Chapter 2
Psychoeducation for Problem Gambling

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Problem gamblers are often deeply embarrassed, ashamed and mystified by their ongoing self-destructive behaviour. Indeed, bewilderment seems to be a feature of both those who experience problem gambling and those who study it. Two different authors writing decades apart both wrote books titled *The Psychology of Gambling*. Both express bewilderment from their very different perspectives.

"The gambler is apparently the last optimist. He is a creature totally unmoved by experience. His belief in ultimate success cannot be shattered by financial loss, however great. He did not win today? So what? Tomorrow will be lucky. He's lost again? It doesn't prove a thing: someday he's bound to win. Where logic ends, the unconscious takes over. His illogical senseless certainty that he will win is an unconscious attack on reality" Dr. Edmund Bergler (1957).

"Gambling behaviour is an enigma. It is an area of human behaviour that is full of paradoxes. Most of all, it is a challenge to our best theories of human nature. Nearly all gambling is structured so that the gambler should expect to lose, all things being equal. Some gamblers give up everything of value in their lives in order to gamble: family, properties, friends, self-esteem. Why should anyone give up so much in such a futile cause?" Dr. Michael Walker (1995).

Problem gamblers are often similarly bewildered. They ask themselves questions such as "Why don't I stop before I run out of money? Do I really want to destroy myself and my family?" Problem gamblers present to therapy already having formed their own theories. Unfortunately, their theories often involve an unchangeable, incomprehensible, inner flaw deep within. One can easily hear Seligman's three helplessness attributions in these explanations – personal, permanent and

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pervasive (Seligman 1990). One of the aims of psychoeducation, therefore, is to open opportunities for intervention. Theoretical explanations, even if only ever partial accounts, that allow for change provide a rationale for treatment and help to counter demoralisation, shame and stigma.

Psychoeducation needs only take one session (a syllabus checklist may stop the client from feeling overwhelmed). To be memorable, psychoeducation should be presented using vivid examples as described below (e.g. the Stroop, Muller-Lyer illusion, the story of Ulysses).

Our All Too Human Minds

Over the past decade or so, the public imagination has engaged with the notion that human kind is not as rational and reasoned as we like to think ourselves. Recent popular books by academics include *Predictably Irrational* by Dan Ariely (2008), *The Invisible Gorilla and Other Ways Our Intuition Deceives Us* by Christopher Chabris and Daniel Simons (2010), *Brain Bugs: How the Brain's Flaws Shape Our Lives* by Dean Buonomano (2011) and even one by a magician, *Tricks of the Mind* by Derren Brown (2007). Perhaps the best known is *Thinking, Fast and Slow* by Nobel Prize winner Daniel Kahneman (2011).

There are many ways to illustrate that we can't always trust how or what we think. One easy way of suggesting that we can believe two contradictory things at once is the Muller-Lyer illusion. Draw two parallel lines of equal length. Measure them in front of your client. Then draw arrow heads on one line (as if the line represented an outside corner) and outward open-ended fins or "reverse" arrow heads on the other line (as if the line represented an inside corner). Now one line will look decidedly shorter than the other. This gives the client a sense of simultaneously believing two contradictory things (the lines are the same; the lines are different). This illusion can be used to vividly highlight the point that we can seemingly simultaneously hold two inconsistent beliefs despite our factual knowledge. In the case of gambling – a client may be simultaneously torn between thoughts about going gambling and thoughts about resisting the urge; thoughts acknowledging the possibility of losing while simultaneously believing one is on the verge of a big win.

Kahneman (2011) labelled two distinct ways of thinking. System 1 is automatic, quick and involuntary and uses heuristics. System 2 is effortful, slower and deliberate. The conclusion we want our problem gambling clients to draw is that these heuristics are very human and not unique to gamblers. All of us rely on them in situations of ambiguity, uncertainty and when under cognitive load. This means of course that some cognitive distortions are inherent in gambling (Petry 2005). This information should help the gambler have more scepticism towards any hunches they may feel as well as making them feel less foolish.

The Awesome Power of Intermittent Reinforcement Schedules

In the case of electronic gaming machines (EGMs), problem gamblers have unknowingly been subjected to powerful conditioning schedules; the strength of which can be judged by their financial losses and extent of their bewilderment. Informing our clients about relevant aspects of learning theory does not deny their individuality but affirms it. Behaviourist explanations of reinforcement schedules resonate with people struggling with their attraction to slot machines (Schull 2012).

Explaining intermittent reinforcement need not take long – especially if the client has ever had a pet. During continuous reinforcement rats learn that pressing the lever brings a food pellet. If the food stops, the rat will stop pressing, the response has been extinguished. However, if the rat has been reinforced intermittently when food stops, the rat will continue to respond. Knowing this helps the client appreciate one reason it is so hard to stop – their responses cannot be extinguished: they can never be sure that the next bet won't be a winner. Furthermore, the intermittent reinforcement in EGMs is highly variable, so unpredictable as to approximate randomness. If the reinforcement was on a fixed interval or a fixed ratio, then the rat (or gambler) could take a rest after certain periods of time or after a number of presses. But when the reinforcement is unpredictable, rests are avoided, rats press to exhaustion, and similarly, players avoid leaving their machines.

What Urges Do and Don't Mean

Kavanagh et al. (2004) note that one of the most distressing aspects of urges during attempted abstinence concerns the meaning of the urge. Gamblers worry that perhaps it means they can never gain control or that relapse is imminent (Marlatt and Parks 1982). In motivational interviewing Miller and Rollnick (1991) reframe the meaning of alcohol tolerance from "I can handle my drinks so it doesn't hurt me" to "drinking could be harming my health without me noticing the effects". Urges can be helpfully reframed as a sign that the urge is felt because the habit is fading; an urge is a conditioned response and a natural part of extinction and not a sign of personal weakness (Marlatt and Parks 1982).

Practice Makes Too Perfect

Bargh and Chartrand (1999) cite research indicating that a wide range of mental processes and behaviours can unintentionally or intentionally become automatic and cued outside conscious awareness. Using the Stroop paradigm can illustrate the effort necessary to inhibit such well-learned responses. Provide a list of colours, written in the same colour as the word, e.g. RED is written in red ink, BLUE in blue,

and GREEN in green. Ask the client to identify the colour instead of the content of the word. This is easy. Then provide a second list in which the words are printed in non-matching colours, e.g. RED is printed in blue ink, BLUE is printed in green ink, GREEN is printed in red ink, etc. Again, ask the client to identify the colour instead of the word. Most people find themselves stumbling when they need to inhibit the overlearned response of reading the word. This is due to repetition making the reading of words automatic. Gamblers have undergone an amount of repetition which would please any music or language or sports teacher.

Unfortunately, the automaticity persists, rather like the aphorism that something is like learning to ride a bicycle – having learned to ride a bicycle in one's childhood, one is quicker to pick it up again than if one had never learned. A skill that has not been utilised for many years does not vanish altogether but lies dormant until the cues are present. Anecdotes exist of Australian gamblers who lived overseas in jurisdictions without poker machines for many years and didn't miss them at all, only to relapse when back in Australia.

The implication that one has developed a habit which is long lasting and potentially lies dormant can be discouraging. The point is not to be discouraged but to appreciate that learning new habits in response to the old triggers may take a lot of repetition and awareness. New habits of course can be learned. The folk wisdom that weeks of meditation change your brain and other examples of neuroplasticity can provide hope.

When the Thrill of the Chase Is Never Ending: Affective Neuroscience

Zack (2006) asserts that the field of affective neuroscience can teach us a great deal about gambling. Panksepp, a pioneer of the field, argues that "various environmental challenges were so persistent during brain evolution that psycho-behavioural tendencies to respond to such challenges have been encoded as neural circuits within the mammalian brain" (1998 page 50). One such circuit is the SEEKING system. Rats don't need to be taught to forage, nor do dogs need to be taught to follow a scent. Similarly, humans seek to understand, to play and to discover. The SEEKING system is accompanied by desire, hope, anticipation, stimulus-bound appetitive behaviour (adjunctive behaviours) and occasionally superstitious behaviour (Panksepp 1998).

The SEEKING system is predominantly mediated by dopamine. The dopamine system responds selectively to novel, attention-grabbing events and stimuli that predict reward. The incentive sensitization theory of addiction posits that dopamine accompanies reward (experienced as pleasure) but that it also responds to cues that signal the possibility of reward (experienced as motivation) (Robinson and Berridge 2000). Furthermore, the cues of a possible reward trigger fluctuations in levels of dopamine. Schultz et al. 1997 established that dopamine is a neural substrate of prediction and reward, making dopamine particularly relevant in problem gambling.

Using functional magnetic resonance imaging (fMRI), Clark et al. (2009) showed that near misses were felt to be less pleasant but more motivating, leading to an increased desire to play due to "an anomalous recruitment of reward circuitry" (Clark et al. 2009).

Zack (2006) also notes that with respect to the SEEKING system, gambling withdrawal would be expected to involve feelings of boredom or restlessness, an uncomfortable state of disengagement with the world. This must be what Blaise Pascal intuitively understood when he invented the roulette wheel. He wrote that people seek *divertissement* from their chronic state of *ennui* (i.e. to be distracted from the anxious emptiness of our lives) (Pascal 1966). Spinella (2003) suggests that pathological gambling is an example of evolutionary mismatch. A more familiar example is how our innate taste for sugar, fat and salt have not served us well in an environment of easily available food. Similarly, Spinella suggests, a whole range of survival skills have been hijacked in modern gambling environments. Persistence, risk-taking, preference for novelty, hope and getting over losses quickly can be advantageous in other contexts. The gaming environment of gambling is artificially unpredictable yet evokes our human inclination to search for patterns and try to learn from previous outcomes.

An explanation of some of the neurobiology that underlies the desire to continue to gamble despite one's best interests helps clients take a step back from such feelings and understand them in an environmental context as well as reducing shame.

Electronic Gaming Machines

Most treatment-seeking gamblers prefer electronic gaming machines (EGMs) (Hodgins et al. 2001). Natasha Schull in her 2012 book *Addiction by Design* describes in fascinating detail how various design features of EGMs are deliberately geared towards extending "time on device". Turner and Horbay (2004) suggest that poker machines or slots (EGMs) take players beyond the limits of human reasoning. They provide an excellent guide to the inner workings of EGMs in the *Journal of Gambling Issues* 2004 volume 10. Available free online at http://jgi.camh.net/doi/full/10.4309/jgi.2004.11.21. They also suggest that EGMs are the most misunderstood of all forms of gambling. Frequently asked questions often centre on random number generators.

A random number generator (RNG) uses a complex algorithm – for example, starting with a seed number such as the time of day and then multiplying, adding and dividing by very large numbers to arrive at a number – the remainder of which is the first random number and the next seed number. Technically RNG generates numbers that are not random but pseudorandom. It could take billions of samples to repeat the cycle. To further increase the impossibility of predicting the cycle, the RNG runs continuously once the machine is turned on, even if no one is playing it. A press by a player merely samples the random number generated at that moment, so a player could never know which part of the cycle they are in. Furthermore, the

pictures shown on a slot reel do not necessarily correspond directly to the odds of winning. A symbol might occur twice on the reel but only land on the payline once every 50 spins. This is accomplished through a process called virtual mapping. Each stop on the slot machine's "virtual" reel is equally likely, but more of these virtual reel stops are mapped onto low or non-paying symbols than onto high-paying symbols.

The players information booklet from none other than the Australian Association of Gaming Machine Manufacturers (now Gaming Technologies Australia) explains: "If a King symbol is assigned to positions 1,4,13,18,22, and 31 that assignment is permanent, it does not change from game to game…. It may be, and this is often the case, that the jackpot symbol is only assigned to one stopping position on the wheel so the chances of getting 5 symbols may be as low as one in 52.5 million". Schull (2012) notes that in legal disputes about the programming of near misses, manufacturers argue that since the source of near misses lies in the reels' configuration prior to a spin, and not in secondary software after a spin, near misses are not programmed in response to player activity.

Mathematics and Probability

Kahneman (2011) says we humans tend to see patterns where none exist and show "serious mistakes in evaluating the randomness of random events" (page 115). Turner found that problem gamblers have a poorer understanding of randomness (Turner and Liu 1999; cited in Turner 2002). For example, problem gamblers were more likely to believe that betting on a number that looks random gives you a better chance of winning. Turner explains "Random numbers don't necessarily look random". A ticket with the numbers 1 – 2 – 3 – 4 – 5 – 6 has the same chance of winning as a ticket with the numbers 3 – 17 – 21 – 28 – 32 – 47, but many people have trouble believing this. Most of the time random numbers look random. Problem gamblers often do not appreciate independence of turns. Turner suggests that what fools many people into believing that randomness is self-correcting stems from our experiences of witnessing regression to the mean. He explains that on average a coin comes up heads 50% of the time. Even if heads come up 1000 times in a row, the next flip could be a head or a tail. If a coin flip is truly random, then it must be possible (although very unlikely) for it to come up heads 1 million times in a row. The number of heads and tails does not have to even out. A head is just as likely to occur after five heads as after five tails. The more flips you make, the closer the average gets to 50%, but nothing can force it to even out.

Turner (2002) concludes "The human mind is not very good at dealing with randomness. Our minds are designed to find order, not to appreciate chaos. We are wired to look for patterns and find connections, and when we find patterns we interpret them as real. Consequently, many people will see patterns in random numbers. When people see patterns in randomness (e.g. repeated numbers, apparent sequences or winning streaks) they may believe that the numbers aren't truly random, and therefore, can be predicted".

Ulysses: A Metacognitive Hero!

In Greek mythology, the sirens were creatures (half woman, half bird) who lured sailors to their deaths. The sirens' song was so sweet that sailors were unable to resist and would steer their boats into the rocks and perish. The term "siren song" now refers to an attraction that is hard to resist but if heeded will lead to a bad result.

Ulysses knew he had to pass the sirens' island to get home to his wife Penelope. He might have relied on sheer willpower and the strength of his motivation to get home and simply made a resolution to be strong when he heard their song. This would have arrogantly assumed that in the same situation, he would act differently to all those sailors who had been caught before him. Ulysses, however, was wiser than that. Ulysses understood human nature and knew that strength and motivation ebb and flow and that even the most committed can waver in the face of temptation. So he put wax in his crews' ears and tied himself to the mast. Although he begged to be untied when he heard the Siren song, his crew could not hear him or the sirens, and they all sailed out of danger.

In a dry retelling of this tale, Ross et al. (2008) say "Notice that Ulysses thereby showed awareness of his own disposition for inter-temporal preference reversal and used this foreknowledge to block its dangers" (page 66).

The Ulysses story contains many analogues to clinically useful insights and strategies. Ulysses is motivated by a meaningful goal, his family relationships and to get home; he wants to reunite with his wife Penelope. He did not blindly trust that the strength of his current motivation to get home would endure through the future high-risk situation of hearing the sirens' song. He understood that motivation is not a fixed state – it is susceptible to environmental influences – our beliefs are somewhat state dependent and can change. He knew motivation was not enough; he needed planning and strategy. He undertook a functional analysis of his high-risk situation. He used a range of creative strategies, wax to prevent the crew from hearing the song (stimulus control) and rope to tie himself to the mast to prevent himself from responding.

Ulysses and the sirens is a good metaphor for dealing with cravings that we cannot avoid. Ulysses shows a lot of wisdom – sophisticated self-awareness, practical compassion and cunning strategy rather than blind hope. What these days could be called metacognitive insight! He adopts strategies which mirror behavioural strategies such as stimulus control and alternative behaviours as recommended for the early stage of treatment in a number of contemporary manuals: For example, identify high-risk times; bind up access to money; schedule alternate non-gambling activities, especially for those times one would be at a loose end without gambling; and arrange to get together with friends and family (see, e.g. Petry 2005; Ladouceur and Lachance 2007; Raylu and Oei 2010).

In practice, clients can tie themselves to a metaphorical mast in all sorts of creative ways. For example, to avoid the risky period after work, a client can ring home before leaving work, "I'll be home soon – do you want me to get milk or bread on the way home?" Soon this will become an expected daily routine and thoughts like

"I'll only pop in for half an hour and no one will know" will no longer occur. The partner may not even realise the problem gambler has been tying him or herself to the mast.

With insight, self-awareness and a little forward planning like Ulysses, problem gamblers can set things up now (while motivated) so that they can resist when temptation strikes in the future.

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