

THE BIOPSYCHOSOCIAL APPROACH TO ADDICTION

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For many people the concept of addiction involves taking of drugs. Therefore it is perhaps unsurprising that most official definitions concentrate on drug ingestion. Despite such definitions, there is now a growing movement that views a number of behaviours as potentially addictive including many behaviours which do not involve the ingestion of a drug such as gambling, sex, exercise, videogame playing and Internet use. This paper argues that all addictions consist of a number of distinct common components (salience, mood modification, tolerance, withdrawal, conflict and relapse) and that there are many other types of commonality on a psychological, biological, sociological, and cultural level. The paper argues that addictions are a part of a biopsychosocial process and evidence is growing that excessive behaviours of all types do seem to have many commonalities. This may reflect a common etiology of addictive behaviour and suggests that addiction may be a syndrome. It is argued that an eclectic approach to the studying of addictive behaviour appears to be the most pragmatic way forward in the field.

The biopsychosocial approach to addiction

»Certain individuals use certain substances in certain ways, thought at certain times to be unacceptable by certain other individuals for reasons both certain and uncertain« (Burglass & Shaffer, 1984)

Conceptualizing addiction has been a matter of great debate for decades. Although the opening quote is not recent, it still holds true despite the enormous amount of research into addictive behaviours. Any conceptualization of addiction has implications for several groups of people (e.g., addicts, their families, researchers, practitioners, policy-makers etc.). Obviously, the

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needs of these groups may not be equally well served by certain models, and in some cases there will be absolute incompatibility. Any framework for the conceptualization of addiction must allow for the bottom-up development and integration of theory by each of these groups – that is, it must be flexible, accountable, integrative and reflexive.

For many people the concept of addiction involves taking of drugs (e.g. Walker, 1989; Rachlin, 1990). Therefore it is perhaps unsurprising that most official definitions concentrate on drug ingestion. This is highlighted by the following definitions:

»Addiction is the compulsive uncontrolled use of habit forming drugs« (Webster's New International Dictionary, 3rd edition)

»An addict is a person addicted to a habit, especially one dependent on a (specified) drug« (Concise Oxford Dictionary)

»An addict is one who habitually uses and has an uncontrollable craving for an addictive drug« (Webster's New International Dictionary, 3rd Edition)

»Addiction is a state of periodic or chronic intoxication produced by repeated consumption of a drug, natural or synthetic« (World Health Organization)

Despite such definitions, there is now a growing movement (e.g. Miller, 1980; Orford, 2001; Shaffer, LaPlante, LaBrie, Kidman, Donato & Stanton, 2004) which views a number of behaviours as potentially addictive including many behaviours which do not involve the ingestion of a drug. These include behaviours diverse as gambling (Griffiths, 1995), overeating (Orford, 2001), sex (Carnes, 1983), exercise (Terry, Szabo & Griffiths, 2004), videogame playing (Griffiths, 2002), love (Peele & Brodsky, 1975), Internet use (Griffiths, 2000) and work (Griffiths, 2005). Such diversity has led to new all encompassing definitions of what constitutes addictive behaviour. One such definition is that of Marlatt, Baer, Donovan and Kivlahan (1988) who define addictive behaviour as:

»..a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems. Addictive behaviours are often experienced subjectively as 'loss of control' – the behaviour contrives to occur despite volitional attempts to abstain or moderate use. These habit patterns are typically characterized by immediate gratification (short term reward), often coupled with delayed deleterious effects (long term costs). Attempts to change an addictive behaviour (via treatment or self initiation) are typically marked with high relapse rates« (p.224).

In addition, it has been argued that addiction is most usefully described as a process (Krivanek, 1988), with involvement in addictive behaviour being placed upon a spectrum of severity of use and abuse (McMurrin, 1993). The boundaries of this formulation are flexible enough to include both substance and non-substance behaviours and to account for the inclusion of a wide variety of influencing factors. However, on an ethical level, the emphasis on the 'subjective experience' of loss-of-control means that the above definition does not locate the problem entirely within the individual concerned, but nor does it preclude our attribution of some responsibility to that individual.

Most people have their own idea or some common sense intuitive component about what 'addiction' constitutes but actually trying to define it becomes difficult. Defining 'addiction' is rather like defining a 'mountain' or 'tree', i.e. there is no single set of criteria that can ever be necessary or sufficient to define all instances. In essence, the whole is easier to recognize than the parts.

It is also important to acknowledge that the meanings of 'addiction' as the word is understood in both daily and in academic usage, are contextual, and socially-constructed (Howitt, 1991; Truan, 1993; Irvine, 1995). We must ask whether the term 'addiction' actually identifies a distinct phenomenon – something beyond problematic behaviour – whether socially constructed or physiologically based. If so, what are the principle features of this phenomenon? If we argue that it is hypothetically possible to be addicted to anything, it is still necessary to account for the fact that many people become addicted to alcohol but very few to gardening. Implicit within our understanding of the term 'addiction' is some measure of the negative consequences that must be experienced in order to justify the use of this word in its academic or clinical context. It seems reasonable at this stage to suggest that a combination of the kinds of rewards (physiological and psychological) and environment (physical, social, and cultural) associated with any particular behaviour will have a major effect on determining the likelihood of an excessive level of involvement in any particular activity.

The way of determining whether non-chemical (i.e. behavioural) addictions are addictive in a non-metaphorical sense is to compare them against clinical criteria for other established drug-ingested addictions. This method of making behavioural excesses more clinically identifiable has been proposed for behavioural addictions such as 'television addiction' (McIlwraith, Jacobvitz, Kubey & Alexander, 1991) and 'amusement machine addiction' (Griffiths, 1991; 1992). Further to this, authors such as Carnes (1991) and Brown (1993) have postulated that addictions consist of a number of common components. Carnes (1991) outlined what he called the 'signs of addiction' (see Table 1). To a large extent, these ten signs are subsumed within the components outlined by Brown (1993) and later modified by Griffiths (1996). The components of addiction are salience, mood modification, tol-

erance, withdrawal, conflict and relapse. These are described in more detail below with some relevant examples.

Table 1: 10 Signs of Addiction (adapted from Carnes, 1991)

- 1) A pattern of out of control behaviour
- 2) Severe consequences due to behaviour
- 3) Inability to stop behaviour despite adverse consequences
- 4) Persistent pursuit of self destructive or high risk behaviour
- 5) Ongoing desire or effort to limit behaviour
- 6) Uses behaviour as a coping strategy
- 7) Increased amounts of behaviour because the current level of activity is no longer sufficient
- 8) Severe mood changes around behaviour
- 9) Inordinate amounts of time spent trying to engage in behaviour and recovering from it
- 10) Important social, occupational and recreational activities are sacrificed or reduced because of behaviour

Saliency: This refers to when the particular activity becomes the most important activity in the person's life and dominates their thinking (preoccupations and cognitive distortions), feelings (cravings) and behaviour (deterioration of socialized behaviour). For instance, even if the person is not actually engaged in the behaviour they will be thinking about the next time they will be. Quotes from Griffiths' (1995) studies of slot machine addicts highlight the concept of saliency in gambling:

»If I wasn't actually gambling I was spending the rest of my time working out clever little schemes to obtain money to feed my habit. These two activities literally took up all my time«

»Gamble, gamble, gamble your life away..you might as well have put it down the drain. You've got to face the truth that you're having a love affair, and it's with a machine whose lights flash, takes your money and kills your soul«

»During four or five years of compulsive gambling I think I missed about six or seven days of playing fruit machines – keeping in mind that about four or five of those days were Christmas days where it was impossible to gain access to a gambling machine...As you have probably gathered, I ate, slept and breathed gambling machines...I couldn't even find time to spend with the people I loved..The machines were more

important than anything or anyone else. All I can remember is living in a trance for four years..as if I'd been drunk the whole time«

It should also be noted that some addictive behaviours such as smoking (nicotine) and drinking (alcohol) are activities that can be engaged in concurrently with other activities and therefore do not tend to dominate an addict's thoughts or lead to total preoccupation. For instance, a smoker can carry around their cigarettes and still engage in other day-to-day activities. However, if that person was in a situation that they were unable to smoke for a long period (such as a 24-hour plane flight), smoking *would* be the single most important thing in that person's life and would totally dominate their thoughts and behaviour. This is what could be termed 'reverse salience' with the addictive activity becoming the most important thing in that person's life when they are prevented from engaging in the behaviour.

Mood modification: This refers to the subjective experience that people report as a consequence of engaging in the particular activity (i.e., they experience an arousing 'buzz' or a 'high' or paradoxically a tranquilizing and/or de-stressing feel of 'escape' or 'numbing'). What is interesting is that a person's drug or activity of choice can have the capacity to achieve different mood modifying effects at different times. For instance, a nicotine addict may use cigarettes first thing in the morning to get the arousing 'nicotine rush' they need to get going for the day. By the end of the day they may not be using nicotine for its stimulant qualities, but may in fact be using nicotine as a way of de-stressing and relaxing. It could be argued that in these situations, psychology to some extent overrides physiology because of expectation effects.

In essence, many addicts use substances and behaviours as a way of producing a reliable and consistent shift in their mood state as a coping strategy to 'self-medicate' and makes themselves feel better in the process. Such mood modifying experiences are also common in many behavioural addictions such as gambling. These have included both subjective self-reports from interviews and questionnaires (Dickerson & Adcock, 1987; Griffiths, 1990) and objective experimental studies that have measured heart rate as an indicator of arousal (Leary & Dickerson, 1985; Griffiths, 1993a).

Tolerance: This refers to the process whereby increasing amounts of the particular activity are required to achieve the former effects. The classic example of tolerance is a heroin addict's need to increase the size of their 'fix' to get the type of feeling (e.g., an intense 'rush') they once got from much smaller doses. In gambling, tolerance may involve the gambler gradually having to increase the size of the bet to experience a mood modifying effect that was initially obtained by a much smaller bet. It may also involve spending longer and longer periods gambling. Tolerance is well established in psychoactive substance addictions and there is growing evidence in the field of behavioural addictions.

For instance, Griffiths (1993a) appeared to show that tolerance could be observed in an experimental situation involving gamblers. He found that both regular and non-regular slot machine gamblers' heart rates increased significantly during the playing period by approximately 22 beats per minute. However, the interesting finding was that after playing slot machines, regular gamblers' heart rates started to decrease at once, whereas non-regular gamblers' heart rates did not change significantly. In terms of an additive model of gambling, both regular and non-regular gamblers get a 'high' physiologically when playing, but the non-regular gamblers stay 'higher' for longer, meaning they do not have to gamble as fast or as often to induce the arousal peaks. Regular gamblers, in contrast, could be seen as becoming more tolerant to the gambling 'highs', meaning they have to gamble either faster or more often to experience the initially desired effect. It was argued by Griffiths that the study could be viewed as the first study to show an objective measure of tolerance in gambling.

Withdrawal symptoms: These refer to the unpleasant feeling states and/or physical effects which occur when the particular activity is discontinued or suddenly reduced. Such withdrawal effects may be psychological (e.g., extreme moodiness and irritability) or more physiological (e.g., nausea, sweats, headaches, insomnia, and other stress-related reactions). Withdrawal effects are well documented in drug addictions (Orford, 2001) and there is growing evidence that behavioural addictions such as pathological gambling also feature withdrawal symptoms (Griffiths, 2004). For instance, Rosenthal and Lesieur (1992) found that at least 65% of pathological gamblers reported at least one physical side-effect during withdrawal including insomnia, headaches, upset stomach, loss of appetite, physical weakness, heart racing, muscle aches, breathing difficulty and/or chills. Their results were also compared to the withdrawal effects from a substance-dependent control group. They concluded that pathological gamblers experienced more physical withdrawal effects when attempting to stop than the substance-dependent group.

Conflict: This refers to conflicts between the addict and those around them (interpersonal conflict) or from within the individual themselves (intrapsychic conflict) which are concerned with the particular activity. Continual choosing of short term pleasure and relief leads to disregard of adverse consequences and long term damage which in turn increases the apparent need for the addictive activity as a coping strategy. The conflict in the addict's life means that they end up compromising their (i) personal relationships (partner, children, relatives, friends, etc.), (ii) working or educational lives (depending on what age they are), and (iii) other social and recreational activities. Intra-psyche conflict may also be experienced in the form of addicts knowing that they are engaged heavily in the behaviour and want to cut down or stop – but find they are unable to do so experiencing a subjective loss of control.

Relapse: This refers to the tendency for repeated reversions to earlier patterns of the particular activity to recur and for even the most extreme patterns typical of the height of the addiction to be quickly restored after many years of abstinence or control. The classic example of relapse behaviour is in smokers who often give up for a period of time only to return to full time smoking after a few cigarettes. However, such relapses are common in all addictions including behavioural addictions such as gambling (Griffiths, 2002).

Griffiths (2002) has argued that all these components need to be present for a behaviour to be operationally defined as addictive. It is clear that some individuals engage in behaviours that have addictive elements without it necessarily being a full-blown addiction. For instance, if someone has no negative withdrawal effects after stopping their excessive behaviour, are they really addicted? If the excessive behaviour does not conflict with anything else in that person's life, can it be said to be an addiction? The difference between an excessive healthy enthusiasm and an addiction is that healthy enthusiasms add to life whereas addictions take away from it.

Addictive behaviour: A biopsychosocial approach

Addictions always result from an interaction and interplay between many factors including the person's biological and/or genetic predisposition, their psychological constitution (e.g. personality factors, unconscious motivations, attitudes, expectations and beliefs etc.), their social environment (i.e., situational characteristics) and the nature of the activity itself (i.e., structural characteristics) (Griffiths, 1999). This model is diagrammatically represented in Figure 1 and highlights the interconnected processes and integration between individual differences (i.e., personal vulnerability factors), situational characteristics, structural characteristics, and the resulting addictive behaviour. Each of these three general sets of influences (i.e., individual, structural and situational) can be subdivided much further depending on the type of addiction. Figures 2 to 4 diagrammatically represent this when applied to the example of gambling addiction.

Figure 1:
Influences on Addictive Behaviour

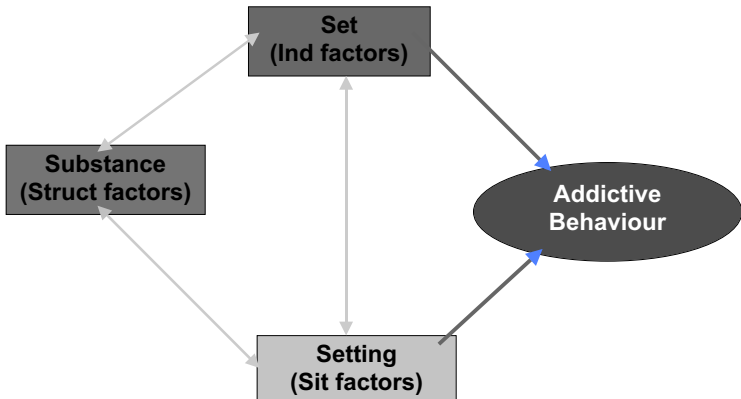


Figure 2:
Individual Factors in Gambling

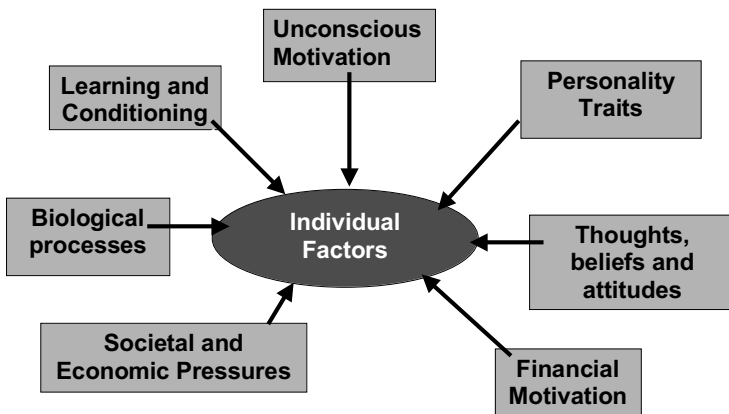


Figure 3:
Situational Characteristics in Gambling
(example: Amusement Arcade)

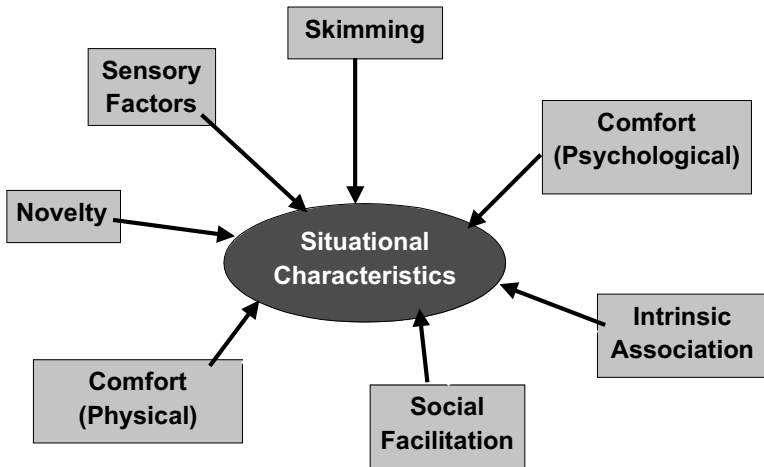


Figure 4:
Structural Characteristics in Gambling
(Example: Slot Machines)

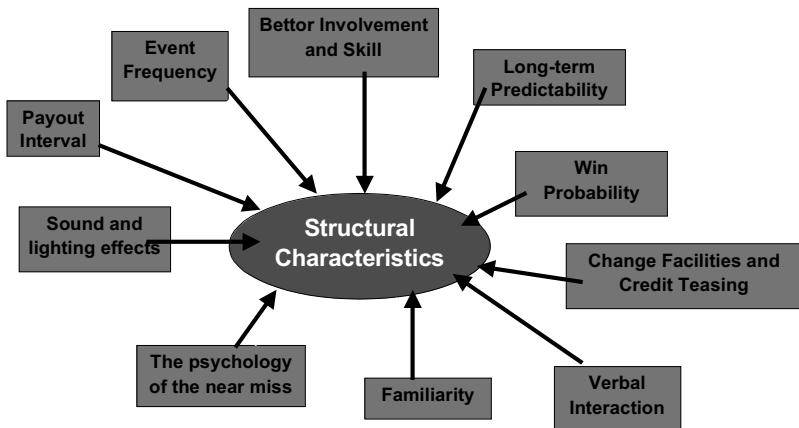


Figure 2 highlights the main individual (personal vulnerability) factors that may be involved in the acquisition, development and maintenance of gambling addiction. Most of these factors are equally applicable to other addictions (e.g., personality traits, biological processes, unconscious motivations, learning and conditioning effects, thoughts, beliefs and attitudes, etc.), although some are more idiosyncratically related to gambling (e.g., financial motivation, economic pressures). Figure 3 highlights the situational factors involved in gambling in an amusement arcade. Most of these factors are likely to be involved in acquisitional elements of gambling behaviour. This is what some researchers have referred to as 'object exposure' (i.e., Shaffer et al., 2004). They include such factors as the use of light, colour, and music in the environment, social facilitation factors, the novelty of the activity, and how physiologically and psychologically comfortable the person is in the environment. Context can be an important factor in the development of addictions. For instance, drug taking in Vietnam was highly prevalent but on returning to the US, most soldiers' addictive drug use stopped spontaneously when they were in their home environment (Robins, Helzer & Davis, 1975). Another example is the effects of Ecstasy which are likely to be different depending on the presence or absence of 'rave' music (Larkin & Griffiths, 2004).

Figure 4 highlights the structural characteristics of slot machines that are known to be one of the most addictive types of gambling (Griffiths, 1999, 2002). Almost all of these factors are unique to slot machines and represent the features that are specifically incorporated into the machine by the designers and operators in the gaming industry to keep people gambling once they have started. They are important in the development and maintenance of gambling addiction. This is what some researchers have referred to as either 'object interaction' (i.e., Shaffer et al., 2004) or 'psycho-structural interaction' (Griffiths, 1993b). Griffiths (1999) has noted there is no precise frequency level of a gambling game at which people become addicted since addiction will be an integrated mix of factors in which frequency is just one factor in the overall equation. Other factors and dimensions (external to the person themselves) which have been reported in the general gambling literature and which were summarized by Griffiths (1999) include:

- stake size (including issues around affordability, perceived value for money)
- event frequency (time gap between each gamble)
- amount of money lost in a given time period (important in chasing)
- prize structures (number and value of prizes)
- probability of winning (e.g. 1 in 14 million on the lottery)
- size of jackpot (e.g. over £1 million on the lottery)
- skill and pseudo-skill elements (actual or perceived)
- 'near miss' opportunities (number of near winning situations)

- light and colour effects (e.g. use of red lights on slot machines)
- sound effects (e.g. use of buzzers or musical tunes to indicate winning)
- social or asocial nature of the game (individual and/or group activity)
- accessibility (e.g. opening times, membership rules)
- accessibility (e.g. number of outlets)
- location of gambling establishment (out of town, next to workplace etc.)
- type of gambling establishment (e.g. betting shop, amusement arcade etc.)
- advertising (e.g. television commercials)
- the rules of the game

Each of these differences may have implications for the gambler's motivations and as a consequence the social impact of gambling. Although many of these gambling-inducing structural characteristics are dependent on individual psychological factors (e.g., reinforcement) they are a direct result of the structural characteristics and could not have influenced gambling behaviour independently. It is for this reason, above all others, that a structural approach could be potentially useful. For drug addictions, structural characteristics would include things such as the dose amount, the drug's toxicity, and the route of administration.

It is clear that by including the situational and structural characteristics of the addictive process, the etiology of how and why addiction occurs, starts to become very complex. Shaffer et al. (2004) argue that evidence supporting a broader conceptualization of addiction is emerging. Citing the latest neurobiological research, they claim that addiction disorders may not be independent. Put simply, they suggest that each addiction – whether it be to gambling, drugs, sex or the Internet – might be a distinctive expression of the same underlying syndrome (i.e., addiction is a syndrome with multiple opportunistic expressions). To support their observations, Shaffer et al. report that many commonalities occur across different expressions of addiction, and that these commonalities reflect a shared etiology. These commonalities will be reviewed in the next section.

Commonalities across the addictions

It has been noted by a number of authors (e.g. Griffiths, 1996; Shaffer et al., 2004), that there appear to be psychological, sociological and cultural commonalities between many addictive behaviours. For some, this is seen as evidence that all addictions reflect a shared etiology (i.e., Shaffer et al., 2004). These will be briefly outlined in turn.

Psychological Commonalities: A number of authors (e.g., Donegan, Rodin, O'Brien & Soloman, 1983; Griffiths, 1996; Orford, 2001) have noted there are many psychological commonalities between drug ingested behav-

hours like drinking alcohol and non-drug ingested behaviours like gambling. In brief, these commonalities are:

- The ability of the substance/activity to act as a reinforcer. Since addictions rely on constant rewards, reinforcement must be continually present and can occur on many different levels (i.e., psychological, physiological, financial, and social)
- Acquired tolerance, physical dependence and withdrawal
- Affective contrast (euphoria/dysphoria)
- The capacity of the substance/activity to act as an unconditioned stimulus
- Capacity of states like arousal, stress and pain to influence use

It is clear that these commonalities across the addictions are very similar to the addiction components outlined earlier in the paper.

Sociological Commonalities: A number of authors (e.g., Kandel & Maloff, 1983; Griffiths, 1996) have noted there are many sociological commonalities between excessive behaviours although the commonalities tend to come from drug-ingested behaviours. These commonalities are:

- Association with youth (18-25 years) then a decline in use
- Social meaning (i.e., using the addictive behaviour as a ‘rites of passage’ into adulthood, a form of rebellion, or using it to test limits etc.)
- Similar social and developmental influences (e.g., engaging in the behaviour because parents or peers do)
- Early introduction more likely leading to addiction (i.e., the earlier that someone is initiated into the behaviour, the more problems there are likely to be later in life)
- Lifestyle/attitudes of addicts tending to be similar (e.g., less conforming, truanting and lower school performance, weaker religious commitment etc.)
- Contextual factors being of importance (e.g. drug taking in Vietnam, Robins et al., 1975)
- Commonalities in spontaneous termination (although there are differences)
- Addictions being higher/more problematic amongst certain groups (e.g. single, divorced, unemployed etc.)
- Links with crime (addicts having to steal in order to get money to feed their addictions to drugs, gambling etc.)

Further to the psychological and sociological commonalities, Walker and Lidz (1983) have noted cultural commonalities such as addictive behaviours (i) being problem inducing and undesirable, (ii) being prohibited at various times (for example, activities such as drinking alcohol and gambling),

(ii) having ‘normative ambiguity’ (in that some parts of the behaviour are encouraged but stigma results from their overenactment) and (iv) having self-help groups with similar 12-Step philosophies adopting the Minnesota Model (e.g. Alcoholics Anonymous, Gamblers Anonymous, Narcotics Anonymous, Overeaters Anonymous, Sexaholics Anonymous etc.). Both Miller (1980) and Griffiths (1996) have outlined other commonalities among addictive behaviours such as (i) the short term benefits and long term costs, (ii) significant health risks, (iii) the lack of a single, simple, scientifically satisfying model of etiology, (iv) the lack of a clear treatment model (e.g., alcoholics go to AA, heroin addicts undergo methadone maintenance, overeaters go on crash diets and smokers undergo hypnosis or use nicotine replacement therapies) and (e) reciprocity (i.e., pattern changes in addiction especially in cross addictions and with ‘triggers’). Further to this there have been increasing reports of similarities in neurochemistry/neurobiology (Chelton & Bonney, 1987; Sunderwirth & Milkman, 1991; Wise, 1996; Betz, Mihalic, Pinto & Raffa, 2000).

Addiction research: Some conceptual problems

At this point a brief overview of some of the major problems in the field is necessary. Evaluation of the literature in the field cannot be attempted without taking into account the many problems (definitional, methodological, conceptual) that characterize the area of addictive behaviours. Below are some of the main problems that face the area. The list (adapted from Griffiths, 2003) is not exhaustive but does contain some fundamental problems that need to be addressed.

- As is clear from the preceding review, addiction is multi-faceted and not a unitary phenomenon. Treating all forms of addiction as equivalent in terms of underlying motivations etc. may cloud the issue rather than clarify it. For instance, can we really say that an alcoholic, a pathological gambler, a ‘shopaholic’ and an Internet addict all have a similar underlying psychology? This may have implications for intervention, prevention, and treatment of these particular addictive behaviours.
- As mentioned previously, evidence suggests that addiction is more of a syndrome than a single disorder. A syndrome is a cluster of signs and symptoms related to an abnormal underlying condition. Not all signs and symptoms are present in every expression of the syndrome, and some manifestations of a syndrome have unique signs and symptoms (Shaffer et al., 2004). Shaffer and Korn (2002) suggest a syndrome’s common components (e.g. depression, anxiety, impulsivity) are shared with other disorders (e.g. drug abuse), whereas unique components (e.g., chasing, betting increased amounts of money) are specific to some addictions (in

this case, problem gambling). Again, this may also have implications for intervention, prevention, and treatment.

- Addiction is a behaviour that sometimes has to be viewed as part of a behaviour cluster rather than in isolation. For instance, a pathological gambler who is also an alcoholic may be very different in motivational terms from someone whose only problem is gambling. Comorbidity clearly has implications for intervention, prevention, and treatment.
- Demographic differences may produce very different findings. Take the example of gambling addiction and motivation to gamble. There may be significant differences due to age (an adult pathological horserace gambler cannot be easily compared to an adolescent slot machine addict), gender (a male pathological horserace gambler cannot be easily compared to a female bingo player), and culture (slot machine playing in the UK cannot necessarily be compared to slot machine playing in the US).
- Addiction – like most other behaviours – has definitional problems. What are the boundaries of addiction? As noted in the introduction, some definitions of addiction only include those behaviours that involve the ingestion of a psychoactive substance. Other problems arise when concepts such as ‘social’ and ‘normal’ behaviour are defined. For instance, ‘normal’ and ‘social’ drinking and gambling are on a continuum and there is always an arbitrary cut off point as to when these become excessive, addictive and/or problematic (i.e. ‘normative ambiguity’). The definition of addiction also suffers from the fact that there are so many words that appear to be used interchangeably throughout the literature (e.g. pathological, compulsive, dependent, addictive, habitual, impulsive, excessive etc).
- Research into addiction suffers from the fact that there are so many different screening instruments that findings on addiction in one study cannot be easily compared with results from another study if a different measurement tool was used. Furthermore, screening instruments for assessing addiction may not be appropriate, valid and/or reliable for some groups (e.g., adolescents).
- Addiction has a temporal dimension and is therefore not fixed or static which has implications for prevention, intervention and treatment. This may also affect research findings that examine addicts at different stages of their addiction.
- Almost every branch of psychology has a perspective on addiction (e.g. psychobiological, cognitive, behavioural, psychodynamic, psychosexual, personality) which tends to narrow the focus of addiction research. The same argument can be made about other disciplinary perspectives (genetic, sociological, economic etc.). All of these insular perspectives have implications for both research and treatment in the addiction field.

Conclusions

It is clear that many research paradigms are insular and inadequate in explaining addiction. Addiction is a multi-faceted behaviour that is strongly influenced by contextual factors which cannot be encompassed by any single theoretical perspective. These factors include variations in behavioural involvement and motivation across different demographic groups, structural characteristics of activities/substances, and the developmental or temporal nature of addictive behaviour. Research and clinical interventions are best served by a biopsychosocial approach that incorporates the best strands of contemporary psychology, biology and sociology.

Over 25 years ago, Shaffer and Gambino (1979) put forward some steps towards a paradigm for the analysis of the addictions. They stated that:

- Individual differences must be considered and not ignored
- Individuals are self determining agents
- A taxonomy of situations must be developed that describes the vast majority of contexts and conditions in which people use substances or engage in habitual behaviours to alter their perceived experience
- Behaviours that are not completely self developed or understood by the people themselves must be compensated for
- Drugs and habitual behaviours alter the perceived experience of the individual

Despite a quarter century of further research, the addictive behaviours field does not seem to be much further advanced and the quote by Shaffer and Burglass right at the start of this paper still rings true. Unfortunately, this paper has posed more questions than it has answered but such questions need to be asked if the field is to move forward. In addition to Shaffer and Gambino's assertions, Griffiths and Larkin have suggested there are core components of what a successful theory of addictions should contain (Larkin & Griffiths, 1998; Griffiths & Larkin, 2004). A successful theory must (i) synthesize pharmacological, cultural, situational and personality factors, (ii) account for varying nature of addiction across cultures, individuals and time, (iii) account for commonalities between all addictions, and (iv) be faithful to lived human experience.

Larkin and Griffiths (1998; Griffiths & Larkin, 2004) have also argued the case for a complex systems model of addiction. 'Complex' for obvious reasons, and 'systems' after Davies (1992), who argued that alternative explanations for excessive behaviour require »the development of a 'system' within which drug use is conceived of as an activity carried out for positive reasons, by people who make individual decisions about their substance use, and who may take drugs competently as well as incompetently« (p.163). Gambino and Shaffer (1979) have emphasized the difficulties of

re-integrating research and practice in the area of addiction. On the basis of Polkinghorne's (1993) observations on the nature of such divisions, a more flexible theoretical approach, such as the complex systems model, ought to go some way toward bridging the epistemological gap.

The complex systems model corresponds well to the biopsychosocial approach to addiction (e.g., Marlatt et al., 1988; McMurrin, 1994). It may also be considered to be a descendent of previous multi-factorial approaches to the addiction process (e.g., Wanberg & Horn, 1983; Zinberg, 1984). Obviously, from the perspective of the complex systems model, it is possible to consider the interaction of both the common and the unique elements of any specific individual's situation. This includes psychological, physiological, social and cultural factors that may be particular to any individual. It also allows for consideration of the pharmacological properties of specific substances, or the reinforcing properties of certain kinds of gaming machines (see Griffiths, 1995). It is important, therefore, to point out that this is not a return to siting the property of 'addictiveness' as located within particular substances (or within particular activities). However, it is necessary to be aware of effects that may be common to certain kinds of substances or activities, but not to others.

Hopefully what this paper has demonstrated is that addictions are a part of a biopsychosocial process and not just restricted to drug-ingested behaviours. Evidence is growing that excessive behaviours of all types do seem to have many commonalities and this may reflect a common etiology of addictive behaviour. Such commonalities may have implications not only for treatment of such behaviours but also for how the general public perceive such behaviours. Behavioural addictions do exist, and should be treated no differently from more established (chemical) addictions.

REFERENCES

- BETZ, C., MIHALIC, D., PINTO, M.E. & RAFFA, R.B. (2000): Could a common biochemical mechanism underlie addictions? *Journal of Clinical Pharmacological Therapy*, 25, 11-20.
- BROWN, R.I.F. (1993): Some contributions of the study of gambling to the study of other addictions. In W.R. Eadington & J. Cornelius (Eds.), *Gambling Behavior and Problem Gambling*, pp.341-372. Reno, Nevada: University of Nevada Press.
- BURGLASS, M.E. & SHAFFER, H.J. (1984): Diagnosis in the addictions I: Conceptual problems. *Addictive Behaviors*, 3, 19-34.
- CARNES, P. (1983): *Out of the Shadows: Understanding Sexual Addiction*. Minneapolis: CompCare.
- CARNES, P. (1991): *Don't Call It Love: Recovery From Sexual Addiction*. New York: Bantam Books.
- CHELTON, L.G. & BONNEY, W.C. (1987): Addiction, affects and self object theory. *Psychotherapy*, 24, 40-46.
- DAVIES, J. B. (1992): *The Myth of Addiction: An Application of the Psychological Theory of Attribution to Illicit Drug Use*. Reading: Harwood Academic.

- DICKERSON, M. & ADCOCK, S. (1987): Mood, arousal and cognitions in persistent gambling: Preliminary investigation of a theoretical model. *Journal of Gambling Behavior*, 3, 3-15.
- DONEGAN, N.H., RODIN, J., O'BRIEN, C.P. & SOLOMON, R.L. (1983): A learning theory approach to commonalities. In P.K. Levison et al. (Eds.), *Commonalities in Substance Abuse and Habitual Behaviour*, pp.11-156. Lexington, Mass.: Lexington Books.
- GRIFFITHS, M.D. (1990): The acquisition, development and maintenance of fruit machine gambling in adolescents. *Journal of Gambling Studies*, 6, 193-204.
- GRIFFITHS, M.D. (1991): Amusement machine playing in childhood and adolescence: A comparative analysis of video games and fruit machines. *Journal of Adolescence*, 14, 53-73.
- GRIFFITHS, M.D. (1992): Pinball wizard: The case of a pinball machine addict. *Psychological Reports*, 71, 160-162.
- GRIFFITHS, M.D. (1993a): Tolerance in gambling: An objective measure using the psychophysiological analysis of male fruit machine gamblers. *Addictive Behaviors*, 18, 365-372.
- GRIFFITHS, M.D. (1993b): Fruit machine gambling: The importance of structural characteristics. *Journal of Gambling Studies*, 9, 133-152.
- GRIFFITHS, M.D. (1995): *Adolescent Gambling*. London: Routledge.
- GRIFFITHS, M.D. (1996): Nicotine, tobacco and addiction. *Nature*, 384, 18.
- GRIFFITHS, M.D. (1999): Gambling technologies: Prospects for problem gambling. *Journal of Gambling Studies*, 15, 265-283.
- GRIFFITHS, M.D. (2000): Internet addiction – Time to be taken seriously? *Addiction Research*, 8, 413-418.
- GRIFFITHS, M.D. (2002): *Gambling and Gaming Addictions in Adolescence*. Leicester: British Psychological Society/Blackwells.
- GRIFFITHS, M.D. (2003): Adolescent gambling: Risk factors and implications for prevention, intervention, and treatment. In D. Romer (Ed.), *Reducing Adolescent Risk: Toward An Integrated Approach*. pp. 223-238. London: Sage.
- GRIFFITHS, M.D. (2004): Betting your life on it: Problem gambling has clear health related consequences. *British Medical Journal*, 329, 1055-1056.
- GRIFFITHS, M.D. (2005): Workaholism is still a useful construct *Addiction Research and Theory*, in press.
- GRIFFITHS, M.D. & LARKIN, M. (2004): Conceptualizing addiction: The case for a 'complex systems' account. *Addiction Research and Theory*, 12, 99-102.
- HOWITT, D. (1991): *Concerning Psychology*. Milton Keynes: OUP.
- IRVINE, J.M. (1995): Reinventing perversion: sex addiction and cultural anxieties. *Journal of the History of Sexuality*, 5, 429-450.
- KANDEL, D.B. & MALOFF, D.R. (1983): Commonalities in drug use: A sociological perspective. In P.K. Levison et al (Eds.), *Commonalities in Substance Abuse and Habitual Behaviour*, pp.3-27. Lexington, Mass.: Lexington Books.
- KENDLER, K.S., JACOBSON, K.C., PRESCOTT, C.A. & NEALE, M.C. (2003): Specificity of genetic and environmental risk factors for use and abuse/dependence of cannabis, cocaine, hallucinogens, sedatives, stimulants, and opiates in male twins. *American Journal of Psychiatry*, 160, 687-695.
- KRIVANEK, J. (1988): *Addictions*. London: Allen and Unwin.
- LARKIN, M. & GRIFFITHS, M.D. (1998): Response to Shaffer (1996): The case for 'complex systems' conceptualizations of addiction, *Journal of Gambling Studies*, 14, 73-82.
- LARKIN, M. & GRIFFITHS, M.D. (2004): Dangerous sports and recreational drug-use: Rationalising and contextualising risk. *Journal of Community and Applied Social Psychology*, 14, 215-232.

- LEARY, K. & DICKERSON, M.G. (1985): Levels of arousal in high and low frequency gamblers. *Behaviour Research and Therapy*, 23, 635-640.
- MARLATT, G.A., BAER, J.S., DONOVAN, D.M. & KIVLAHAN, D.R. (1988): Addictive behaviors: Etiology and treatment. *Annual Review of Psychology*, 39, 223-252.
- MCILWRAITH, R., JACOBVITZ, R.S., KUBEY, R. & ALEXANDER, A. (1991): Television addiction: Theories and data behind the ubiquitous metaphor. *American Behavioral Scientist*, 35, 104-121.
- MCMURRAN, M. (1994): *The Psychology of Addiction*. London: Taylor and Francis.
- MILLER, W.R. (1980): *The Addictive Behaviors*. Oxford: Pergamon Press.
- ORFORD, J. (2001): *Excessive Appetites: A Psychological View of the Addictions (Second Edition)*. Chichester: Wiley.
- ROBINS, L.N., HELZER, J.E. & DAVIS, D.H. (1975) Narcotic use in Southeast Asia and afterward. *Archives of General Psychiatry*, 32, 955-961.
- PEELE, S. & BRODSKY, A. (1975): *Love and Addiction*. New York: Taplinger.
- POLKINGHORNE, D.E. (1992): Postmodern epistemology of practice. In Kvale, S. (Ed), *Psychology and Postmodernism*. London: Sage.
- RACHLIN, H. (1990): Why do people gamble and keep gambling despite heavy losses? *Psychological Science*, 1, 294-297.
- ROBINS, L.N., HELTZER, J.E. & DAVIS, D.H. (1975): Narcotic use in southeast Asia and afterward. *Archives of General Psychiatry*, 32, 955-961.
- ROSENTHAL, R. & LESIEUR, H. (1992): Self-reported withdrawal symptoms and pathological gambling. *American Journal of the Addictions*, 1, 150-154.
- SHAFFER, H.J. & GAMBINO, B. (1979): Addiction paradigms II: Theory, research and practice. *Journal of Psychedelic Drugs*, 11, 299-304.
- SHAFFER, H.J. & KORN, D. (2002): Gambling and related mental disorders: A public health analysis. *Annual Review of Public Health*, 23, 171-212.
- SHAFFER, H.J., LAPLANTE, D.A., LABRIE, R.A., KIDMAN, R.C., DONATO, A.N. & STANTON, M.V. (2004): Towards a syndrome model of addiction: Multiple expressions, common etiology. *Harvard Review of Psychiatry*, 12, 1-8.
- SUNDERWIRTH, S.G. & MILKMAN, H. (1991): Behaviourial and neurochemical commonalities in addiction. *Contemporary Family Therapy*, 13, 421-433.
- TERRY, A., SZABO, A. & GRIFFITHS, M. (2004): The Exercise Addiction Inventory: A new brief screening tool. *Addiction Research and Theory*, 12, 489-499.
- TRUAN, F. (1993) Addiction as a social construction: A postempirical view. *Journal of Psychology*, 127, 489-499.
- WALKER, M.B. (1989): Some problems with the concept of 'gambling addiction': Should theories of addiction be generalized to include excessive gambling? *Journal of Gambling Behavior*, 5, 179-200.
- WALKER, A.L. & LIDZ, C.W. (1983): Common features of troublesome habitual behaviours. In P.K. Levison *et al* (Eds.), *Commonalities in Substance Abuse and Habitual Behaviour*, pp.29-44. Lexington, Mass.: Lexington Books.
- WANBERG, K.W & HORN, J.L. (1983): Assessment of alcohol-use with multi-dimensional concepts and measures. *American Psychologist*, 38, 1055-1069.
- WISE, R.A. (1996): Addictive drugs and brain stimulation reward. *Annual Review of Neuroscience*, 19, 319-40.
- Zinberg, N.E (1984) *Drug, Set, Setting: The Basis For Controlled Intoxicant Use*. New Haven: Yale University Press.