

CONCEPTUALIZING ADDICTION

Addiction as excessive appetite

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Abstract

The excessive appetite model of addiction is summarized. The paper begins by considering the forms of excessive appetite which a comprehensive model should account for: principally, excessive drinking, smoking, gambling, eating, sex and a diverse range of drugs including at least heroin, cocaine and cannabis. The model rests, therefore, upon a broader concept of what constitutes addiction than the traditional, more restricted, and arguably misleading definition. The core elements of the model include: very skewed consumption distribution curves; restraint, control or deterrence; positive incentive learning mechanisms which highlight varied forms of rapid emotional change as rewards, and wide cue conditioning; complex memory schemata; secondary, acquired emotional regulation cycles, of which 'chasing', 'the abstinence violation effect' and neuroadaptation are examples; and the consequences of conflict. These primary and secondary processes, occurring within diverse sociocultural contexts, are sufficient to account for the development of a strong attachment to an appetitive activity, such that self-control is diminished, and behaviour may appear to be disease-like. Giving up excess is a natural consequence of conflict arising from strong and troublesome appetite. There is much supportive evidence that change occurs outside expert treatment, and that when it occurs within treatment the change processes are more basic and universal than those espoused by fashionable expert theories.

Which addictions? Changing the shape of the field

Although 'addiction' is an apt, commonly understood word to use with respect to excessive appetitive behaviours, it has the important disadvantage that it has come to be overly identified with drugs that have an effect on the central nervous system. More than that, it has become identified with a narrow range of such drugs, particularly those that were outside the law in the West in the late 20th century, and especially with heroin. Not only has this distorted the provision of services for people who might be in need of help in overcoming an excessive appetite, but in my view it has very seriously biased our theoretical understanding.

This restricted focus on a particular part of the phenomenon about which we should be theorizing continues to lead us astray, although as this paper will attempt to demonstrate there are some healthy signs that theorizers in our field are searching for a more comprehensive account. Meanwhile the field is still frequently confined to 'drug addiction' or 'substance abuse' in a way that is unhelpful for the development of a complete theory.

The starting-point for a view of addiction as excessive appetite is that there exists a range of objects and activities which are particularly risky for humans, who are liable to develop such strong attachment to them that they then find their ability to moderate their behaviour

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Alcohol

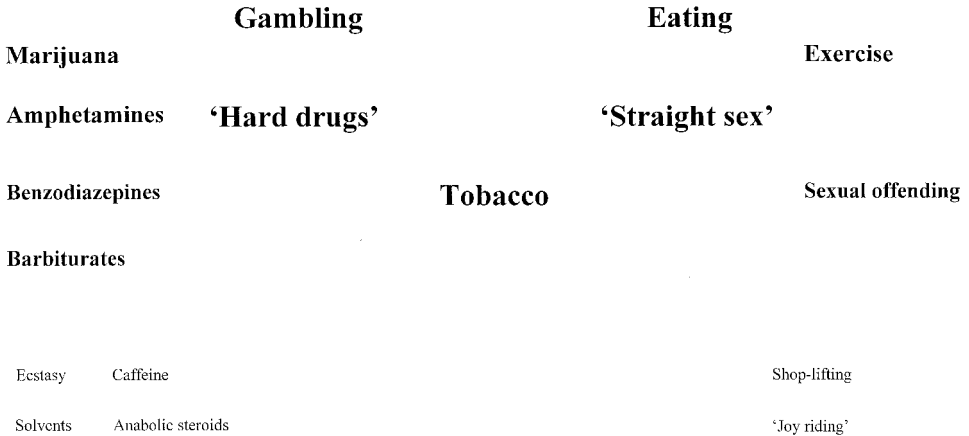


Figure 1. *The excessive appetites.*

significantly diminished. Those for which we have the clearest evidence, situated as we are at a particular point in human history, are shown in the centre of Fig. 1.

The inclusion of alcohol needs little defence. According to Warner (1994) the idea of individual habitual excess or addiction, as opposed to voluntary drunkenness, can be seen as early as the beginning of the 17th century in the sermons and other moralizing tracts of the times. The earliest she unearthed was attributed to John Downame, who wrote of some of his parishioners:

... they who addict themselves to this vice, doe finde it so sweete and pleasing to the flesh, that they are loth to part with it, and by long custome they turne delight into necessitie, and bring vpon themselves such an vn-satiabie thirst, that they will as willingly leaue to liue, as leaue their excessiue drinking; and howsoeuer the manifold mischiefes into which they plunge themselves, serue as so manie forcible arguments to dissuade them from this vice, yet against all rules of reason, they hold fast their conclusion, that come what come may, they will not leaue their drunkennes (Downame, 1609, p. 101, cited by Warner, p. 687).

Already in this early description there appear the essential ingredients of a plain, straightforward

statement on what constitutes addiction. Indeed, it has hardly been bettered since as a working definition. Here we have recognition that, by long usage, an activity that was originally pleasurable has become a 'necessity'; that a strong craving is part of the experience; and that despite the many harms that it has brought, neither the exercise of reason nor encouragement from others have been sufficient to bring about control. Late 20th century experts have often brought muddle and confusion to this plain account, attempting to import new-fangled ideas from the theories in which they have been schooled. As we consider, later, some of the ways in which psychologists and others have tried to understand addiction, we would do well to remind ourselves of the insightful observations of the Reverend Downame.

Tobacco occupies an important place in the picture because its legality and acceptability in modern times, plus its apparent lack of intoxicating properties, provide a striking contrast with heroin and alcohol, and for a long time obscured its addictiveness. Sir Humphrey Rolleston, whose report on opiates in the 1920s was to be of such importance in laying the foundations for the comparatively permissive British approach to heroin prescribing in the 1960s, is quoted as saying: 'To regard tobacco as a drug of addiction is all very well in a humorous sense, but it is hardly accurate' (Rolleston, 1926, quoted by Jaffe, 1977, pp. 207-208).

Even the multi-national tobacco companies are now beginning to admit that Sir Humphrey had got it wrong. The evidence that millions of people, the world over, have developed such an attachment to tobacco smoking that they find it difficult to give up when they want to do so is now overwhelming. There is still no better evidence for this than the results of the study of adults' and adolescents' smoking habits and attitudes, carried out for the British Government Social Survey by McKennell & Thomas (1967) in the 1960s. Their report was particularly noteworthy for their introduction of the concept of 'dissonant smoking', a simple and straightforward concept which may go some way towards clearing a great deal of the confusion that surrounds such terms as 'addiction' and 'dependence'. A 'dissonant' smoker is simply someone who would like to behave otherwise than he or she does: someone who smokes but would prefer not to or who smokes more than an amount considered ideal. As McKennell & Thomas wrote, 'Dissonant smokers appear to be people who are trapped by the smoking habit, somewhat against their will. The majority of them have in fact tried several times to give up smoking... One of the most remarkable findings that emerges from social surveys of smokers' habits and attitudes is the very large number who either express a wish to give up smoking or else have tried to do so' (pp. 90, 96). If addiction is judged by the criterion of difficulty in leaving off a behaviour despite wishing to do so, then tobacco might be judged to be, not simply addictive, but probably the most addictive of all substances.

Figure 1 shows a number of other drugs, for each of which there is at least some evidence of initial 'delight' developing into a degree of 'necessity' and the erosion of personal control. What is instructive is the diversity of the list: it includes substances prescribed and illicit, ancient and modern, natural and synthetic, stimulating and calming. It includes such challenging examples as caffeine and cannabis. The former has been described as the most widely used psychoactive drug in the world, and laboratory studies have clearly shown the existence of withdrawal symptoms on cessation of intake: yet the evidence is weak that many people feel their intake of tea or coffee to be out of control, or that they have become preoccupied with caffeine intake to the point of neglecting other roles or activities, or continue to take caffeine despite

knowing that they have health problems aggravated by it, or that many people try to stop taking it but have difficulty doing so (Hughes *et al.*, 1992). Cannabis, by contrast, appears to produce little in the way of withdrawal symptoms (at least not in the doses of THC normally taken) but now, after much delay, is being recognized in the West as one of the more common forms of drug 'dependence' with an adult point prevalence of between 4% and 5% in countries such as the United States and New Zealand (Hall, Solowij & Lemon, 1994). Cocaine offers a particularly challenging example. Its image in the West has changed dramatically in the 20 years since the first edition of *Excessive Appetites* (Orford, 1985) was in preparation. Despite the sinister reputation that it has acquired in the meantime, its addictiveness is still sufficiently controversial that Ditton & Hammersley (1996) could conclude from their interview study of Scottish consumers that cocaine was: '... not addictive in the normal sense of the word' (p. 69). On the other hand, other statements in their report suggest that they were concerned, not to deny that cocaine could *ever* addict, but rather to demolish the extreme, 'straw man' position that cocaine would *always* enslave.

However, the biggest challenge to the development of a comprehensive understanding of addiction comes from those forms which are not drugs and which have therefore been marginalized in the past. The excessive appetites model puts gambling, eating and sex near the centre of the picture. It is not simply that we might reluctantly permit them to the periphery of our gaze, but rather that they need to be restored to a proper, central position in order to correct the eccentricity of previous thinking that has come about as a result of attending far too closely to a limited class of addictive activities. Gambling is particularly important because of the long-standing and wide-ranging evidence of its addictiveness. The following quotation is from a book published in 1619 under the title, *The Nicker Nicked, or The Cheats of Gaming Discovered*:

Most gamesters begin at small game; and, by degrees, if their money or estates hold out, they rise to great sums; some have played first of all their money, then their rings, coach and horses, even their wearing clothes and perukes; and then such a farm; and, at last, perhaps a

Table 1. *Selected 12-Step Movements in the United States*

Date founded	Name	Number of groups	International
1951	Al-Anon Family Groups	32 000	+
1953	Narcotics Anonymous	22 000	+
1957	Alateen	4100	-
1957	Gamblers Anonymous	1200	+
1960	Overeaters Anonymous	10 000	+
1971	Emotions Anonymous	1200	-
1976	Adult children of alcoholics	1800	+
1976	Debtors Anonymous	400	-
1976	Augustine Fellowship	1000	+
	Sex & Love		
	Addicts Anonymous		
1982	Survivors of Incest Anonymous	800	+
1982	Cocaine Anonymous	1500	+
1985	Nicotine Anonymous	500	+
1986	Co-Dependents	3500	+

Taken from Mäkelä *et al.*, 1996, p. 217

lordship (Ashton, 1898, cited by France, 1902, p. 268).

In the early 1980s Lesieur (1984), in his classic work, *The Chase*, reported the results of lengthy interviews with 50 'compulsive gamblers', one of whom said:

Sold my tools, sold my car, sold my camera, sold my wristwatch. Sold personal things, antiques that I bought from Europe. I sold them for gambling. A stamp collection. Yes, I sold everything (p. 69).

In the early 1990s a young British machine gambler told Griffiths (1993):

... any dinner, bus fare money went into fruit machines during school hours. When I started my full time job... as a cashier, my weekly wages (£75) went in a few hours. I needed more money therefore I stole from the cash till I am now going to court (female, aged 16).

Table 1, taken from Mäkelä *et al.*'s (1996) report of a study of AA in eight different countries, shows the growth of 12-Step programmes in the United States for groups other than 'alcoholics', but in all cases based upon AA principles. All the major excessive appetites considered in this paper are represented. Gamblers Anonymous was one of the first such programmes to develop, and

'pathological gambling' (a misleading term) has been recognized in the 3rd and 4th versions of the American Psychiatric Association's *Diagnostic and Statistical Manual* (DSM). Addiction to gambling is not controversial so long as a plain definition of addiction is adopted, such as the following:

Addiction: an attachment to an appetitive activity, so strong that a person finds it difficult to moderate the activity despite the fact that it is causing harm.

Defining addiction in that way, people with acknowledged gambling problems are found to be equally attached to gambling as those with drinking problems are to alcohol (Orford, Daniels & Somers, 1996).

Excessive eating forces itself upon our attention because of the close parallels between what is now recognized as 'bulimia' and 'binge eating disorder' and other forms of excessive appetitive behaviour (e.g. Fairburn & Wilson, 1993). At present the scientific and professional worlds of 'drug addiction' and 'eating disorders' are utterly separate. This probably has more to do with the history of those fields (associated with anorexia and obesity in the case of eating) and different populations (adolescent women being a particular focus for eating). If these arbitrary and superficial differences can be put aside, however, it may be seen that the opportunities for mutual borrowing of ideas are many. The theoretical

concepts of behavioural 'restraint', the 'abstinence violation effect', appetite-specific attentional effects and the equivalence of theoretically distinct treatments are four points at which the two fields touch.

One of the most challenging ideas for students of addiction brought up in the scientific and professional world of the late 20th century is that of 'sex addiction'. In fact, the evidence is overwhelming that ordinary, 'straight' sex does, for many people, become so out of hand that it becomes difficult to control despite its excessiveness. The evidence comes from the 19th and early 20th century literature on 'nymphomania' (Groneman, 1994), autobiographies and biographies of Victorians such as Walter (Anonymous, 1966) and earlier notables such as Samuel Pepys and James Boswell (Stone, 1979), more recent, detailed accounts of the phenomenon (e.g. Carnes, 1983; Goodman, 1998), and the existence of 12-Step groups such as *Sex Addicts Anonymous*, *Sex and Love Addicts Anonymous*, *Sexaholics Anonymous* and *Sexual Compulsives Anonymous* (Goodman, 1998). The question is not whether out-of-control sexuality exists, because it clearly does, but rather how it is that we have viewed it as outwith the boundaries of the addiction field. This may be partly because it is now unfashionable to speak of excessive or immoderate sexual behaviour, but the main factor has probably been the narrowness of prevailing ideas about what constitutes addiction. Interestingly enough, psychoanalysts have taken a continued interest in 'hypersexuality' while those of other persuasions have not. Putting excessive sexuality near the centre of our field of view will be very instructive for developing theories of addiction, as I hope to show.

How do appetites sometimes become excessive?

A crucial implication of changing the shape of the field is that we should be looking for explanations, not simply of abnormal or artificially created forms of excess, but principally of how appetites that give mainly pleasure, delight, joy or harmless entertainment can sometimes become so excessive that they threaten to spoil our lives. Let us start by considering how appetitive behaviours are distributed in the population.

It is now a commonplace observation that the distribution of volume of alcohol consumption in

the population produces a curve that is markedly skewed towards the higher consumption end of the distribution: the majority of people are found to conform more or less to a relatively moderate norm, with smaller and smaller proportions of people displaying consumption in excess of this norm to a greater and greater degree (Ledermann, 1956; Purser *et al.*, 2000). There is good evidence that such a distribution is a feature of most, perhaps all, of the forms of appetitive behaviour considered above. This is illustrated by data from The National Survey of Sexual Attitudes and Lifestyles carried out in Britain in the early 1990s. In relation to the numbers of people's heterosexual partners (life-time or last 5 years), Wellings *et al.* (1994) commented, 'One of the striking features of these data ... [is] the marked variability between individuals in the number of partners reported, and the extreme skewness of the distribution' (p. 94). The same turns out to be the case for gambling activity in the general population as demonstrated by data from the first British National Survey of the Lottery and Other Forms of Gambling, which showed a markedly skewed distribution of numbers of different types of gambling activity participated in during the 12 months prior to the survey (Sproston, Erens & Orford, 2000). Whether the peak of such a curve, representing the mode or norm, lies at or above the zero point, and how steeply the curve falls from the modal point, will vary with the nature of the activity and the particular population. What unites all such appetitive consumption curves, however, is their very marked skewness, showing the existence of a long tail, representing minorities of people, distinguishable from the majority only quantitatively, who are involved in the activity to an extent far beyond the norm. Their appetitive behaviour is excessive, at least in the statistical sense.

Deterrence and restraint

There are two general explanations for the generation of such curves. The first lies in the psychology of restraint and conformity. Nearly 70 years ago Allport (1934) noticed that certain behaviours, such as times of arrival for work or the speed of vehicles crossing intersections which carried Halt or Slow signs, followed skewed or reversed J-shaped frequency curves. He argued that this would always be the case when behaviour was subject to social control. Provided this

control was effective to some degree, most people would more or less conform to a norm or a rule or law governing behaviour, and decreasing proportions of people would deviate to an increasingly great extent. Allport referred to the skewed curve as the conformity curve and he considered it to be the result of the imposition of conformity processes on people's inclinations to do such things as stay in bed when they should be at work, or drive fast across junctions. Many years later, Hyman (1979) pointed out that similar distributions are obtained for many geographical, social and economic variables. He put forward the hypothesis that the underlying theme of all such distributions is that of, 'major deterrents nipping the evolution of a phenomenon in the bud (though not entirely suppressing it)' (p. 345). Just as there are a number of impediments to the further development of a river tributary (competition from other tributaries, insufficient rain, excessive evaporation, hard rockbeds, etc.) or the size of cities (competition from other cities, inability to generate exports, inability to provide a wide range of services, etc.), so the evolution of appetitive behaviour to higher levels of consumption might, he argued, be impeded by a variety of deterrents including (he was considering alcohol use) gastric distress, headaches and dizziness, a psychological makeup which makes intoxication seem unpleasant, family and friendship norms that proscribe heavy drinking, and competition from other activities for time and money. The idea basic to both Allport's and Hyman's explanations is that of inclination restrained: in the one case by social conformity, in the other by deterring forces of various kinds, social and otherwise.

The foregoing suggests, therefore, that we should be looking for some kind of deterrent, restraint, control or conformity explanation for why it is that minorities of people indulge in appetitive behaviours to an extent that is so markedly deviant from the moderation or abstinence norms to which most of us adhere. This is a kind of pushing-down-of-natural-inclinations explanation. The idea is that, given unrestrained access to opportunities for appetitive consumption, most of us would be doing these things much more than we actually are. The idea of deterrence or control has a long history in the related field of criminology (e.g. Hirschi, 1969). Although this idea has been less explicit in the addictions field, evidence for the importance of

restraint abounds. Its importance is suggested by evidence that unconventionality and non-conformity are amongst the most significant predisposing 'person' variables for appetitive behaviours among school and university students, at least within the cultures and times in which most of the research was carried out (e.g. Jessor *et al.*, 1991); the inverse relationship so often found between religiosity and appetitive behaviour (Hawkins, Catalano & Miller, 1992; Miller, 1998), evidence on the role of family members, especially women, in restraining the appetitive behaviour of their loved ones (e.g. Holmila, 1988); not to mention the role of leaders and governments over the centuries in keeping their subjects' appetitive behaviour under control.

Primary, positive incentive learning mechanisms

The second type of explanation for skewed frequency distributions is very different, but is not incompatible with the restraint or control explanation. Here we are looking, not for an explanation in terms of dampening down appetitive inclinations, but rather in terms of how such inclinations might escalate or be amplified. We are looking for some kind of explanation that obeys what Aitchison & Brown (1966) called the *law of proportionate effect*, whereby the effect of any one influence upon behaviour is proportional to the cumulative effect of preceding influences. To produce a skewed curve according to the law of proportionate effect we require a *developmental* theory, one that supposes that the chances of proceeding to the next stage, or of responding to the next positive influence inclining towards further 'consumption', are greater the more previous 'stages' have been passed through or the greater the number of previous influences that have been effective. Any theory which relies on an accumulation of influence would qualify.

An obvious contender for a developmental theory of addiction is some variety of learning theory, in particular operant theory. Gambling provides perhaps the clearest example of Skinnerian conditioning principles, since financial payout to participants, for example on gaming machines, could hardly be better designed to produce and maintain high levels of involvement (Cornish, 1978). Gamblers themselves, however, often put emphasis upon the excitement associated with gambling, and it has been suggested that emotional regulation may be more import-

ant than financial gain for understanding excessive gambling (e.g. Carroll & Huxley, 1994). The power of drugs such as alcohol and heroin to change emotions rapidly hardly needs demonstrating and the idea that an excessive appetite for food might be linked to the emotional regulation function of eating is also an old one (Kaplan & Kaplan, 1957). More recently studies of eating and emotion have focused on the cycle of emotions associated with eating binges (Beebe, 1994). Typical were the findings of Hsu (1990), who found that women being treated for eating disorders described feeling less anxious/nervous/tense as an episode of binge eating went on, and also less depressed/unhappy during the early part of a binge before feeling full, and again during self-induced vomiting. Note the emphasis on negative feeling states in this very clinically orientated literature.

Many attempts have been made to theorize about the nature of the emotional rewards associated with appetites that can become excessive. Although each such theory is persuasive, and appears at first to account for many of the research findings, all fail because they are over-specified. They fail to account for the diversity of emotional rewards associated with even one form of appetitive consumption, let alone with the full range of excessive appetites. This has been true of the once popular tension-reduction theory of alcohol reward (Cappell & Herman, 1972) and later variants such as the theories that tension would be reduced when self-awareness was reduced (Hull, 1981) or when conflict might be reduced by the impairment of information processing—sometimes referred to as ‘escape theory’ (Steele & Josephs, 1990). Both of the latter theories have also been applied to excessive eating (e.g. Heatherton & Baumeister, 1991).

Similar attempts to specify appetitive reward mechanisms have been apparent at the neuropharmacological level. Attention has focused particularly upon the finding that a number of drugs increase neurotransmission in the mesolimbic dopamine system of the brain. Dopamine neurotransmission has also been found to play a role in both eating and sexual behaviour, and it is this same brain system that it has been widely suggested is involved in mediating reward and reinforcement more generally. Although the consensus remains about the importance of dopaminergic transmission, most experts now favour a more broadly based approach in

which other forms of neural transmission, including serotonergic, opioidergic noradrenergic and cholinergic may also play vital roles (e.g. Kranzler & Anton, 1994; Joseph, Young & Gray, 1996).

The complexities of brain and appetite go far beyond the question of which neurotransmitter systems might be involved in reward. The idea of a single ‘reward system’ in the brain that is activated by a variety of drugs or appetitive activities implies a rather simple, unitary view of the positive outcomes from the appetites. Those who have written about the rewarding functions of nicotine are probably those that have put most strongly the point that drugs can do a variety of rewarding things for people and that these effects are likely to involve a variety of different biological mediators. Ashton & Golding (1989), for example, referred to ‘intricately woven patterns of motivation’ (p. 43) that are involved in the use of nicotine. Their view was that nicotine can simultaneously affect ‘all the major functional systems governing behavior’ (p. 42), including those for reward, for goal-directed arousal, for learning and memory, for the control of pain and for the relief of aversive states such as anxiety, frustration and aggression. Similarly, the activity referred to simply as ‘gambling’ takes many forms which may be associated with different kinds of emotional changes (Cocco *et al.*, 1995).

A more profound limitation of theories that have tried to specify the nature of appetitive emotional reward is their neglect of the social contexts in which appetitive acts take place. A single substance or activity may serve very different functions depending upon how a person is socially situated. This point was pertinently made by Sadava (1975), by contrasting the functions that had been ascribed in the literature to opiate use in urban slums and those ascribed to opiate use by physician addicts. The same point was made some years later by Buchanan (1993), by contrasting the accounts of their heroin use given by low- and middle-income youth. The point is that those appetitive activities that we believe can become excessive, placing a minority of people far out on the skewed population distribution curve, are all capable of providing quick, powerful rewards in the form of emotional changes. The theories that attempt to specify the exact nature of those changes are unlikely to be able to provide anything like a comprehensive account of appetitive emotional reward since the

pleasures and escapes associated with these activities are highly varied, depending upon the person, the activity, the dose, the setting and the wider environmental and socio-cultural context.

If it is in the direction of some kind of learning that we should look for a developmental, escalating or amplifying mechanism to account for the excessiveness of some people's appetitive behaviour, then it is likely that Pavlovian conditioning or incentive learning will constitute a large part of our model. Experimental studies with both animals and humans have shown repeatedly how activity-specific and setting cues, that in themselves have no intrinsic capacity to produce rewarding effects like those produced by an appetitive activity itself, can become conditioned stimuli through a process of classical, Pavlovian, conditioning, and hence acquire the capacity to motivate further appetitive activity (Glautier, 1994). There are in fact two different explanations for what is happening. Some responses that are elicited by formerly neutral cues in these experiments (i.e. conditioned responses) are drug-like in form whereas others are drug-opposite. For example, studies have shown that people's heart rate rises in response to cues associated with cigarette smoking, an effect that is like the initial effects of nicotine itself. On the other hand, some studies have shown that stimuli repeatedly preceding opiate injections produce reductions in people's skin temperature, an effect that is opposite to the elevation in skin temperature usually produced by opiate injections themselves (Carter & Tiffany, 1999).

In keeping with the dominant drive-reduction model of the time, earlier accounts of the role of cue conditioning stressed drug-opposite responses. By mimicking the, usually aversive, psychobiological responses associated with withdrawal, formerly neutral stimuli, it was supposed, acquired the capacity to motivate further appetitive activity via drive-reduction or negative reinforcement. Wikler's (1973) model of conditioned opiate withdrawal is one of the best known. More recently, in line with the move towards positive incentive models of appetitive motivation, greater emphasis has been placed upon drug-like conditioned effects. Rather than motivating further appetitive activity through the negative reinforcement mechanism of the relief of an aversive, withdrawal-like state, conditioned cues are thought to take on positive incentive

value, eliciting approach responses and signalling the probability of positive reinforcement.

Cognitive schemata

A core postulate of the excessive appetite model of how an addiction is generated is, therefore, that a combination of operant reward, usually in the form of some powerful emotional change, plus wide cue elicitation of conditioned responses that assist consumption in one way or another, operating within diverse social contexts, between them constitute a powerful set of processes responsible for the amplification of a small and unremarkable liking into a strong and potentially troublesome attachment. An additional step has been taken by a number of theorists who have posited a combining of learning and memory elements into 'cognitive schemata'. An early example was Leventhal & Cleary's (1980) 'multiple regulation model'. They believed that emotional regulation was the key to smoking, but that several emotional processes might operate simultaneously. Smokers formed a strong emotional memory of this complex action of smoking. It was this 'memory schema' that was responsible for provoking desire or, as they called it, 'craving'. A later model of tobacco dependence based upon this idea of an integrated system or schema of elements that provides the motivating force for continued excessive appetitive behaviour, was Niaura, Goldstein & Abrams's (1991) bioinformational model. This posits that information concerning drug use and its effects is represented as a 'propositional' neural network that encodes information about stimulus elements (setting and events that activate the network), response elements (including cognitions, physiological responses and drug-seeking behaviours) and meaning elements. Such networks develop through experience with drugs. 'Dependence', in this framework, is not defined by any single element, and can only be understood in terms of the extent and articulation of the network, the threshold for activation of part or all of it, the amount of automaticity and coherence among the response elements, and the dominance of the system in overriding other ongoing activities. White's (1996) model, based on the idea of three parallel learning and memory processes, is yet another in this apparently growing tradition of trying to account for excessive appetitive behaviour in terms of complex memory schemata

based on past experience of the substance or activity.

Such models represent a definite step forward in conceptualising addiction. Most importantly for our purposes, they have the great merit of being applicable beyond the domain of substances within which the addiction field has been unnecessarily confined in the past. On the other hand, it may be argued that positing a memory schema that represents addiction, dependence or strong attachment is little more than a modern form of 'mentalism' unless 'schema' can be more precisely defined, located or accessed. The cue-reactivity paradigm is one method of testing for the existence of such appetitive cognitive processes or schemata, involving recording physiological and psychological responses to photographic, video, laboratory objects or real world representations of substance or activity-related materials (Carter & Tiffany, 1999).

Another procedure that has become popular for examining cognitive processes in the context of excessive eating, in particular, is the Stroop colour-naming reaction-time test. There have been consistent findings that people concerned about their excessive eating show the expected effect of interference with colour-naming words related to eating, shape and weight, as revealed by comparatively long reaction-times to such words, and that the effect disappears after successful treatment (Cooper & Fairburn, 1992). Other methods for examining addiction-related cognitive biases include visual probe detection tests of attentional bias, that have been used with excessive eaters (Rieger *et al.*, 1998) and heroin users (Lubman *et al.*, 2000) and word-stem completion tests of implicit memory, used with excessive gamblers (McCusker & Gettings, 1997). Hence, there does appear to be considerable evidence that people whose appetitive behaviour is excessive show biases in cognitive processes such as attention and memory, specifically concerning materials that relate to the object of their excessive appetite.

Secondary amplifying processes

Although the proposal is that the mechanisms outlined above are at the core of addiction, and although some years ago Reinert told us that we should 'Never underestimate the strength of a habit' (1968, pp. 37–38), the excessive appetites model supposes that there are additional pro-

cesses that further amplify a person's state of attachment and further propel him or her to the further reaches of the consumption distribution curve. I think of these as constituting a set of 'secondary' processes in distinction to the 'primary' conditioning, learning and cognitive processes described earlier. They are of two kinds.

The first might be termed *acquired emotional regulation cycles*. In accordance with the law of proportionate effect, it is supposed that the stronger an attachment becomes the more likely it is that these new processes will 'kick in', providing further incentive for consumption by serving new emotional regulating functions. Some of these processes may be peculiar to particular forms of addiction. For example, a number of students of 'compulsive gambling' have identified 'chasing losses' as an important additional source of drive (e.g. Lesieur, 1984; Custer & Milt, 1985). Based on our results of semi-structured interviews with problem gamblers we also concluded that, in addition to the primary positive experiences associated with their gambling (largely described in terms of arousal and excitement), there existed a powerful set of attachment-promoting secondary processes which had the effect of adding a strong drive-reduction component to the primary positive incentive element. The main component of this secondary acquired motivational cycle was a strong, negative feeling state associated with losing at gambling, associated with an increased desire to recoup losses by further gambling (Orford *et al.*, 1996). Indeed, 'chasing' might be thought of as the gambling equivalent of neuroadaptation as a secondary, attachment-enhancing process. Although neither is central (e.g. Jaffe, 1992), nor even essential, each, when it occurs, provides a strong further push towards greater excess, helping to further overcome natural controlling and restraining influences.

Another secondary process of a kind that sets up a new cycle of emotions and hence further appetitive drive towards excess, is the so-called *abstinence violation effect* (AVE). This phenomenon, first described in the context of excessive alcohol use, now represents one of a small but growing number of points where literatures on excessive drinking and excessive eating overlap (Cummings, Gordon & Marlatt, 1980). The AVE includes feelings of guilt and self-blame, self-attributions that are internal, global and uncontrollable, and feelings of helplessness and

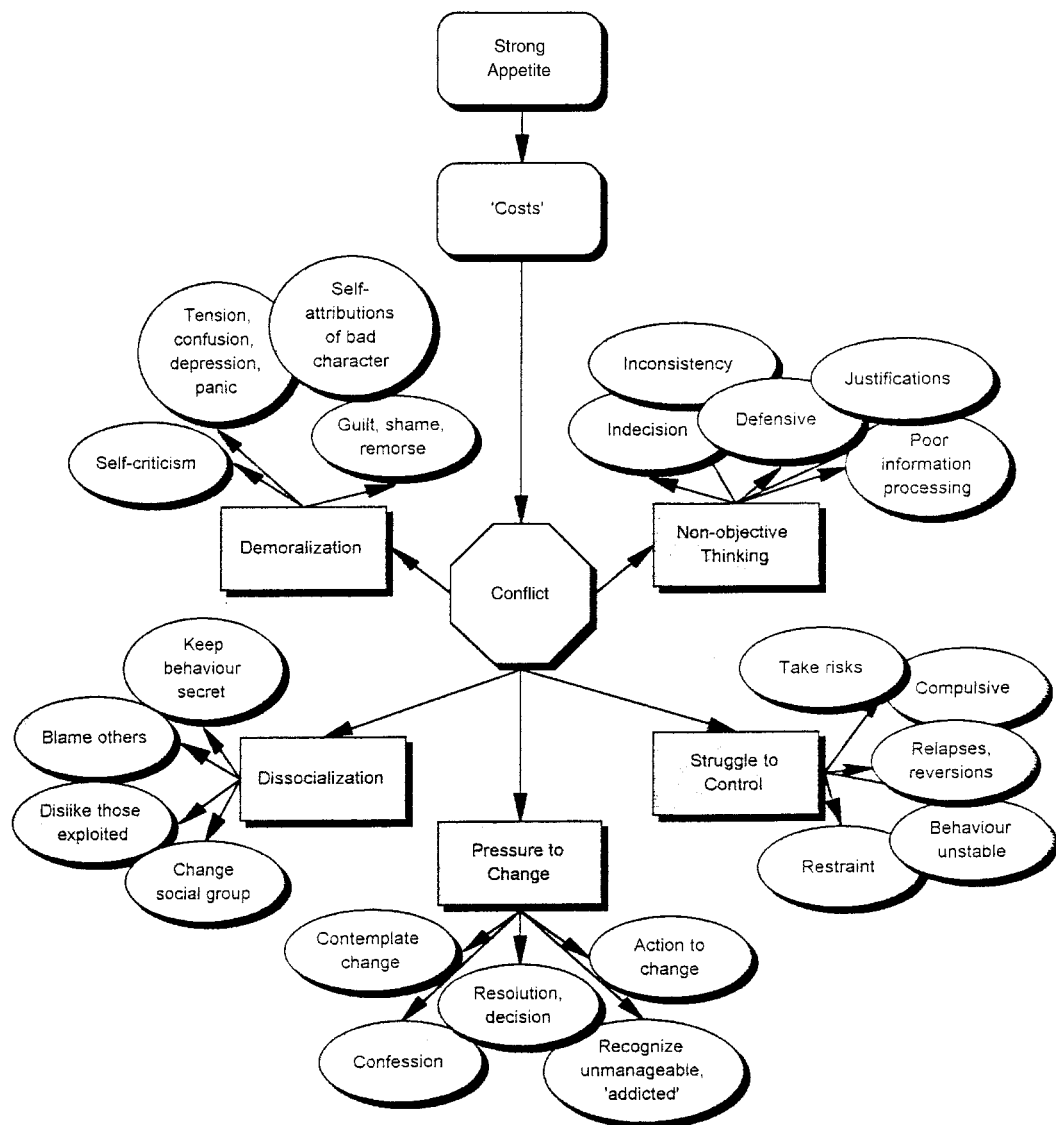


Figure 2. The consequences of conflict.

hopelessness (Hsu, 1990; Grilo & Shiffman, 1994).

The second type of additional, amplifying processes may be thought of as the *consequences of conflict*. The development of a strong appetite alters in a fundamental way the balance that has to be struck between inclination and restraint. What characterizes strong and troublesome appetite, as distinct from relatively troublefree, restrained, moderate, or normal appetitive behaviour, is the upgrading of a state of balance

into one of conflict resulting from the harms or 'costs' associated with growing attachment to an appetitive activity. It is the *consequences* of the conflict brought about by strong attachment to appetitive behaviour which are of concern here. Some of the consequences of conflict, or we might say the *consequences of dissonance*, are shown in Fig. 2.

Continued commitment to a form of behaviour which is harmful or troublesome calls for *dissonance reduction* in the interests of consistency.

Table 2. Assumptions regarding the treatment of alcohol problems

	Is treatment effective	Do therapies vary in efficacy?	Is there a superior therapy?
The technique hypothesis	Yes	Yes	Yes
The matching hypothesis	Yes	Yes	No
The non-specific hypothesis	Yes	No	—
The natural healing hypothesis	No	—	—

Taken from Lindström, 1991, p. 847.

Thus, on theoretical grounds, if it is right to think of someone whose appetitive behaviour is excessive as essentially someone who faces a dilemma or conflict of a behavioural, conduct, or even moral kind, we should expect such a person to experience discomfort and to be motivated to escape from it, much as people wish to escape from pain or anxiety. Indeed, this 'dissonance' should not be thought of as simply theoretical, but as something very real, experienced as tension, depression, confusion or panic. The consequences of appetitive conflict are numerous, varying from biased or non-vigilant information processing (Janis & Mann, 1977) through to changes in terms of the social groups to which a person belongs (Bacon, 1973). The key point is that each alters the motivational nexus, often in an upgraded direction, hence contributing a further escalating or amplification mechanism responsible for creating yet stronger attachment.

Giving up excess as a natural process

One set of options for the reduction of dissonance consists of modifying appetitive behaviour to make it compatible with other needs, with other values or attitudes, or with the desires of other significant figures such as husband, wife and other family members. It is in fact the principal argument of this part of the model that change, in the direction of moderation or abstinence, is a *natural consequence* of the development of strong appetite. This way of looking at the change process suggests a radical change of focus. Instead of assuming that addictions, like diseases, require expert treatment, we should be assuming that on the whole they do *not* require treatment, and trying to understand the real world, everyday processes whereby people make their own changes. This point of view was nicely summed up by Lindström (1991), who wrote:

Perhaps psychosocial treatment research has started at the wrong end. Instead of moving from the top downward in Table 1 [Table 2 here], it might be more profitable to move from the bottom up... it is my recommendation that research on treatment for alcohol problems should adopt a diversified strategy, with its main focus reoriented from the effects of specific techniques to natural healing processes, common therapeutic elements and effects of client-treatment interaction (p. 848).

There is every reason for agreeing with Lindström that the search for specific 'best' treatments is doomed (his first hypothesis). Expert treatments (as opposed to natural, unaided change) have been remarkably diverse and a strong case can be made for concluding that all credible treatments are effective to a more or less equal degree. This appears to be the case even when treatments differ markedly in intensity (e.g. treatment versus advice: Orford & Edwards, 1977); when treatments have utterly different theoretical rationales (e.g. 12-Step facilitation versus cognitive-behavioral: Project MATCH, 1997a, 1997b); when treatment focuses on the object of the addiction and when it does not (e.g. interpersonal versus cognitive-behavioural therapy for excessive eating: Agras, 1993; imaginal desensitization versus imaginal relaxation for excessive gambling: McConaghy *et al.*, 1988); and even when theory-consistent treatment has been compared with counter-theoretical treatment (e.g. contingent versus non-contingent aversion for smoking: Carlin & Armstrong, 1968). Nor, in the light of the findings from Project MATCH (1997a, 1997b) can we hold out a great deal of hope for the idea of client-treatment-matching (Lindström's second hypothesis). Most of the hypothesized matches in that most statistically powerful of all studies to date were not supported, and those that were were mostly not

strong nor replicated across the two arms (out-patient and aftercare) of the study. The conclusion was that, 'Despite the promise of earlier matching studies... the intuitively appealing notion that matching can appreciably enhance treatment effectiveness has been severely challenged' (Project MATCH 1997b, p. 1690, but note the possible shortcomings of Project MATCH as well as its strengths, Project MATCH, 1999).

There is, on the other hand, abundant evidence that people can give up excessive appetites without the aid of expert treatment. The idea that tobacco smokers might make their own decisions to give up or moderate on the basis of the evidence available to them, perhaps with the aid of advice from their doctors or exhortations from their family, comes as no surprise. Despite the fact that tobacco smoking is by many criteria one of the most addictive of all activities, we have no difficulty conceiving of change as a perfectly ordinary, natural occurrence. The evidence that many excessive drinkers, indeed the majority, give up excess unaided by expert treatment (e.g. Sobell, Sobell & Toneatto, 1991) came as more of a surprise. Indeed, the term 'spontaneous remission', originally applied to this phenomenon, implied that change with the help of treatment was understandable, but without it was inexplicable. The excessive appetites model leads to precisely the opposite view. Perhaps because of the central position that heroin addiction has held in professional and lay conceptions of addiction in the 20th century, evidence that large numbers of heroin addicts can be found who have given up without formal treatment is the most challenging of all (Biernacki, 1986).

How might we characterize this natural process of giving up excess? Prochaska, DiClemente & Norcross's (1992) 'transtheoretical' model of change has been very helpful since it enables us to cross the otherwise heavily guarded borders between the separate addiction territories. It is the 'processes' aspect of their model, rather than the better known 'stages' component, which is most useful to us here. Provocative findings have already emerged; for example, that the process they term 'self-liberation' (e.g. a day-to-day commitment to quit) is one of those most commonly endorsed (DiClemente & Prochaska, 1982), and that those in 12-Step and CBT programmes change in similar ways during treatment, as assessed by increased use of some of the

'processes', despite the very different treatment rationales (Finney *et al.*, 1998).

Another helpful source of ideas was Hunt & Matarazzo's (1970) demonstration that relapse curves following attempts to modify heroin, alcohol and tobacco habits were remarkably similar, with high proportions of people relapsing in the first few weeks, and a flattening-out of the curve well below 100%, leaving perhaps as many as 20–30% having made at least medium-term changes. This figure of 20–30% recurs in a number of unexpected places. That is the proportion, for example, found to give up opiate use after detoxification with herbal medicines and Buddhist rites in Thai temples (Poshyachinda, 1980, cited by Groves & Farmer, 1994). It was also one informed estimate of the proportion of pledge-takers who continued to honour their pledges after committing themselves to abstinence at meetings of the Washingtonian Temperance Society in the 1830s and 40s (McPeck, 1972). This is not to argue that expert treatment never works, but rather to point out that treatment operates within a context and against a background of powerful natural processes (Bacon, 1973; Moos, 1994). When it does work, the prediction would be that it does so because of processes that are non-specific (Lindström's third hypothesis). These processes far transcend the fads and fashions of particular groups of experts working at one particular time.

Fertile though the 'processes of change' (Prochaska, *et al.*, 1992) idea has been, it does not go nearly far enough in exploring the naturalness of addictive behaviour change. It leaves out, in particular, three vast domains of human experience that can not be ignored: the social, the spiritual, and the moral. Bacon (1973) saw the importance of the social when he wrote, 'The recovery personnel of prime significance are the associates, the significant others... crucial for recovery are the daily life associates through time, not the specialists during formal "treatment periods"' (p. 25). Much more recently ways have been found of deliberately harnessing the concern of 'significant others' in order to encourage excessive alcohol or drug users into treatment and to support them once they are there. These include the 'pressures to change' approach of Barber & Crisp (1995), and 'social behaviour and network therapy' (Copello *et al.*, 2000) being used in the UK Alcohol Treatment Trial (UKATT Research Team, 2000).

The possibility that conventional, expert formulations of the change process may have omitted some of the more profound elements has been recognized from time to time by some of the more thoughtful commentators. For example, Drew (1990) observed, 'We have produced a psycho-bio-social model of drug dependence that excludes the essence of human existence—options, freedom to choose and the centrality of value systems.' Miller (1998) has written of the neglect of the spiritual component in the theory and practice of addictive behaviour change despite its clear presence in the philosophy of Alcoholics Anonymous and other 12-Step programmes. The continued prominence and growth of such mutual help organizations in the spectrum of modern forms of help for people with excessive appetites (Mäkelä, 1991), and the evidence of successful outcomes following attendance at AA (Tonigan, Toscova & Miller, 1996; Humphrey, Moos & Cohen, 1997; Miller, 1998), strengthen the argument that the change process is not to be understood most readily by accepting the supposed rationales of modern physical or psychological treatments, or by taking too seriously their techniques, but rather by an appreciation of the factors that are common to a variety of forms, whether religious, medical, psychological or unaided.

Is it too fanciful, then, to go one step further and conclude that giving up an excessive appetite is essentially a process of moral reform or, as Gusfield (1962) put it, one of 'moral passage out of deviance'? Some of the processes of change identified by observers of AA, and highlighted in AA's own teachings, relate to character change: acceptance, selflessness, humility, surrender, forgiveness, ego-reduction (Tiebout, 1944; Alcoholics Anonymous, 1955; Miller, 1998). Sarbin & Nucci (1973) believed that all programmes of conduct reorganization, whether these be religiously, politically or therapeutically motivated, involved a common process of symbolic death, surrender and re-education. Although the processes were thought to be essentially the same, the form and language in which they were couched needed to be acceptable to the place and times. In mid-19th century Britain and the United States change might often have been brought about by evangelical religious means. Later, in the era of the purity campaigns in Britain, a period running roughly from 1880 until the outbreak of the First World War (Mort,

1998), morality was part of a dominant discourse regarding drinking, gambling and sex. This was the era of the Salvation Army, whose purpose was to rescue large numbers of the 'sinking classes' from a sea of misery and temptation to excess in which drunkenness, gambling, adultery and fornication figured large. Early psychologists of that time, such as Emile Coué and William James, had no hesitation in using the language of 'will-power'.

Half a century or more later aversion therapy was popular in the treatment of almost all the excessive appetites. The commitment to carrying out such a 'treatment' and the process of going through the aversion routine repetitively could scarcely have been better arranged for enhancing a newfound attitude towards the at-one-time attractive appetitive object. It contained all the ingredients necessary for inducing dissonance (see Kelman & Baron, 1974) or self-liberation (Proschaska *et al.*, 1992). Right up to the present day, some of the more thoughtful behaviourally orientated psychologists have pondered the nature of the appetitive change process, and come up with challenging ideas. Premack (1970) concluded that the experience of some sort of 'humiliation' (e.g. in the case of smoking, realizing that one was putting money into the pockets of cigarette manufacturers, or that one was encouraging one's children to smoke) was crucial. Kanfer & Karoly (1972) concluded that in order to bring about a reduction in the occurrence of a high probability behaviour involving actions that were usually run off smoothly, automatically and without self-monitoring, some form of 'editing' of behaviour was necessary, often involving a kind of 'performance promise' or 'contract'. Heather (1994) argued that we should take more seriously the lay view that addiction was, in essence, a problem of 'weakness of will', addiction being characterized by repeated breaking of strong resolutions to desist from harmful behaviour.

Conclusion

The excessive appetites model of addiction was first presented in full in my book, *Excessive Appetites, A Psychological View of Addictions*, which was published in 1985. The second edition appears this year (Orford, 2001). The core ideas have remained the same across the 15 years that have intervened, although the book has almost

been completely re-written in an attempt to reflect some of the considerable changes in fashions and ideas that have taken place and the vast output of research since the early 1980s. Cocaine, for example, merited only limited attention then, but within only a few years it was to constitute possibly the most worrying addiction of all, at least in some parts of the West. Binge eating disorder, to give another example, had not yet made its appearance as a term in the literature. When it came to constructing a psychological model of the addictions, learning based upon the relief of withdrawal symptoms was probably still the leading idea 15 years ago. Since then withdrawal relief has become less prominent, and positive incentive explanations more so. The literature on the addictions has expanded in all directions, but I think I detect a general swing of the pendulum towards the psychobiological and away from the psychosocial. For example, much has been written in the meantime about brain functioning in addiction, and comparatively little about the deviance amplifying effects of social reactions to behaviour.

I refer to the excessive appetites idea as a 'model' rather than a 'theory' since its intended scope is very broad indeed, claiming as it does to provide a coherent account of the whole process of taking up, establishing, and (in some cases) giving up any one of five or so core forms of appetitive behaviour to which people can become so attached that it can seriously spoil their lives, and the lives of those immediately around them.

A very general point about this model needs to be made in conclusion. Not only are the processes described all applicable to each of the forms of appetite discussed at the beginning of this paper, but it is also the claim that the excessive appetites model can embrace the full range of severity from mild to very severe. Near the heart of the model is a set of very ordinary basic human processes: the development, within a social context, of appetite-specific schemata based on different kinds of learning. These in themselves can form the basis of habits that are difficult to break, but with the addition of the secondary processes outlined we have the basis for habits of sufficient strength that it is perfectly understandable that these have attracted the terminology of 'manias' (dipsomania, narcomania, nymphomania, etc), 'isms' (alcoholism) or disease entities (bulimia nervosa, etc). This is an

important point, because in the past the suggestion that non-substance appetites such as gambling might be considered addictions has led to a trivializing of the argument. What about gardening or playing tennis? some have asked (Eysenck, 1997). Or, addiction is 'a myth', some have claimed (Davies, 1992). Addiction, as defined earlier, is no myth. Each of the excessive appetites described spoils many lives, and often shortens them. The psychological mechanisms discussed can account for this.

Although as a comprehensive model its main function is not to generate testable hypotheses, there are points at which hypotheses can be formulated. For example, it would be predicted that strength of attachment of excessive eaters to eating, or of excessive gamblers to gambling, as indexed by any valid method of accessing relevant appetite-specific cognitive schemata, would be equal in magnitude to the attachment of excessive tobacco smokers to smoking or excessive heroin users to heroin. In the field of treatment it would be predicted that, if credibility to clients can be equated, there would be no main treatment outcome effects from comparing different forms of treatment, however distinct they might appear to be.

There are, however, a number of broader implications of taking the kind of view adopted here. One is that journal editors, directors of treatment programmes and research grant-giving bodies, to name but three powerful groups of ideas-controllers in our field, should seriously reconsider the scope of their enterprises, since it is part of the excessive appetites argument that the way their scopes are currently defined exerts a damaging, distorting effect on ideas and is inhibiting progress.

A second implication, equally controversial, is that we should reconsider the value of the attempts, exemplified by the American Psychiatric Association's DSM and the World Health Organization's ICD of trying to define certain disease-like conditions such as 'alcohol dependence', 'pathological gambling' or 'bulimia nervosa'. It is already evident that attempts to define these terms with any precision involve making arbitrary decisions, and almost always leave us wanting to make up for their deficiencies by creating additional categories such as 'alcohol abuse', 'problem gambling' or 'binge eating disorder'. However, the excessive appetites model goes further in suggesting that any such attempt is bound

to be spurious since the processes that give rise to strong appetitive attachment are normal ones and, although the distribution curves may be highly skewed, there is no point at which normality ends and abnormality begins. Furthermore, at the very core of addiction, according to this view, is not so much attachment per se but rather *conflict about attachment*. The restraints, controls and disincentives that create conflict out of attachment are personally, socially and culturally relative. No definition of addiction or dependence, however arbitrary, will serve all people, in all places, at all times. From this perspective, systems such as DSM and ICD which claim universality may in fact be standing in the way of scientific progress by leading us to believe that such absolutes might exist.

If the foregoing arguments were thought to have any substance, one of the consequences would be a shift in research questions and designs. I have two suggestions to make here. First, the excessive appetites model should lead to much more comparative research: instead of pursuing mainly mono-substance research, far greater priority should be given to research that includes two or more forms of addiction, and particularly to research that combines substance and non-substance addictions in the same study. Secondly, treatment research should be reoriented in focus, away from the concentration on named therapies and therapeutic techniques, and towards basic change processes. Change research should, wherever possible, include groups who have changed or are trying to change without formal treatment. When change research is confined to clinical settings, efforts should be made to study the wider context within which treatment episodes are set. If such research supports predictions from the excessive appetites model, the addictions field should be in for a big change, and our present preoccupations with the addictive properties of individual drugs, or the efficacy of individual expert-based therapies, will with hindsight appear very restrictive.

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