three of these instances, the payout ratio and the MIMO ratio does not change. All three 'secret functions' appear to induce a high illusion of control. Being able to offer such features is one of the benefits of fruit machines using 'adaptive logic' (such secret features would not be possible on a machine using an RNG as in most other jurisdictions). In addition, many of the fruit machine gamblers passionately believe that they can "beat" or "outsmart" the machine as they feel that by knowing such 'cheats' they have an advantage over players that do not. For many reasons (e.g., need for achievement, self-esteem, peer praise, etc.), these forms of specialist play features appear to make the fruit machine more appealing and potentially more addictive. Furthermore, not only can gamblers get on fruit machine companies' mailing lists, but there are internet websites that have sections which provide fruit machine players tips about the machines they manufacturer (e.g., www.jpm.co.uk).

6.2.2.3. Music used in fruit machine gambling

Music is used in most machines, particularly newer machines which feature television shows, films and video games. The music that fruit machines are capable of producing may be important in how players form impressions about the machine. More specifically it is associated with the quality of the machine, familiarity, distinctiveness, and the sound of winning. These are expanded upon below.

- *Quality of machine* – The quality of the music on a fruit machine may influence player perceptions, as some gamblers equate the quality of a machine with the quality of the sound and music.

- *Familiarity* – Consistent with Dunbar and Griffiths' (1997) claim, it may also be that music produced by a fruit machine is important in creating familiarity. Table 6.2 highlights some examples of some very common UK slot machines all that have familiar theme tunes. Some of the most popular fruit machines are those that feature *The Simpsons*. There are many cases similar to this one where it could be proposed that the slot machine becomes more inducing because it represents something that is special to the gambler. As Dunbar and Griffiths (1997, p.18) note :

  > *"it is possible that familiarity is a very important aspect of why (for example) media-related slot machines have been more prominent over the last few years in the UK. The media theme may induce a "psycho-structural interaction" (Griffiths, 1993) and may result in repeated use. Consequently, if the themes are increasingly*

"familiar", an individual might be more likely to persevere with the complexities of a machine. Players may find it more enjoyable because they can easily interact with recognizable images and music they experience. Therefore, the use of familiar themes may have a very persuasive effect, leading to an increase in the number of people using them, and the money they spend."

The introduction of better quality music used more frequently may be a powerful vehicle to facilitate this process.

- *Distinctiveness* – Music can be used in fruit machines to create a distinctive feature that is memorable to players and that facilitates further gambling. For instance, the company *Red Gaming* utilises a distinctive guitar riff when slot machine players gamble on the game's feature (on the fruit machine *"Rampage"*). It was noted that some gamblers who played this machine were eager to play again as a consequence of the music. When the jackpot is won on this machine, the machine plays a rock music anthem. It is interesting to note that short guitar sequences were played during normal play, and it could be the case that this serves as a reminder of what happens when they win the jackpot (i.e. this music sequence may become a conditioned sequence).

- *Sound of winning* – Music from a slot machine is instrumental in creating that sound of winning. As seen in the example above, a particular piece of music (i.e., a rock anthem) can indicate that a person has won on the machine. When this music plays it sends out a signal to others in the vicinity that someone has won on the machine. It also helps raise the self-esteem and standing of the person playing. This may be reinforcing for the gambler, and may lead to further play. As Griffiths (1993) points out, sound can create the illusion that winning is more common than losing as you cannot hear the sound of losing. As a consequence, successful and potentially addictive fruit machines will minimise music that signals losses.

6.2.2.4. The evolution of the near miss

6.2.2.4.1. The near miss and the feature game

The psychology of the near miss is an established and recognized structural characteristic of fruit machines which has been shown to influence player behaviour (Strickland & Grote, 1967; Moran, 1979; Reid, 1986; Griffiths, 1991; 1994; 1997a, 1997b,1999a, 1999b; Chantal, Vallerand, Ladouceur, & Ferland, 1995; 1999; Kassinove & Schare, 2001; Griffiths & Wood, 2001; Ladouceur & Sevigny, 2002).The most significant role of the near miss in fruit machines appears to involve the *types* of near misses that can be perceived by players. Observations suggest that for most experienced players, a near miss related to symbol ratio proportions may not be as effective as other types of near miss.

A 'trail' is the primary gateway to participating on a feature game. In Figure 6.1, it can be seen that the trail comprises of a series of steps that have to be completed to participate in the feature game. Obtaining numbers that are attached to random reel symbols on the 'win line' or 'win matrix' provide these steps. For example, Griffiths (1995) notes obtaining a bell with the number '2' attached to it would take the gambler two places up the trail. The machine makes a decision whether or not to 'hold' the trail (so that the player does not have to start from the beginning with each new credit or spin if not held). Often, this is held right up until number '7' (or the equivalent of the end of the feature) so that the player is close to participating in the feature game. The trail may also be held there for several credits while offering no numbers from the spinning reels. If the trail is no longer held, the player has to start collecting numbers of symbols again. Therefore, "almost participating in feature game" becomes a variation of the near miss.

Like the traditional near miss, the player feels the excitement of "nearly" being taken to 'feature' participation, and may become aroused at no extra expense to operators. Perhaps more importantly, it may cause frustration or cognitive regret that may perpetuate gambling. Where the psychology of the near miss was previously limited to symbol ratio proportions, there are now several aspects of the feature game that manipulate the gambler through the 'near miss'. The more 'features' incorporated into the fruit machine, the more opportunities there are for the manufacturer to implicate different types of 'near miss'. Another example can be demonstrated by looking at

Figure 6.2 again. In this example, a player can often move their way up the 'feature board' without actually winning any money. They could potentially be located at a point where they are just one 'roll of the dice' away from the jackpot or a high cash prize. A near miss at this point (e.g., landing on a losing square or failing at the feature game) despite (a) a high level of player investment, and (b) the perception of close proximity to win, could potentially have a strong effect as reinforcing as a near miss. There are various similar examples on all fruit machines offering feature games.

6.2.2.4.2. The near miss and repeat chances

Another manipulation of the near miss involves 'repeat chances'. Many fruit machines now offer a 'repeat chance' when the jackpot is obtained. For example, after winning a jackpot (with repeat chance), *'yes'* and *'no'* will flash alternately on the machine's screen, and the player will hit the designated button and win another jackpot if they hit the button when 'yes' is flashing, or nothing if they hit when 'no' is flashing. This will continue until the player hits 'no'. Experienced players argue that some machines can give as many as ten repeats (e.g., £150) but somewhere between one repeat (e.g., £15) and three repeats (e.g., £45) is most common. Obviously, such a feature will make playing the fruit machine more attractive. Given that the repeat opportunity is offered on the next credit, this is a useful way to circumvent any limits that are imposed by legislation. Players refer to a series of repeat wins as a "streak". A "streak" can also occur where several high wins are paid in immediate succession rather than winning the jackpot and securing repeats.

Here, a powerful mechanism may be at work which could make a machine more appealing and may potentially induce persistent gambling. Most wins, other than the jackpot or 'top feature game' (a game where a jackpot is guaranteed), are usually quite low value (between £1 and £10). For this reason, players may be tempted to continue to play on a feature until they win the jackpot or top feature. If this is true, then players could participate in several feature games and have to the opportunity to collect medium-sized wins, knowing that some players will refuse to collect them and will continue to try to win the jackpot or top feature. In such situations, unless the jackpot is won, the players will have experienced a high level of interaction, distraction and

many near misses at no extra cost to the operator. This form of near miss may be particularly appealing and play inducing because:

1) the player actually has access to several wins but decides not to take them in order to pursue the jackpot. This process itself appears to be reinforcing;

2) the play leading up to the jackpot involves intensive bettor involvement and may cause increased arousal;

3) given a high MIMO ratio, fruit machine players will often continue until secure a jackpot or top feature.

Furthermore such factors could give the impression that losing is the players fault since they did not collect potential winnings while they had the chance. As one player said "...in the last three feature games I could have collected £5, £8 and £9 respectively, but I chose to risk it to get the jackpot and now I have nothing".

6.2.2.4.3. The near miss and credit teasing

Another manipulation of the near miss involves 'credit teasing'. Most fruit machine environments do not have facilities to change £1 coins into 2, 5, 10, 20 or 50 pence denominations and now some do not even have facilities to change notes into £1 coins leaving players no choice but to deposit notes (e.g., £5, £10, £20). Therefore, even though a fruit machine may be staked at 25/30p per play, the gambler often has to play in £1, £2 or £5 denominations as they have no change (even when players deposit notes they have the option to withdraw some of that deposit in coins). A common scenario in fruit machine play is to manufacture a situation on the last credit (e.g. almost getting enough symbols or numbers to play a feature game – see the section on near miss and the feature game above). The fruit machine player is thus encouraged to continue playing to find out how this inviting situation unwinds. A 'credit tease' could come in the form of a 'repeat chance' or win streak. For example, if a gambler wins a jackpot on their last credit of play, the player will invariably continue playing to play the repeat chance and have another attempt at winning the jackpot. More often than not (as determined by the MIMO ratio) they fail to get the repeat, and the machine has successfully induced more gambling, and sometimes more chasing. Another potential ploy that can facilitate continued play is to set a credit amount which does not equally divide a pound (e.g., 30 pence per play instead of 25 pence). Quite often players will put £3 into the machine that gives them 10

credits of play (instead of putting just £1 in and having an unused 10 pence left). By depositing £1, the player will yield three plays and 10p residual credit. Some players reported that they do not like leaving such residual credit behind since they reason "that it belongs to them". In this situation, some players will continue to play until no residual credit remains in the machine.

6.2.2.5. Pay out interval and event frequency

It was discussed in Chapter 2 that a high event frequency and brief payout interval may contribute to the potential addictiveness of fruit machine gambling, and exploit psychological principles of learning (i.e., operant conditioning) (Griffiths, 1993). A high event frequency will mean that the loss period is brief, which can cause players to give too little consideration to the consequences of continued gambling, and allow winnings to be re-gambled almost immediately (Griffiths, 1993). With regards to this particular structural characteristic there seems to have been a two main developments: (1) the 'autoplay', and (2) the 'bank facility'.

6.2.2.5.1. Autoplay

Some of the fruit machines have what is commonly referred to among players as 'auto-play'. By using this play option, the machine plays on autopilot for the gambler in a method that always selects the optimum choices. This option is often presented as a way to help player through convenience (i.e., not having to think or press a button) and tutelage (i.e., showing the player how to play which may particularly useful for new machines or elaborate feature games). The key implication of such as option is an increased event frequency. As previous authors have identified (Cornish, 1979; Griffiths 1993) there is a risk of problematic play under such conditions, which makes these machine more profitable to operators. Game speed and a higher event frequency is achieved by reducing the level of human interaction (i.e., compared to a machine, human choice inevitably slows down overall playing time). The 'auto-play' only stops when the player needs to make a decision regarding some specialist play features such as feature games, holds, nudges or wins.

6.2.2.5.2. Bank facility and payout interval

There have been some subtle changes in the way winnings are paid out in recent years. A provision of a built-in machine 'bank' has become a feature increasingly used by manufacturers. During play, cash winnings can be kept in the machine's 'bank' until the gambler decides to collect them by pressing of the 'collect' button. Usually, the accumulated winnings are digitally displayed on the face of the machine so that the gambler can keep track of the total of their winnings. The overall effect of such a feature may be very subtle. For instance, to the inexperienced fruit machine player, immediate payout might be more effective as the reinforcement contingencies are strengthened. Consistent with behavioural theory, the quicker the reward, the stronger the reinforcement.

However, in contrast, immediate payout might not be preferred by the experienced fruit machine gambler as they may prefer to have the option to use the 'bank' to keep the winnings until they are ready to 'cash in'. According to more experienced players, there are a few reasons for using a bank:

1) to ascertain the level of 'tubes' or 'hopper' (devices used to store and recycle coins) by testing whether the machine is 'boxing'. Such an action gives the gambler an idea of the money-in-to-money-out-ratio;

2) to keep money in the bank for accounting purposes (i.e., their own financial performance). Immediate pay outs make this difficult to do as the player will need to continuously review how many cycles the bankroll (money set aside for gambling) has made while playing. Players argue that by initially keeping winnings separate from bankroll, calculating their current financial performance is easier.

The issue of the 'bank' is potentially complex as it is not clear whether a 'bank' facilitates persistent play. In marketing terms, it may make more business sense for establishments that attract more non-regular gamblers (e.g., tourist seaside arcades) to house more immediate payout fruit machines and vice-versa for those who attract regular fruit machine gamblers. Older fruit machines offer immediate payouts when compared to newer, high stake machines, where the majority offer a banking facility. It is also clear that this issue has not been resolved, as some newer machines are

reverting back to immediate payouts. Manufacturers and operators may appreciate that the contingencies of reinforcement have a stronger effect than the utility of a 'bank' feature. However, it could be speculated that immediate payouts reduce cues or indicators (such as boxing) to fruit machine players.

6.2.2.6. Familiar themes and branding

Dunbar and Griffiths (1997) first reported that familiarity in fruit machine design can facilitate play through attention, comprehension and yielding. Results from the current research were consistent and analogous to these findings. However, observations suggest that less experienced or less frequent players were more likely to be influenced by this structural characteristic. As previously stated, more experienced players preferred to select machines based on the MIMO ratio. Reasons among players for preferring "familiar themes and brands" include:

- *"Celebrity" endorsement and Trust*– some players reported that if *The Simpsons* creator Matt Groening or the celebrity cartoon character *Homer Simpson* put their names on this machine, they felt that the machine would be honest, reliable and would represent better value. For instance:

  > *Respondent* [male in early twenties]: "you know where you stand with a Simpson's machine. It's "The Simpsons" isn't it?"

- *Experience* - Players lacking experience stated that they preferred games where they were familiar with characters or the theme or plot. This was particularly common among female players who often stated preferences for machines such as '*Eastenders*' and '*Coronation Street*'. Awareness of this kind was argued to be potentially useful during game play, especially among players who would not normally exhibit any awareness.

- *Fun* – This was a common response for most players (both experienced, skillful players and less experienced or less skilful players). Players reported that familiar themes such as '*The Simpsons*' are more exciting, and that the sound effects and features are novel, cute and/or more humorous than other machines (see section on verbal interaction below).

Some examples of familiar themes used in fruit machines are presented in Table 6.2 (those previously noted by Dunbar and Griffiths [1997] have an asterisk).

Table 6.2 Some common examples of UK fruit machines that employ familiarity

Machine name	Theme Genre
The Simpsons	US TV show
Friends	US TV show
Eastenders*	UK TV show
Coronation Street*	UK TV show
Only Fools and Horses*	UK TV show
Gladiators	UK TV show
Blind Date	UK TV show
The Crystal Maze	UK TV show
Match of the Day	UK TV show
Sky Sports	UK TV show
The Flintstones Vega	US Film
Indiana Jones	US Film
The Pink Panther*	US/UK TV show / Film
Tetris	Videogame
Sonic the Hedgehog	Videogame
Mario Kart	Videogame

6.2.2.7. Sound effects on the fruit machine

Chapter 2 highlighted that a number of authors over the last thirty years (e.g., Hess & Diller, 1969; White, 1989; Griffiths, 1993) have argued that the sound effects of slot machines are gambling-inducers, as constant noise and sound gives the impression of a noisy, fun and exciting environment. Other factors relating to sound include: (1) cues for gathering information for the MIMO ratio, and (2) reinforces for winning and losing.

1. *Cues for gathering information regarding MIMO (money-in-to-money-out) ratio*: For more experienced players (and skimmers) the sound of a payout is an important cue to playing an individual machine, as this payout signals that this machine is less likely to pay out again in the short-term.

2. *Reinforcers for winning and losing*: Sounds and music from fruit machines may act as reinforcers. Of particular relevance are the sound effects after losing (that could be termed "acoustic frustration") and the role sound plays in the reinforcement of losses. Many machines make loud or antagonistic noises after a player has lost. Some players commented on how antagonistic sounds had invoked frustration and disappointment. For example, on *The Simpsons* fruit machine, *Mr. Smithers* smugly informs *Homer Simpson* that *"You're fired"*, or

Chief Wiggum says *"You're going away for along time, Ha!"*. In line with hypotheses supporting frustration theory and cognitive regret (Amsel, 1958; Kahneman & Tversky, 1982), this might make the fruit machine more gambling-inducing. However, it may be that antagonistic sound effects only perpetuate gambling in the short-term or within session. In the long-term or "between sessions", regular fruit machine players might avoid machines that induce frustration, cognitive regret and aggression. Further research clearly needs to be carried out in this area.

6.2.2.8. Verbal Interaction

A particular sound effect which may play a significant role in influencing player behaviour is verbal interaction, in the form of commands and reinforcers which operate in most fruit machines that were observed, across all sites and locations. A number of factors might be involved in verbal interaction that could make fruit machines more play-inducing including raising self-esteem, giving hints and guidance, and providing percieved 'company' and 'friendship'. These are briefly expanded upon below:

6.2.2.8.1. Raising self-esteem

Several fruit machines play statements which may serve to raise self-esteem when a positive play was made on the fruit machine by the player. For instance, *PsychoCashBeast* plays "You're cool" (in a female seductive voice). *Top Tenner* plays "You are genius", and *Buccaneer* plays "That's a swell idea". On *Viva Las Vegas*, there are cheers from a crowd.

6.2.2.8.2. Fun and playability

One of the most popular brands of fruit machine during the time of observation was *The Simpsons*. Both experienced and inexperienced players had often commented that it was fun to play machines which offer some level of verbal interaction from characters themselves. Examples of this 'interaction' include:

- When a player leaves the fruit machine, the machine plays the character *Apu* saying: *"Thank you come again"*;

- When a player starts playing the machine again, the machine plays the character *Krusty the Clown* saying: *"I knew you'd come crawling back!"*;

- When a player experiences any losses on the feature-play, the machine plays the character *Homer* saying his *"D'oh"* catchphrase;

- When any player wins, the machine plays the character *Bart* saying *"Wow Cool man"*;

- When a player wins the jackpot, the machine plays *The Simpsons* theme song;

it was suggested that such verbal interactions made game play more interesting, interactive and fun.

6.2.2.8.3. Giving hints and guidance

As mentioned earlier, verbal instructions are often given to players so that they play as efficiently as possible and learn the secret features and functions (*"Hold reel three"* or *"Let 'em spin!"*). This again may be reinforcing for the player and could have a significant role to play in fostering an illusion of control and skill orientations.

6.2.2.9. Colour

Griffiths' original (1993) review of structural characteristics outlined a comprehensive overview on colour effects in relation to fruit machines. Little seems to have changed since, except that red lighting is being used as a cue to indicate that a particular feature game will yield a jackpot. Players refer to this play mode as being "indestructible". For example, some title text on machines entitled: *Cluedo, The Great Escape, Eastenders, Trivial Pursuit* will turn red when playing on the feature game indicating that the jackpot or 'top feature' will be won. Upon this cue the player must continue playing the feature until the end with out collecting any prizes along the way. Red feature games are referred to by players as "superfeatures" and are expected to pay out more money than ordinary features. Also, when a cash prize glows red, experienced players are expected know how to interpret this to mean that a 'repeat' chance will be offered. It would seem that while colour is not being used in this context to influence arousal as suggested by previous authors, it is being used to facilitate and reinforce skill orientations. In other words, players need to know how to interpret variations in how red is used within the fruit machine in order to win ore money. This is another example of a 'secret' or 'cheat' outlined previously.

6.2.2.10. Multiplier potential

As outlined by Griffiths (1993), a 'multiplier potential' is a structural characteristic which refers to the range of odds and stakes that a particular form of gambling offers, and can be viewed as a primary inducement to play. Fruit machines have begun to incorporate multiplier stake systems. For example, stakes for a fruit machine with a £25 jackpot currently include 10p, 25p and 50p with an upper limit on these being 50p (Gambling Commission, 2007). Although playing at a higher stake does not entitle the player to winning higher prizes (as it does in other jurisdictions), it can offer one or a combination of the following:

1. the feature game on offer is a red feature game (see colour above);
2. numbers or symbols being more valuable or useful (i.e., increases the chances of playing a feature game) and/or;
3. bringing more pay lines (lines where symbol matching pays rewards) into play.

Although, there was little evidence from observations regarding the effect of multiplier systems on player behaviour, it should be noted that bettor involvement and choice may be increased. Players may want to play at a higher stake to take advantage of the more frequent levels of interaction and higher levels of excitement on offer and to avoid situations where they feel responsible for missed opportunities (e.g., a winning sequence of symbols on a payline that was not valid because the required stake was not paid).

6.3 Further Discussion

6.3.1. Assessing the impact of the money-in-to-money-out (MIMO) ratio

To many, the fact that the system by which fruit machines pay out money is not random may appear to be cheating the player, or at least, to be self-defeating. What point is there in playing a machine which offers wins which are not truly random, particularly when they are designed to pay less money than they take? The answer to this question is important and may be one of the most important sub-cultural themes in fruit machine gambling. Therein lie two important reasons why fruit machines may be more appealing and potentially addictive:

1. Persistence as a result of skill orientations;
2. Persistence as a result of chasing.

6.3.1.1. Persistence as a result of skill orientations

Its seems that experienced players will try to use the MIMO ratio to their advantage.

> *Respondent*: [male in mid twenties]: "You never play a machine that has paid out. The good players will know them [slot machines] but play the ones that haven't been rinsed [paid out substantial monies]. You need to be patient and know what your doing though – something most of these twats don't know how to do [signals to other players in the arcade]."

If machines are currently operating below the payback percentage it intuitively makes more sense to play such a machine since it will re-adjust itself in the short-term to offer more wins to honour the percentage. Similarly, it also makes good sense to avoid machines operating above the percentage as these will offer less wins. Both statements are consistent with fruit machine "adaptive logic" as discussed above. For example, some players argue that if a player spends £100 on a machine without a taking any money out, they would argue that this machine essentially owes £72 (according to an associated payback ratio of 72%) over the short-term.

Some players believe that they can use different skills to find out this information. Techniques such as boxing and skimming are used in addition to cues such as empty chairs by a machine (as mentioned earlier, if there are limited chairs then players may infer that someone has played it recently) to make a decision regarding MIMO. Players also feel that in addition to using skill to select the appropriate machine, skill is also needed for playing and operating these machines. Many of the bonus games are argued to be difficult and complex. Players argue that they need specialist skills to successfully make money from these features. Furthermore, cheats, hints and tips are also built into the machine to give players the illusion of control. In fact, some manufacturers have information regarding such cheats on their web-sites, players can also register for a mailing list where such information can be posted or e-mailed to players. This specialist knowledge is also debated and shared over web-forums. However, many of these are accessible to machine manufacturers and operators and are considered to provide a valuable source information regarding player behaviour. Lastly, many bonus games incorporate an actual skill element where psycho-motor co-ordination can improve success within the bonus game.

While verifying the validity of such claims is beyond the scope of this investigation, there is evidence, consistent with Griffiths (1994), that such operation skills and

pseudo-skills may only marginally increase the players' chances of winning. In fact, over-reliance in such skill may instill false confidence, leading players who experience losses to discount these temporarily, with the expectation that they will soon make profits, as their skills and knowledge develops. Therefore, as Griffiths (1994) suggests, an over-reliance on such pseudo-skills may be a risk factor for excessive playing and losing, rather than gaining and advantage for improving financial performance. A conversation with one arcade manager supports this claim:

> *Manager* [male thirties]: "These ones get on my tits [irritate me] mate. I'll be glad when I'm gone. I think I'd be content as postman. No hassle – just get on with the job don't ya.
> *Researcher*: If they give you so much hassle – why don't you just bar them from the premises?
> *Manager*: I wish I could mate but got me rent to pay on this place you know.
> *Researcher*: I thought those guys were the ones that made money. I thought they'd scare other more profitable customers off by their backstabbing [skimming].
> *Manager*: Don't believe that for a minute. These regulars are my bread and butter. I've barred ones before and you notice the difference in the week's takings."

Further support for this claim can be found in the following exchange with an experienced and well respected player:

> *Player* [male thirties]: "....there was a time yeah, where you get a raise [profit] outta these bandits [fruit machines]. But anyone who tells ya now that can make a livin' of 'em is lying c*nt. I'm telling ya now. They've all been chipped [reprogrammed] haven't they... The good old days are gone mate. That's it.
> *Researcher*: So would you say that those making money are lying?
> *Player:* I think you're always gonna find a machine where you can get a raise outta it but you can't get money from a couple of machines alone can you. You know what I mean? There is about one guy that I know of and that's it. He knows everything about bandits. You just got look at them...do they look like they have money? I mean look at him [points to poorly dressed man] playing a machine, does he look like bandits are doing him any good?"

However, it should be noted that a member of staff from a different site felt that skilful players were bad for business since they rarely lose and actually inhibit good customers (where good is defined as profitable for the operator):

> *Researcher*: So how come you don't let V**** and those guys in here then?
> *Staff Member* [male mid twenties]: we don't want those type in here do we, they scare off other customers.
> *Researcher*: I would have thought that over the time that those guys spend in these places you would make money from them to.
> *Staff member*: No, those lot are too smart. They are bloodsuckers mate. Watch out they'll try and be your mate but'll stab you in the back [skim] at the first opportunity.

Essentially, it is not possible to provide strong evidence that non-random technology is profitable for the players rather than the operators. However, the following pieces of evidence suggest that even regular skilled and knowledgeable players can potentially lose more than they win;

1. Manufacturers create and distribute cheats and other forms of knowledge with the hope that players will decide to play their machines;

2. Managers in gambling environments who work daily with such players suggest that skilful players can lose more than they win (often more than they can afford);

3. Even some of the best players admit that most good players (themselves included) lose more than they win. Therefore, using skills in such contexts when gambling might encourage persistent gambling rather than profitability.

6.3.1.2. Persistence as a result of chasing

Essentially, the fruit machine player may be more motivated to chase losses than EGM players in other jurisdictions. Lesieur and Rosenthal (1991) documented that gamblers experience a "downward financial spiral" as they tried to compensate for previous gambling losses by gambling more to recoup previous expenditures. As a result of 'compensation' and the MIMO ratio, players may be inclined to persevere longer in the absence of a win. Ironically, the more players lose the more potentially profitable the machine becomes. Therefore, there may be three processes at work: (1) the need for financial reparation; (2) the need to avoid negative feelings or potential damage to pride or self-esteem; and (3) preventing other players from benefiting from their losses by playing a machine they eventually left empty-handed. The following is an interaction between the researcher (working as a change attendant) and a regular player who had lost money on a particular machine, which further supports these claims;

> *Researcher:* What is the worst thing about losing that £50 in that machine?
> *Respondent:* I know that some f*cker will win when I'm off. I f*cking hate that. Makes you feel like sh*t. I knew I should have taken the small wins. I never get caught like that.
> *Researcher:* If you had more money would you have continued to play despite the fact that you have already lost so much?
> *Respondent:* Look...that's how they [slot machines] work. If ya fill 'em they have to give some back. All of us lot [signals to friends in the arcade] know that....thats why people like M****** can support a family.

Therefore, some players also wish to avoid the negative feelings associated with knowing that when they terminate play in a raking or losing period other players (most notably skimmers) may come and win some of their money back. Consequently, these self-esteem needs work in tandem with the financial needs associated with chasing. The result may be a determination to persevere until they have won some of the money back, which may help to counter these processes. Any eventual compensation will improve the financial situation and prevent the skimmer from winning any of their money. Unfortunately, persistence of this kind may also lead to increased losses and problem behaviour.

6.4. Conclusions

6.4.1. Summary and Interpretation

Observations regarding new or developed structural characteristics identified in this research and how they affect gambling behaviour are summarised in Table 6.3. and each of these are described in detail below in the following section.

Table 6.3 Summary Table: Observed Structural Influences on Gambling Behaviour

Predictors		Predicted Outcomes							
General	Specific	Facilitating						Inhibiting	
		Winning beliefs	Discount past losses	Arousal	Player Interaction	Esteem reinforcement	Skill orientations	Social interaction	Time out
Feature or Bonus Game		↑		↑	↑		↑		
Player Involvement, Specialist Play Feature, Secret features		↑	↑	↑	↑	↑	↑		
Music		↑	↑	↑	↑	↑	↑		
Autoplay (Faster Event Frequency)					↑		↑		↓
Skill	Machine selection	↑			↑		↑	↓	
	Machine operation	↑			↑		↑		
Near Miss	Feature	↑		↑	↑		↑		
	Repeat Chances	↑		↑	↑		↑		
	Credit Teasing			↑	↑		↑		
Bank Facility (Longer Payout Interval)			↑	↑	↓				↑
Familiarity		↑	↑	↑	↑		↑		
Sound	Losing Sounds (Reinforcing Loss)	↓	↓	↑		↓	↓		
	Verbal Interaction (Various)	↑	↑		↑	↑	↑	↑	
Money-in-to-money-out (MIMO) ratio		↑	↑		↑		↑		

Note: ↑ indicates a potential increase as a result ↓ indicates the potential decrease as a result

One of the key findings in this chapter was the clarification of the issues surrounding the randomness of fruit machines. This issue has been referred to in many ways: 'compensation', 'negative feedback control', 'adaptive logic' and for the purposes of this chapter has ultimately been referred to as the money-in to money-out (MIMO) ratio. Through participant observation, checking official secondary sources, and triangulating this with evidence from players, regulators, manufacturers and operating staff, it has been confirmed that knowledge about the MIMO ratio offers the player a potential advantage. Furthermore, this, to some extent clarifies the ambiguities raised by previous research (Fisher, 1993; Griffiths, 1994) relating to whether machine selection is a real skill rather than an illusion of skill, or an 'idiot skill' (Griffiths,

1994). This may be why some studies have failed to find differences in success rates between regular and non-regular gamblers (e.g., Griffiths, 1994; Fisher, 1993). Often the experimental condition will inhibit such strategic play, especially if they are restricted to playing a designated machine by the researchers. Griffiths also suggested that it is common sense to avoid a machine which has just paid out money. However, this is not the case for machines in the majority of other jurisdictions using random number generators to drive machine technology.

Furthermore, there is the added dimension of knowing how much money has been deposited, as knowing how much money has been paid out is only one piece of the puzzle. Therefore, knowledge of the MIMO ratio offers an actual potential advantage to players. However, as discussed previously, such an advantage needs to be viewed with caution. Such technology has real implications for initiating and perpetuating chasing, in relative terms, compared to EGMs using RNGs. Ironically, with fruit machines using this technology, the chances of winning improve as player continues to lose money. Players may wish to persevere both for financial reparation, but also to prevent skimmers profiting from their loss. Therefore, while knowledge of the MIMO ratio is potentially beneficial, there is also potential scope for persistent and problematic behaviour.

Fisher (1993) and Griffiths (1994) both identified a series of skills related to fruit machine operation. However, the role that such skills play in terms of machine performance and outcome was unclear. As a result of this research, many new structural factors and related skills have been identified, which seem to play a role in player success (when success is defined as better financial performance or increased time on the machine) at least in the short-term. The reason being players need to maximise opportunity for winning and take such opportunities whenever they are presented, as players may not have enough stake to continue playing to capitalize on the opportunity when it presents itself again. There is also another cognitive dimension to the implications for the machine operation skill. If players realise that jackpot or a high win amount is on offer, and all that is standing between them and such a win is their own skill, then they will take more responsibility for the failure. Arguably this may instil a high level of cognitive regret and frustration. In such a context, more so than ever, these players will wish to 'hook the fish that nearly got

away', as argued by Amstel (1958), Reid (1986), and Griffiths (1993). The essential point to grasp is that ability in this context has only short-term implications. Opportunities in this context are still ultimately decided by the MIMO ratio. The presentation of an opportunity to win a prize using skill is the same as the presentation of a win itself, as far as the internal workings of the machine is concerned. In other words, the opportunity to win will only be made available when the requisite "money-in" has been satisfied. Furthermore, this opportunity to win via real skill has an advantage over a straightforward presentation of a win. As discussed, failed opportunities may result in self-blame and frustration, but successful opportunities will potentially be more reinforcing for the player and may further contribute to the development of skill orientations.

With regards to the level of experience of players, there are instances where experienced and non-experienced gamblers may react differently to a particular structural characteristic, for example, the sounds of the coins hitting the metal payout tray. This might induce the infrequent or inexperienced gambler to play because they might hear others winning and feel that they can win too, or they might feel that a machine is a 'loose' one and worth playing since people seem to be winning from it. In contrast, the more experienced player will understand that their chances of winning will be better if they play a machine with a higher MIMO ratio.

With regards to individual differences and preferences, there appear to be some instances where the structural characteristic might have a different effects on different players. For instance:

(1) the use of verbal compliments might be effective on the gambler with low self-esteem, but not on the confident fruit machine player;

(2) the same piece of music on a fruit machine might affect individuals differently depending upon musical preferences;

(3) the external locus of control, skill orientation, and bettor involvement may have differential influence on play depending upon the player. For instance, it could be argued (similar to the contention made by Griffiths, [1995]), that fruit machine players with a high internal locus of control will enjoy playing fruit machines that require more involvement and skill from the player. A machine which relies on bettor involvement to induce more play, will have little effect on an individual who

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has a high external locus of control and prefers games of chance. For instance, it could be hypothesized that individuals who attribute events to external factors prefer fruit machines with limited bettor involvement (i.e., machines where symbol matching is the primary objective).

It is also clear that the near miss has evolved considerably in recent years. It may be the case that the traditional near miss – "symbol ratio proportions" as argued by Strickland and Grote (1967) – is less likely to have an effect on the fruit machine player. The near miss has become more prominent in other areas of the fruit machine playing experience – most notably the feature game, repeat chances and credit teasing. From an operational point of view, the new forms of near miss are even more successful because the player does not have to perceive that they are nearly winning cash, but also that they are nearly getting the opportunity to win cash through an interactive game. The more feature games and interaction associated with a fruit machine, the more opportunities there will be to use the near miss. Near misses that require investment, through skill features and decision making may have a stronger effect than near misses utilising symbol ratio proportions because of higher level of frustration or cognitive regret as discussed above. Therefore, not only are there more opportunities to use the near miss, but the near miss is also potentially stronger.

Another key finding from this research is that structural factors, such as the multiplier potential, payout ratio and win probability, which are normally considered to be key determinants in the decision to gamble (Cornish, 1979), are less important to the fruit machine player, something that Griffiths (1993) had previously speculated. Fruit machine players seem to be more interested in how much a machine has already paid out and how much they expect it to pay out in the immediate future as a consequence. If this is the focus of their attention, then factors such as the multiplier potential, payout ratio, and win probabilities (as previously identified by Cornish, 1978 and Griffiths, 1993) will have less impact on player behaviour. When a fruit machine is expected to pay out, the ratio of money lost to money won is all that matters to players, most importantly because the machine is governed by adaptive logic. For this reason, the structural characteristics which may offer cues to whether the machine has paid out (e.g., skimming or and boxing sounds) or design features that increase skill

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orientations and player interactions (familiarity, bonus games and cheats) are key determinants of the acquisition and maintenance of fruit machine gambling.

A summary of potential impacts for structural factors on problem behaviour and successful play is presented in Table 6.4, and is an attempt to summarize the extensive structural factors identified in this research and their potential implications for player behaviour. As stated, further empirical support is required to further validate the conclusions reached in this summary table.

Table 6.4 Summary Table: Observed Structural Influences on Problem Behaviour and Success (Financial Performance and Longer Play)

Predictors		Potential for Problem Behaviour	Predicted Outcome		
General	*Specific*		Potential for Impact on Success (Financial Performance and Longer Play)		
			No Effect	Short Term but not Long Term	Short Term and Long Term
Feature or Bonus Game		✔ ✔		YES	
Player Involvement, Specialist Play Feature, Secret features		✔ ✔		YES	
Music		✔	YES		
Autoplay (Faster Event Frequency)		✔ ✔ ✔	YES		
Skill	Machine selection	✔ ✔ ✔			YES
	Machine operation	✔ ✔ ✔		YES	
Near Miss	Feature	✔ ✔	YES		
	Repeat Chances	✔ ✔	YES		
	Credit Teasing	✔ ✔	YES		
Bank Facility (Longer Payout Interval)		✔	YES		
Familiarity		✔	YES		
Sound	Winning Sounds (Reinforcing Loss)	✔	YES		
	Verbal Interaction (Various)	✔	YES		
Money-in-to-money-out (MIMO) ratio		✔ ✔ ✔			YES

Note: ✔ limited potential; ✔ ✔ some potential; ✔ ✔ ✔ considerable potential

6.4.2. Future research

One of the key aims of this research was to carry out in-depth observations of how fruit machine players interact with machines. This was: to identify the presence of structural factors in ecologically valid environments in order to establish a framework for further investigation. Areas for further investigation include more in-depth research on the feature play, familiarity and appeal, sound effects and 'within session' factors. These will be briefly outlined in turn.

6.4.2.1. MIMO Ratio

Having identified that fruit machines are not completely random, and operate using adaptive logic, probably the most important area requiring future research is how useful information on the MIMO ratio actually is to players, and which strategies are most effective in its identification. Some questions which still remain unanswered by this research. Can real skill in machine selection overcome the machine take and permit a skilful player to avoid many of the problems which are normally associated with persistent play? Research of this nature will inevitably prove difficult as it will require co-operation from operators to conduct experiments in ecologically valid environments, or alternatively would require access to a significant number of fruit machines. The key question which requires more empirical support is whether machine selection based on the MIMO ratio may offer a bonafide route to more successful play (i.e., playing for longer or winning more money). An example of such a research paradigm to further explore such an ambiguity might involve selecting ten machines, each with its internal accounts reset to zero, and then subsequently selecting five of which where the MIMO ratio would be increased by depositing a reasonable sum of money (say £50). The basic research hypothesis would then be that significantly more money or winning sequences would be presented across those five machines where the MIMO ratio has been increased. An additional hypothesis would also be that on these five machines, participants would be more likely to witness 'enriched periods' offering more interaction through feature games, bonuses and win opportunities. Conversely in machines not receiving an increased MIMO ratio, participants would be more likely to experience 'raking periods', with limited interaction and less cues for profitable play. Both raking and enriched periods, according to the Gambling Commission (2007), are trends which should not be

identifiable in fruit machine play. Initial evidence from this research suggests that it could well be the case.

Future research should also focus on using questionnaires, interviews and focus groups with players to try to relate different strategies and techniques to a number of variables (e.g. are players who use 'boxing' as a cue for machine selection more likely to be profitable players, or to exhibit symptoms of problematic behaviour), in comparison to players who arbitrarily choose their machines using more superficial determinants (e.g., theme or flashing lights).

6.4.2.2. Feature Games

For experienced players, participating in a feature game appears to be the primary aim of the gamble and many structural characteristics are integrated and linked with the 'feature' element. Observations suggests this has a significant effect on persistent gambling although more empirical research is needed to ascertain whether this is indeed the case. In addition, further research is required to examine the feature ratio and the number of in-built features. It could be the case that regular players prefer machines that have a higher feature ratio (but smaller wins) to a machine with a lower feature ratio (but slightly bigger wins). Furthermore, the new multi-feature machines may be more habit-forming if they increase the play frequency of the in-built features and facilitate feelings of psychological 'immersion'.

6.4.2.3. Sound effects

Another area worthy of further investigation involves the use of sound and background music on the machine. Sound effects appear to heighten emotional states. Improved sound effects (music or verbal interaction) may make the fruit machine more appealing on a general level and/or may facilitate a psychological feeling of 'immersion'. It would also appear that musical effects have the potential to facilitate, stimulate, maintain, and/or exacerbate gambling behaviour in some individuals. It is likely that this will depend on the musical preferences of the fruit machine player. Furthermore, among fruit machine players, music may increase confidence, modulate arousal and relaxation, and/or help the fruit machine player disregard previous losses.

6.4.2.4. Frustration and within session characteristics

Although there is plenty of evidence to suggest that habitual fruit machine playing is maintained through intermittent schedules of behavioural reinforcement and high event frequencies, there are other 'within session' characteristics that would make interesting areas of investigation, for instance, the role of emotional states such as frustration. It may be that the potentially frustrating antagonistic sound effects perpetuate gambling within session, but that between sessions players avoid these machines. Research may also give insight into whether immediate payouts reduce cues or indicators (such as boxing) to experienced players.

CHAPTER 7
SITUATIONAL CHARACTERISTICS
IN FRUIT MACHINE GAMBLING IN THE UK

7.1. Background and Aims

Situational characteristics in gambling are described as those factors that operate in a local environment or site that may influence gambling behaviour in some way. Wider environmental factors, such as number of sites, level of advertising, and social acceptance as a normal activity were not considered in this definition, and therefore will not be the focus of this particular research study. The variables discussed here may be important in both the initial decision to gamble and the maintenance of the behaviour. They may also help clarify why some forms of gambling are more attractive to particular socio-economic classes. By identifying particular situational characteristics it may be possible to:

a) Examine how different situations might influence gambling behaviour;

b) Understand player motivation, what influences how they gamble, what they gamble on, when they play, and by whom;

c) Educate problem gamblers about possible warning signs of excessive gambling as an ancillary form of awareness training, prevention and treatment.

The aim of this chapter is to build on work by Cornish (1978), Fisher (1993) and Griffiths (1993) by identifying new situational characteristics, develop information on previously identified characteristics; and to report how these factors are specifically different in terms of slot machine gambling through the use of participant observation as discussed in Chapter 5. This research systematically explores potential factors which operate in the situation and site of fruit machine gambling in order to assess the impact these may have on the acquisition, and perhaps more importantly, the development and maintenance of fruit machine playing.

7.2. Results and Initial Discussion

Based on participant observation from this study the following situational factors have been newly identified:

1. Skimming
2. Physical Comfort
3. Psychological Comfort
4. Stimulation and Novelty
5. Incentives
6. Social Facilitation

    7. Music.

Each of these will be discussed in detail below:

7.2.1. Skimming

In the same way that 'randómness' or negative feedback control represented a key 'cultural theme' that operates structurally, 'skimming' would appear to be a key cultural theme in terms of situation. 'Skimming' is a practice that involves (usually skilful) players waiting to play a fruit machine on which the previous player was perceived to have deposited significantly more money than they won. This practice is directly related to the negative feedback control or 'compensator' discussed in Chapter 6, which affects the degree of randomness and predictability of fruit machines. Although skimming is a word that has been coined by this research, several terms used by players for the same phenomenon have been noted throughout observation and these include 'sniping' (Northern Ireland); 'backstabbing' (Nottingham); 'sharking', popular in various locations (whereby they pray on 'fish' [weaker players]) and also 'snaking'(Nottingham).

Skimming can be carried out in different ways. Firstly, through simple observation, whereby the skimmer may either stand behind another player, or try a friendly approach and strike up a conversation where they pretend to be interested and helpful. Direct observation is usually frowned upon by most fruit machine gamblers as they suspect that such behaviours signal an intention to skim. The exceptions are mainly adolescents, very inexperienced players, and friends (although friends are often expected to lend money to continue playing rather than 'skim'). Below are different examples in the arcade environment of the same player who complained to arcade staff to remove the spectator or skimmer.

> Player [male early twenties]: "Someone is watching me. Tell them to go awa-aaayyy".
> [player tells in a sarcastic voice signalling to the change attendant to remove the spectator].
>
> "I have an audience here mate…don't want it…it got to go."

Even novice players wish to avoid having an audience. Although the issue of privacy may be a contributing factor, it appears that even those less experienced

players, who may not understand the concept of skimming, know that spectators may be targeting their machine. Below are two examples of an older male who also expresses concern regarding being observed:

> Player [male early fifties]: "You get them away from me, they want this machine"

> Player: "You watching me lose my money before…wait till I lose everything and then play?"

Secondly, and probably the preferred method, is to play something else which is cheaper (such as a videogame, a game of pool or a low stake fruit machine) until the other player leaves.

Attention must be paid to particular auditory cues (e.g., cash hitting metal or plastic trays, or certain musical cues indicating money wins or jackpots) in order to ascertain if a significant win can be made. Most experienced players suggest that this auditory cue is most effective cue in determining skimming opportunities. The skilful player can then move to play the target fruit machine when the other player leaves. Some players mentioned that they monitor the play of skimming targets in the reflection of the glass in the fruit machine in which they are playing as this offers a more subtle and less disruptive method to observe.

7.2.1.1 Factors Affecting Skimming: Amusement Arcades

Aspects of the sites and situations which may influence skimming in an arcade setting include:

a) *Open plan layouts*: gaming environments with open plan layouts allow unobtrusive observation for skimming. This is particularly useful for the 'reflective glass' method mentioned above;

b) *Arcades with a friendly environment*: this reduces a player's negative reaction to direct observation or other skimming tactics;

c) *Metal payout trays*: payout trays made of metal or hard plastic give skimmers an acoustic advantage by alerting them to machines which have paid out without obtrusive or direct observation;

d) *Seaside arcades*: seaside arcades are considered by experienced players to be a "haven" for skimming. This is because tourists, inexperienced players or some

children (i) are not usually conscious of the presence of skimmers, (ii) play with allocated money and do not care as much if they lose, and (iii) do not possess the same level of skill or awareness so the machines pay-out potential will build up, as the more inexperienced players let wins slip though their fingers.

e) *Congested arcades*: Skimmers prefer arcades that are congested, or have a high turnover of customers. This means that there are more opportunities to skim.

f) *Arcades with low stake machines*: Arcades which have videogames or low stake fruit machines will also facilitate skimming. This way the experienced player may wait for an opportunity to skim by spending time on low-cost pursuits until the target machine is free.

7.2.1.2 Skimming: Other Environments

As demonstrated by Figure 7.1, the amusement arcade is considered to be the most difficult environment in which to skim. This is because there are usually more staff giving focus to player conduct in and around the fruit machines, and there are usually more frequent or experienced players in the arcade who would be unlikely to tolerate or condone overt skimming behaviour. In contrast, playing in a pub or LBO environment is considered to be best for skimming, since the skimmer may find it easier and less expensive to remain inconspicuous – in a pub, a player can sit and drink beer or chat to friends; in a LBO, a player can study racing form or watch (and bet on) the races. Skimming at a casino is considered to be more difficult than a pub or LBO but easier than most arcades. Essentially, the more functions within a premises (e.g., serving beer, food, providing betting on racing), the less awareness and less attention paid to the conduct of fruit machine players.

Figure 7.1: Variations in skimming across sites

Ease of Skimming	Location
	Pubs
	LBOs
	Casinos
	Inland Arcades
	Coastal Arcades

Finally, a distinction should be made between inland arcades and seaside arcades as discussed above. Based on the researcher's observations, inland arcades usually have more staff per machine, and have older or more experienced customers, whereas the seaside amusement centre will normally be viewed by players as a more favourable environment to skim.

7.2.2 Music

Observations made in the study of various locations in the field suggest that music might:

1. Influence arousal, either through increasing arousal or relaxation depending on the players needs. For example, one player said how good he felt when the "Eye of the Tiger", a theme song from the film "Rocky", came on the radio, while mimicking a boxer by throwing punches. He said it "makes him play better." When the researcher asked him to elaborate, he said he could not explain it;

2. Help the fruit machine player disregard previous losses. For example, a player who appeared to be losing and was displaying mild signs of frustration and aggression, mentioned that he "hated this place but at least the music was good".

The findings presented here are broken down into a number of distinct areas. These are observations concerning the (i) use of background music in arcades, (ii) use of music in pubs and clubs housing slot machines, and (iii) the absence of music in some gambling environments (e.g., betting shops). These are examined in turn below.

7.2.2.1 Background music in arcades

It is clear from the observations that arcades often have music that caters for specific customer demographics. Furthermore, the clientele can be differentiated between those who play 'lo-tech' (reel order) machines, and those that play 'hi-tech' (feature) machines. Arcades and designated areas in arcades that have hi-tech slot machines often attract males aged around 18 to 30 years. In these areas, dance and rock music are often played or (alternatively) customers will ask for requests. Requests by the gamblers themselves may possibly have the strongest affect on gambling behaviour as

these songs may have personal meaning bringing new factors (such as emotionality) into play. Lo-tech machines, in contrast, attract a different group of gamblers – primarily women aged over 45 years. These areas or arcades often decide to play 'pop' music or the local radio station. Arcades which cater for those under 18 years of age invariably play pop music or may have a jukebox to cater for these tastes and also to earn additional income.

The arcade where this researcher worked as a change attendant was split into two levels, where the first level housed both feature machines and reel order machines, and the second level housed video games. Three different genres of music were used by the arcade management. These were:

- easy listening (local radio station, some older pop music) was played in the first level in the morning to cater of older players, many of which were female, which made up the majority of patrons at that time;
- rock and dance music was played in the first level in the afternoon and evening to cater for the younger males, usually playing the 'hi-tech' fruit machines;
- pop and dance music was played in the second level to cater for older teenagers playing video games.

In this particular arcade, it is important to note that playing other peoples' music was encouraged by management. Staff were usually keen to play their own. During discussions with the management, they argued that playing requests "keeps the customers happy, and when they are happy, they are spending".

7.2.2.2 Music in pubs and clubs housing slot machines

The use of music in pubs and clubs is in some ways different. More specifically, it was noted that:

- the music is "focal" rather than in the background (listening to music is one of the key consumer motivations unlike the casino, arcade and LBO.).
- the quality of background music (for example, good quality sound systems used by DJ's and live bands) improves in terms of sound, volume and content.
- most slot machines in these environments are "hi-tech" (feature) machines that cater for the same group as the club or pub itself (i.e., males aged 18- to 30-years).

It is possible that these elements may increase arousal and risk taking, particularly the quality of the music. In terms of inhibition, pub and club music can detract from the machine's auditory cues that may be needed for skilful gambling (e.g. sound cues are often given when players play feature games that 'test' reaction times).

7.2.2.3. *Absence of music in some gambling environments*

Some gambling environments (e.g., LBOs) do not usually play background music. The main reason for this is that it would interfere with both the television broadcasting of events being gambled upon (e.g., horse races, greyhound races, etc.), and other betting information that is given out (e.g., possible sports betting, random numbers betting, and tips from experts who are interviewed). The implications for lack of background music in these environments are perhaps limited, however, they are still worth considering. It is possible that the lack of music will:

- Decrease the gambler's concentration level. Given that music is not played (not even from the fruit machine itself as the volume will be disabled or turned down), players' concentration levels may be negatively affected as there will be no auditory cues from the machine or no facilitating effect from the background music. The only background noise is the broadcast commentary on sporting events.

- Put more focus on the loss for the gambler (i.e., the lack of soothing auditory stimuli may heighten the loss feeling). Music may reduce negative effect experienced by players through cognitive regret and frustration.

It is tentatively suggested that music (whether it is in the gambling environment or in the activity itself) has the potential to be important in the acquisition, development, and maintenance of gambling behaviour. Based on these observations, it is suggested that fruit machines can be more appealing, depending on the music in the background or from the machine itself.

7.2.3 *Money Access*

7.2.3.1. *Lack of change facilities*

The decision to continue gambling may often depend on the ease with which the gambler can gain access to more change. Some amusement arcades in the UK do not

have facilities to change £1 coins into 2p, 5p, 10p, 20p or 50p coins. Therefore, even though a fruit machine may offer a stake at 5p per play, the gambler often has to play £1 at a time as they have no access to change. This may lead the gambler to overspend and/or put in more money into the machine than they would have done so had there been the right denominations of coin. Seaside arcades would be more like to offer change than inland arcades because they usually house lower stake fruit machines and other category D machines (e.g., penny falls, "grabbers"). Environments such as casinos, pubs and LBOs will usually not offer change less than one pound.

7.2.3.2 Access to an Automated Telling Machine (ATM)

Consistent with other research (e.g., Hing, 2003; McMillan et al, 2004) proximity to an ATM may affect the player's decision to continue play and potentially chase losses. If the gambler only brings a limited amount of money into the arcade and there is no ATM nearby, they will usually give up. Therefore, the ATM may have a close relationship with the MIMO ratio discussed in Chapter 6. It is harder to skim (or for a player to chase their losses) when the machine is perceived as 'ready to pay' if the player does not have immediate access to further funds.

If a fruit machine player has lost a relatively large amount of money, they will want to continue to play hoping to get most of it back according to their expectation of the MIMO ratio. However, most players do not usually bring large amounts of money into gambling environments, since most players feel unwilling (before play) to lose a large amount. Therefore, they may try to get more money from the ATM. Whether they do this or not depends on the proximity of the ATM. Few players would travel a long distance and then return, for reasons such as the time-out period after a negative cognitive state, or with the expectation that someone else might be playing 'their' machine when they return. Therefore, the proximity of the cash dispenser may mean that more experienced fruit machine players will play in environments where there is restricted access to cash machines. If the previous player leaves a machine and does not return, the experienced player will start gambling on the fruit machine in order to win some of the money that the previous player has lost. The experienced players themselves are usually unaffected by the location of a cash dispenser, as they often

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have a back-up amount of money themselves. Once the previous player has left, it becomes an open invitation to skim the machine. Where there is easy access to a cash machine, such opportunities will be at a premium, as many inexperienced or problem players will continue playing until they win at least some of their money back. This leaves experienced players with little opportunity to skim their profits, particularly if the previous player leaves with nothing. Therefore, one aspect of the importance of having access to an ATM is unique to fruit machine playing. The MIMO ratio could potentially create a stronger motivation to recoup losses or chase, than player in other jurisdictions.

7.2.4 Physical Comfort

If a gambler is physically comfortable, there is more chance they will stay in the arcade. Comfort can be maximised by the arcade management in order to encourage and prolong gambling. Prolonged gambling can be surprisingly tiring, particularly under stressful financial situations such as chasing. Fatigue often ends the gambling session before a gambler becomes satiated or their desire to chase wanes. Often gamblers will continue to chase their losses for very long periods (i.e., the whole day) or until their money runs out. However, if players get physically and emotionally tired, or lose concentration, their gambling session might become prematurely terminated – players often refer to this as "submission" or "giving up". The following are some aspects of physical comfort that were noted in the gambling environments as being influential in the decision to gamble and continue gambling.

7.2.4.1 Seating

Arcades were often observed to have a limited supply of chairs or stools. Taking a gambler off their feet would enhance physical comfort considerably, given that some players are inclined to play fruit machines for very long periods of time. For example, it was common for some players to play on one fruit machine during the whole period of a staff shift (8 hours). Players with the option of sitting down instead of standing up appeared to gamble for longer periods of time. Fatigue can prematurely terminate a gambling session before the satiation of a players desire to gamble. It would appear that the lack of seating is an inhibitory factor in prolonged gambling. LBOs and Casinos were more likely to offer seating for fruit machine players and machines located in pubs or night clubs were least likely to seats available for players.

7.2.4.2 Heating and ventilation

Heating is often a problem in arcades, but normally well regulated in other environments. Playing fruit machines appeared to result in increased temperatures in arcades, for players, for a combination of the following reasons:

a) Some players reported that the emotional effects of gambling often cause an increase in body temperature and perspiration, because of the arousing or exciting nature of the activity;

b) The proximity of the gambler to fruit machines can also increase body temperatures (i.e., the machine becomes hotter through constant playing);

c) Staff who do not usually spend as much time close to a machine, often dictate the arcade's room temperature. For this reason, room temperatures may be too warm for players even though they may be suitable for non-gambling staff.

The combined effect of such factors causes physical discomfort, which may discouraged prolonged or excessive play.

7.2.4.3 Refreshments and amenities

An obvious factor that was considered important among players was the availability of refreshments and amenities (e.g., toilets). This is of particular importance to fruit machine gamblers since:

a) they are often gambling for long periods of time, in a gambling venue, therefore require some snacks or beverages;

b) those in casinos and arcades could often receive complimentary non-alcoholic drinks which has obvious implications for needing to go to the toilet;

c) they are often reluctant to leave the machine to get a drink or food, or go to the toilet as they are often chasing losses do not want to lose out to skimming by 'experienced' players. Therefore, not only do amenities and/or refreshments need to be provided, but staff may provide some kind of service where a players machine can be watched or 'saved'. Arcades were the only environment to monitor machines, although ironically, they were the least likely of all sites to have customer toilets.

In summary, players will be more likely to select a site and play for a longer periods of time where there refreshments and toilets are available to customers, particularly those environments that make provisions to protect players from skimming.

7.2.5 Environmental stimulation, distraction and novelty

Another way in which the environment might affect gambling behaviour on fruit machines depends on how stimulating or novel a particular gambling environment might be for the gambler or what other distractions may exist. It might be logical to assume that newer, more unusual environments might inhibit high levels of gambling and risk-taking as new environments usually signal uncertainty to the individual making caution an automatic response. Furthermore, arousal theories of gambling assume that excitement and stimulation are primary motivations for gambling. In fact, several studies have shown increased levels of arousal due to the result of gambling (Anderson & Brown, 1984; Leary & Dickerson, 1985; Griffiths, 1993). If this is true, it is logical to argue that the need to gamble or to take risks might be lower if the individual is already receiving stimulation from somewhere other than gambling itself. Therefore, a stimulating gambling environment may lower the need to be aroused from gambling. This also applies to other forms of distraction in a fruit machine gambling environment, for example, the provision of pool tables, jukeboxes, live music or games available in a pub environment. Potential distraction levels across various locations are summarised in Table 7.2.

Figure 7.2: Observed level of distraction across sites

Potential level of Distraction	Location	Sources of Distraction
↑	Pubs	Higher level of social interaction, live music, restaurant and bar facilities, pool tables, juke box, other games (e.g., darts, dominos).
	Casinos	Other gaming opportunities, resturant and bar facilities, more opportunities for watching (secondary gambling) other players
	Coastal Arcades	Higher ratio of the following games compared to inland arcades: video games, pool tables, other category D machines (penny falls, "grabbers" etc.)
	Inland Arcades	Video games, pool tables, other games (e.g. air hockey; punch bags, test your strength)
	LBOs	Other betting opportunities

Therefore, sites with more opportunities for players to be distracted from gambling, will potentially have an inhibitory effect on fruit machine play. Clearly, personal preferences and other factors play a mediating role (i.e., does the individual like playing pool, did they go with friends [see section on social facilitation]).

Las Vegas is an ideal destination that can be used to empirically test these speculations. It could be hypothesised that 'Vegas' as an environment has some inhibiting effects on gambling levels. It is a commonly held view that this destination resort is a novel and exciting environment. Becoming aroused or excited by the Vegas experience is possible, even without having gambled at all. Live shows, firework displays and architectural originality are only a few examples from a long list of provisions that this area offers in addition to the gambling experience. Therefore, while they may be attracting a wider range of customers to their resorts, it could be argued that they are simultaneously lowering the drive to gamble.

Admittedly, there are some problems with this speculation. The theory assumes that individuals are motivated only by the need to become aroused, a claim that is that has yet to be empirically substantiated. Secondly, there are some that claim that increased arousal may lead to an increased desire to gamble (Griffiths, 1993). Research is clearly needed in this area to evaluate the effect of environmental stimulation with any precision.

7.2.6 Incentives: Acquisition and maintenance

Chapter 6 discussed the role of the 'bonus' as a structural characteristic that may facilitate gambling behaviour on a fruit machine (e.g., "secret holds", "repeat chances", etc.). In some cases, the same strategy has been applied within the site itself. Such bonus incentives come in the form of (i) cash prize draws, (ii) gift raffles, (iii) tokens or credit boosts (i.e., winning additional credit on the selected slot machines instead of cash), and (iv) scratchcards (which can only be redeemed in the arcade). These ploys have a number of effects. Firstly, they provide incentives for initial exposure to the gambling environment. Secondly, they expose customers to other forms of gambling (e.g., scratchcards, raffles, etc.). Thirdly, the prizes awarded are often tokens to play on the machines. This ultimately increases exposure to fruit machines with the aim of continued play.

The provision of such bonuses varies depending on the site, but can occur hourly, daily, weekly, seasonally or not at all. Table 7.3 summarizes observations on the provision of incentives according to site.

Figure 7.3: Observed Provision of Incentives

Potential Level of Provision	Location	Level and Frequency of provision
	Inland Arcades	Prize draws, regular bingo, proportional bonuses (e.g., tokens); seasonal draws (e.g., Christmas draws)
	Coastal Arcades	Some may offer incentives similar to inland arcades but tend to be less frequent or organised
	Casinos	Tend to offer incentives but these usually relate to the entire casino and rarely relate directly to fruit machine play
	LBOs	Very limited provision (tends to be general and not specific to fruit machine play)
	Pubs	No provision of incentives related to fruit machines

The appeal for fruit machine players seems to be that they are "getting something for nothing". Participation in these bonuses can usually be subdivided into two categories – general and proportional bonuses. These are briefly described below.

a) *General bonuses* – Many establishments offer a simple membership scheme that offers the same benefits to each member regardless of how much time they spend in the arcade. These can sometimes be just as effective in reinforcing attendance at the site, since bonus draws are made on site in the arcade, and many customers prefer to be in the arcade to collect any rewards. This increases the duration of the stay, increases the number of players in general, and works to introduce new players.

b) *Proportional bonuses* – This is where the bonus given depends upon the length of time the player spends in the arcade. For example, raffle tickets might be given to customers every 30 minutes. Therefore, the longer a player gambles in the establishment, the greater the chance of winning the raffle or lottery (as they will

have more tickets). Many gamblers seemed to fail to realise that even though they might win a small prize worth perhaps £40, they eventually might lose £300 collecting 10 tickets a day over a three-week period due to extended gambling time. Alternatively, rewards can be given with, say every £10 changed in the arcade. However, arcade managers stated that this approach is less common as many customers are able to abuse this system by simply changing money and not actually playing on the fruit machines.

7.2.7 Social facilitation and inhibition

The presence of other individuals appeared to effect an individual's gambling behaviour. Social facilitation occurred in a variety of contexts. Observations suggest that this social process operates in the gambling environment together with social inhibition. Data indicate that the presence of a lively atmosphere, friends, or younger more impressionable players may affect performance levels in fruit machine gambling.

7.2.7.1 Friends (who gamble)

The impact that playing with friends has on fruit machine behaviour ultimately depends on whether or not these friends are actually gamblers themselves. The presence of gambling friends when gambling on fruit machines appears to have three main effects regardless of site or location:

a) *Increased risk-taking.* This occurs because there is a need to impress fellow gamblers through risky but exciting play (i.e., increased risk-taking). Friends who gamble are used to risk-taking, and in addition to the ability to win players respect a certain "fearless" element in another persons play. Friends may encourage riskier play since they enjoy a secondary high from the gambling themselves (Griffiths, 1995) and therefore, there is a selfish element to their encouragement.

b) *Improved skill level.* This occurs because gamblers want to demonstrate the highest skill levels to fellow gamblers. As a result, the fruit machine gambler is usually very alert and aware and maximizes any opportunity to win, not only for a profit motive but to ensure a positive evaluation from fellow gamblers.

c) *Increased play duration.* This occurs because a group of friends gambling on slot machines will watch each other and enjoy the 'secondary high' thereby staying longer in that environment. Furthermore, an 'exposure cycle' may occur between

friends. For example, take the case of three friends who gamble. Friend A begins playing the first slot machine while his two friends observe and encourage. After a short while, Friend B gets bored as the secondary high is no longer enough, so he begins to play another machine. Meanwhile, Friend A is ready to leave the arcade but Friend B does not want to leave yet as he not finished playing on his fruit machine as he continues to chase his losses. The effect is a vicious circle where each of the three friends remain in the arcade until all of them are ready and willing to leave (or decide to leave the group altogether). The implications of this dynamic for prolonged gambling are clear – the longer they observe each other in the gambling environment, the more environmental cues they will experience which may have the effect of eventually inducing further fruit machine gambling.

7.2.7.2 Non-gambling friends

Observations across a variety of sites and locations indicate that the presence of non-gambling friends may have an inhibitory effect on fruit machine gambling. Reasons include:

a) *Non-gambling friends giving negative appraisals for unnecessary risk taking.* This is because friends who do not gamble, do not understand the motivations for gambling, particularly when the individual is losing. As a result, it is common for non-gambling friends to make negative judgements regarding the gambler's character (e.g., they are unwise, impulsive, weak, etc.). For this reason, many gamblers take less risks, play lower stake machines, and stay in the gambling environment for shorter periods of time.

b) *Non-gambling friends wanting to do something else.* Impatient non-gambling friends who find fruit machine playing boring may encourage the gambler to leave the environment to pursue other activities with them which they perceive to be more 'sensible' and 'fun'.

7.2.7.3. Impressionable audience

One of the most interesting observations of the fieldwork relates to the effect of younger more inexperienced onlookers. Essentially, fruit machine players admit to showing off by (i) increased concentration on skilful tasks, and (ii) general reckless play. Gamblers who are watched by inexperienced onlookers may gain both increased

self-esteem and social approval. However, some more experienced 'savvy' players may evaluate aspects of the above as irresponsible.

7.2.7.4 Presence of unwelcome spectators

Another factor that is socially inhibiting and psychologically uncomfortable for players is the presence of unwelcome spectators while gambling. Some arcades place limits of two spectators per customer and were willing to remove spectators at the player's request. Typically, the less favourable environments to gamble are those where spectating is not discouraged. The main concerns of the players are:

a) the effect from potential 'skimming';

b) the general distraction by spectators (particularly annoying or threatening);

c) the reduction of skilled performance (by not being able concentrate fully on playing).

7.3 Variations According to Site

7.3.1 Amusement Arcade: Inland versus coastal

Different sites appeared to have encouraged slightly different kinds of gambling behaviour. Coastal sites primarily targeted family and tourist markets. Consequently, they usually had lower stake, lower jackpot machines and therefore, they accommodated and attracted a larger number of younger players. As Fisher (1993) points out, such a youthful milieu can inhibit older players. However, it is not true that all adults have this point of view. Some experienced adult players argued that coastal sites are more profitable and relaxed than inland sites. For instance:

> Player [Male, mid forties]: "You can make a packet in 'ere mate. Here's great for getting up (making a profit). Tourists don't know how to play and end up just filling up the machines. The kids (local) think they make the cash but they can only play the 5p machines – can't win f**k all on those things."

Some players claimed that coastal sites can be a more profitable place to play. As the above player mentions, tourists spend for leisure, are less knowledgeable or skilful (see selection and operation skill in Chapter 6) and they are less expectant on winning.

One gambler also suggested that there may be some seasonal variation to how potentially profitable such environments may be:

> Player [Male, late twenties]: "I remember the best part of Easter Monday was going to Barry's [a coastal amusement arcade] to make a killing off the ones that come up for the day on the train."

Some experienced players argue that although there is more risk involved, it is more profitable to stake high amounts. These players argued that this is a result of the 'payout ratio' as described in the previous section.

Most coastal sites had separate areas for over 18s to gamble. It is illegal to allow anyone who is under 18 years in an area where the higher stake machines are available to play. Inland sites either operated exclusively for the over 18 age category or offered distinct rooms for younger players where only legal machines are made available. Furthermore coastal sites have a more 'diluted' gambling environment since a significant amount of the floor space is occupied strictly by amusement machines or other category D machines (Gambling Commission, 2006), such as test your strength machines, "grabbers" (where players can trying to win stuffed toys), penny falls, and small rides for young children. As one inland arcade manager said:

> [Inland arcade manager]: "In one you've got the family just out for the day having fun, and in the other, you have those who are there to do some serious gambling."

As researchers have illustrated (Fisher, 1993; Griffiths, 1995), coastal sites still play a particular role in attracting potential players. Although, the environment may be less threatening and competitive, it may be for these reasons and the absence of age restrictions that so many young people are attracted to begin their gambling careers in these environments.

7.3.2 Casinos

The most distinguishing characteristic of casino environments compared to other fruit machine sites was a high level of comfort including comfortable seating, clean and accessible toilets, appropriate levels of heating and ventilation, professional and courteous staff, and the provision of complimentary non-alcoholic drinks . ATMs and cash withdrawal facilities were also easily accessible.

However, unlike amusement arcades, casinos did not have dedicated change attendants, whose responsibilities included giving change (saving the need to use a

change machine which was slower), assisting with any technical faults, and temporarily supervising machines (in the player's absence if they were using the toilet or going to an ATM). Furthermore, players suggested that skimming tended to be tolerated more at casinos. This included some of the more overt forms of predatory behaviour such as directly watching other players over their shoulders. This was usually because there were no staff directly responsible for supervising the fruit machines. Supervision consisted of CCTV cameras for security purposes. However, some players did qualify these complaints by reporting that the more skilful or experienced players, those more likely to skim, were less common at casino sites than at arcade sites.

Finally, an interesting observation was the extent to which players had 'confidence' in machines at the casino compared to any other site. The 'confidence' to which players referred included factors such as randomness (although paradoxically this is incorrect), offering a fair payout ratio (i.e., a low house edge), honouring the payout ratio (i.e., the true payout ratio is what they advertise this to be), and having more reliable machines (i.e., they do not malfunction or do not experience jams in the note acceptors or coin mechanisms). Reliable machines are important to fruit machine players since if they are chasing on one particular machine, and there is a malfunction, usually this machine will be turned off and would subsequently be unavailable for play. This is frustrating for the player, especially given the importance of the MIMO ratio.

7.3.3 Peripheral sites

These are sites where fruit machines can be played but they are not the primary function of the premises on which they are situated, (e.g., pubs, clubs, licensed betting offices, take away restaurants and similar environments). The more skilful or experienced players tended to go to play fruit slot machines whereas the less skilled and inexperienced players would gamble on those slots when they visit these premises to access the primary service (e.g., to drink alcohol, socialize, or have something to eat). The skilful players argue that despite these environments having a less competitive payout ratio than other environments, they sometimes can be more profitable. For instance:

> Player [male, early thirties]: "Machines are good in here (inland arcade) most of 'em will pay over 90%. You go to the bookies or a pub and they give you 70 or 80."

> Player: [male, mid twenties]: "Pubs are good cause people playin them are drunk and they can't change right. They just fill up and then can't play'em anymore cause they don't have change."

It seems that lack of change facilities is considered to be a factor facilitating profitability for some of the more skilful players who wish to engage in skimming. Experienced players suggested that weaker players will play for leisure or social reasons with their loose change only. They argue that even if they win it will only be small amounts because lack of skill and low propensity for risk-taking and this often gets reinvested until they have no money left. A further reason suggested by these players for preferring these sites is the absence of control or surveillance: Players in these sites explained that it was easier to skim. Finally, the behaviour of non-regular players in these sites is usually governed by the social group. In other words, if friends or a significant other want them to stop or decide to leave – then these players will finish playing a machine that might "payout". These are ideal opportunities for skimmers to "swoop in".

7.4. Conclusions

7.4.1 Summary and Interpretation

Based on this research, there is continued support that for Griffiths (1995) claim that situational characteristics of fruit machine sites have the potential to initiate gambling behaviour. However, contrary to what was suggested by Griffiths, there is also support for the claim that situational variables also have integral role to play in maintenance and persistence in fruit machine gambling. A large portion of this chapter examined skimming behaviour, which although it may give some gamblers a significant advantage by knowing more about the MIMO ratio, also it has implications for continued play, (a) because players will want to continue playing to prevent someone from successfully skimming from their machine, and (b) for the skimmers themselves, where after an initial investment of time, they manage to locate and secure a skimming target. A problem may then arise where they overestimate the benefit afforded by the skimming behaviour, and persist in a losing situation. Furthermore, other situational factors may also have a serious influence on continued play, such as high levels of comfort, availability of ATMs, music, access to change facilities, and the role that

gambling friends can play in excessive play. While skimming and access to ATMs and change facilities create ideal conditions to for chasing behaviour, high levels of comfort and presence of gambling friends have the potential to increase exposure, and variables such background music may create a mood which (from a learning perspective) is resistant to punishment. Table 7.1 and 7.2 summarise new situational characteristics outlining the predicted effects on fruit machine gambling behaviour.

Table 7.1 Summary Table: Situational Influences on gambling behaviour

Predictors		Outcomes										
		Facilitating gambling									Inhibiting	
General	Specific	Exposure	Winning beliefs	Discount past losses	Arousal	Romantism	Visual acuity	Financial back-up	Esteem reinforcement	Skill orientations	Social interaction	Time out
Music		↑	↑	↑	↑	↑			↑	↑		
Light					↑		↑			↑		
Change facilities		↑						↑				↓
ATM availability								↑				↓
Psychological comfort	Tips/hints	↑								↑		
	Friendship	↑							↑		↑	
	Security	↑										
Physical comfort	Seating	↑										
	Heating/ventilation	↑										
	Amenities	↑										↓
Stimulation/Novelty		↑			↓							
Incentives		↑		↑								
Audience	Lively atmosphere	↑			↑						↑	
	Non-gambling friends	↓	↓	↓	↓	↓			↓	↑	↓	
	Gambling friends	↑	↑	↑	↑	↑		↑	↑	↑	↑	
	Strangers				↑					↑		
	Impressionable				↑					↑		
	Skimmers				↑							
Skimming opportunities		↑	↑							↑		

Note: ↑ indicates a potential increase as a result ↓ indicates the potential decrease as a result

Fisher (1993) touches briefly on what she refers to as "payout potential" where players can see value in playing a certain machine based on how much it has recently paid out. On reflection, Fisher's original idea was essentially the beginnings of academic consideration to the MIMO ratio and the technique of skimming. This research

contributes to our understanding for why such reasoning by players is rational. It also clarifies that it is predicated on real technology that changes the chances of winning based the ratio of money going into the machine compared to money going out of the machine. Perhaps, more importantly, Chapter 6 has identified the strategies employed by players to select machines to improve the chances of winning, and how this may differ across sites and locations. Ironically, it has also revealed how such techniques may have implications for problem gambling despite also giving a real advantage in improving chances for winning.

There may be other clinical applications of these findings. Knowing that situational variables exist gives researchers and treatment professionals a better concept of the potential ambiguities surrounding fruit machine play. For example, if treatment professionals know which aspects of the environment are likely to perpetuate gambling behaviour they might be able to train their clients to interpret these and deal with them appropriately. Where many problem gamblers may have only been subconsciously aware of situational variables, better control might be achieved with such an improved awareness. In other words, knowing that they may gamble more or take more risks when in the presence of a group could possibly help to avoid the situation in the first instance or at least try not be influenced once aware of the potential effects.

Probably the most important aspect of bringing the presence of these situational variables to attention is the new supply of information that it provides us with regarding the motivation of the gambler. Using the example of social facilitation, we can see that some gamblers might be driven to gamble for social recognition or for certain esteem needs. If group presence affects performance when gambling, then this would most probably be the case. To pinpoint another example, if access or proximity to money affects gambling behaviour we could speculate that self-control as also being implicated in the maintenance of gambling behaviour. The main point to be taken from this is that understanding that situational variables do exist, and understanding what they are, brings academics, clinicians and players alike a little closer to understanding fruit machine play and its related behaviours.

A summary of potential impacts for situational factors on problem behaviour and successful play is presented in Table 7.2 which aim to summarize the various

situational factors identified in this research and their potential implications for player behaviour. As stated, further empirical support is required to further validate the conclusions reached in this summary table.

It is acknowledged that many of the ideas presented in this chapter require further empirical support and that more substantial experimental evidence is required before many of the observations can be confirmed. However, it is worth noting that this research is only the first stage in examining situational variables in gambling, and hopefully will act first to create a better understanding amongst interested parties, and second, to act as an impetus for more concrete and definite research.

**Table 7.2 Summary Table: Observed Situational Influences
on Addiction and Success (Financial Performance and Longer Play)**

Predictors		Potential for Addictive or Problem Behaviour	Predicted Outcome		
			Potential for Impact on Success (Financial Performance and Longer Play)		
General	*Specific*		No Effect	Short Term but not Long Term	Short Term and Long Term
Music		✔ ✔	YES		
Light		✔	YES		
Change facilities		✔			YES
ATM availability		✔ ✔ ✔			YES
Psychological comfort	Tips/hints	✔		YES	
	Friendship	✔	YES		
	Security	✔	YES		
Physical comfort	Seating	✔ ✔	YES		
	Heating/ ventilation	✔ ✔	YES		
	Amenities	✔ ✔	YES		
Stimulation/Novelty		✔	YES		
Incentives		✔	YES		
Audience	Lively atmosphere	✔	YES		
	Non-gambling friends	✔	YES		
	Gambling friends	✔ ✔			YES
	Strangers	✔	YES		
	Impressionable	✔	YES		
	Skimmers	✔ ✔ ✔	YES		
Skimming opportunities		✔ ✔ ✔ YES	YES	YES	YES

Note: ✔ *limited potential;* ✔ ✔ *some potential;* ✔ ✔ ✔ *considerable potential*

7.4.2 Future research

Below are some specific areas future research that may be particularly interesting.

7.4.2.1 Music

This research found that players reported having an improved mood as a result of certain types of music being played on site. The potential impact on players was that they may stay longer at the site, and that the positive impact of music on mood may counteract the potential negative impact of losing. Based on this research there have been three studies which have investigated the role of music on gambling behaviour.

Parmenter (2005) found that dance music significantly increased speed of betting and level of risk when playing Internet roulette, and Parke et al (2007) found that poker players who reported playing music during play online claimed to be winning more money on a monthly basis than those players who did listen to music. Marmurek et al (2007) found limited support that music had any impact on intentions to gamble, however they did not look at actual gambling behaviour.

In the context of these findings, the focus of future research should be on pinpointing the exact processes at work. For example, is it the effect on mood or arousal which is causing the impact on gambling decisions? Furthermore, research is needed to explore the relationship between type of music and type of gambling. Is it the case that music affects gambling based entirely on genre or tempo or does the impact rely on player preferences? For example, a player may not prefer fast paced dance music yet it still may influence how they gamble. In terms of gambling type, the outcome may be different depending on the form of gambling being undertaken. Parke et al. (2007) concluded that in the case of poker, players may be playing more aggressively, a tactic which is often rewarded when playing no limit poker. However, increased risk taking in other forms of gambling, such as roulette or EGM games, may have more negative implications.

7.4.2.2 Role of skimming

In an academic context, skimming is a new phenomenon and, should be the focus of further research. A stated previously, unplanned gambling may occur as a consequence of self-protection from the perceived financial loss and threat to self-esteem by other players playing "their" machine and winning some of their money back. There are implications for continued play while sustaining losses as a consequence. Furthermore, skimmers may also be at risk, as they may overestimate the advantage of a successful skim, and may also persevere during a losing streak. Future empirical research may prove difficult on these issues. However, further exploration using focus groups, surveys and in-depth interviews may confirm or reject conclusions reached in this research and may offer further insight regarding these processes and their relationship to problem gambling or financial performance.

7.4.2.3 ATMs

Consistent with other research (Hing, 2003; McMillan et al., 2004), ATMs may facilitate chasing and unplanned gambling by allowing players to have access to additional monies for staking. The closer the ATM is to the gambling situation, then the shorter the 'time-out' period, and the less time will be available to consider the potential implications for continued gambling. Future research to give empirical support to this phenomenon could involve administering scales relating to negative affect (such as mood, frustration, regret, aggression) and problem gambling, and compare scores from patrons using ATMs (particularly those using it on more than one occasion) with scores from players not using the ATM and other credit facilities. It would be expected that players using ATMs would demonstrate higher levels of negative affect and problem gambling behaviour. Issues such as site access and controlling for players using the ATM prior to any gambling would also need to be taken into consideration. However, evidence that ATMs facilitate problem gambling and dissatisfaction among players would make a strong case to operators for their removal. It should also be noted that in Chapter 3 a preference for having access to an ATM was significantly associated with neither DSM criteria nor financial outcome. However, this finding could simply reflect the unplanned nature of reliance on ATMs.

7.4.2.4 Comfort

Designing ecologically valid experiments and getting access to gambling premises may make getting further empirical support for many of these findings reported in this research a substantial task. However, basic experiments could be set up which test the hypothesis that players may spend longer playing machines when they are comfortable. Future research should focus on separating out factors which influence a player decision to enter and play at a site and the decision to stay for a longer period of time. It would be useful to explore further whether increased comfort may lead to increased exposure (spending more time in the environment), or if it effects other aspects of play, such as mood and risk-taking, which may affect gambling independent of considerations relating to time.

CHAPTER 8

A TYPOLOGY OF UK FRUIT MACHINE GAMBLERS

8.1. Background and Aims

Parts A and B of this research study have demonstrated that fruit machines have evolved considerably since Fisher (1993) and Griffiths (1993; 1994; 1995) first gave consideration to them twelve to fifteen years ago. A comprehensive analysis of all the important structural and situational changes and the use of skill in fruit machine playing have been provided in chapters 6 and 7. This new information feeds directly into Part C of the research and will be necessary in understanding the proposed typology of fruit machine players.

This chapter seeks explain how fruit gamblers interact with the fruit machine, the site and their social environment. In doing so, a typology of fruit players is proposed which has implications for further understanding player behaviour and applications for consumer behaviour, prevention and treatment for "problem" behaviour. In addition to this, it will also provide an updated "ethnographic roadmap" (Rosecrance, 1984; Fisher 1993) for those seeking to develop a critical understanding of fruit machine behaviour.

This chapter was in part inspired by Fisher's (1993) seminal work (see chapter 2 for an overview of her typology) describing adolescent fruit machine gambling in a seaside arcade. Through bringing together information relating to newly identified situational and structural characteristics presented in chapters 6 and 7, this typology aims to develop and update Fisher's existing framework, by extending its focus to include:

1. Adults, rather than adolescents;
2. A variety of gambling environments, not just one amusement arcade in one location;
3. Changes in technology and legislation;
4. Exclusivity of player category membership;
5. Development of clear criteria for player category membership.

8.2. Results

8.2.1 Observed Criteria

There are three criteria which were systematically and consistently observed in the field and will be used to classify the fruit machine players in this typology. These are (a) ability, (b) control and (c) time (frequency of visits and duration gambling session). These factors represent the latent, observable actions of fruit machine gamblers and comprise of smaller "sub-factors". These criteria relate directly to observations discussed above and discussed in chapters 6 and 7. The other potential criterion was financial performance. However, a decision was made regarding its exclusion in determining the typology based on two grounds:

1) It was difficult to observe and measure. It was also the variable about which players appeared to be either deceptive or secretive, and therefore precision in estimating this criterion would have been poor;

2) Upon reflection it was concluded that estimated financial performance would be better considered as an underlying factor in problem gambling and is dealt with in the discussion.

8.2.1.1. Ability

This factor relates to general levels of measurable skill and playing knowledge, and comprises of;

1. *Skimming ability and machine selection* –This is the ability to use the adaptive logic of machines to one's advantage where possible. Able to identify cues for a high MIMO ratio (boxing, skimming, enriched periods). Also aware of possible predatory behaviour focused on their play.

2. *Ergonomic factors* – This is being comfortable using the machine. This could mean knowing where buttons are located, how to press these in the quickest response time and knowing the function of each button. This is important for playing feature games and ensuring holds and nudges are operated effectively. Players who are comfortable using the buttons do not have to look at buttons during play. This means that they can focus on other aspects of play (e.g. skill features on the feature board).

3. *Knowledge* – This is general knowledge regarding secret functions and cheats (for symbol matching and feature games), how feature games work and information regarding economic utility, such as percentage payout ratio. Also,

includes knowledge of the best premises for maximising bonuses such as free draws and hourly tokens for free credits.

4. *Psychomotor skills* – This also relates to button control. As a result of the high degree of player involvement, many bonus games involve hand-eye co-ordination and good reflexes. Such skills allow players to maximize every winning opportunity.

8.2.1.2. Control

This factor relates to general and specific forms of self-control over various aspects of their gambling behaviour and comprises;

1. *Emotional display* – Players high in control will minimize overt displays of frustration or disappointment. Exhibiting negative affect will signal to potential skimmers that machine is taking more money than it is giving which may mean that they identify that machine as profitable.

2. *Patience* – This includes the ability to avoid playing "unprofitable" machines which are not ready to pay out. Players low in patience will play any available machine for non-profit motives such as boredom and escapism, and ignore the MIMO ratio.

3. *Discipline* – This, in addition to patience, is where players with discipline will be able to stop playing a machine despite having made some initial investment. Many players will try to chase money until they have recouped all investment (i.e., they aim to break even). Disciplined players will acknowledge that in specific circumstances it is prudent to cut losses.

4. *Poor judgment* – This is where players with poor control will rationalise reasons for persistent play, even when they know that playing at certain times, on certain machines is unwise.

5. *Button control* – As well acting as a cue to ability, use of buttons can also identify player control. Players who act aggressively with buttons (punching, slapping or even kicking) are often demonstrating negative affect as a result of losing.

8.2.1.3. Exposure (Time)

This refers to the frequency and duration of gambling sessions. In other words, the cumulative amount of time interacting with a fruit machine.

8.2.2. The Typology

Overall six "types" of UK slot gambler were observed, based on levels of control, ability, and the time spent playing fruit machines. These are summarised in Table 8.1. These are explained in detail with examples below.

Table 8.1.
Classification of fruit machine gamblers based on key criteria

Type	*Criteria*
Type A 1	High exposure, high ability and high control
Type A 2	High exposure, high ability and low control
Type A 3	High exposure, low ability and low control
Type B 1	Low Exposure, high ability and high control
Type B 2	Low Exposure, high ability and low control
Type C	Low Exposure, low ability and low control

There are a few important points to consider before discussing the types in more detail. Firstly, it should be noted that while these types are considered to be mutually exclusive, there is potential for movement between categories, and this is explained further in the discussion. Secondly, some combinations of criteria were not included, given that they were either not observed or were not a logical combination. For example, players exhibiting high levels of control but low levels of ability were rarely, if ever, observed. Therefore, while these were theoretically possible combinations, they were excluded to keep the typology parsimonious whilst ensuring that this was not at expense of significance or utility. Finally, the alphanumerical labels for the types, while they lack the convenient and descriptive qualities of some typologies (e.g., Moran, 1970; Fisher, 1993), were used in order to accommodate the nature of the criteria under consideration (for example, the terms "shark" and "fish" may adequately describe the A1 and the A3 respectively, but they would also describe

the B1 and C just as well, and would therefore be ineffective when incorporating time as third criterion).

8.2.2.1. Type A1

In terms of criteria, A1 exhibits high ability, high control and high exposure. The A1 sub-group are characterised through their self-control and their knowledge and understanding of fruit machine gambling. Fundamentally, the A1 player acknowledges what it takes to make profit on fruit machines. The A1 player displays a high level of control in terms of machine selection, how long to play machines, whether to chase losses, how to react after a 'bad beat', and not to exhibit any emotional reactions.

On a basic level the A1 are image conscious, and this may contribute to self-control in various sites. The A1 is primarily a predator of the weaker players, feeding on their inability to maximise the compensatory offers presented by the 'adaptive logic' of fruit machines. The A1 makes a conscious decision to minimise their status as 'sharks' or skimmers. For example, the A1 will not evaluate whether a player is losing by standing right behind and watching them. They know this is non-productive for two reasons: (1) The player will feel uncomfortable while being watched and might leave. This could reduce the amount of money the weaker player deposits in the machine, or (2) the player could realise the skimmer is going to play their machine. This can often motivate them to continue playing until they recoup some losses which would once again lower the MIMO ratio. Rather, the A1 is subtle in assessing the MIMO ratio by listening to the machine acoustics: how much money fell in the money tray, watching in mirrors and reflective glass of other machines and verbal statements made by the player displaying aggression or frustration (which usually indicates losing play). Essentially, they use their ability to assess low level of control in other players and situations, and interpret these as opportunities to find machines with a high MIMO ratio.

The A1 player realises that skimming always exists and they are therefore vigilant and avoid falling prey to these practices themselves. They endeavour to carry more than sufficient stake (in pound coins – although note acceptors are becoming more common) so that they can capitalize on opportunities for skimming or so that they can

continue playing to avoid players skimming their machine. If the stake is not available, the A1 player will be wary of putting themselves in a position where they have deposited substantial funds without winning. For example, if there is a machine which is considered volatile and is 'due' for a payout and the A1 player does not have sufficient bankroll, they may just accept a small loss, despite the fact that it is perceived to be "ready to pay out" because the risk is too great of exhausting all one's funds before the volatile machine pays out. To the A1 player, it makes economic sense to incur several small losses if the ideal conditions are not available. Some players suggest that such volatile machines are those operating deceptively on a low payout ratio (e.g., below 50% despite advertising at least 70%). These players suggest that arcades can get away with this because of the lack of legislation (at least the time of observations).

The A1 will very quickly discover the most efficient strategy of play for various machines. For example, consider the decision of whether to collect small wins on a more frequent basis or to hold out for a jackpot or streak (i.e., a series of large wins) on a less frequent basis. This knowledge will be assimilated through trial and error and also learning from mistakes of those who display less control. As Fisher (1993) points out in her observations, the more skilful players will often form a fellowship where they share information regarding beating the machine. To the naïve player, some of these strategies may appear ludicrous. For example, a player may reject the opportunity to win a jackpot to try and obtain a "jackpot repeat chance" because they realise from experience that a jackpot with repeat chance may be worth as much as four or five jackpots (i.e., £100-£125 pounds). The following is one of initial inquiries by the researcher regarding such a behaviour.

> *Researcher:* "Why is he [male observed in an arcade, early twenties] only collecting mystery   wins and not taking anything else offered?"
> *Arcade Manager*: "Because sooner or later Mega streak will come up. Best feature in whole arcade; £70 or £80 a go. Its worth a lot more than all those 5 and 6 added up."

The A1 players appear physically comfortable with a machine (e.g., knowing where buttons are located and able to work fast by knowing just how to press the button). When presented with a bonus or feature game, the A1 will be more likely to maximise any possible payoff. This is the advantage the skilled A1 players have over the

infrequent non-skilled gamblers. Their skill is often so highly regarded that weaker players will ask the A1 to perform the feature, sometimes in return for a small percentage of the winnings (something which Fisher, [1993] reported in her analysis of "Arcade Kings"). The following is an excerpt from a less skilful player (male in late teens) requesting help from an A1.

> "I****! Call I**** over. I got 'follow me' [a type of feature game]. Quick before it starts. Quick. I****!"

One of the most crucial skills of the A1 player is keeping control of their anxiety and frustration. In doing so, the A1 can reduce several of the pull factors such as 'cognitive regret,' linked to poor decision making in risky situations (Amstel, 1958; Kahneman & Tversky, 1986) in turn reducing the propensity of chasing. The A1 players suggest that this can be achieved by making decisions on a rational basis rather than an emotional basis. The following is an example of an A1 player ignoring money invested and avoiding chasing.

> [male, less skilful player] "C'mon mate. Sunk 20 didn't ya. It'll give something!"
>
> [male, A1 player] "It's been rinsed. I'll just fill it up for when B**** comes in. I'm going to try something that hasn't already been cleaned out."

In the above excerpt, the A1 player feels that the machine has a low MIMO ratio, however, it has cost that player money to arrive at that decision. Nonetheless, the player decides to cut their losses and avoid a situation that may encourage chasing or provide a good skimming opportunity to other players.

One of the weakness of such players seems to be that they tend enjoy high levels of social reinforcement. They enjoy showing off and attaining status as a 'great player'. Ego-boosting appears to be one of their primary motives. The following is an excerpt of an A1 player (male early twenties) demonstrating his superiority of the other players to his friends.

> [Player moves through the arcade, with an entourage of friends (parallel Arcade Kings and Apprentices, Fisher, 1993) pointing to the left, saying in a loud voice]
>
> "He's playing that. I ripped that." I., age 21, male
>
> [and pointed to the machines on the right,]
>
> "He's playing that. I ripped that."
>
> [Pointing to the left again]

> "He's playing that. I ripped that." [his audience that followed was laughing].

This was mentioned several times as the player made an exit. Here, the A1 player is trying to inform his audience that he is one of the most skilful players in the arcade. By "ripping" the player is referring to winning so much money, that the machine barely has any coins left in the hopper or tubes (the facility for accepting and distributing coins), implying that it is unlikely that current players will win.

8.2.2.2. Type A2

The A2 is considered to exhibit high levels of ability and exposure but low levels of control. The A2 often has as much knowledge and understanding or fruit machines and probably plays as frequently as the A1. However, the fundamental difference of the A1 and A2 lies in self-control. The A2 is very sensitive to the frustration of losing and the perceived injustice of the adaptive logic. An example would be consistently losing a 'hi-lo' gamble in ordinarily favourable situations (e.g. choosing lower than 11 on a 12-number reel and getting it wrong). The frustration seems to be sometimes exacerbated by the acknowledgement that to continue play was the incorrect decision as they suspect a relatively low MIMO ratio. It is probable that this will only enhance cognitive regret.

> [male late twenties in a casino] "Should have left it £40 ago when I was only down 30. As usual it was boxing on the first credit now its not giving me nothing. I can't leave it now."

The A2's feel regret for playing a machine where they get initial cues that it has a low MIMO ratio. This feeling of regret and frustration may reduce rationality and promote an aggressive defence in trying to 'beat the machine'. Perhaps this is the excitement for the A2s; the attempt to recover difficult situations. With an initial investment and the MIMO ratio beginning to increase, chasing will often ensue and in many instances, such poor control will imply that the A2 gambles until there is nothing left or until they have won a jackpot. Unfortunately, if they start playing when the MIMO ratio is low, this usually means that they will have spent more than they have won. As the A2 has a good understanding of the fruit machine behaviour they may be aware of predatory behaviour and that their reckless chasing is probably

acknowledged by experienced players, and they acknowledge that they are targets for skimming.

> [male, late fifties to arcade staff] "Keep them [other spectators] away from me they are after my machine."

The social aspects of gambling are not of great importance to the A2 player and are not influenced by social reinforcement or peer appraisal, therefore aggressive or emotional outbursts are common. In fact, such aggressive outbursts may be acts of defence against 'predatory behaviour' or even to vent frustration that builds up. The A2 gambling strategy often initiates as cautious and rational. However, after a short period of time the patience and discipline erodes and the A2 begins to gamble more recklessly (by going on 'tilt' [Browne, 1989]). Essentially, the combination of high ability and low control in the A2 is a dangerous combination, facilitating an obstinence that can lead to very heavy losses.

8.2.2.3. Type A3

The A3 gambler is characterised by low ability, low control and high exposure. They generally, have a poor knowledge of how fruit machines operate and poor self-control. Often the high frequency of gambling from the A3s is socially motivated. Older gamblers are prone to being in this category because they often have more leisure time and a weaker grasp of new technology. A3 gamblers often neglect to acknowledge that fruit machines exist to make profits, and that the probability of making a profit is slight. The A1 gambler realises this and will only decide to play in optimum conditions with strict discipline. The A3 will have little knowledge of payout ratios, MIMO ratios, modes of machine play, and will probably adopt a similar style of play across all games instead of applying appropriate strategies on different machines. The A3 will have less skill or experience while playing features rendering them unable to capitalize on all winning opportunities. The A3 will be attracted to the machines where winning is primarily through symbol matching because of their simplicity.

Those A3 players who try to adopt similar styles of play of A1 and A2 often are unable to sustain the strategy, for example playing two machines at the same time.

An A1 player has the concentration and the reflexes to play two machines at the same time. Below is an excerpt of a situation demonstrating poor ability and control in a woman in her sixties in an arcade:

> *Manager:* " G*** always tries to play 2 machines at a time like N***. Firstly she picks 2 machines at opposite ends of the arcade. Leaves credits in one while playing the other, not watching of course. So a Chinese guy ended up taking the credits by accident"
> *Researcher:* "What did she do?"
> *Manager:* "She pushed him in his face. I had to remove her, crying as usual."

As described, A3 players have a difficult time in containing their emotions. Similar to A2s they have a propensity to chase losses out of frustration, instead of rationally making a decision about the situation. The motivation to gamble may have initially been social, however, after incurring losses, the A3 may chase and therefore gamble 'on tilt'. The probability of retrieving losses will be decreased because of the A3's lack of skill and knowledge (i.e., low ability) of what strategies to employ on which machines.

8.2.2.4. Type B1

What primarily separates a B1 from an A1 is frequency of gambling. The B1, similar to the A1, is highly knowledgeable and skilful in fruit machine play. They understand the main source of profit comes from 'predatory behaviour' and that in order to avoid significant losses they must exhibit a level of control. Essentially, this means avoiding chasing losses and being able to accept small losses, by remaining detached from the pull factors of the fruit machine such as 'cognitive regret'.

Fruit machine gambling maintains a secondary role to the B1 in comparison to A1 where the gambling is salient in their everyday lives. The B1 acknowledges that there are more important issues in everyday life beyond slot machines, especially one's family, career and even social lives. The B1 perceives fruit machine gambling as a leisure activity which is engrossing and enjoyable. However, their ability to limit their amount of time spent gambling perhaps is evidence of their acknowledgment that fruit machine gambling is potentially 'dangerous' and should be limited to a leisure pastime. The following exchange is a good example of this;

> *Researcher:* "Do the slots ever interfere with your job?"

> *Respondent*: [male, late twenties] "Oh yeah…I actually stopped coming in before work. I come in after. The last thing you want is to be into a machine for notes and have to leave it for work."

The B1 places more value on significant others and functions better socially when compared to the Type A's. However, it is difficult to conclude whether this is a cause or an effect of gambling less frequently. The following is an exchange between an A2 and B1 highlighting such differences;

> *Researcher*: "Do you ever leave a machine or not play a machine you think is going to payout because you simply don't have time?"
> *B1*: [male late twenties] "Yeah, when I got to meet the 'bird', she hates them [the fruit machines] and if she thought I didn't turn up 'cause I was in here it would be over".
> *A2*: [male early thirties] "Boy got his priorities all wrong."
> *B1*: "Give me a fine piece over a run on one of these any day, mate" [laughs].

B1s function well in society as a whole. They can control their participation in the activity, and view fruit machine gambling as secondary to their careers, education, family, and social activities.

> *B1*: "These guys got no lives. I am not going to lie, chilling here is good yeah, but I don't want to end up like those guys in their seventies with 2ps in a plastic bag."

8.2.2.5. Type B2

The B2 is classified as exhibiting low exposure, low control, and high levels of ability. Similar to the B1, the B2 participates less frequently in fruit machine gambling than the Type As. The difference lies in the B2's inability to control their gambling behaviour when they are actually gambling. Although the B2 is knowledgeable about how the fruit machines work and they have an inability to act rationally instead of emotionally, they are susceptible to the 'pull' factors of the fruit machines such as the near miss, cognitive regret, experiences of frustration and anxiety when losing. Such experiences make it difficult to cease playing a machine, through making a rational decision to accept a loss instead of continuing. The B2 is often driven by recouping past losses, something which seems logical to them given the adaptive logic of fruit machines discussed in chapter 6. Unfortunately this concern overrides other factors which the A1 or B1 may consider, such as how much the machine has paid out on previous occasions, and the probability of making a profit from their current position. The B2 is often determined to obtain what they perceive they are owed from a slot machine. For example, if they have spent £100 and payout

ratio is 72%, they will not be happy until they get "their £72 back". If they are successful, not only is their financial situation improved but they neutralize the risk of a skimmer winning back their money (the A1 or B1 will prioritize financial considerations over protecting themselves from skimming). Unfortunately, such determination usually leads to losses. The following example demonstrates such persistence:

> *B2:* "I know exactly what its up to but I am already in for a few quid so you say to yourself it should offer me at least half back soon. Before you realise you are in for big money and there is no way your going to leave it for some bloke to rinse it."

The B2 when outside the gaming environment has strong control over frequency of fruit machine play. However, once they have made the decision to play their self-control diminishes. When the B2 is gambling, they will often chase losses and go on 'tilt'. After the gambling session, it is common for the B2 to rationally evaluate the behaviour as reckless and problematic. As a result the B2 may take a decision to minimize play frequency, and this probably accounts for why they gamble less frequently than the A2s. However, their behaviour appears to be cyclical. After a 'time out' period, they may conclude that they do possess gambling skills and knowledge, and that if played conscientiously the activity is harmless and possibly profitable, only to once again chase incurred losses. This is demonstrated in the following excerpt;

> *Researcher:* "If you know when you go into the arcade that you invariably lose, why do you still go in?"
> *B2:* [male late twenties] "You think…if I only play machines that are boxing then I wont lose. But its like if you mess up a jackpot feature, that's you hooked. You won't get off until you get that jackpot out no matter what you are down."

8.2.2.6. Type C

Type C accounts for all the other combinations of the three specified criteria that have not been included; a category for players not otherwise specified. Type C tends to include those who display a passing interest, particularly those who play as a result of secondary motivation (e.g., playing a takeaway restaurant while waiting on their order or playing briefly in the pub with loose change). This classification also accounts for senior citizens who play infrequently while on holiday. It incorporates friends of gamblers who play fruit machines while waiting for their friends to finish gambling. Finally, it also includes the beginner. The beginner may of course, be any of the three

Type Cs previously mentioned. Essentially, the Type C accounts for new players, whether that new play is incidental or driven by curiosity. Being new to playing fruit machines, Type Cs necessarily have a poor understanding of how they operate. Here are examples from a novice player:

> C: [female, sixties] "I put in over a tenner in this. If it is supposed to payout at least 70% where is my seven pounds. It didn't give me seven pounds. The way I look at it sooner or later you have to win. It is the law of averages. That's what it comes down to. Just have to be patient."

Similar to the A3, the C may be primarily motivated to visit sites for social reasons. The elderly will often be classified in this category because of their relative lack of understanding of technology, and poor conception of how the fruit machines operate in terms of probability and MIMO ratios. The C player may gamble less frequently than the A3 because of restrictions, such as lack of gambling funds or familial commitments. The fact that such variables are perceived as restrictions is a positive indication that fruit machine gambling plays a secondary role in player's life.

8.3. Discussion

8.3.1. Summary

The aim of this chapter was to provide a typology of fruit machine gamblers in the United Kingdom. It aimed to extend and build on previous work by Fisher (1993), by including adults, using a variety of locations, giving consideration to changes in technology and legislation, and most importantly identifying clear criteria for membership. It was also important to minimize any overlap between groups so that classification to a particular type is mutually exclusive.

Six subtypes of fruit machine gambler were observed based on three criteria; ability, control and exposure (time). Type A1 players (high ability, high control, high exposure) prey on other players in the environment and therefore react negatively to being observed themselves. They assimilate knowledge through trial and error but also through sharing information among other A1 players. They always have sufficient stake when playing in peripheral sites (as change is not always available). A1 players seem to enjoy social reinforcement and therefore self-esteem might be a significant motivational factor.

A2 gamblers were similar to the A1 except they primarily exhibited low levels of control. They tend to be too emotionally involved in terms of cognitive regret and frustration, and were determined to chase money as a principle, even at the expense of losing money. The combination of high ability and low control means that they are a high risk player. The A3 player (low ability, low control and high exposure) tend to be socially motivated, and spend substantial time in these environments as they may not have anywhere else to go. They have a weak grasp of technology and usually play simplistic machines (symbol matching only). They are especially vulnerable since they can not always take advantage of winning opportunities (i.e., they cannot maximize profits from skill features).

All Type B's and the Type C vary from Type A as a consequence of the amount of time spent gambling. Type As could be described as 'full-time gamblers' whereas the rest may be classified as 'part-time'. This distinction signifies that the B1 gambler (high ability, high control and low exposure) usually limits time spent in the gambling environment as they realise the potential dangers. Although they enjoy gambling and possess considerable skill, gambling occupies a marginal place in their life behind family, friends, work and other priorities. The B2 player (high ability, low control and low exposure) has high levels of control outside of the gambling session. However patience and discipline dissipate within session. Consequently, problem gambling tends to be cyclical, infrequent but ultimately destructive because it erodes time, money and self-esteem. Type C gamblers include those not otherwise specified – primarily relating to new players who may or may not progress to another type.

8.3.2. Implications for problem gambling

In terms of predicting pathological gambling, several clear conclusions can be drawn (summarised in Table 8.2). A1 players are only at moderate risk because they have such high levels of control. They are at potential risk of developing problems as they chase losses, with the expectation that the machine will eventually payout. Even if the findings from previous chapters are correct, and the MIMO ratio does have a positive impact on profitability, there is a still a chance that players may have misinterpreted cues regarding the MIMO ratio (e.g. a boxing machine which may have been recently refilled if the previous player won a large amount of money). Players may also over-estimate the money deposited and under-estimate the money which has been paid out.

Furthermore, simply by virtue of their play frequency, and time spent in these environments these players will 'leak money' as a result of the house edge (usually between 20-30%). Although they have more discipline than A2 players, they too succumb to recouping past losses as a result of the adaptive logic of machines described in previous chapters. The part-time equivalent (B1) may be less at risk, as not only do they possess high levels of skill and control, but they have a realistic perspective regarding the motivation for gambling. Since these players do not consider gambling priority in their life they are unlikely to spend enough time or money to classify their behaviour as "problematic".

Table 8.2:
Risk of pathological gambling by type

Type	Risk
A1	**
A2	****
A3	**
B1	*
B2	***
C	*

* - least at risk; **** - most at risk

Table 8.2 indicates the level of risk for pathological gambling by the number of symbols attributed to each type; * represents least at risk and **** denotes most at risk category. It is argued that A2 gamblers are the category most at risk of developing gambling problems. A high level of skill and knowledge coupled with poor self-control is a precarious grouping of criteria - particularly when they gamble frequently. The high ability, while assisting in game play also serves to instil a false sense of security and over-confidence. They are less cautious than any other types, particularly at the beginning of a session. Where an A1 might wait and evaluate which machine is most profitable to play based on estimating the MIMO ratio, the A2 may impatiently select a machine at random with the expectation that their skills may be sufficient alone to ensure profitability. B2 players are also at high risk for the same reasons. However, self-control outside of the gambling session will limit potential problems.

A3 players are considered to be at moderate risk of problems. They often spend more than they can afford, and this is the key risk factor. However, because of their low

level of ability they are much more cautious and selective in how they play, compared to the A2 and B2. It seems that loosing money through gambling is the price they pay for leisure and having social interaction. In terms of the type C gamblers, there is minimal risk of pathology. However, this is only because for many, inclusion in this category is transient as some will move on from experimentation and progress to regular play, at which point they will be classed as type A or B.

8.3.3. Implications for treatment

It is beyond the remit of this current research to consider the merits of various types of prevention and treatment of problem gambling. Nevertheless, it may be useful to briefly speculate on possible treatment implications from this typology. This is consistent with aims for this typology to offer real applications in terms of treatment and prevention in addition supplementing the literature. These suggestions are summarised in Table 8.3.

Table 8.3.
Implications for treatment based on type

Type	Possible Treatment	Aim
A1	Lifestyle Change	Controlled Gambling
A2	CBT	Abstinence
B2	CBT	Abstinence
A3	Refocus Social/Leisure	Abstinence

Given that A1 gamblers possess high levels of control it was concluded that they were at risk principally by virtue of being in the gambling establishment for long periods of time and requisite "ego-boosting" through "showing off" to spectators. Based on the observations and conclusions in this research, it is proposed that this type of player may not benefit from any formal treatment as such but rather by shifting the focus of their lifestyle. They would require guidance in terms of motivation and career development. Many A1 gamblers which were identified were unemployed and therefore, it makes intuitive sense to help develop their livelihood and give them worthwhile priorities outside gambling. This strategy should aim to reduce time spent in the fruit machine sites, but in addition might reduce the need for social reinforcement by enhancing self-esteem through healthier channels. It is suggested

that if this can be achieved then A1 players may continue to gamble as a low-risk leisure activity.

Both A2 and B2 players might benefit from formal treatment since the emotional involvement, high level of risk and lack of control might suggest an underlying neurosis, biological deficit, or the use of cognitive distortions. Therefore, there may be some similarities between the A2 and B2 player types and the "emotionally vulnerable" or "antisocial impulsivist" gambler identified by Blaszczynski and Nower (2002). There are a variety of options including psychodynamic psychotherapy, 12-step programmes, pharmacological interventions and behavioural techniques. As mentioned, deciding which of these is most appropriate is beyond the scope of this discussion. However, it would seem that cognitive behaviour therapy (CBT) may be particularly relevant given the need to the address the cognitive processes behind their excessive chasing behaviour. CBT might challenge beliefs relating to the importance of ability in winning. In other words, skill and experience may not be enough to prevent problems from developing in their play. This type of therapy can offer skills training in self-control and discipline which might assist in harm minimisation should the patient reject abstinence as their treatment goal. Fruit machine players may be prone to dissociative states (Blazscsynski, 1996) when losing or playing for long periods of time. Cognitive interventions may have a vital role to play in raising awareness. For a good example, see Griffiths (1995) use of audio playback therapy. Griffiths tape-recorded verbalizations of fruit players during play. Players reported feeling embarrassed upon hearing the recording stating that it helped them see the futility of their gambling.

In terms of the A3 player, the solution may be social rather than psychological. If these players are socially-inclined, where the primary motivation is distraction and belonging, then perhaps the motivation to gamble is only secondary. It is suggested that prevention and intervention strategies should be attempted in this case by offering guidance on social development. These players may in fact benefit from joining clubs and associations where gambling is not offered. Here, they can interact with similar individuals, without the risk of losing money through gambling. The A3 player possibly began gambling because was the most accessible social meeting place they could find; one where they could interact all day, every day getting complimentary

beverages and snacks. If so, then perhaps they could be assisted in locating cheaper, healthier and more congenial social environments to replace the amusement arcades, LBOs or casinos.

8.3.4. Progression between stages

It is suggested that movement between types can occur in two ways. Firstly, through development of ability, a beginner (Type C) may progress to a Type B or Type A. This conclusion is consistent with Fisher's (1993) observation that Apprentices may eventually develop enough skills and experience to become an Arcade King. Secondly, at levels one, two or three, changes in time spent gambling (exposure) may change their status from A to B, or vice versa. For example, if an A1 begins full-time employment they are likely to reduce their playing hours and would then be classified as a B1 player. After a player progresses from being a beginner (movement out of Type C), it is suggested that change rarely occurs in either ability or control. Notwithstanding these two exceptions, the classification of players according to this typology is generally static and unchanging (as there was no evidence for changes in level of control).

8.3.5. Predictive value and situational preferences

Aside from implications for problem gambling and treatment, this typology offers other predictive values. For example, situational preferences can be assessed based on membership to specific types. It would be more likely to find an A1 or A2 in an arcade environment, and a B1 or C in peripheral sites such as a pub or licensed betting offices. The A1s will establish themselves within an arcade where they can familiarize themselves and equip themselves with knowledge in order to maximize profitability. For example, they will want to know the abilities of most of the players; so that they know from whom they should skim and whom they should befriend (and share information). They will prefer the arcade since they can become friendly with staff. This offers benefits like getting tips on loose machines and being given some freedom in terms of skimming behaviour. The A3 on the other hand, will choose the arcade because it offers more social opportunity than other environments.

Type B1 will prefer peripheral environments as they do not have the specialist knowledge mentioned above, without which they know they will be at a disadvantage when competing against the A1 in an arcade environment. They know that if they gamble in pubs, licensed betting offices, or casinos, they will have the better chances of success, as they will consider themselves on an equal footing. Type C will usually be found peripheral environments, as they are secondary fruit machine gamblers. In other words, when experimenting with fruit machines they are usually satisfying a primary need such as drinking in a pub or betting on horse racing in the betting office. Of course, all of these examples represent general predicted trends, and presence of all types can be found at all sites at some point or another.

Finally, it should be acknowledged that there may be some limitations regarding the typology. In addition to the lack of precision such a typology may have in determining the financial performance of the various types, it fails to identify the relative distribution of such types across various sites. While the author is confident that this typology accurately reflects players in the amusement arcade and casino, it could be that it holds less relevance to the other peripheral sites such as pubs and LBOs. There is no obvious reason why such a typology would not apply in these environments. However, opportunities to observe player interaction were few, given the small number of machines on site (usually one or two). In this context, fewer cues could be observed regarding the category membership of players.

Essentially, this chapter critically develops our understanding of fruit machine gambling in the UK, by integrating information regarding current situational and structural characteristics, and updating Fisher's (1993) previous typology. In doing so, in-depth information has been established regarding player behaviour, and suggestions have been made regarding who may be at risk of developing problems. Suggestions have also been offered regarding possible directions for the treatment of such gamblers. It is hoped that this research will broaden the understanding of fruit gambling in the UK so that those interested may better know who they researching or treating.

CHAPTER 9
SITUATIONAL AND STRUCTURAL
FACTORS IN FRUIT MACHINE GAMBLING:
A QUALITATIVE INVESTIGATION USING FOCUS GROUP INTERIEWS

9.1. Background and Aims

One of the key findings from Chapter 4 was that a belief in skill being important in fruit machine playing was likely to predict a better overall financial performance per session. Based only on findings from Chapter 4 it was neither possible to conclude why player believe this to be the case nor what kind of real effect skill might have on determining the outcome of fruit machine play. Findings from Chapters 6, 7 and 8 clarified the perceived role of skill in fruit machine gambling in terms of operating and selecting a machine. Machine selection was considered to be the most influential in improving a player's chances of winning, in the short-term, as well as potentially in the long-term. It was concluded that a skilful selection was based on identifying machines with a higher 'money-in-money-out (MIMO) ratio' primarily through techniques such as skimming and boxing. Consequently, a high level of importance was attributed to structural and situational factors such as the MIMO ratio, skimming and boxing. However, it was also concluded that persistent and excessive play may be a risk to players if they overvalue the utility in using such techniques or getting information on the MIMO ratio.

Other situational and structural factors were also identified as being important in fruit machine play. It was suggested that structural factors such as feature games, secret functions, sophisticated near misses, music and verbal interaction may also play a role in increasing winning beliefs, discounting losses, increasing player involvement and choice and increasing skill orientations. Situational factors such as ambience, bonuses, access to change and additional monies, social facilitation and comfort may also have implications for player behaviour in terms of increased exposure, skill orientations and arousal.

These findings and conclusions thus far have relied heavily on observational methods which, as previously discussed, can be limited in terms of subjectivity, and the potential for the observer to miss critical data in the field. Consequently, the aim of this chapter is to give players a voice to discuss the situational and structural factors identified in

previous chapters. Through focus group interviews, groups of frequent and infrequent players will consider the importance of situational and structural variables in fruit machine gambling. This will be done using a three-phase approach:

1) Asking participants to identify and discuss (without any prompts) design-specific and site-specific factors which they consider to be important fruit machine playing;

2) A scoring and ranking task where participants will rate situational and structural factors in terms of importance and then rank factors in an abbreviated list of the 'top 5'. This will be from a list of 33 factors including those identified in previous research and those identified in the observational phase of this research;

3) A more focussed discussion on some of the key factors such as randomness, skimming and jackpots.

The general aims of this study, where appropriate, are:

a) To corroborate findings and conclusions reached in previous studies relating to situational and structural factors, and to consider evidence which may run counter to previous claims;

b) To build, where appropriate, on the level of detail and understanding associated with situational and structural factors in fruit machine playing where previously identified;

c) To identify new factors which may been ignored by previous research.

9.2 Method

9.2.1. Participants and Recruitment

Three tape-recorded focus group interviews were conducted with 22 individuals who played fruit machines within the past year. Two researchers were present during each focus group; one to facilitate dialogue and mediate the group, and one to deal with administrative tasks such as taking written, informed consent, note-taking on the order in which participants spoke to aid transcription, and providing refreshments. Of the three groups, one comprised of infrequent players (playing once a month or less) and the other

two comprised of frequent players (playing at least on a bi-weekly basis). This sample lived up to its reputation as a hard to reach population as discussed in Chapter 3. In order to recruit the 22 participants overall, a three-pronged recruitment strategy was used. This included advertising in the local daily newspaper, distributing 'recruitment cards' at gambling sites over a two-week period (See Figure 9.1), and by advertising on a university campus using flyers, e-mails and recruitment cards.

Figure 9.1 Recruitment cards used on gambling sites and around campus

Participate in Group Discussions on
Fruit Machine Gambling with
Nottingham Trent University

Each Participant Paid £20 in Tesco Vouchers
Sessions last about 1 to 2 hours

For more information contact Jonathan at:
gamblingresearch@ntu.ac.uk or
Phone 07984538183
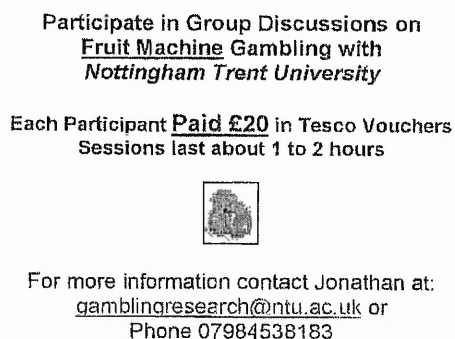
Out of 45 replies from individuals, 24 (8 participants per group) were able to attend the focus group location at appropriate times for focus group meetings. Two participants from the infrequent player group (Group 1) failed to arrive and to notify the researcher. A summary of participant details is presented in Table 9.1.

As demonstrated in in previous research (Griffiths, 1990, 1991, 1993; Huxley & Carroll, 1992; Fisher 1993) young males are the largest demographic representing fruit machine players. The participants in this study reflected this, with 20 of 22 participants being male and 20 of the 22 participants being under 40 years of age. However, it is acknowledged that the sample is biased in favour of this demographic despite various attempts to get broader representation in terms of age and gender. It ignores the second biggest demographic (females over 50). Recruitment attempts in the field to recruit older players or female players were met with some resistance, usually at the point of approach (this reflected either a lack of time or concern that they may not add anything to the focus groups).

Table 9.1 Participant Information

Gender	Age	Recruitment	Group No.	Play Frequency
19	Male	Card	1	Infrequent
47	Female	Newspaper	1	Infrequent
45	Male	Newspaper	1	Infrequent
22	Male	Card	1	Infrequent
23	Male	Campus	1	Infrequent
24	Male	Card	1	Infrequent
19	Female	Newspaper	2	Frequent
20	Male	Newspaper	2	Frequent
20	Male	Campus	2	Frequent
21	Male	Campus	2	Frequent
21	Male	Campus	2	Frequent
19	Male	Card	2	Frequent
21	Male	Card	2	Frequent
19	Male	Campus	3	Frequent
20	Male	Campus	3	Frequent
20	Male	Campus	3	Frequent
25	Male	Card	3	Frequent
20	Male	Campus	3	Frequent
21	Male	Campus	3	Frequent
20	Male	Newspaper	3	Frequent
20	Male	Newspaper	3	Frequent

9.2.2. Focus Group Materials and Procedure

Focus groups lasted between 85 and 120 minutes, and took place within three days of each other. Participants were compensated with £20 in supermarket vouchers as an inconvenience allowance and as a measure of thanks for their participation. Participants were also provided with refreshments (sandwiches, pastries, biscuits and soft drinks) during the session. The focus group protocol was based on questions and prompts that related to situational and structural factors associated with fruit machine play. Topics to be discussed included some general questions on gambling and related preferences, questions related to fruit machine preferences for machine design and environment, and more focused questions on randomness, skimming and jackpots. A full copy of the focus group protocol (structure of session, questions and prompts) is provided in Appendix 3. During the session, participants were also asked to complete a scoring and ranking task

(see Appendix 2) where participants scored how important each factor was to fruit machine play in general, and then were asked to rank the top five most important situational and structural factors. The aim of this task was to (a) stimulate further debate during the session giving further ideas for discussion points and (b) collect some basic quantitative information which may guide large-scale quantitative studies in the future.

9.2.3. Analysis

Focus groups were selected as the research method to realise the four aims of this study. One of the reasons for using this method is that they are useful for extracting multiple perspectives on a potentially straightforward topic and for eliciting subtle information that might have otherwise been ignored (Slavin, Batourney & Murphy, 2007). This may be especially true of a behaviour, such as fruit machine playing, which has a considerable albeit implicit social component (e.g., skimming). It has been suggested that focus groups have both advantages and limitations as a form of data collection. Whilst they encourage less inhibition from participants, allowing a topic to be flexibly explored with the moderator able to follow up on emerging themes, and participants 'bouncing off' one another and prompting memories to enhance the exploratory information generated, focus groups may attract a biased sample of participants who are more extroverted than the general population, and can also cause participants to conform due to the effects of social desirability (Byers & Wilcox, 1991). Thematic analysis was used to analyse the data. There are essentially two types of thematic analysis based on either (a) an inductive approach (data-driven) using a constructionist method or (b) a 'top-down' approach which is theory-driven (Braun & Clarke, 2006).

As this research was carried out in the context of a developing theory on situational and structural factors in fruit machines and their role in player's intentions and skill perception, this study employed the latter.

Table 9.2 Phases in thematic analysis

Phase	Description of the Process
Getting familiar with data:	Data transcription, establishing initial ideas and re-reading the data.
Generating inititial codes:	Systematic coding of anything interesting in the data
Searching for themes:	Collating codes into potential themes and matching units of data to each potential theme
Reviewing themes:	Generating a thematic map by checking if themes work in relation to the coded extracts and the overall data set.
Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, geneating clear definitions and names for each theme.
Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extracts, final analysis of selected extracts, consideration of themes in relations to study aims, producing scholarly report of the analysis

Source: Braun and Clarke (2006, p. 87)

An inductive approach is argued to be useful since it considers data with no preconceptions about what the researcher 'should' find. However, a theory-driven approach is argued to be effective because the experience of a topic or knowledge regarding a theoretical position may permit the researcher to find subtle nuances and themes that a fresh reading would not allow (Braun & Clarke, 2006). During analysis, transcripts were read several times in detail, while making notes and developing ideas regarding the construction of themes. Themes, sub-themes and extracts were reviewed and reorganised until a coherent set ideas could be finalised which addressed the aims of the study. This procedure for analysis followed six-step approach as identified by Braun and Clarke and is summarised in Table 9.2.

9.3 Results and Initial Discussion

9.3.1. Ranking and Sorting Task

A summary of players' top five most important factors to consider when playing fruit machines is presented in Table 9.3. Players across all three groups on average rated money paid and money paid out of a machine as the most important. With each of these two factors being ranked either 1st or 2nd by nine players they were valued more than other factor previously identified.

Table 9.3 Participants top 5 most important factors in fruit machine playing

Factor	Ranked 1st	Ranked 2nd	Ranked 3rd	Ranked 4th	Ranked 5th
Money Deposited	4	5		1	2
Money Paid Out	6	3			
Background Music				1	
Change Availability	1	1	2		1
Temperature		1			
Ventilation					1
Refreshments		1	1		
Toilets				1	1
Many Spectators	1		2		
Low Stake Availability				3	
High Stake Availability	1		1		
Feature Game Availability	1		1	3	
Machine Bonuses			1		3
Secret Functions				1	
Boxing	1	1		1	1
Skill Involved			2		1
Interaction Involved	1		1		
Repeat Chance Availability			1	1	2
Familiar Theme				2	2
Sound Effects				1	
Lights or Flashing Sequences			1	1	1
Payout Ratio	1	2			1
Jackpot		1			1
Simplicity		1	1		
Bar	1				

Note: Any factors which were not ranked in the top 5 by any player were excluded

Excluding these two factors, there were no other trends in player preferences. The importance attributed to the remaining factors was quite varied with no other factor being ranked first more than once. Overall, 11 factors were not ranked in the top five by any player and these included: music played by the machine; availability of ATMs, seats,

auto-play or bank facilities; verbal interaction; colour of décor or machine; note acceptors; the availability of on-site bonuses, or whether they were many players gambling on fruit machines.

9.3.2. Thematic Analysis - "Finding MIMO": Utility and strategy in determining the money-in-money-out ratio

There were 37 situational and structural factors which were identified in the ranking and sorting task, therefore there were a large number of factors that could be have been discussed and analysed from the focus group data. The analysis which follows focuses on those overarching themes and sub-themes which were extensive, frequent, and consistent in terms of how they were represented in the data. There were several interesting themes that were raised in the data corpus concerning situational and structural characteristics, both previously identified (e.g. jackpot, familiarity, alcohol) and newly identified (e.g. site status, territoriality). However, these were not considered in detail, as (i) supporting extracts were often inconsistent, (ii) the themes received little coverage in the data (especially across groups) or (iii) they lacked coherence.

What follows is consideration of an over-arching theme, consisting of three superordinate themes and their sub-themes. Consistent with findings in previous chapters (Chapters 6, 7 and 8), the key theme extracted from the focus groups relates to the adaptive logic of fruit machines, and the implications this has for player behaviour, specifically when trying to gauge the ratio of money deposited to money paid out (MIMO ratio, see Chapter 6). This overarching theme is referred to as "Finding MIMO".

This theme consists of the participant's experiences and understanding of the role that adaptive logic (i.e. compensation or negative feedback control – see Chapter 6) plays in determining which machines they choose to play, and how they play them. The important aspects, as identified by players, were made up of two key considerations: (1) the money that had been deposited into a machine, and (2) the money that had been paid out of a machine. These were the two highest rated factors on average across all participants in the rating and ranking task.

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This theme represents a combination of situational and structural factors, as will be discussed below. Overall, this theme was comprised of three relevant sub-themes, which were MIMO Cues, Skimming (etiquette, strategies, protection), and Persistent Play. The overall structure of this cultural theme is summarised in Figure 9.2. This denotes the relationship between the three superordinate themes: MIMO Cues, Skimming and Persistent Play. MIMO cues are techniques used by players to gather information to make an informed judgement regarding the MIMO ratio. As concluded in Chapter 6, when players consider that that this ratio is high (i.e. that substantially more money has been deposited compared to money paid out) then they will be more likely to play and will consider the fruit machine as potentially more profitable.
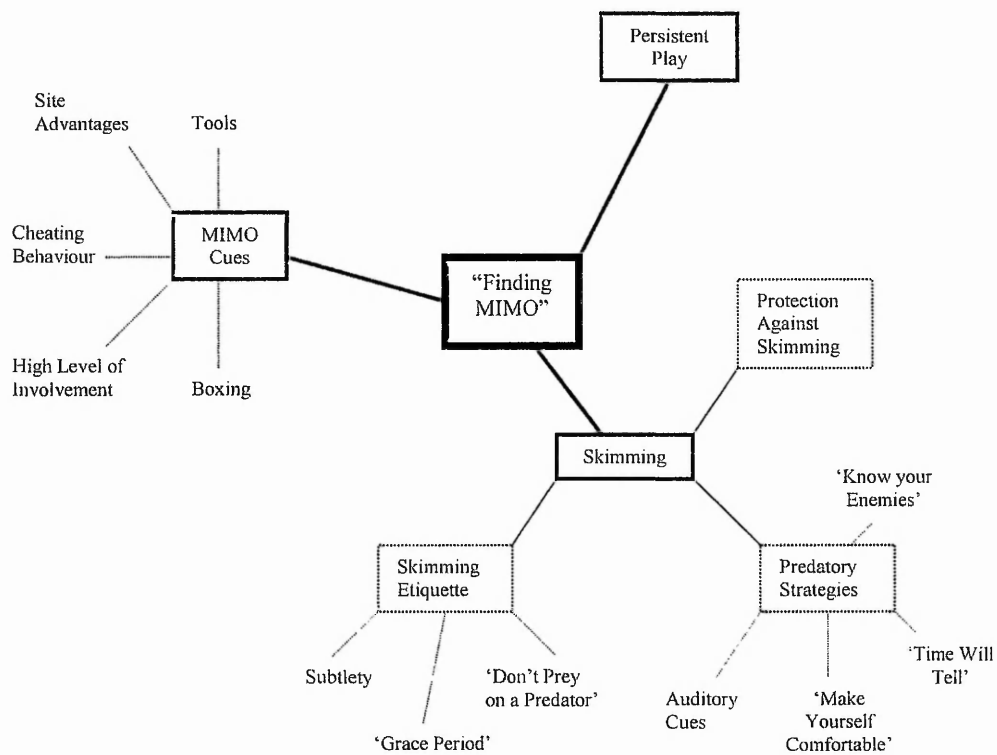
Figure 9.2 Thematic map demonstrating complexities of the overarching cultural theme: "Finding MIMO"

Part Four: Focus Group Interviews

In Chapters 6 and 7, it was speculated that despite the potential benefit of playing a machine perceived to have a high MIMO ratio, there may be some potential risks for players gambling excessively, or experiencing problems. This is consistent with the superordinate theme; Persistent Play. The data support an irony that was identified in chapter 6, namely that players may persist in losing situations, whereby motivation to continue may be proportional to how much has been lost. This is based on the players' interpretation of how MIMO works; if a fruit machine takes money in, it will eventually have to give some back. The third superordinate theme, skimming, has been previously identified in Chapter 7. Further insights have emerged from the focus group data which were useful, not only in terms of supporting previous claims, but additionally, in further developing our understanding of how skimming works, whom it affects, and the potential impact it has on player behaviour. While MIMO Cues and Skimming are precursors to "Finding MIMO", Persistent Play is a potential consequence of it. These superordinate themes and their sub-themes are each discussed in turn. Accompanying each quote is information about the participants in brackets including the respondent number, group membership and level of play frequency (i.e. frequent or infrequent).

9.3.2.1. Superordinate Theme One: MIMO Cues

A MIMO cue is a technique used by fruit machine players to identify which machines may be more profitable, fun, and more interactive. Previous consideration has been given to some techniques employed to measure the MIMO ratio (e.g. boxing – see Chapter 6), and it was also acknowledged that these could have an impact on profitability. However, it also became clear from the focus group data that some players consider that a high MIMO ratio can also have implications for making a machine more interactive and fun, through offering more opportunities to win, and more chances to use skill or chance to influence the outcome of play. Implications for player interaction were evident from the extracts, supporting these sub-themes is presented below. Overall, five cues were identified from the data which included: High Level of Involvement; Use of Tools; Boxing; Site Advantages; and 'Cheating Behaviour.'

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9.3.2.1.1. High Level of Involvement

Across all of the focus groups, players reported that if a fruit machine is 'playing well', this means that it could pay out in the near future. The players' experience of a machine playing well implies that it will be giving the player opportunities to win, and this usually requires the player to interact more with the machine:

> [R4, Group 1, Infrequent]: If you watch people on a fruit machine and they get a lot of involvement and they still have not won [...] that is when you go on it.

Players consider such interaction to be frequent and immediate:

> [R1, Group 3, Frequent]: If you have a few pound coins and you put 50p in and then on your first go it says that you have three nudges then you think you have a good chance, if it gives you three nudges on that first go then you are more inclined to stick your money in.

> [R2, Group 3, Frequent]: It's how many times you get on the board as well. If you get on the board a lot and it's just like pretty much every £1 [of credit] you get on the board. You have to familiarise yourself with the machine as well, the more you play it the more you know it.

According to players, the reverse is also true, whereby a lack of interaction may signal a low MIMO ratio and therefore a potentially unprofitable situation:

> M: How would you describe what the raking in period is like?
> [R1, Group 3, Frequent]: If you just put money in and you are not getting on the board and not getting any nudges or holds
> [R2, Group 3, Frequent]: Yeah if your money is just going down and down and getting nothing.
> [R4, Group 3, Frequent]: You are not getting any interaction with the machine and you are just wasting your money.

9.3.2.1.2. Tools

A player in Group 1 suggested that there was a more direct means of testing the MIMO ratio and that is by using a tool referred to as a "refill key":

> [R4, Group 1, Male, Infrequent]: Certainly with a lot of players I know they have a refill key. With that you can tell how much money is in the machine and you can tell if the machine is full. What will happen is that the machine will not pay out until it is back to the top level so it is nearly full again.

Refill keys are used by staff to determine which machines are low in pound coins in order to decide which to need be 'refilled'. If these are available to players, it could be the case that this tool would give players immediate, exact and reliable information regarding money deposited and money paid out. However, there would seem to be two issues that

need to be explored further. Firstly, the availability of such keys is questionable. If they are intended for staff use, then the only source of such keys would be from gaming staff (probably management) or the manufacturer. Secondly, and perhaps more crucially, the use of such a key might prove difficult given the level of supervision in most gambling environments, and that this may even be considered an illegal activity.

9.3.2.1.3. 'Boxing' or 'The Drop'

Boxing as a concept has been thoroughly explained and discussed in Chapter 6. This refers to listening to coins bypass the payment mechanism and drop to the bottom of the machine to the draw box (i.e. a device used to collect profit from fruit machines) which players reason indicates a 'full machine' (i.e., has not paid out). The players describe this in the following way:

> [R3, Group 3, Frequent]: Another cue is when you hear the money drop and then you know the machine is going to pay out.

> [R1, Group 3, Frequent]: Just hearing the money drop, then you may look up or have a glance across.

However, it was interesting to note that an 'infrequent' player reported that such a technique is now obsolete:

> M: From other research we did, some people argued that there is a backing sound, and if you put a £1 coin in, and the pot is full and it bypasses to the bottom.
> [R4, Group 1, Male, Infrequent]: A lot of machines fake that.
> M: Previously would that have been a bona fide method?
> [R4, Group 1, Male, Infrequent]: Yes, 7 or 8 years ago.

Therefore, based on evidence available from focus group data, there is mixed support for the utility of boxing as a means of discovering the MIMO ratio. This is consistent with conclusions from Chapter 6 where refilling machines, fake 'boxing' sounds and 'covering devices' (i.e. dropping coins intermittently) were all considered to undermine the confidence that players can place in using a such a technique to determine machine selection.

9.3.2.1.4. Site Advantages

Some players reported that the site itself can yield information regarding the MIMO ratio if it is cross-referenced with player trends and associated temporal factors. For example, some players argued that by playing in pubs and nightclubs, you can locate higher MIMO ratios in the late evening, as players will often be intoxicated or distracted, and may spend more money than intended and may not be taking all opportunities to win:

> [R6, Group 2, Frequent]: I have used them [fruit machines] in a club towards the end of the night and when I think that a lot of people have been on it.
> [R3, Group 2, Frequent]: You also try and win the jackpot when you are drunk whereas in the daytime, you will play and maybe get £10 but when you are drunk you are determined to get more money and want to get the jackpot.

Participants did not comment on whether they themselves would be intoxicated which may counteract any potential site-related advantages. This needs to be examined further in future research. However, some players did comment on their own personal experience of distractions for their own play in such sites:

> [R6, Group 2, Frequent]: Um.....nightclubs, but you do not really concentrate as you are trying to pull birds. It is a very clever place to have them as you put your money in and just walk off as there isn't even the interaction.

9.3.2.1.5. 'Cheating Behaviour'

This particular cue is related to a 'High Level of Interaction' as described above. Players argued that in addition to level of interaction, they could also gauge potential profitability by avoiding situations where unlikely outcomes were determined in favour of the fruit machine. If a machine has a low MIMO ratio, then it may need to increase the money deposited relative to money paid out. Participants suggested that, in such a scenario, a machine will present little opportunity for winning (as discussed above), or it will offer a 'perceived' opportunity that will rarely lead to win. Below a player reported an example which players felt was common in the context of a low MIMO ratio. What is being referred to here is a gambling opportunity using a numbered dice reel (usually numbered from 1-12). The player must decide whether to go higher or lower to win the gamble:

> [R6: Group 2, Frequent]: Or you get stitched up on the numbers where you get two and you go higher and it gives you a one.

Therefore, if a player gambled higher than a 2 and lost (of which there would have been approximately be a 9% chance), they would have interpreted this as the machine bringing money in (to satisfy the payout ratio) rather than paying it out. This was particularly the case when unlikely outcomes favouring the machine occurred in a sequence. As a consequence players may rationalize that this machine has a low MIMO ratio and therefore may not be profitable. These 'dead' periods play were reported, not just during gamble opportunities (as discussed above) but in other contexts such as feature games and bonuses:

> [R4: Group 1, Infrequent]: It is like J**** said. It cuts up your bonuses as it is giving you things to do.

The above player is referring to a situation where some interaction and the perceived opportunity is presented. However, the machine is argued to "cut up" opportunities (i.e. opportunities are ultimately fruitless) but because of a low MIMO ratio. In this way, as suggested in Chapter 6, it could be intended that players can get some interaction and value for money even in financially losing situations.

9.3.2.2. Superordinate Theme Two: Skimming

This was the most extensive, consistent and frequent sub-theme that came out of the focus group data. This technique was identified in Chapters 6 and 7, where it was concluded that this approach was adopted by experienced and skilful players as a cue (just like those other cues mentioned above) to a high MIMO and profitable play. According to focus group data, skimming is adopted by both infrequent and infrequent players:

> [R1, Group 1, Infrequent]: If you watch someone when they have hit the jackpot then you are not going to go on that machine whatsoever.
> M: Why is that?
> [R1, Group 1, Infrequent]: Because the payout ratio on that machine is not going to pay the jackpot two times in a row. The way that it will work is that someone will put more money and, more money in, and then it will pay out. And that will be a long time before someone hits the jackpot. If you watch people on a fruit machine and they get a lot of involvement and still have not won that is when you go on it.

> [R4, Group 1, Infrequent]: It is good for me 'cos the people that put money in the machines are the ones that don't go there that often and only playing as they are out for a

> drink and do not know what to do. So someone of my knowledge can go on the machine and win the money after they have left.
>
> [R2 Group 2, Frequent]: Say if you are in a pub and you are watching someone on it and they have not won and if they've been on it for 20 minutes or half an hour you've watched them put quite a bit in it. You think well I will put in a couple of quid myself.

A supplementary finding to those from Chapters 6 and 7 is that although players have a negative view of this technique and those who use it, most accept that it is part of the fruit machine sub-culture and they engage in this practise too:

> M: Points of view when an audience is, someone is, watching you, how do you feel about that?
> [R5, Group 3, Frequent]: Oh, you mean when they watch you and wait for you to come off and then play to get the jackpot
> M: Yes. Is there any word that you would use to describe that behaviour?
> [R3 Group 3, Frequent]: Scumbag
> [R5 Group 3, Frequent]: Yeah but at the same time I would do that. Not that I would watch them all night, but I would think haven't heard the machine go, I would think that I would go on.
> [R1 Group 3, Frequent]: It is like that episode in Friends when Phoebe goes to Las Vegas and the old woman goes on afterwards and wins it.
> [R5 Group 3, Frequent]: If someone looks over and gives you a few sly looks then fine but if they are constantly looking over your shoulder
> [R1 Group 3, Frequent]: Or if you lose because someone keeps talking to you constantly
> [R2 Group 3, Frequent]: It is really annoying and you lose all your money and they go on afterwards and win the jackpot.

Therefore, it may be that skimming is viewed as a two way process. However, as suggested by Respondent 5 in the above extract, it may be that skimming related behaviours are 'fair game', up until a point and that there are normally some kind of protocol to which one should adhere. This is considered in the next section.

9.3.2.2.1. Skimming Etiquette

Skimming protocol was only discussed by frequent players. However, across both groups of frequent players, the same three codes of behaviour were reported; (1) adopting a subtle approach; (2) leaving a brief pause before playing the skimmed machine; and (3) avoid skimming players where aggression or conflict could result. These are each discussed in detail below.

Subtlety

According to players, there are two ways to subtly position oneself, and these reflect either an active approach or a passive approach. The passive approach consists of

remaining unnoticed or inconspicuous whilst still being able to engage in predatory strategies:

> [R3, Group 2, Frequent]: I am subtle when I do it, I do not stand directly behind them and hoping that they are not noticing what you are doing.

The active approach is to engage with the players on a social level whilst all the time trying to portray an indifferent interest in their financial performance, but ultimately looking to profit from their loss if they leave empty-handed. This approach is captured in the following extract:

> [R3, Group 3, Frequent]: Don't be transparent and pretend be friends with them when in fact you are going to rip them off.
> [R2, Group 3, Frequent]: Do not make it obvious that you have been watching.
> [R1, Group 3, Frequent]: Yeah as you want them to put in as much money as they can and if they are not comfortable in that environment they will leave.

Even if an active approach does not achieve the aim of being subtle it may have the unintended but just as useful consequence of a premature departure of the player being skimmed, as suggested by Respondent 1 in the above extract.

'Grace Period'

Another important aspect of skimming etiquette, that was reported by a number of players, is a 'grace period'. There is an expectation among players that there should be a brief waiting period between completion of the previous player's game and the commencement of play by the skimmer:

> [R6, Group 2, Frequent]: Well if I have seen someone lose 30 quid on the machine I will not then go straight onto the machine after they have finished […] I would leave it.
> [R4, Group 2, Frequent]: There are some people that will go straight on the machine as soon as you have left it, but you should leave it for a few minutes.
> [R3, Group 2, Frequent] : The thing that annoys me when you think that they have finished and they have gone to the toilet only you don't know that they've gone to the toilet and they have left 10 pence credit on it and you know that they are coming back. Maybe not so much in a pub, but they do it in a club that I go to.

Based on the above extract, this gesture is a pause out of courtesy, in order to allow players a chance to return to the machine after any of a variety of brief departures (e.g., toilet breaks, ATM visits, getting change). It could be speculated that the grace period is also a means of withholding one's status as a skimmer, in that the player may casually

then stroll up to a machine after the grace period as if they had never been watching at all. This may be particularly true given how skimming as a practice is held in such low esteem (as suggested in the section on skimming above).

> [R2, Group 3, Frequent]: You can't go straight on. But you have to make sure that you are on next.

It also may be the case that some aspects of etiquette may be dependant upon certain conditions (as suggested in the above extract). As suggested in the following extract, a grace period may not apply if a skimmer is facing competition from other skimmers for the same machine. Offering a grace period in this situation may mean losing the machine to the rival competition.

'Don't prey on a predator'

The final, but potentially most important aspect of skimming protocol is the need to proceed cautiously in situations which may lead to aggression or a conflict:

> [R8, Group 2, Frequent]: If they don't look too pleased, and you know that they want to give that machine a good kick you would wait for them to leave.
> [R3, Group 2, Frequent]: If he is bigger than you, you will be wary.

In some situations, it may be prudent to refrain from skimming altogether:

> [R2, Group 3, Frequent]: If there is someone who looks hard then you won't go on.
> M: You have just said what the last group said as well, right down to the fourth point appearance that if they look dangerous then you would not risk it.
> [R3, Group 3, Frequent]: Like there are three huge skinheads, and they've lost 100 quid you won't just go straight in there.

Both groups of frequent players were emphatic on this point. The element of danger was treated in a light hearted manner which lead the moderator to review how serious respondents were regarding real risk or threat. When prompted on this point the players were quick to point out that this was in fact a serious point and that skimming in the wrong context could be potentially threatening.

9.3.2.2.2. Predatory Strategies

As discussed in Chapter 7, a variety of strategies for skimming were identified (e.g., using reflective glass in other machines, listening for auditory cues, or playing other less

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expensive games or machines). There was some support for these findings, for example, players discussed how they use auditory cues:

> M: Any strategies on how to monitor how much is giving out or taken in?
> [R8, Group 3, Frequent]: As the machines are quite noisy you would hear it paying out say 25 quid in coins, and when someone is getting out their wallet and putting money in, you can see out of the corner of your eye.

However, there were few strategies that were not originally identified during the observational research presented in Chapter 7, and these will be discussed below.

'Make yourself comfortable'

An approach (which may not be applicable in all sites) involves blending into the background in a relaxed fashion, which works in tandem with the previous aspect of etiquette, i.e. subtlety. This has the added advantage of minimal investment in the absence of a skimming opportunity materialising, (i.e., the player wins, somebody else secures the machine first, or the skimmer and their group have to leave):

> M: Strategies for the skimming itself? How would you work out what is the best way to keep an eye on things?
> [R6 group 2, Frequent]: To sit close by the machine, turn your chair if you are with friends.
>
> M: Any strategies for being a shark?
> [R4, Group 1, Infrequent]: I don't think so, but in the Students Union there are a group of Asians who sit on the couches watching people play and they will go on.
>
> [R2, Group 3, Frequent]: You get with a mate and you look as though you are looking at your mate when you can see the other person on the machine.

This approach may be possible in sites where fruit machine gambling is the secondary function of that establishment (i.e., in a bar or night club; in an LBO). Here players can skim without either having to play another machine or be accused of loitering. In an arcade or casino environment this approach would be more difficult to carry out since gambling is usually the primary function of the premises, and therefore 'making oneself comfortable' without gambling would not be well received by staff and management.

'Time will tell'

According to some players, a technique to monitor skimming opportunities, which may require minimal investment in terms of observation is using time spent by a player on a machine as an indicator of the MIMO ratio. Players argued that the more they (i.e. those being observed) spent in terms of time, the more they spent in terms of money:

> [R5, Group 2, Frequent]: Some people want to win, and the length of time they have been on the machine shows if they have lost.

Without more information it is hard to evaluate the veracity of such a claim. However, it is clear, that such a technique would most likely need to be combined with other strategies. For example, if a player (the one being skimmed) is on a machine for a long period of time, then the skimmer might conclude that he or she has deposited a large amount of money into the machine. However, the other component of the MIMO ratio is being ignored, i.e., the money which has been paid out. Therefore, a player would also need to use auditory cues combined with the 'timed' approach to improve the accuracy in estimating the MIMO ratio.

'Know your enemies'

As discussed under skimming etiquette, skimming is a complex procedure that takes several variables into consideration and monitoring the social environment may influence skimming strategies and protocol:

> [R1, Group 3, Frequent]: If you can notice other people looking on the machines and they are ready to go after then you have to on straight away.

This lends further support for the assertion that skimming is a multi-faceted technique that involves monitoring the wider social environment in addition to monitoring the activities in and around the fruit machine itself. The demands on the player will vary depending on a variety of factors. Here, it is suggested that demands will increase as the level of competition increases. Furthermore, this may be site-specific since, as identified in Chapter 7, skimming may operate more in an arcade than in a pub or LBO. Therefore, skimming may become more complex and require more resources in an arcade compared to other locations.

9.3.2.2.3. Protection Against Skimming

In Chapters 7 and 8, and in many of the extracts in this chapter, being 'skimmed' appears to be unwanted even though players have also acknowledged that it is part of the fruit machine playing sub-culture. Nevertheless, there appear to be a variety of ways in which players aim to minimise the impact of skimming and protect themselves. Some players report avoiding situations from the outset which may invite skimming behaviour:

> [R4, Group 1, Infrequent] If there are lots of people watching you play then you would not want to play it so much.
> M: Why is that?
> [R4, Group 1, Infrequent] Because you think that if you are going to lose your money, they will then go on after you and take the money out.
> M: Anyone else had that kind of experience?
> [R1, Group 1, Infrequent]: Yeah, I don't like playing if it is crowded and there is people watching and waiting to pounce.

It could be speculated that there is one real motivation for protection, namely avoiding negative affect, which could be made up of a combination of the following: envy, frustration and self-loathing. There does not appear to be any pragmatic or financial advantage for protection, given that money is already spent, and the intention or the resources to play are no longer available. In fact, protection motivated to avoid negative affect may only serve to increase playing time and the amount of money spent, as will be discussed in the following section (Persistent Play).

In addition to discussing why players aim to minimise being skimmed upon, players also shared their views on how this could be achieved:

> [R7, Group 2, Frequent]: Kind of covering yourself up and stand close to the gambling machine so that it is difficult for them to see the machine.
> [R5, Group 2, Frequent]: Collect the money in your hands so that it does not drop too loudly.
>
> [R3, Group 3, Frequent]: You should be in the right place with your pals around so that you know what is happening, but not around loads of people so that every Tom, Dick or Harry can see what you are doing with your gambles or something.
>
> [R1, Group 3, Frequent]: It is hard to get that though isn't it, you have to get into a tactical position and if you are not doing well you do not want people to see you lose.

As Respondent 1 above indicated, protection may be easier to talk about than to achieve. Firstly, positioning, as suggested in the above extract, may seem both contrived and may take away from the actual experience of gambling, particularly in a social setting.

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However, more importantly, in the above section (predatory strategies) and in Chapters 7 and 8, nine different approaches to skimming were identified. It may be the case that one, or a combination, of these approaches can be employed to overcome any protective measures that a gambler may put in place. For example, if a player shields their machine from view, using auditory cues (e.g., listening for coins dropping) may still be effective means by which to skim.

9.3.2.3. Superordinate Theme Three: Persistent Play

Skimming and utilising the MIMO ratio were suggested to give a competitive advantage to players (see Chapters 6, 7 and 8). This advantage was that these players may be better informed when deciding which machines might be more profitable, and when trying to avoid a machine that may prove costly. In these previous chapters it was also speculated that players may inadvertently gamble excessively, or lose more money than planned by overestimating the utility of this information. There was substantial support from the focus group data for the claim that adaptive logic and the skimming sub-culture may lead to persistent play:

> [R3, Group 3, Frequent]: Sometime there are periods that you do not get anything and you put in 10 quid and you think that you can't leave £10 quid.

Despite the straight simplicity of the above extract, it epitomises the relationship between money in, money out and persistent play. Given the adaptive logic of UK fruit machines, a higher MIMO ratio will eventually imply a better chance of winning, therefore the player perceives the more that they have lost, the closer they are to winning.

It is also interesting that the majority of players appear to be aware of the potential for entrapment. This is typified in the following exchange between the moderator and respondents from the infrequent group of players:

> M: Would you continue to play if a shark is going to play after –would it affect the way you play?
> [R1, Group 1, Infrequent]: Not for me, but have seen it happen and the player put more money in to ensure that the shark cannot win.
> M: What about you M***?
> [R2, Group 1, Infrequent]: Yes I have done this but sometimes if your money has run out you got to walk away.

> M: What about you guys?
> [R4, Group 1, Infrequent]: Think more likely to play to stop them from winning.
> M: Do you agree R*****?
> [R3, Group 1, Infrequent]: For me it is annoying so I would play extra to annoy them.

This sentiment regarding entrapment was also expressed by the frequent players:

> [R8, Group 2, frequent]: You do that and then you've lost a fiver or tenner and then you start to lose more as you panic to get the money back that you've lost. Panic gambling.

> [R1, Group 3, Frequent]: It feels like I win more if I put in more money whereas I find if I put in £2 and lose it then I feel bad as I could have bought something else with it so [...] Once you've put money in you are committed as you have to keep going to win it back.

As previously discussed, players might find themselves in a precarious position if, when they are presented with a choice between playing until they win a jackpot or stopping to let somebody else have their chance to play the machine, they choose the former. It seems that this kind of reasoning breeds a whole new kind of chasing, whereby the common chasing motive of financial reparation is intensified by the thwarting of would-be competitors in the form of skimmers. This is expressed in the following exchange:

> [R8, Group 2, frequent]: If strangers are watching me on the machines then I will not get off until I've won as they are watching me to get on after me and win.
> [R3, Group 2, frequent]: You don't mind losing but if strangers are watching you then tend to want to win.
> M: So it is a couple of different things that can affect you if stranger watches. So someone who is watching you and then it becomes a significant thing in that you will not come off the machine even though you would have.
> R6: Yes even if not they are winding you up but they are just watching you, they are watching it for a reason.

9.4. Conclusion

The aims of this chapter were to explore fruit machine player's perceptions regarding situational and structural factors and fruit machine play. These factors include both findings from previous research (e.g., Cornish, 1978; Griffiths, 1993) and newly identified factors from previous chapters in this thesis (Chapters 6, 7, and 8). There was also an additional aim of identifying new factors that had not previously been identified. Based on the focus group data, there was an overarching theme which was consistent with the key findings reported in Chapters 6, 7, and 8; namely the role of adaptive logic and the implications it has for (a), focusing on money paid into the machine in relation to money paid out (i.e., MIMO ratio), and (b), the process of skimming, which in itself is a

cue to gathering information about the MIMO ratio. Additionally, other interesting and relevant information was revealed in data collected from the three focus groups, which included debates on the importance of jackpot size, preferences between simplicity and player involvement, and the role that status and territoriality plays in site selection. However, none of these issues were frequent, extensive or consistent enough to comprise an overarching theme.

In addition to corroborating findings from Chapters 6, 7 and 8, a considerable level of detail has been added to what was previously known about the MIMO ratio and skimming. In the rating and ranking task, there was clear support for both money deposited and money paid out as the two most important factors to be considered in fruit machine selection and operation. However, beyond these two factors, it was surprising that there were no real trends or strong preferences which were indicated regarding any of the other thirty-three situational and structural factors. The various differences in preferences may be reflective of other more subtle processes that are responsible for deciding preferred characteristics beyond the MIMO ratio. For example, it is speculated, based on the themes identified, that perhaps 'social' players are motivated by factors relating to fun, enjoyment and leisure, (e.g., familiarity, flashing lights, low stake availability), whereas the more serious players, those who may be more financially motivated, may be more interested in those characteristics which provide some form of utility or function in helping them achieve that objective (e.g., seating, toilets, refreshments, change availability, high stake availability). There may be characteristics that apply to both types of player that are just as relevant, (e.g., feature games, payout ratio and jackpot size). Therefore it might be interesting for future research to focus on the link between characteristic preferences and other individual differences (e.g., personality, socioeconomic status, motivation).

The importance of the MIMO ratio initially identified in the rating and ranking task was prominent throughout and across all the focus groups. In identifying and describing a variety of ways to determine the MIMO ratio, a new ecological factor (bringing together both situational and structural characteristics) was recognized (i.e., MIMO cues). These

cues included the role of boxing, player involvement, 'cheating behaviour', site advantages and tools. According to players and the level of consistency with previous findings in Chapters 6, 7 and 8, such cues may have an actual effect in giving a player an advantage for more profitable or enjoyable play. The new addition which the focus group data brought to this finding was that the MIMO ratio was important, not just in determining profitability, but also in determining fun and interactive play. This conclusion is reached on the basis that a high level of involvement and the absence of feeling cheated are both considered to be cues for profitable play. However, what is not clear from the data was how useful such cues are and what the actual impact is on play. Based on some players descriptions some cues may have a high level of risk associated with them than others. For example, while some players argue that boxing is an effective method for MIMO determination, other players argue to the contrary, with some suggesting that this method is long since outdated. Other contradictions also exist, for example when players talk about advantages achieved in playing certain sites, if a player argues that there would be higher MIMO ratios where players are drunk and otherwise distracted, to what extent do the same restrictions apply to the player themselves? It is quite clear that these findings are open to further research to clarify whether there is a real impact or whether these are really just another illusion of control.

Skimming (as identified in Chapters 6, 7, and 8) played a substantial role in the experience of both frequent and infrequent players. The majority of players reported that they sought to avoid being a target of skimming, while the vast majority admitted to engaging in skimming behaviour themselves. As such, most players accepted that his was part of the sub-culture of fruit machine gambling, and was a two-way process, where certain rules affected how skimming was carried out. Although skimming etiquette was not addressed by the infrequent players, three distinct codes of behaviour were identified by both groups of frequent players. Despite skimming and associated strategies being identified in Chapters 6, 7, and 8, the level of organisation and the extent to which they are both understood and practised was unexpected. Despite only being recognised by frequent players, this suggests that skimming is not an idiosyncratic activity practised at just one location or one site. Rather, it suggests that it is an activity that has long been

established in the fruit machine playing sub-culture, which is widespread across players, sites and locations.

Although there was limited support for findings relating to strategies for skimming (see Chapters 7 and 8), new information on predatory strategies emerged from the focus group data. These new strategies included a 'sit and wait approach', using time spent as a cue to money spent and making friends with those whom the player is trying to skim from. Although different strategies have been identified at different stages of this research, this may reflect a bias in site coverage at each specific stage of the research. During the observational stage, substantially more time was spent in the amusement arcade (as the researcher obtained a job as a change attendant in an arcade) than in any other site, and during the focus group stage, more players anecdotally expressed preferences for playing in a pub. Therefore predatory strategies may be site-specific. For example, in a pub environment, players may be more likely to use a 'Make Yourself Comfortable' approach, or be more socially-orientated and befriend their 'prey'. However, as discussed in section 10.3.2, these approaches may not be possible in the arcade. As discussed in Chapter 7, skimming strategies may involve strategic positioning while engaged in less expensive activities, (e.g. playing cheaper machines, playing machines more slowly, playing video games or playing at the pool table). Players may also use the reflective glass of other machines or mirrors (which are a common characteristic of amusement arcades).

As speculated in Chapters 6, 7, and 8, the protective measures and a feeling of entrapment may have implications for persistent and excessive play. This also came across strongly in the focus group data. Players emphasised the importance of avoiding being skimmed upon, and reported that they would go so far as to playing longer than they would ordinarily, or engage in protective measures that may detract from the playing experience (e.g., shielding and obscuring the skimmer's view). Therefore, not only may players persist as a result of other motives, (e.g., escape and dissociation [Jacobs, 1986; 1988] arousal [Blaszczynski et al, 1986], chasing [Lesieur, 1984, 1991]) we can now add competing with other players to the list. Furthermore, the role of chasing becomes more

prominent in the context of adaptive logic. As previously stated in Chapters 3 and 6, a player's belief that persistence in the face of losing will increase the MIMO ratio and its associated cues, will ultimately increase the chances of a payout. In other words, it is a cause for concern that players may find it difficult to terminate play after spending potentially large sums of money, as they rationalise the jackpot to be 'due.'

It should be during the recruitment stage it was noted that older players, female players and more serious players were reluctant to participate in focus groups. It is likely that such players would have made a significant contribution to the focus group discussions. Attracting these forms of players is predicted to be a problem more generally and one that will be faced by all researchers who wish to study fruit machine gambling. This may be a restrictive factor which needs careful consideration before attempting data collection.

In addition to limitations regarding representation of type of player, it was noted that many of the players had a preference for playing in pubs and nightclubs. Therefore, players with a preference for arcades or casinos were to some extent under-represented in the focus groups. That being said, given the extensive observational research undertaken in the latter two sites (see Chapters 6, 7 and 8) having additional input from players from the pub and nightclub environments may serve to strengthen previous findings, by confirming trends that exist across various sites, and highlighting subtle differences that may be present in the pub or club environment (e.g. differences in skimming strategies).
Future research should focus on examining preferences and perceived impact of such ecological factors in relation to other key variables (e.g., profitability, problem gambling, play frequency, session length and motivation). More empirical work is also needed to determine the real impact of knowledge and use if the MIMO ratio and skimming. Despite highlighting these processes, and why players engage in them, the actual impact is to date unclear.

There are potential implications for revealing issues such as cues to the MIMO ratio, player etiquette and skimming strategies. In identifying and explaining these approaches to researchers and clinicians, they may, (a) learn more about their client group, and (b)

develop a greater awareness and insight into the social world in which these clients exist. From a clinical perspective, it can be difficult to rely on player accounts, either as a result of not being able to verbalise how they behave in certain gambling situations, or run the risk of giving biased interpretations and accounts.

CHAPTER 10
CONCLUSION

There is a distinct lack of research investigating the psychology of fruit machine gambling in the UK which focuses on adults. The slot machine, or fruit machine as it is often termed in the UK, forms a substantial proportion of the gambling industry worldwide. In the USA, 70-90% of gaming revenues for casinos come from the fruit machine, and an overwhelming $20 billion was spent on fruit machines in the USA in 2003 alone (Eadington, 2003). Here in the UK, 47% of all calls to GamCare (a primary source of counselling and advice for problem gamblers in the UK) were from fruit machine or from fixed odds betting terminal players (Gamcare, 2005). This is clearly an area which requires empirical and ecologically valid research.

The aim of the research presented in this thesis was to develop an understanding of fruit machine gambling among adults, particularly in terms of the psychological implications of machine design and environment. This thesis essentially aimed to explore fruit machine gambling in the United Kingdom from both a qualitative and quantitative perspective, incorporating a range of demographics, sites and locations. This conclusion will draw together the key findings and their implications for understanding and managing player behaviour.

One of the main themes arising from the current research was the possibility of skill playing a role in the selection and operation of fruit machines, and having an actual influence in determining outcome. This notion of skill is founded upon two key, interrelated, factors; skimming and the MIMO ratio. Both Fisher and Griffiths have reported on important studies describing and explaining the fruit machine sub-culture (Fisher, 1993) and considering situational and structural factors in fruit machine playing (Griffiths, 1993; 1997). However, in research spanning over two decades, neither Fisher nor Griffiths have managed to highlight and explain the role of skimming and the MIMO ratio. These two processes have been revealed to be critical to fruit machine players of all types and levels of experience. The MIMO ratio and skimming are critical in so much as they make a significant contribution to explaining:

(a) Why fruit machine gambling is so popular – fruit machine playing invokes a significant level of skill and player that requires not just a consideration of the machine characteristics but also of the situation in which the gambling is taking place and;

(b) Why they may evoke excessive or problematic behaviour – in addition to normal sources of excessive play, fruit machine players have additional motivation to continue play after sustaining losses since they believe that the machine may play better and be more profitable but also they wish to protect themselves against skimming.

Identifying and understanding the role of the MIMO ratio and skimming has extensive implications for all further academic, clinical, and commercial research into fruit machine gambling in the UK. Based on the research studies in thesis, support has been found for a the role for working out the money deposited into a fruit machine in relation to the money paid out (MIMO ratio) and how this may affect the play and potential profitability of the machine. In the light of this finding, there is a strong argument that any attempt to understand, research, prevent or treatment aspects of fruit machine must take into consideration the MIMO ratio, skimming and their associated consequences. This applies not only to understanding the fruit machine playing sub-culture, but will also inform methodology employed in research (e.g., including machine selection as well as machine operation when observing behaviour and measuring skill in experiments). Some previous research (e.g. Griffiths, 1994; Coventry and Constable, 1999) focused only machine operation, and therefore in light of the importance of the MIMO ratio, future research should also include machine selection.

Despite this contribution to our understanding of fruit machine play, one important question remains unanswered to some extent: Is using the MIMO ratio and the practice of skimming a help or a hindrance to play and profitability? On one hand, there seem to be clear benefits to selecting and operating machines by using these principles; however, as highlighted in chapter 9, there may be a kind of entrapment occurring, whereby players feel 'trapped' into further play if there is a high MIMO ratio, or if there are other players who want to skim their machine. This ambiguity is certainly an area which requires further research. Empirical research in ecologically

valid settings would be particularly helpful, despite the obvious difficulties in researching in such environments as indicated in Chapter 2.

Table 10.1 Summary of findings - structural characteristics of fruit machine gambling	
Characteristic	**Brief Explanation**
*Event frequency**	The number of times that the gambling activity will permit a play or bet over a specific period of time.
*Payout interval**	How quickly the winnings are paid out i.e. contingencies of reinforcement. This has implications for persistent gambling as a result of trying to recoup past losses
*Auto-play***	A characteristic that increases event frequency through reducing the level of human interaction
*Bank facility***	Gamblers use this to keep accounts regarding how much they have spent versus how much they have lost
*Personal Involvement and skill**	The more a player believes they have control of the gambling event, the more they will persist in the face of losing
Associated attractions	These are activities which attract interest beyond its basic gambling parameters, will successfully encourage more bets, more often by more people
Token systems	Where money is replaced by some form of token. The psychological impact of the loss may be devalued and may cause gamblers to make riskier decisions. This could represent a temporary disruption in the player's 'financial value system'
*The near miss**	A failure which is nearly successful. It facilitates gambling behaviour as a result of behavioural and cognitive factors and has been substantially developed over the past ten years
*Money-In-Money-Out (MIMO) Ratio***	The ratio of money deposited into a machine in relation to money paid out. Players feel that a high MIMO ratio will imply a increased profitability, involvement and fun.
Multiplier potential	The range of odds and stakes that the form of gambling offers and can be viewed as a primary inducement to play
*Verbal interaction***	The use of verbal reinforcement to minimize the effect of a loss, reinforce the effect of a win, reinforce self-esteem for players and generally enhance play
*Familiarity***	The use of familiar themes to improve trust, understanding and brand loyalty in relation to fruit machines
*Sound**	The use tempo, pitch and music to influence gambling behaviour.
Light and colour	different colours influence physiological arousal and hence gambling behaviour
*Credit teasing***	the use of different stake sizes to encourage further play when the player would have otherwise ceased play
*Choice***	by allowing players increased choice, blame may shift from the machine to the player

***denotes a new characteristic which was established as a result of observational analysis carried out in this thesis*
**denotes an extended characteristic as a result observational analysis carried out in this thesis*

Through acknowledging the existence of structural characteristics, researchers are also acknowledging the capacity of the design and features of a gambling activity to influence behaviour at the time of gambling, and influence gambling behaviour in the future. This research reports on several new structural characteristics that are now in operation and proposes revisions to other pre-existing features. Table 10.1 (structural characteristics) and 10.2 (situational characteristics) attempt to bring these new and extended features together with those already identified in chapter 2. The role of

situational and structural characteristics in the acquisition and maintenance of fruit machine gambling now appears to be even more sophisticated than previously thought, incorporating more "attractive" features for the fruit machine gambler than ever before.

Table 10.2 Situational characteristics of fruit machine gambling	
Characteristic	**Brief Explanation**
Sound effects	the use of sound in the environment to reinforce winning and promote the gambling environment as fun and exciting.
Music*	increases player confidence, increases arousal and gives players a sense of romanticism making players more susceptible to problem gambling
Light and colour	different colours have been found to influence physiological arousal and in turn influences gambling behaviour
Physical comfort**	heating, ventilation, seating, amenities and provision of refreshments can influence how long the gambler stays in the gambling environment
Psychological comfort**	staff can provide hints and tips, efficient change services, watch fruit machines while players are temporarily away and can provide friendship for lonely players which can influence how long the gambler stays in the gambling environment
Environemntal stimulation and novelty**	new and exciting environments may increase arousal and may reduce the motivation to gamble if arousal is ordinarily involved
Incentives**	exposure to fruit machines may be increased though offering alternative incentives such as raffles or free plays as an initial or secondary form of reinforcement
Intrinsic association	where customers are attracted to the gambling environment for reasons other than the gambling activities and subsequently gamble as a result of proximity
Accessibility	age and other legal restrictions can prohibit gambling for otherwise interested "potential" gamblers
Availibility	in addition to affecting decisions to gamble in relation to proximity. can also act as a subtle form of advertising
Social Facilitation**	gambling behaviour being facilitated as a result of an audience
Social Inhibition**	gambling behaviour being inhibited as a result of an audience
Skimming**	where players attempt to make a profit from playing a machine where the previous player had lost a significant amount of money without winning
Olfaction	using aromas to influence gambling behaviour

** denotes a new characteristic which was established as a result of observational analysis carried out in this thesis
* denotes an extended characteristic which was established as a result of observational analysis carried out in this thesis

In addition to the development of these new characteristics, there has been a shift in the influence that these situational and structural characteristics may have on player behaviour. For example, factors such as the multiplier potential and win probabilities (as previously identified by Cornish, 1978 and Griffiths, 1993) may have less impact on player behaviour than previously thought. As a result of adaptive logic, the ratio of money lost to money won seems to be much more important to the player. Consequently, the features of machine design and environment which may offer cues to whether the machine has paid out (such as a high level of player involvement, skimming and "boxing sounds") or design features that increase skill orientations and player interactions (familiarity, bonus games and cheats) seem to have become more

important to the fruit machine player. These will also have a bigger role to play in addiction and hence knowledge of their existence is vital for prevention and treatment specialists (see implications for prevention and treatment).

Through the identification and careful evaluation of these situational and structural characteristics, there are clear implications for the treatment and prevention of pathological gambling related to fruit machines. There are almost certainly advantages for clinicians and treatment professionals in having a good understanding of the psychology of fruit machine design and environments. By being aware of these variables, the clinician may have additional insight into the motivation of the pathological fruit machine player. For example, in treatment, the clinician can discuss any of these situational or structural characteristics with the client in order to explore reasons for their gambling. By asking if the gamblers' play is affected by being observed by groups (social facilitation), for example, the clinician may speculate that the gambler could motivated by social recognition, or certain esteem needs. This would be further supported, for example, if the player prefers playing machines with high levels of verbal interaction (that which offers praise for successful plays). Furthermore, the clinician may also enquire if access or proximity to an Automated Telling Machine affects gambling behaviour; if so, this would implicate low levels of "self-control" as a reason for problem gambling, and this could possibly be addressed in cognitive behavioural therapy. The essential advantage in having an awareness of the psychology of machine and site design is that it may facilitate the clinicians' understanding of specific player motivations.

Moving away from external factors and considering individual factors, the research presented in this thesis reported findings that have other important implications for treatment. Chapter 6 found that more than half of the fruit machine gamblers who were interviewed used at least one kind of positive thinking strategy after incurring losses when playing fruit machines in the UK. Various forms of such post-gambling cognition were reported, including *Comparative thinking, Prophylactic thinking, Biased frequency thinking, Chasing Validation, Responsibility avoidance, Prioritization, Resourcefulness, Thoughtfulness, and Fear Reduction.*

Part Five: Conclusion

It is suggested that the modes of positive thinking discussed in this thesis are in fact maladaptive for a problem gambler, unlike positive thinking's more proactive use in other aspects of health. As discussed, any potential benefits of losing money can be achieved by other, less potentially destructive, behaviours. The purpose of behavioural therapy is to readjust clients' belief systems and aid the gambler in pursuing a functional life. Perhaps illustrating alternative behaviours by which the gamblers may gain the same positive reinforcements could be a fundamental stage of recovery from problem gambling. If these gamblers fail to attach the appropriate importance to each individual consequence, there is the potential for these perceived positive benefits to actually perpetuate gambling. In other words, based on the reasoning and evidence outlined in chapter 6, identifying good things that arise from losing may facilitate problem gambling, and counter therapeutic efforts for those in or seeking treatment.

Table 10.3 Implications for classification of player using typology

Type	Risk	Preferred site	Possible Treatment	Recovery Aim
A1	**	Arcade	Lifestyle Change	Controlled Gambling
A2	****	Various	CBT	Abstinence
A3	**	Arcade	Refocus Social/Leisure	Abstinence
B1	*	Peripheral	N/A	N/A
B2	***	Various	CBT	Abstinence
C	*	Peripheral	N/A	N/A

*= low risk; **** = high risk*

In Chapter 8, findings from preceding chapters were brought together to construct a typology of fruit machine gamblers in the UK, using three criteria (control, functionality and time) which were identified from participant and non-participant observation. It is suggested that this classification system will assist in the treatment and prevention of pathological gambling and in gaining a good understanding of fruit machine gambling in the UK. Table 10.3 summarises the key implications for category membership for risk (prevention), treatment and general player information, and these discussed in detail in Chapter 8.

In Chapter 9, a considerable level of support was given to findings from Chapters 6, 7 and 8. The importance of the MIMO ratio and use of skimming as a strategy to play profitable more interactive machines was discussed extensively across all three focus

groups. This suggests that frequent and infrequent players are aware of this factor and their play, at least to some extent, appear to be governed by these principles. Perhaps more importantly, most players reported that game play is usually bound by a set of cultural rules, which suggest that the MIMO ratio and skimming are well-established processes. Furthermore, the presence of a 'skimming etiquette' suggests that these processes are not specific to a particular location or site, but are widespread, and are adopted in variety of contexts.

It is important to point out that design and environmental characteristics are to some extent individually specific. In other words, how each situational and structural characteristic affects player behaviour will depend on individual factors, such as personality, and frequency of play. Griffiths (1995) referred to this as a "psycho-structural interaction". For example, regular and non-regular gamblers may react differently to a particular structural characteristic; an auditory cue such as the jackpot alarm or sounds of the coins hitting the metal payout tray may mean something different to different types of player. For experienced gamblers (such as the A1) this could be an important signal which provides information that the machine has already paid ou,t and they may conclude that it will be less likely to offer any large wins in the immediate future. On the other hand, this could attract the novice gambler (e.g. A3) to play, as the auditory cue facilitates an availability heuristic whereby they may feel that if others win on that machine, they can win too.

As discussed earlier, the psycho-structural interaction regarding personality is another useful example of how situational and structural characteristics do not operate independent of the individual. For example, the effects that music will have on an individual's gambling behaviour will obviously depend on that individual's musical preferences. Consider Lesieur's (1988) distinction between the action seeker and the escape seeker; each would interpret arousing and relaxing music differently. As discussed in chapter 7, this why site managers are likely to be selective with which music they play, and will use indicators (such as time of the day) to help inform their choice. As another example, one's locus of control may dictate which characteristics are more influential on the player. For instance, it could be argued (consistent with Griffiths, [1995]), that players with an internal locus of control will prefer playing games with a higher skill requirement and offer more bonus games. In contrast, players

with an external locus of control may prefer more straightforward machines where the outcome is perceived to be an outcome of chance or luck.

As outlined in Chapter 2, researching fruit machine gamblers in an ecologically valid setting is difficult due to player specific issues (such as social desirability, deception and distraction), researcher specific factors (such as subjective sampling and blending in), and gate keeper issues (such as refusal of entry). For this reason, data were collected using a combination of methods. The survey data used in chapters 3 and 4 will certainly be affected by such player-specific biases. However, the decision was made that this risk was acceptable in order to gather data from an ecologically valid environment from a population receiving little attention in previous research. It is also worth acknowledging once more that limited inferences may be drawn by qualitative analyses such as participant observation. However, it is the author's wish to reiterate that such observations aim to develop an agenda to drive more empirically based studies. Furthermore, this research is limited in that it did not consider fruit machine play in bingo environments. Given that members in these environments are predominantly female and that they only play at certain times (e.g. between bingo sessions and during breaks) it is possible that some dimensions of fruit machine play have been ignored. Further research in this area should endeavour to include this sub-group along side those already identified in this thesis if they wish to get a more comprehensive understanding of fruit machine playing the United Kingdom.

Further work is needed to pinpoint which situational characteristics are more likely to affect initiation of gambling. If the environment is important in defining gambling behaviour, then this clearly has implications for studying gambling in ecologically valid settings. In the Reno Model, Blaszczynski, Ladouceur and Shaffer (2004) suggest that only scientific and ecological valid research should guide decision-making regarding problem gambling and harm minimisation. Of course, this presents a problem for those researching the impact of structural factors on gambling. Firstly, there is the problem of access. There are gatekeeper issues which must be navigated, whereby operators are reluctant to permit researchers into the gambling environment. The reasons for such reluctance could be for any of a variety reasons including maintaining privacy of customers, minimizing the potential disruption at gambling venues, and/or limiting the exposure of the potentially problematic nature of their

gaming devices.

This reluctance contributes to the second problem, that of carrying out non-ecologically valid research. It would seem reasonable to propose that if gambling cannot be researched in a real gambling environment, then the next best option should be to research gambling in a simulated laboratory setting. However, despite suggestions to the contrary (e.g., Ladouceur et al., 1991) what can actually be learned from non-gamblers, in situations where they can not lose money, cannot win money (or a significant amount of money), in an environment that does not resemble a real gambling environment is highly questionable. Furthermore, even if we were able to start to address some of these issues by creating real outcomes in gambling simulations (e.g., increasing risk by allowing participants to lose or win more), as researchers, we are strictly bound by an ethical code not to put participants at risk.

Ladouceur et al (1991) reported that there were no significant differences between the cognitive and behavioural components of video poker players in a natural setting compared to a laboratory setting, and consequently suggested that, in some cases, laboratory-based experiments can have good ecological validity. This empirical investigation represents one of the few attempts to examine differences in validity in this way and as such is an important step forward in confirming the value of laboratory research investigating structural characteristics in gambling. However, such confidence in the validity of laboratory experiments should be viewed with caution. In this particular experiment, none of the respondents met DSM-III-R criteria for pathological gambling. Therefore, such findings cannot be generalised to problem gamblers, arguably the key population for which harm minimisation initiatives are targeted. It could be that such experiments might have utility in investigating cognitive variables (e.g., erroneous beliefs) as these may already exist, and may be manifested regardless of the experimental manipulation. However, behaviour is a better yardstick by which laboratory-based ecological validity can be judged. In this investigation, monetary risk was significantly lower within the natural setting. This may have been because any incurred losses were the participant's own monies, and not monies provided by the researchers, as was the case for the laboratory group. Finally, the situational aspect of this particular "natural" setting (i.e., a grocery store) is very different from many other forms of natural settings, such as casinos, slot halls, amusement arcades, internet

gambling, etc. Therefore, these findings are not only limited to certain populations, but are also limited to a certain gambling situations and forms.

It is clear that more research like that conducted by Ladouceur and his colleagues' should be carried out. However, until more robust research on this issue is available, researchers must continue to find ways to conduct research and experiments investigating gambling in more realistic situations. For the time being, there seems to be two main ways in which this can be achieved; firstly, by conducting experiments in real environments. and secondly, and perhaps more controversially, challenging the ethical stance on permitting research participants to win and lose their own money.

As stated earlier, researchers are met with resistance from gatekeepers for a variety of reasons when trying to conduct research in real gambling environments. Perhaps it is time for more pressure to be placed on regulatory bodies that could push for researcher access on actual gambling locations. Demonstrating commitment to responsible gambling is something that has been given precedence by the new regulatory body, the Gambling Commission, in the UK, and as such this might be a stipulation for licensing, or could be considered part of an operator's drive to become more socially responsible. Relationships between the gambling industry and the research/clinical community must be forged and/or further developed. Clear information should provided for industry stakeholders from researchers which sets out a thoughtful and organised approach to any proposed research which would not significantly affect the gambling environment or its customers. Furthermore, discussions need to begin and/or develop to confirm what kind of priority stakeholders should give to understanding to how games actually work, and what affect these may have on gambling behaviour, including, but not limited to, problematic behaviours.

As researchers, the safety and well being of participants in our experiments should always be one of the highest priorities a principle rarely under debate. What *is* often under debate however is how we interpret safety and well being, how we satisfy the cost/benefit ratio of our research, and its potential impact on participants. Conditions and financial incentives used in gambling experiments fit squarely into this category and attract much debate. If we believe that valid experiments are more likely to be conducted under conditions whereby gamblers lose their own money, can keep money

they win, and do so with limited constraints imposed by the experimenter, then this presents us with an ethical conundrum – one that has not been appropriately addressed. While it is beyond the remit of this chapter to make a significant contribution to this debate, this is an issue that needs further attention if research on ecological factors of gambling is to progress in the way that is recommended in the Reno Model.

There are recommendations and issues that need to be further considered regarding structural characteristics and harm minimization. In the UK, manufacturers go to great lengths to research successful fruit machine design. According to contacts in the industry, various employees from a full range of positions within the company go to the different venues and engage in concealed participant observation, where they interact with players as players themselves. They are test sites where manufacturers test new products, chat to customers, and get feedback. Regular players are asked to take part in focus groups with game designers and are treated as paid consultants, which often caters to player's egos, who in turn share as much as they can to be useful. They set up discussion forums where players discuss games, strategies and generally share thoughts on fruit machines. Manufacturers monitor this dialogue to keep to date with player perceptions regarding situational and structural characteristics. Having received information from a variety of sources within the industry, it is interesting to note that to the best of their knowledge, there is no one employed to actually analyze the data stored in the machine regarding program output and the subsequent player responses. This would essentially be data reflecting every result of every game. So for example, data to could be analysed to see if after a near miss do gamblers play more, play faster or increase the denomination with which they play? If manufacturers are to show that they are serious about harm minimization it may be that they should allow researchers to have access to such data.

An option for future research and policy initiatives may be to focus on regulating factors relating to payment (spending), and player awareness/education, and focus less on factors relating to playability (which may also include reward, ambient, and speed characteristics). In this way, EGMs can continue to be fun, exciting, and play-inducing, even with the eventual aim of minimizing harm. By targeting spending, game transparency, and, perhaps most importantly, the education of players, the competing objectives can begin to be addressed. It is hoped that this research develops

what we know about the structural aspects of fruit machine gambling and attempts to offer a fresh perspective from which to engage in the challenges inherent in research and consumer protection.

This thesis makes original contributions to knowledge at a time where gambling in the UK is being revolutionized. Extensive changes within the UK, including legalizing the advertising of gambling, regional casinos and lifting limits on the stake and jackpot size of EGMs, are beginning to take place. Consequently, not only will the UK gambling industry become one of the fastest growing industries world-wide, but gambling is also likely to become a more serious social problem.

Research contributing to our understanding of the psychology of fruit machine gambling will be requisite considering the "New Future" of gambling here in the UK. On many levels, fruit gambling is the most distinguished form of gambling in terms of profitability and addiction. It is surprising, therefore, if we consider that the literature in this area is limited, particularly in terms of adult players. It is also clear from this research that our knowledge and understanding of the structural aspects of gambling is inadequate. Some factors (e.g., feature games, jackpot size, cashless gaming), argued to be influential in governing player behaviour, have been subject to little or no empirical inquiry. And findings for those factors which have received more attention (e.g., near misses, payment features, event frequency) have been inconsistent or inconclusive. Therefore, more research is needed. Moreover, the conditions for research—experiments in particular—need to be suitable. More focus needs to be given to the ecological validity of experiments, and improved access to valid environments (e.g., casinos, online gaming software) needs to be afforded researchers. Opportunities for precision in research and measurement of structural factors rest heavily on building relationships with the gambling industry, and putting pressure on regulators to prioritize this issue. In addition, we may even need to revisit the ethical position relating to spending, winning, and losing in gambling-related experiments.

It is strongly argued that the research presented in this thesis further develops what is known about fruit machine players and the associated ecological factors. It systematically lays the foundations within this area, addressing issues relating to situational and structural characteristics in fruit machine gambling. In many areas,

existing literature has been updated and enhanced, however, much of the research introduces new concepts and ideas in this area that require further empirical investigation. It is hoped that work presented in this thesis helps form a framework to do so.

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APPENDIX ONE
FRUIT MACHINE GAMBLING SURVEY

I have some questions that I would like to ask you regarding your gambling behaviour and in some cases you behaviour in general. When answering simply tick the answer or score which most accurately reflects your response. If you feel you do not want answer a question then simply move to the next one. Below is an example of how to answer a question;

How much do you enjoy gambling on slot machines?

Thoroughly hate   Don't mind   Thoroughly Enjoy

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

By choosing 8 you are stating that you very much enjoy gambling on slot machines
By choosing 3 you are stating that you dislike gambling on slot machines

Complete confidentiality is ensured for any of the information that you give.

General information

What age are you?

| under 18 | 18-25 | 26-35 | 36-45 | 46-60 | over 60 |
| □ | □ | □ | □ | □ | □ |

Do you gamble?

Yes   No
□   □

If the answer is no please go to Section 2 now.

How often do you gamble?

| Daily | weekly | 2-3 per month | monthly | 2-3 per year | Annually |
| □ | □ | □ | □ | □ | □ |

Do you gamble on slot machines? Yes □   No □

If so, how often do you gamble on slot machines?

| Daily | weekly | 2-3 per month | monthly | 2-3 per year | Annually |
| □ | □ | □ | □ | □ | □ |

Part Seven: Appendices

What age did you start gambling?

under 10	10-15	16-18	21-25	26-30	over 30
☐	☐	☐	☐	☐	☐

If you can remember, what was your first gambling experience?

cards	lottery	casino games	slot machine	bingo
☐	☐	☐	☐	☐

sports bets	with family	marbles
☐	☐	☐

Do any of your friends or family gamble?

none	a few	several
☐	☐	☐

Do any of your friends or family disapprove of your betting?

none	a few	several
☐	☐	☐

What is your career?

What is you level of education?

pre-high school	high school	degree	higher degree
☐	☐	☐	☐

What makes slot machine gambling more attractive than other types? *Choose only one.*

it's a solitary activity	easy to understand	most fun	win more money
☐	☐	☐	☐

What other types of gambling do you participate in?

cards craps	lottery	black jack	roulette	poker	
☐	☐	☐	☐	☐	☐

slot machine	bingo	sports bets	informal betting (with friends/family)
☐	☐	☐	☐

Do you feel you know any good strategy for gambling on slot machines?

please describe if you know any

Which types of slot machine do you prefer most?

basic reel-order slot machine □

feature slot machines □

progressive slots □

skill or trivia machines □

Matrix slot machines □

Any slot machine □

Do you ever gamble on slot machines over the Internet?

Daily	weekly	2-3 per month	monthly	2-3 per year	Annually
□	□	□	□	□	□

Do you ever do any kind of gambling over the Internet

Daily	weekly	2-3 per month	monthly	2-3 per year	Annually
□	□	□	□	□	□

In terms of other customers do you prefer the gambling environment to be

very empty   moderately busy   very busy

1	2	3	4	5	6	7	8	9	10

When people watch me gamble on slot machines

I feel worse   I don't care   I feel better

1	2	3	4	5	6	7	8	9	10

When people watch me gamble on slot machines

I play worse   I play the same   I play better

1	2	3	4	5	6	7	8	9	10

When people watch me gamble on slot machines

I win less   I win the same   I win more

1	2	3	4	5	6	7	8	9	10

I would rather play poker with friends than play casino slot machines?

Never   Sometimes   Always

1	2	3	4	5	6	7	8	9	10

The thing I hate most about others watching me gamble

☐ they might play my machine and win after I leave
☐ they generally put me off
☐ I just prefer privacy to enjoy my gambling

Which of these statements refers best to you?
☐
☐ The best way to make a profit from a slot machine is by making small but frequent wins
☐ The best way to make a profit from a slot machine is by making large but infrequent wins
I know I will never make a profit in the long run and I just play for fun/leisure

Do you notice any physical changes when you make a big win on the slots – what are they?

Heart rate increase
Dizzyness
Nausea
Stomach contractions

Do you notice any physical changes when you lose a lot of money on the slots – what are they?

Heart rate increase
Dizzyness
Nausea
Stomach contractions

When you lose, which of the following is the biggest reason why

bad luck   poor selection   lack of skill or experience   machine design
☐   ☐   ☐   ☐

How much do you believe that the outcome of your slot machine gambling is based on luck?

nothing   some   everything
| 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 |

How much do you believe that the outcome of your slot machine gambling is based on skill?

nothing   some   everything
| 1 | | 2 | | 3 | . | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 |

If you were to describe yourself in terms of your gambling behaviour which of the following would you consider yourself to be?

social   professional   compulsive/problem   leisure   escapist   competitor
☐   ☐   ☐   ☐   ☐   ☐

On a scale of one to ten please state how much you agree with each of the following statements

I would rather gamble with my friends than by myself

Never   Sometimes

Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I prefer to remain quiet rather than talk while I am gambling

Never   Sometimes

Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Before I gamble I do a lot of planning before hand rather than simply just arrive on impulse

Never   Sometimes

Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

While gambling I usually set aside money and when this is done I leave the slot machines

Never   Sometimes

Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

On a scale of one to ten please state how much you agree with each of the following statements

I like to gamble to win money.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to get cheered up when I feel down.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to forget my problems.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to meet people.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble because there is nothing better to do.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to get a physical rush or to get aroused.

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to show others certain skills/abilities that I possess.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to take my mind off my stress.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to see how good I am at it.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I like to gamble to beat the system.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

What is your preferred method of payment?

Card   Account   Cash
☐   ☐   ☐

I would prefer to have access to a Automated Bank Dispenser in the Casino in case I run out of money?

Never   Sometimes
Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

How often have you lost money that you have not budgeted for?

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

On a scale of one to ten please state how much you agree with each of the

following statements

When I lose I feel angry

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

When I lose I feel guilty.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

When I lose I feel frustrated.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

When I lose I feel determined.

Never   Sometimes   Always
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

When I lose I feel cheated.

Never					Sometimes				Always
1	2	3	4	5	6	7	8	9	10

I would be more likely to gamble sooner rather than later after losing?

Never					Sometimes				Always
1	2	3	4	5	6	7	8	9	10

I would be more likely to gamble larger sums of money after losing?

Never					Sometimes				Always
1	2	3	4	5	6	7	8	9	10

Do you ever feel like your gambling is done in an attempt to regain past losses?

Never					Sometimes				Always
1	2	3	4	5	6	7	8	9	10

Where other people will unsuccessful, I have the necessary resources to make money from gambling.

Completely disagree agree					Sometimes				Completely
1	2	3	4	5	6	7	8	9	10

One of the most important things in gambling is persistence since you eventually collect a big win

Completely disagree agree					Sometimes				Completely
1	2	3	4	5	6	7	8	9	10

Which best describes your work pattern?

Non-shift work (day)	Non-shiftwork (night)	Shiftwork (8hr)	Shiftwork (12hr)	Shiftwork (other)
☐	☐	☐	☐	☐

To what extent do you feel your job gives you enough time to gamble?

Never					Sometimes				Always
1	2	3	4	5	6	7	8	9	10

As gambling progressed did you ever

become more and more preoccupied with reliving past gambling experiences, studying a gambling system, planning the next gambling venture, or thinking of ways to get money

Yes ☐   No ☐

need to gamble with more and more money in order to achieve the desired excitement

Yes ☐   No ☐

become restless or irritable when attempting to cut down or stop gambling

Yes ☐   No ☐

gamble as a way of escaping problems or intolerable feeling states

Yes ☐   No ☐

after losing money gambling, return another day to get even (chasing one's loses)

Yes ☐   No ☐

lie to family, employer or therapist to protect or conceal the extent of involvement with gambling

Yes ☐   No ☐

need another individual to provide money to relieve a desperate financial situation produced by gambling (a "bailout")

Yes ☐   No ☐

commit illegal acts such as forgery, fraud, theft or embezzlement, in order to finance gambling

Yes ☐   No ☐

jeopardize or lost a significant relationship, marriage, education, job or career because of compulsive gambling

Yes ☐   No ☐

Section 2

Do you enjoy taking risks?

Never   Sometimes   Always
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Would gamble on general things in life?

Never   Sometimes   Always
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Do you consider yourself to be cautious?

Never   Sometimes   Always
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Do you prefer to be responsible for your actions even if there are negative consequences?
e.g. dropping a vase in a shop?

Never   Sometimes   Always
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Do you find your moods are normally the same or would you consider them to be quite changeable?

Never   Sometimes   Always
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

ON a scale of 1-10 how confident would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how modest would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how happy with your life would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how happy with you as person would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how masculine would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how feminine would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how confident would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how rebellious would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how socially active would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how physically active would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

ON a scale of 1-10 how ambititios would you say you are?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Do you ever feel depressed?

Never   Sometimes   Always

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

To what extent do you enjoy games in general?

Thoroughly Enjoy   Sometimes   Thoroughly Enjoy

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

If you playing games do you prefer playing by yourself rather playing against other players?

Thoroughly Enjoy   Sometimes   Thoroughly Enjoy

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

To what extent would say you are competitive person?

Uncompetitive   Sometimes   Thoroughly
competitive

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

How often do you smoke?

| never | occasionally | <10 per day | 10-20 per day | 21-30 per day | >40 per day |
| □ | □ | □ | □ | □ | □ |

How often do you drink?

never   occasionally   <5 units/week   5-10 units/week   11-20 units/week >20
units/week

| □ | □ | □ | □ | □ | □ |

APPENDIX TWO
RATING AND RANKING TASK

BELOW ARE ASPECTS OR SITUATIONS OF FRUIT MACHINES THAT HAVE BEEN IDENTIFIED AS BEING IMPORTANT IN SOME WAY TO THE FRUIT MACHINE GAMBLING EXPERIENCE

Please read the following factors and rate how important they are when playing fruit machines (importance can relate to aspect of playing fun; winning money excitement; occupy time – please make your decision based on what is important to you).

How much money has been deposited (you or someone else) into a fruit machine before you play?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

How much money has been paid out from a fruit machine before you play?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Is music being played in the background?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Is music being played by the fruit machine?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

How easy it is to get change (notes to coins) to play?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are there bank machines (aka ATMs; cash machines) nearby?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are there seats/chairs to use when playing.

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

What temperature it is (how hot or how cold)?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

How well ventilated is the environment?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are snacks, drinks or refreshments available?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are there toilets available for customer use?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are bonuses offered for playing (|usually limited to arcades e.g. bingo; free tokens etc)?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance
3	Quite Important
4	Very Important
5	Extremely Important

Are there a lot of players in the place where you playing?

0	Not At All Important
1	Has Very Limited Importance
2	Has Limited Importance

3   Quite Important
4   Very Important
5   Extremely Important

Are there a lot people watching you play?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Are there are low stake machines (5p/10p) available?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Are there are higher stake machines (25p/30p/50p) available?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Is a feature board associated with the fruit machine?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Do you get bonuses (e.g. respins; superhold; boost etc) in the fruit machine play?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Are there are secret functions included?

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

If you can hear the pound coin hit the bottom of the floor ("backing"/ "boxing"/ etc).

0   Not At All Important
1   Has Very Limited Importance
2   Has Limited Importance
3   Quite Important
4   Very Important
5   Extremely Important

Does the fruit machines that require a lot of skill?

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Does the fruit machines offer a lot of interaction or player involvement?

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Does the fruit machines that offer repeat chances to win?

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Is there an auto-play feature (i.e. you press a button and the machine plays itself – using best the strategy to help you win)?

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Does the fruit machine keeps your winnings in its bank or pays out winnings automatically?

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Whether the fruit machine has a familiar theme or licence (e.g. Simpsons; Eastenders etc).

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

The sound effects.

    0   Not At All Important

    1   Has Very Limited Importance

    2   Has Limited Importance

    3   Quite Important

    4   Very Important

    5   Extremely Important

Does the fruit machine speak/talk (verbal interaction such as "well done!; of homer saying "Doh!")?

    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

Lights/flashing sequences.
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

The colours used in the environment/décor.
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

The colours used on the fruit machine.
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

The payout ratio (the amount that it pays out in relation to how much it takes in in the form of stake [in the UK this usually between 70-90%])
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

Does it have a Note Acceptor (a facility that permits players to pay using £5/£10/£20 notes rather than £1 coins)
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

If you can choose which stake you can play on any one fruit machine (e.g. 10p/30p/50p).
    0   Not At All Important
    1   Has Very Limited Importance
    2   Has Limited Importance
    3   Quite Important
    4   Very Important
    5   Extremely Important

Are there important factors missing?

Out of all of the factors mentioned please rank in order of importance (1 = most important) the 5 most important factors to you when playing fruit machines.

1. _____

2. _____

3. _____

4. _____

5. _____

APPENDIX THREE
FOCUS GROUP PROTOCOL

Focus Group Protocol:
Situational and Structural Characteristics
of Fruit Machine Gambling in the UK

STRUCTURE AND TIMING

- **Overview** (10 minutes)
- **Section 1** – Introduction (estimated 10 minutes)
- **Section 2** – Situational and Structural Characteristics (estimated 30 minutes including rating and sorting task)
- **Section 3** - Randomness (estimated 15 minutes)
- **Section 4** - Skimming (estimated 15 minutes)
- **Section 5** - Jackpots (estimated 10 minutes)
- **Closing** (estimated 10 minutes)
- Total estimated time 1hr 40minutes

OVERVIEW (10 minutes)

1. **The Welcome**
   a. Greet and thank
   b. Ensure everyone is comfortable, has food and drink
   c. What a focus group is and how it works.
   d. About me and my role

2. **The Topic Overview**

The are a few areas that we want to focus on today is a) aspects of slot machine design and its features/characteristics b) aspects of the environment in which you play fruit machines and c) how both these affect player behaviour. EXPLAIN BRIEFLY.

3. **The Ground Rules**
   a. Be respectful of others points of view;
   b. No aggressive interjections
   c. Considerations for recording:
      i. Speak Loudly and clearly;
      ii. Please do not speak over each other – one at a time;
   d. Please stop me if you wish something to be explained further (e.g. definitions, words, what you think you have to);
   e. Remember that participation is voluntary at every stage – you may leave at any stage;
   f. You do not have to answer any question that you do no feel comfortable answering.

<u>Section 1 – Introduction (estimated 10 minutes)</u>

- **Getting everyone to speak:** [Name & Favourite Slot]

- **Other types of gambling?**
    - [PROMPTS: lottery; Internet; poker/cards; sports; racing (dogs/horses); scratch cards; spread betting]

- **Why do you play?**
    - [PROMPTS: money; boredom; the "buzz"; escape; etc]

Section 2 - General Questions: Situational and Structural Characteristics (estimated 30 minutes)

- **What is the most important aspect of a fruit machine for you**
  - [PROMPTS: is different according to fun; profitability; staying on longest period of time etc.]
  - Why?

- **What makes a "good game"?**

- **What are the best brands of slot machine?**
  - [Manufactures: e.g. Barcrest; Red; Mazooma; BellFruit etc]
  - Why?
  - Do you only play certain brands/play certain brands more often?

- **What is the most important aspect of the environment i.e. where you gamble and whats going on around you? [EXAMPLES OF ENVIRONMENT: pubs, arcades, casinos etc]?**

- **Give rating lists for Sit and Struct factors (from Study 2)**
  - Rate
  - Score
  - Discuss

Section 3 - Randomness (estimated 15 minutes)

- **Are games predictable – why?**
  [PROMPTS]
  - o Does it matter if it has paid out a substantial amount of money?
  - o Does it matter if some has deposited a substantial amount of money?
  - o Is it important to making a profit/having fun?

- **How do they work?** [In terms of randomness?]

- **Do you ever notice losing periods** (raking periods) **and/or winning periods** (enriched periods).
  [PROMPTS]
  - o Do they follow any trends/logic?
  - o Are they predictable?

- **Would you play a machine that was random? (i.e. that was not predictable and did not have raking and enriched periods)?**
  [PROMPTS]
  - o Why?
  - o Ever play in other countries (e.g. US, Australia or Canada?

- **Do any of you play FOBTs?**
  [PROMPTS]
  - o How are they different/similar to Fruit Machines?
  - o Are they random?
  - o Will jackpot machines (proposed CATEGORY a MACHINES be random?

<u>Section 4 - Skimming (estimated 15 minutes)</u>

- **Terms of reference** [establish cultural reference to skimming and definition].

- **Do you do it?**
    - Why/why not?

- **Why does it work/not work?**

- **Skimming - implications for winning/losing/excessive play?**
  [PROMPTS]
    - ....spend more than you can afford?
    - ....a method to improve chances of winning

- **Skimming – will it work on jackpot machines or FOBTs?**

- **Skimming – best strategies to skim?**

- **Skimming – best strategies to avoid being a target of skimming?**

Section 5 - Jackpot (estimated 10 minutes)

- **What do think of current jackpots on fruit machines?**
  [PROMPTS]
  - [low/high?;
  - easy to get;
  - do you play for jackpots/or for more frequent smaller or medium sized wins;
  - difference for fun or profitability?

- **Would you be more likely to play fruit machines with higher jackpots?**
  [PROMPTS]
  - Why?
  - Stake? Lower/Same/Higher

- **Do you ever notice losing periods** (raking periods) **and/or winning**

<u>Closing (estimated 10 minutes)</u>

1. **Moderator offers summary of session.**

2. **Anything we missed?**

3. **Thanks to everyone who participated.**

4. **Debrief.**

5. **Participant inconvenience allowance and receipts.**