

The psychology of

Many of us are familiar with the conditioning explanation of gambling, but this is only part of the story...

Throughout the last century, the gaming industry has used various inducements and ploys to entice people to gamble. It is likely that many of these have arisen spontaneously or fortuitously without in-depth psychological analysis (Griffiths 1995). However, the effectiveness of these methods suggests that there is much to be learned about the psychology of gambling from an analysis of structural characteristics, i.e. those characteristics that either induce gambling in the first place or are inducements to continue gambling irrespective of the individual's psychological, physiological or socioeconomic status. This article briefly overviews how psychology is used in the acquisition, development and maintenance of fruit-machine gambling by examining the behavioural conditioning effects and the psychology of colour, sound, lighting, familiarity, player involvement, the near miss and the suspension of judgement.

Signposts

- Edexcel AS Unit 2 — The learning approach

This article is also interesting from the aspect of health psychology and addiction for students studying the following specification sections:

- AQA (A) AS Module 2 — Defining psychological abnormality
- AQA (B) A2 Module 4 Options — Health psychology and contemporary topics in psychology
- Edexcel A2 Unit 5C — Psychology of health



Behavioural conditioning

One of the best-known explanations for gambling behaviour is that it is a very good example of operant conditioning (i.e. behaviour is strengthened by simple reinforcement contingencies). Fruit machines exploit this principle to maximum effect through the interdependency of a number of features. These features include:

- the event frequency of the activity (the number of times a person can gamble within a given time period)
- the result of the gamble (a win or a loss)
- the pay-out interval (the actual time between gambling and when winnings are received)

This combination contributes to the potential 'addictiveness' of fruit-machine gambling and exploits the psychological principles of learning (i.e. operant conditioning) by using both variable ratio schedules and random ratio schedules of reinforcement depending on the type of machine that is being played. Because

of the high event frequency, the loss period is also very brief. As a consequence, little time is given over to financial considerations and, more importantly, winnings can be re-gambled almost immediately. For the machine operator, the more plays, the greater the player turnover, and the greater the profit.

The psychology of familiarity

Other innovations in fruit-machine design tap into the psychology of familiarity. Three areas that appear to have relevance are familiarity and its relationship to naming, appeal and persuasion. According to Costa (1988), the names of fruit machines are also important in impression formation.

It is almost certainly the case that the names of fruit machines themselves have little (if any) influence on gambling behaviour. However, when tied in with more recent research on the psychology of familiarity (Griffiths and Dunbar 1997), the names of machines do seem to be critically

the fruit machine



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Table 1 Some common examples of UK fruit machines

Machine name	Theme genre
<i>The Simpsons</i>	US TV show
<i>Friends</i>	US TV show
<i>Coronation Street</i>	UK TV show
<i>Blind Date</i>	UK TV show
<i>The Flintstones</i> (<i>Viva Rock Vegas</i>)	US film
<i>Indiana Jones</i>	US film
<i>Trivial Pursuit</i>	Board game
<i>Monopoly</i>	Board game
<i>Cluedo</i>	Board game
<i>Andy Capp</i>	UK newspaper cartoon strip
<i>Hagar</i>	UK newspaper cartoon strip
<i>Tetris</i>	Video game
<i>Sonic the Hedgehog</i>	Video game
<i>Mario Kart</i>	Video game

important — particularly in terms of gambling acquisition. It is now quite often the case that fruit machines are named after a person, place, event, television show or film. Not only is this something that is familiar to the fruit-machine player but it may also be something that potential players like or affiliate themselves with. Table 1 highlights some examples of common UK fruit machines. These are different from a simple naming effect in that they may encompass the whole play of the machine, including features, sound effects and lighting effects.

The affiliation or familiarity of a machine can be very play-inducing. Why would a gambler play on one machine more than another if both had exactly the same chances of winning? Take, for example, fruit machines which feature *The Simpsons*. Some speculative reasons include:

- 'Celebrity' endorsement — if *The Simpsons* creator Matt Groening or the celebrity cartoon character Homer

Simpson put their names on this machine, a player might think it is a better machine than some of the others.

- Trust — with an international 'quality' brand such as *The Simpsons*, a player might think that they are unlikely to lose a lot of money. They might also think the jackpots are likely to be generous.
- Experience — long-time regular viewers of *The Simpsons* might think they know the television programme inside out. They might think their knowledge will help them in the playing of the machine.
- Fun — it might simply be that the game play of *The Simpsons* is more exciting and that the sound effects and features are novel, cute and/or more humorous than other machines.

It is possible that familiarity is a very important aspect of why media-related fruit machines have become more prominent over the last few years. Players may find them more enjoyable because they can easily interact with recognisable images they experience. Therefore, the use of

familiar themes may have a very persuasive effect on the money they spend. The possible persuasive nature of the themes should not be underestimated.

The psychology of sound effects

General sound

A number of authors over the last 30 years (e.g. Griffiths 1993) have argued that the sound effects of slot machines are gambling-inducers. Constant noise and sound gives the impression (a) of a noisy, fun and exciting environment, and (b) that winning is more common than losing (you cannot hear the sound of coins *not* dropping after losing!) However, these are very general effects that create an overall impression.

Sounds and music from fruit machines may act as reinforcers. Of particular relevance are the sound effects *after* losing (which could be termed 'acoustic frustration'). Many machines make loud or antagonistic noises



Figure 1 A typical modern fruit machine.

when a player loses. Antagonistic sounds invoke frustration and disappointment. For example, on *The Simpsons* fruit machine, Mr Smithers smugly informs Homer Simpson that 'You're fired', or Chief Wiggam says 'You're going away for a long time, Ha!' At present, we can only speculate about the consequences of such sound effects.

Another sound effect that has been used on fruit machines is pulsating sound, where the pitch of the sound increases and the sound becomes faster when a gambling decision needs to be made. This appears to increase the tension and also tends to make players react more quickly towards the machine. This particular utilisation of sound has been termed 'perceived urgency' (Edworthy, Loxley and Dennis 1991). However, sound effects from fruit machines have dramatically changed and improved over the last decade. Basic pulsating ('beeping') sounds have been replaced by complex musical pieces (classical or pop), intricate sound effects and verbal interaction (see below). The psychology has not really

changed over the years. Sound effects still appear to heighten emotional states. In addition, it might also be speculated that improved sound effects make the fruit machine more appealing on a general level.

Verbal interaction

Verbal interaction in the form of commands and reinforcers is now central to many fruit machines. 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 even providing company and friendship.

Several fruit machines make statements relating to self-esteem when players display positive play. For instance, on *PsychoCash-Beast* it says 'You're cool' (in a female seductive voice). On *Top Tenner* it says 'You are a genius', and on *Buccaneer* it says 'That's a swell idea'. On *Viva Las Vegas* there are cheers from a crowd. One

of the most popular fruit machines on the market at the moment is *The Simpsons*. This fruit machine has been so successful in the UK that there are at least three different variations of the machine currently in operation. One of the attractive features of the machine is that there is a substantial level of verbal interaction from characters themselves. For instance:

- When a player leaves the fruit machine, the character Apu says 'Thank you, come again.'
- When a player starts playing the machine again, the character Krusty the Clown says 'I knew you'd come crawling back!'
- When a player experiences any losses on the feature-play, the character Homer says his 'D'oh!' catchphrase.
- When any player wins, the character Bart says 'Wow, cool man.'
- When a player wins the jackpot, *The Simpsons* theme song plays.

These simple verbal and musical interactions all appear to be positive and have the capacity to make the player feel better

about themselves. 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.

The psychology of light and colour effects

Light and colour are two variables (often interrelated) which affect behavioural patterns in a variety of contexts. There is some evidence that colour evokes affective states and influences behaviour. It has been suggested that some colours are associated with certain moods, for example red is 'exciting' and 'stimulating', blue is 'comfortable', 'secure' and 'soothing', orange is 'disturbing' and green is 'leisurely' (Wexner 1954). By comparing peoples' galvanic skin responses, it has been shown that red induces higher levels of arousal than green (Wilson 1966). To date, there has been little research into the differential effects of colour stimulation on more complex behaviour in ecologically valid settings. The limited empirical data suggest that people gamble more under red lighting (because it is more arousing) and that most UK gambling arcades utilise colours towards the red end of the colour spectrum in their lighting and decor (Griffiths and Swift 1992).

Suspension of judgement

The suspension of judgement refers to a structural characteristic which temporarily disrupts the gambler's financial value system and potentially stimulates further gambling (Griffiths 1993). Old-style UK fruit machines often utilised tokens (rather like the casinos' use of chips) to disguise the true value of the money (i.e. to decrease the psychological value of the money to be gambled).

The psychology of the play 'feature'

One of the biggest changes in the format of the UK fruit machine over the last decade has been the rise of the play 'feature', with a gradual move away from money wins dependent on 'reel order' to money wins dependent on 'features'. These are explained in more detail below.

Winning through 'reel order'

Wins dependent upon reel order simply refer to winning money through the order of symbols on the 'win line' (e.g. three melons

in a row). These are typical of the slot machines found around the world in places like Las Vegas. They appear to be popular with non-regular fruit-machine players because little or no expertise is needed to facilitate winning. For this reason, these types of machines are more common in tourist areas (e.g. seaside arcades).

Winning through 'features'

Wins dependent upon the features refer to winning money via the machine's play feature (rather than simple reel order). The feature is basically a more complex extension of the specialist play features associated with earlier machines such as the 'nudge', 'gamble' and 'hold' buttons. Features vary extensively among machines and manufacturers but typically include a core variety of different types. For instance:

- The 'lapper' is a feature where prizes are won by doing circuits (i.e. laps) on the game board.
- The 'trail' is a feature where prizes are won by progressing up the 'trail' in the hope of winning the jackpot or top feature.
- The 'hi-lo ladder' is a feature where prizes are won by advancing up the prize ladders by successful gambles (i.e. players have to guess whether the next number on the game board will be higher or lower). The tops of such ladders usually represent jackpot wins.
- The 'grid' feature is a 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.

More recently, the trend is for fruit machines not to be limited to one kind of feature. Multiple features are now usually centred about a principal feature. Figure 1 shows a fruit machine that has a number of smaller features linked to a principal feature. The feature could be described as a game where cash prizes increase throughout the duration of the game. 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. The aim of most current games is to collect a 'secondary feature' or a cash prize before such an exit or, as many gamblers do, continue until the end to obtain the jackpot or the ultimate feature (see Figure 1). The easiest way to conceptualise 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

dice (usually 12-sided instead of 6-sided) and plays against the machine instead of another player.

This particular structural characteristic has been developed from knowledge about structural characteristics relating player involvement and skill (discussed below). The level of skill needed and the level of player involvement significantly increases the psychological involvement for the player. This feature alone appears to have a significant effect on habitual gambling.

The psychology of player involvement and skill

The gradual introduction of specialist play features back in the 1970s and 1980s, such as 'nudge', 'hold' and 'gamble' buttons, meant that the creation of perceived skill was achieved (i.e. structural characteristics which enabled a fruit machine to mimic skill-determined situations). Early work by Griffiths (1990) argued that the introduction of specialist play features stimulated the illusion of control through personal involvement, perception of skill and familiarity with a particular machine. Over the last decade in the UK, there has been a huge increase in the number of specialist play features and options introduced into fruit machines (the section above on winnings dependent on 'feature' play being a case in point). Previously, the player would start the play button, watch the reels spin and wait for a match. There were limited choices concerning the outcome of the game or play. However, this has changed markedly.

This increase in choice could affect how gambling-inducing the machine is by:

- increasing the level of player involvement
- enhancing the player's perception of the skill involved
- making the fruit machine more exciting and fun

All of these appear to manipulate the fruit-machine gambler at no extra expense to the manufacturer or owner. There have also been some other significant specialist play features which appear to exploit the illusion of control (i.e. the bonus secret functions).

The psychology of the near miss and the 'feature'

Another well-reported structural characteristic in the maintenance of gambling behaviour is the 'psychology of the near miss' (Reid 1986; Griffiths 1991, 1999), which can

act as an intermediate reinforcer. Near misses (i.e. failures that are close to being successful) are believed to encourage future play, inducing continued gambling. Some commercial gambling activities (particularly fruit machines) are formulated to ensure a higher than chance frequency of near misses. At a behavioural level, a near miss may have the same kind of conditioning effect on behaviour as a success. At a cognitive level, a near miss could produce some of the excitement of a win, i.e. cognitive conditioning through secondary reinforcement. Therefore, the player is not constantly losing but constantly nearly winning (Griffiths 1991, 1994).

The most significant change in near misses appears to involve the *types* of near misses employed by the manufacturers. A near miss on reel order does not seem to have the same effect that it did 5–10 years ago. This is because the newer generation of fruit-machine gamblers are primarily interested in winning through features rather than winning through reel order (see above). The gaming industry has adapted and strengthened the near miss by connecting it to the feature play (rather than reel order).

One of the most common and effective near misses is the manipulation of the 'trail'. The trail is the primary gateway to participating on the machine feature. In Figure 1, it can be observed that the trail comprises a series of steps that have to be completed to get to the feature. Obtaining numbers that are attached to reel symbols on the 'win line' or 'win matrix' provide these steps. For example, obtaining a bell with the number '2' attached to it would take the player 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). Often, this is held right up until number '9' so that the player is almost onto the play feature. Furthermore, it is not untypical for the trail to be held there for several credits while offering no numbers from the spinning reels. After this, the trail is no longer held and the player has to start from the beginning, having experienced a near miss.

Like the traditional near miss, the player feels the excitement of 'nearly' being taken to feature participation, and almost certainly gets aroused at no extra expense to the machine's owner. Perhaps more importantly, it may cause frustration or cognitive regret that may perpetuate gambling. As Reid (1986) has pointed out, the near miss can be explained in terms of frustration

theory (Amsel 1958) or cognitive regret (Kahneman and Tversky 1982). According to Amsel, failing to fulfil a goal (not winning on a fruit machine, for instance) produces frustration which energises ongoing behaviour. Subsequent wins then reinforce high rate behaviour. According to Kahneman and Tversky's theory, the frustration produced by 'nearly winning' would induce a form of cognitive regret. The elimination of regret can be achieved by playing again and this in turn encourages future play.

Where the psychology of the near miss was previously limited to the reel order, there are now several aspects of the fruit-machine feature that manipulate the gambler through the near miss. The more features incorporated into the fruit machine, the more opportunities to use different types of near miss. Another example can be demonstrated by looking at Figure 1 again. On this machine, a player can often move their way up the 'feature board' without actually winning large sums of money. They might even get themselves up to a point where they are just one 'roll' away from the jackpot or the ultimate feature. On this final roll, having moved right up the board, they lose! There are numerous examples like this on almost all current fruit machines. The main point to reiterate is that the psychology of the near miss appears to be used now more than ever and in different ways to how it was traditionally used. The near miss appears to perpetuate play, and is therefore a structural characteristic that has the potential to greatly influence the 'addictiveness' of the machine.

The psychology of the near miss and 'credit teasing'

Another manipulation of the near miss involves 'credit teasing'. Many fruit-machine arcades do not have facilities to change £1 coins into 2, 5, 10, 20 or 50 pence denominations. Therefore, even though a fruit machine may be staked at 5 pence per play, the gambler often has to play in £1 intervals as they have no change. A common characteristic for many fruit machines is to create an inviting situation on the last credit of play (e.g. on the twentieth credit after inserting £1 into a 5 pence stake machine). The fruit-machine player is thus encouraged to insert more coins to find out how this inviting situation unwinds. In fact, a credit tease is usually a near miss. Another ploy to persuade players to put more coins into the machines is to have 30 pence credits. Players will often put £3 into the machine, giving them 10 credits of play, instead of

putting just £1 in and having three credits and an unused 10 pence left over.

Closing remarks

It is clear that the structural characteristics of fruit machines have the potential to induce excessive gambling regardless of the player's biological and/or psychological constitution. Some structural characteristics are capable of producing psychologically rewarding experiences even in financially losing situations (e.g. the psychology of the near miss). Further work is needed to pinpoint which structural characteristics are most likely to affect 'addictiveness' potential in particular forms of gambling. For instance, it may be that light, colour and sound effects are integral to increasing baseline levels of gambling among fruit-machine players but not in other gambling forms (e.g. lotteries, horse racing etc.) (Griffiths 1993).

It is widely accepted that the structural characteristics of the fruit machine influence the acquisition, development and maintenance of gambling behaviour. However, it would appear that the role of structural characteristics has become even more significant within the past decade. Arguably, these more developed structural characteristics have an even greater potential to induce excessive gambling in some cases. Interactive feature plays, increased skill orientations and player involvement, and the manipulation of familiarity and sound effects, are now combined to produce sophisticated and psychologically immersive fruit machines. The large number of people admitting to being drawn to such machines against their better 'rational' judgment raises an interesting paradox. Could it be that the subtle (yet powerful) attraction to the fruit machine could be explained by the operation of such structural characteristics? ■

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Key concepts

- Gambling/addiction
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- Verbal interaction
- Secret features and functions
- Light and colour effects
- Suspension of judgement
- Play features: principal features; multiple features