

Risk Factors Associated With Drug Use: the importance of 'risk environment'

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ABSTRACT This paper discusses research findings on non-biological risk factors associated with illicit drug use. There is an established body of North American research in this field, and a growing European literature. We find that there is an interplay of individual and environmental factors associated with drug use, with the permeation of their interactions potentially limitless. Within the behavioural science literature, we identify three main analytical dimensions for understanding 'risk factors'. These are: 'intrapersonal'; 'micro-environmental'; and 'macro-environmental'. We note that it is not new to emphasize drug use as a social activity, involving social interactions within particular social environments, but that, despite this, the balance of focus in research tends towards 'extra-environmental' or 'individualistic' interpretations. We emphasize that future research is best oriented towards generating data of practical value for the development of interventions rather than attempting to delineate causative factors. The failure of most risk factors research rests in its incapacity to capture the variety of social and environmental influences on drug use, and the relevance of these for developing socially appropriate interventions. In addition to recognizing the importance of targeting interventions towards 'high risk' populations and 'high risk' forms of drug use, we emphasize throughout the importance of the 'risk environment' in mediating patterns of drug use.

Introduction

In *Alice in Wonderland*, Alice asks, 'Which way should I go?' to which the Cheshire cat replies, 'That depends on where you want to end up' (Carroll, 1866). We

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borrow this phrase, like others before us (Daugherty & Leukfeld, 1998), to emphasize that what comes out of research depends, in part, on what goes in, and where one wants to end up. Risk factors research on illicit drug use is no different. It comprises competing empirical, theoretical and political perspectives which characterize and reconstruct the nature of drug use, and the factors associated with it, differently.

The 'risk factor' is a staple concept in epidemiology. It provides a means of distinguishing the likelihood between different factors in the determinants and distribution of a behaviour or disease (Susser, 1987). Appreciating the relative risk of agent, host and environmental factors in the determinants and distribution of disease has underpinned models of public health for the last fifty years (Susser & Susser, 1996). The development of contemporary public health policy, and resource allocation to particular interventions, is dependent on an appreciation of which factors constitute a risk of disease occurring. A similar logic applies in the field of illicit drug use, particularly regarding the implementation of drug-prevention and risk-reduction interventions (Daugherty & Leukfeld, 1998; Jones & Batjes, 1985).

An understanding of the risk factors associated with drug use, and its adverse consequences, would appear to have immediate benefits for the design, targeting and implementation of drugs education and prevention (Daugherty & Leukfeld, 1998; Jones & Batjes, 1985; Kandel *et al.*, 1978). If particular risk or protective factors for drug use can be identified, and the effects of their interactions understood, prevention or risk-reduction interventions may be designed with greater specificity and chance of positive output relative to cost input (Kandel *et al.*, 1992). Knowledge of risk factors underpin the development of evidence-based, and thus also cost-effective, interventions (Susser, 1987). If the risk factors associated with drug use can be identified, so the logic in rational policy decision making goes, then the risk of drug use occurring, along with its myriad of adverse effects, may be reduced, and perhaps prevented, if the appropriate interventions are established (Daugherty & Leukfeld, 1998; Jones & Batjes, 1985; Kandel *et al.*, 1992).

However, the adage 'prevention is better than cure' hides a host of ethical and political dilemmas. It may apply when there is a consensus that the evidence is such that the benefits of prevention outweigh those of cure—at the levels of the individual, community and political environment—and when there is conclusive evidence of the risk or causal factors involved, how they interact together, and how they may be reduced or prevented from occurring. But it is equally obvious that many question the ethics and efficacy of policies which place an over-emphasis on primary prevention applied to drug use (Zimmer & Morgan, 1997). Our primary concern here is less directly with ethics or politics than with the nature of scientific evidence. Here then, the logic of primary prevention in the pursuit of rational drug policy is dependent on the nature of the evidence-base on risk factors associated with drug use. If the evidence-base is methodologically inconclusive or practically inappropriate for intervention development then the logic of pursuing primary prevention on the basis of such evidence may be scientifically questioned. It is for this reason that a synthesis of the published literature on risk factors associated with drug use is helpful for debates in policy and intervention development.

An Environment for Risk Factors Research

An increased interest in risk factors research has coincided with shifts towards evidence-based and multi-sectoral intervention development and an increased emphasis in recent European drug policy towards drugs prevention, particularly of 'problematic' or 'risky' drug use. The United Kingdom (UK) provides an incisive case example.

Recent interest in UK risk factors research has coincided with policy shifts which have, once again, emphasized the primary prevention of drug use. The Government strategies *Tackling Drugs Together* (Department of Health, 1995) and *Tackling Drugs to Build a Better Britain* (UK Anti-Drug Co-ordination Unit, 1998) highlight primary drugs prevention as a key national policy priority, alongside that of crime reduction and the promotion of 'community safety'. UK policy discourse currently positions the prevention of drug use as a means of creating safer environments in which to live and work, in which evidence of reduced crime is considered an essential ingredient (UK Anti-Drug Co-ordination Unit, 1998; Advisory Council on the Misuse of drugs, 1998). An emphasis on drugs prevention contemporaneously supersedes that of harm reduction in UK 'anti-drugs' policy (Stimson, 2000). The UK Government's promise is to be 'tough' on the 'causes' of crime, drug use and other social problems (Stimson, 2000). Government strategy implicitly accepts the need to better understand the causes of drug use, particularly problematic drug use, such that it becomes preventable (UK Anti-Drug Co-ordination Unit, 1998; Advisory Council on the Misuse of drugs, 1998). Accordingly, there is increased interest among UK researchers in undertaking research on the risk factors associated with drug use (Lloyd, 1998; Sutherland & Willner, 1998; Barnard & McKeganey, 1994).

These drug policy shifts have coincided with shifts in the epidemiology of drug use patterns and HIV prevalence among injecting drug users (IDUs), as well as with wider shifts in welfare policy. Epidemiological research has indicated increasing levels of drug experimentation and use among UK youth populations since the early 1990s (Measham *et al.*, 1998; Parker *et al.*, 1995; Wright & Pearl, 1990; Ramsey & Spiller, 1997). At the same time, epidemiological studies show a consistent decline and subsequent levelling in HIV prevalence among IDUs to estimates under 2% (Stimson *et al.*, 1996; Judd *et al.*, 1999). Whereas the Advisory Council on the Misuse of Drugs (ACMD)—an independent body of experts advising on UK drug policy—saw the prevention of HIV infection, and other adverse consequences, as a national priority in drug policy between 1987 and 1992 (Advisory Council on the Misuse of Drugs, 1988; 1989), in 1993 their *AIDS and Drug Misuse Update* emphasized the dual importance of the 'twin epidemics' of HIV infection and drug misuse per se (Advisory Council on the Misuse of Drugs, 1993). This policy report marked the beginnings of a refocusing in policy directives back to drugs prevention, similar to those adopted in the time before AIDS (Advisory Council on the Misuse of Drugs, 1984).

The drugs policy climate before AIDS focused on the need to explore the risk factors and conditions associated with drug use (Advisory Council on the Misuse of Drugs, 1984). The 1984 ACMD report *Prevention* highlighted the need to understand the 'causes of drug use', recommending a three-pronged approach, including: (i) a public health perspective to assess the interaction between drug use, individual and environmental factors; (ii) a psychosocial approach emphasizing the role of stress reduction and personal skills development; and (iii) a

structural approach in which it was argued that macro environmental factors do not determine drug problems directly but provide the context in which shared norms and values about drug use emerge. While notions of escalation in drug use were limited to concerns of supply and availability, the report emphasized the need to distinguish factors influencing experimental compared to persistent drug use. Policy concerns immediately pre and post the harm-reduction hiatus (mid-1980s to mid-1990s) share a primary interest in understanding, and manipulating, risk factors associated with drug use.

In addition to drug-specific policy, there has been a growing interest in researching the environmental influences on social, health and welfare problems more generally. Coinciding with the emphasis on environmental approaches in the new public health (Susser & Susser, 1996; Peterson & Lupton, 1996), as well as more recently in the UK with recent shifts in government strategy to tackle underlying problems of poverty and social exclusion (associated with the New Labour administration since 1997), the importance of the 'risk environment' in drugs research is increasingly recognized (Peterson & Lupton, 1996; Pearson, 1987; Parker *et al.*, 1987; Crum *et al.*, 1996; Bourgois, 1989; Marzuk *et al.*, 1997; Clayton, 1991). The most recent ACMD report *Drug Use and the Environment* notes from the outset that drug use is the product of an interplay of individual and environmental factors (Advisory Council on the Misuse of Drugs, 1998). We are contemporaneously in a policy climate which is ripe for risk factors research, and which at the same time, encourages a focus on the role of the risk environment in mediating patterns of drug use. This nexus raises a number of questions for the future of risk factors research, not least of which is the balance struck between a focus on the individual and the environment.

Methods

This paper draws on a synthesis of research in Europe and North America on risk factors associated with illicit drug use (Lilly & Rhodes, 1999). A risk factor is commonly defined as 'an individual attribute, individual characteristic, situational condition, or environmental context that increases the probability of drug use or abuse or a transition in level of involvement with drug users' (Clayton, 1991). Literature was reviewed between May and October 1998. This was achieved by producing annotated bibliographies of key publications in seven Member States of the European Union (Denmark, France, Germany, Italy, Netherlands, Spain, United Kingdom), Canada and the USA. The literature review resulted in a total of 359 annotated bibliographic entries of key research papers or reports, the majority of which emanated from studies undertaken in North America ($n = 153$).

Papers eligible for this synthesis included those concentrating on non-pharmacological, behavioural and environmental risk factors associated with drug use. It is accepted at the outset, therefore, that this paper does not consider the potential role of physiological or neurological factors. In addition, the inclusion criteria placed emphasis on research papers published in peer-reviewed journals in the past decade (1988–1998). Studies focusing on the use of legal drugs or licit drug use alone were excluded, and special emphasis was given to papers focusing on what was described as problematic forms of drug use. Papers focusing solely on the effectiveness of drugs prevention and education interventions, and those focusing on relapse and relapse prevention, were excluded unless they contained findings specifically relating to risk factors. A full description of project methods,

annotated bibliography and review, are available elsewhere (Lilly & Rhodes, 1999).

Limits and Scope

This paper does not provide an exhaustive systematic review of the literature. It is inevitably selective, seeking to generate a synthesis of key findings and concepts, focusing especially on the balance between individual and environmental factors. A number of factors limit its scope. We found a distinct lack of published longitudinal studies, particularly in the European literature. Longitudinal studies are critical if risk factors associated with transitions into problem drug use are to be delineated (Clayton, 1991; Brook *et al.*, 1989; Hawkins *et al.*, 1992). Additionally, and of interest given our focus on European literature, the evidence-base is predominantly North American. We found a paucity of European studies, cross-sectional or otherwise, explicitly focused on the antecedents, causes, correlates or risk factors associated with drug use (though many estimated prevalence). Many of the key reviews published in Europe also draw on North American studies (Lloyd, 1998, Gilli & Cairo, 1990; Orlandini *et al.*, 1996; Ravenna, 1993; Sengers, 1990; Van der Feen, 1990; Lafeber, 1994; Van Pelt, 1986; Eggers, 1995; Hurrelmann & Buendel, 1997; Thomasius, 1991; Naveria, 1987; Orte, 1994; Martín, 1993; Hansen, 1995).

The majority of European studies with a focus on risk factors are, therefore, based on cross-sectional designs, usually with local or regional rather than national convenience samples drawn primarily from school, student or drug-treatment recruited populations. With school exclusion and truancy emerging as key risk factors associated with drug use (see below), we should note that the tendency to recruit from the school environment is likely to limit capturing those most vulnerable to problem drug use (Lloyd, 1998).

Of perhaps greater concern is the variability in risk factor and drug use measures employed. Most studies employ gross measures of 'ever' drug use or 'any' drug use, and show little concern for distinguishing different forms of drug use. Some studies distinguish 'ever' from 'repeated' use—with some defining repeated as 'more than once' (Swadi, 1988), and 'risky' from 'non-risky' drug use—with some defining 'risky' as 'more than once' (Orford & Velleman, 1990), though few aim to distinguish either type or frequency of drug use (Barnard & McKeganey, 1994). Measures of problematic drug use, in particular, yield little scope for comparability across studies, despite acknowledgement that risk factors may be specific to particular drug-use patterns (such as initiation, onwards or reverse transitions) as well as to particular forms of use. With most studies not distinguishing between different stages or forms of drug use, and with most adopting gross measures of drug use, the delineation of risk factors specific to particular forms of drug use is clearly hampered (Clayton, 1991).

Intrapersonal Factors

We refer to intrapersonal factors as those which research studies indicate are endogenous rather than exogenous to individuals, including aspects of personality and cognition. This evidence-base emanates largely from research within psychiatry and behavioural psychology, and adopts a largely positivist frame-

work informed by natural-science approaches. The unit of analysis adopted is the individual with the aim being to delineate the interface between agent and host. Taken together, these studies seek to understand individual differences in patterns of drug use. The notion of environment—either that in which the research is undertaken, or in which individuals use drugs—is largely absent.

Personality and Psychology

Current models of risk factors research recognize the multi-factorial nature of drug use and, accordingly, emphasize what is termed a 'multiple risk factors' approach (Clayton, 1991; Hawkins *et al.*, 1992)—often termed the 'risk factors' approach (De Wit *et al.*, 1995). Additionally, many studies emphasize that the experimentation and use of illicit drugs need not indicate developmental or personality problems, and that patterns of drug use may occur quite independently of personality or psychological problems, and also often without adverse individual effects (Zimmer & Morgan, 1997; Lloyd, 1998; Barnard & McKeganey, 1994; Martín, 1993; Hartnoll, 1990; Perri *et al.*, 1998; Tossman & Heckmann, 1997; Merzagora *et al.*, 1996; Navarro Botella & Gómez, 1998; Ingold, 1998).

Despite consensus that the 'addictive personality' is a misnomer (Orlandini *et al.*, 1996; Lavelle *et al.*, 1993; Calafat *et al.*, 1997; Charles-Nicolas, 1998), there is still a vast literature seeking to delineate whether, and how, multiple personality states are related to drug use. This literature follows a tradition established by North-American research, in which drug use may be depicted as individual 'disorder' (Weiss, 1991; Reiger *et al.*, 1990). While causality remains uncertain, the literature emanating from psychiatry emphasizes comorbidity, associating a higher prevalence of psychiatric morbidity and disorders among problem drug users, and of drug use among those diagnosed with psychiatric symptoms or illness (Kandel *et al.*, 1992; Weiss, 1991; Reiger *et al.*, 1990; Haugland *et al.*, 1991; Brooner *et al.*, 1997; Andreasson *et al.*, 1987; Menezes *et al.*, 1996; Wiesbeck *et al.*, 1994), with drug use—whether problematic or recreational—associated with affective and personality disorders in particular (Bobes *et al.*, 1995; Deykin *et al.*, 1987; Ziedonis, 1995). Studies have shown, for example, comorbidity in over half of psychiatric patients (Reiger *et al.*, 1990; Haugland *et al.*, 1991), and between a quarter and a half of problem drug users (Menezes *et al.*, 1996; Crome, 1999), with one recent five-year follow-up of opiate users revealing a lifetime prevalence of personality disorders of 62% (Krausz *et al.*, 1999). Additionally, the literature focusing on psychological factors emphasizes drug use as a response to developmental problems (Krausz *et al.*, 1999; Block & Block, 1988; Brook *et al.*, 1991; Shedler & Block, 1990; Dobkin *et al.*, 1995; Wittchen *et al.*, 1998). Here, the onset and use of drugs is associated with a multitude of individual attributes, which, in alphabetical order, have included: acting-out; aggression; alienation; anger; anxiety; extroversion; hyperactivity; impulsivity; independence; inhibition; introversion; likability; low self-control; low self-esteem; oppositional behaviour; overconfidence; sensation-seeking; sociability; and unconventionality (Kandel *et al.*, 1992; Calafat *et al.*, 1997; Brook *et al.*, 1991; Shedler & Block, 1990; Dobkin *et al.*, 1995; Wittchen *et al.*, 1998; Hundleby, 1986; Santacreu & Frojan, 1992). In particular, this literature associates problematic drug use with 'social deviance' and evidence of 'antisocial' personality (Lavelle *et al.*, 1993; Wittchen *et al.*, 1998; Hawkins *et al.*, 1986; Scott *et al.*, 1988).

Illustrative of this approach is that adopted by Block and colleagues (Block & Block, 1988; Shedler & Block, 1990). They associate a variety of personality antecedents with an increased propensity to use drugs (this claim is made largely irrespective of type and frequency of drug use) including traits such as rebelliousness, non-traditional values, and a lack of emphasis on achievement among males, and dysphoria, distrust and defensiveness among females. They assert that the tendency for risk factors research to embrace multi-factorial approaches is tainted by an emphasis on interpersonal and environmental factors (see below). They support this claim with longitudinal data (among a sample of one hundred and five adolescents) which shows no evidence of association between environmental factors and experience of drug use among males. With such associations evident among females, they go on to argue that females are more likely to be influenced by parental factors (Block & Block, 1988).

In a later wave of the same cohort (one hundred and one eighteen year olds), 'frequent drug users' (measured as cannabis use 'at least once every weekend' and 'ever tried at least one other illicit drug') are found to be more likely than either 'drug-abstainers' and 'experimenters' to be insecure, unable to form healthy relationships, and to have experienced emotional distress in their childhood (Brook *et al.*, 1991). But drug-abstainers were also found to be more anxious, inhibited and morose as children compared to those who had experimented with drug use. Interestingly, the researchers find that non-drug use is linked to greater psychological maladjustment than experimental use, and argue that those experimenting with drugs had received better parenting, and exhibited greater psychological health, than either drug-abstainers or frequent users. They conclude that individuals are not 'passive recipients' of their environments and emphasize the importance of understanding an 'individual's total psychology since childhood' in order to explain later individual differences in patterns of drug use (Brook *et al.*, 1991).

There is a danger that intrapersonal approaches can yield as many psychological attributes or personality factors associated with drug use as there are drug users (Clayton, 1991). Based largely on standardized diagnostic instruments, such as the Minnesota Multiphasic Personality Inventory (MMPI) and the Eysenck Personality Questionnaire (EPQ) (Crome, 1999), the risk factors identified are nonetheless variously defined and measured, and produce a contradictory depiction of individual factors associated with drug use (however defined). The concept of 'locus of control', for example, commonly features as a risk or protective factor (Bearinger & Blum, 1997). However, findings on whether, and how, individuals perceive events as an outcome of internal and external control factors, and whether or not individuals exhibit high or low self-control, are extremely inconsistent, having been measured in different ways in studies of variable design (Bearinger & Blum, 1997). This risk factors 'overload' has led to an increased emphasis on 'multi-factor' approaches in which the aggregate number of risk factors, and their interplay, is highlighted (Clayton, 1991; Hawkins *et al.*, 1992; De Wit *et al.*, 1995; Hartnoll, 1990; Farrell & Danish, 1993; Bry *et al.*, 1982). This shift has encouraged a move towards exploring personality factors in the context of 'problem' behaviours more generally (Lavelle *et al.*, 1993; Jessor, 1987; Howard & Zibert, 1990).

Personal Vulnerability and Problem Behaviour

Attempts to delineate personality factors as predictors of drug use, even problematic drug use, have become outmoded by the recognition that initiation into drug use often occurs concurrently with a variety of other behaviours deemed problematic (Jessor, 1987; Howard & Zibert, 1990; Elliot *et al.*, 1985; Robins & McEvoy, 1990). Here the concept of delinquency comes to the fore. Emanating from North-American research, this embraces a constellation of 'problem behaviours' associated with youth development, positing that such behaviours share common antecedents. As noted: 'delinquency and drug use are related to a similar set of social psychological and demographic variables' (Elliot *et al.*, 1985). Arguably one of the most significant proponents of drug use as a feature of delinquency was Jessor, who proffered 'Problem Behaviour Theory' (Wiesbeck, 1994; Jessor *et al.*, 1980). Within the European literature, there is considerable affinity with the general proposition that drug use, and particularly problem drug use, is linked to a variety of behaviours deemed problematic (Lafeber, 1994; Van Pelt, 1986; Naveria, 1987; Jansen, 1996; Newburn, 1998; Sussman *et al.*, 1995). Of the problem behaviours interacting together with drug use, studies commonly highlight acquisitive crime, truancy and school exclusion, and fighting and vandalism as strongly correlated or predictive (Lloyd, 1998; Howard & Zibert, 1990; Robins & McEvoy, 1990; Adelekan, 1994; Swadi, 1992a; Powis *et al.*, 1998; Revuelta & Jimenez, 1989; Calafat *et al.*, 1992).

Let us take the example of school exclusion and truancy. In keeping with North American research (Robins & McEvoy, 1990), European studies identify school exclusion and truancy as risk factors. While not designed to demonstrate causality, one UK study among young people excluded from school shows that the prevalence of cannabis, amphetamine, cocaine and crack use was higher than that found within groups of a comparable age (Powis *et al.*, 1998). Other studies have found pupils excluded from conventional school education to be four-times more likely to have used illicit drugs and five-times more likely to be current drug users than pupils who have not been excluded (Adelekan, 1994). Truants are said to be twice as likely to use cannabis or solvents, and three-times as likely to have used 'harder' drugs, than non-truants (Swadi, 1992b). A youth-lifestyles survey of young people in England and Wales also found that truants and school excludes were four-times more likely to have tried a drug in their lifetime than school attendees, with experience of having used a class A drug (such as heroin, cocaine or ecstasy) in the last month also significantly higher (Goulden & Sondhi, 2001). Many studies of young people have failed to account adequately for the increased risk of drug use among school truants and excludees since they rely on school-based survey samples (Lloyd, 1998; Goulden & Sondhi, 2001).

The concepts of delinquency and problem behaviour recognize a multiplicity of intrapersonal 'vulnerability factors' associated with drug use. This points welfare policy towards identifying those sub-groups of the youth population exhibiting problem behaviours—namely those truant or excluded from school and those involved in theft or crime—as groups at 'high risk' (Lloyd, 1998; Goulden & Sondhi, 2001). In European drugs prevention, there is increased emphasis towards targeting 'vulnerable' or 'high risk' youth populations as a means of enhancing protective factors and diminishing risk factors (Lloyd, 1998; Clayton, 1991; Hawkins *et al.*, 1992; Newburn, 1998). This shift invites a more inclusive vision of risk, encompassing appreciation of both contextual and individual-level factors.

Age at Initiation

Studies emphasize that initiation into alcohol and drug use at an earlier age increases the likelihood of drug experimentation and problematic use (Daugherty & Leukfeld, 1998; Kandel *et al.*, 1978, 1992; Lloyd, 1998; Sutherland & Willner, 1998). Arguably one of the most quoted studies in this respect is a retrospective study conducted by Robins & Przybeck (1985). This showed that 19% of those who experimented with cannabis prior to the age of fifteen later developed drug-related problems; twice as many as those who began their drug use at the age of nineteen. Research in North America and elsewhere has attempted to substantiate these findings (Clark *et al.*, 1998; Kaplan *et al.*, 1986; Kandel & Yamaguchi, 1993), including studies which aimed to control for length of drug career; where the duration of drug careers differ, the chances of problematic use occurring may also differ (Anthony & Petronis, 1995). Recent Spanish research, for example, also associates an increased risk of problem drug use with initiation into drug use prior to the age of fifteen (Orte, 1994).

In addition to age at initiation, experience of drug use is commonly associated with the use of other drugs, and later problem drug use (Daugherty & Leukfeld, 1998; Kandel *et al.*, 1978, 1992; Sutherland & Willner, 1998; Kandel & Yamaguchi, 1993). A theory that frames much of risk factors research is Kandel's 'stage' theory of drug use. This posits that the use of a drug at one stage is a necessary, but not sufficient, condition for the sequential progression through various drugs into the use of 'harder' drugs (Kandel *et al.*, 1978, 1992; Kandel & Yamaguchi, 1993). It is argued, therefore, that delaying the age at initiation into the 'gateway' drugs—such as alcohol and cannabis—may constitute 'optimum public health policy' for reducing later problematic use (Kandel, 1992). One recent UK study concluded that since alcohol use by adolescents was 'a major risk factor' for having used an illicit drug, and early initiation may be encouraged by parents within the family home, the implication for prevention is that the onset of alcohol use is delayed (Sutherland & Willner, 1998). The prevention logic proffered by stage and gateway risk factor theories is: 'Stop use early and you stop problems later' (Daugherty & Leukfeld, 1998).

However, age at initiation may be no more than an indicator of other risk factors predictive of drug use, in which case there may be situations in which delaying age of onset may have little impact in reducing the risk of problem drug use. One recent longitudinal study which followed-up a sample of 1265 from birth to the age of eighteen, found that a substantial part of the difference in patterns of later drug use (and other problem behaviour) attributed to age of onset was accounted for by other individual and situational factors, including environmental factors such as social disadvantage and greater exposure to peers who used drugs (Fergusson & Horwood, 1997). These authors conclude that situational factors antecedent to initiation explain most of the elevated risk of later drug use (and also offending and school drop-out) associated with an earlier age of onset. While age at initiation appears to some extent to be associated with problem use, this does not necessarily mean that it is causative, or even predictive, of problem use. It may only be a marker or indicator for other risk factors (Daugherty & Leukfeld, 1998; Lloyd, 1998). Age itself may be less the issue than the interplay of factors which bring about drug use earlier than would normally be the case (Lloyd, 1998; Fergusson *et al.*, 1994).

Similarly, the belief that alcohol, tobacco and cannabis inevitably operate as gateway drugs to later problem use may be something of a cultural myth (Zimmer & Morgan, 1997; Room, 1994; Peele & Brodsky, 1997). Studies show that the large majority of people who use cannabis, for example, do not progress to cocaine, heroin or problematic use, and that many problem drug users show an atypical or alternative sequencing with respect to drug use transitions (Peele & Brodsky, 1997; Cohen, 1989; Mackesy-Amity *et al.*, 1997). The dynamics of the association between early use of alcohol and illicit drugs and later problem drug use are correlational and not causal.

Micro-environmental Factors

We refer to the micro-environment as the immediate social setting in which human interaction, and drug use, occurs. The bulk of studies focusing on micro-environmental factors emanate from social psychological research, and to a lesser extent sociological research, and have concentrated on interpersonal interactions, largely within family and peer networks. The family and peer networks emerge as key social relationships in risk factors research (we do not discuss the school environment here). This leads us towards appreciating drug use transitions as a product of social relationships.

Family Structure and Quality

The family is the social relationship that has received the greatest attention in risk factors research, with the core analytical interests being family structure and quality (Gilli & Cairo, 1990; Van der Feen, 1990; Van Pelt, 1986; Needle *et al.*, 1988, 1990; Ripple & Luthar, 1996; Simons & Robertson, 1989). Many studies find associations between initiation into or current drug use and a 'dissolved' family, a 'broken' home, or conflict in the family (Ripple & Luthar, 1996; Simons & Robertson, 1989; Merikangas *et al.*, 1992; Wells & Rankin, 1991). Of the North American prospective studies, one of best known is the five-year follow-up of over 1000 families, conducted by Needle and colleagues (1990). By the final follow-up (1987), 13% (67) of families had experienced divorce or separation, with divorce a significant predictor of both initiation into drug use and transitions towards problematic use among male youth. Similarly, a recent national survey among Spanish school students ($n = 3468$), concluded that cohabitation with a single parent and parental divorce or separation was positively associated with drug use, whereas cohabitation with biological parents was protective (Coams, 1990). General population surveys in Galicia in 1990 ($n = 3700$), 1993 ($n = 2000$) and 1996 ($n = 2300$) also identify conflict within the family as a risk factor (Equipo de Investigacion Sociologica, 1990, 1993, 1996). Such findings have led researchers to argue that divorce or separation should act as a marker for targeting drugs prevention (Stoker & Swadi, 1990).

Quite apart from the fact that general population and census surveys indicate multiple structures of family beyond the restricted vision of the traditional or ideal family unit (Clayton, 1991), studies of family structure are contradictory in the findings they produce and are rarely based on standardized measures (Advisory Council on the Misuse of Drugs 1998; Wells & Rankin, 1991). In their review of such studies Wells & Rankin (1991), for example, found no common

definition of what constituted a 'broken home'. Moreover, the 'broken home' is associated with an interplay of 'problem behaviours', and a variety of contextual factors, and may have little independent predictive influence (Advisory Council on the Misuse of Drugs 1998; Jessor, 1987; Jansen, 1996; Wells & Rankin, 1991). The UK ACMD recently remarked on the limits of the literature on familial risk factors: 'It is almost entirely from North America, suffers from having no common theoretical or methodological base, and has been criticised in some quarters as being disjointed and contradictory' (Advisory Council on the Misuse of Drugs 1998).

There is an emerging consensus that the nature of communication within the family is more important than family structure alone (Lloyd, 1998; Ripple & Luthar, 1996; Simsons & Robertson, 1989; Kandel, 1990; Angel & Angel, 1989; Kallong Knight *et al.*, 1995; Foxcroft & Lowe, 1995; Emmelkamp & Heeres, 1988; Padrino, 1994; Baraldi & Ravenna, 1994; Duncan *et al.*, 1995; Smith & Fogg, 1978). Studies have thus focused on the influence of parenting style (Kandel, 1990; Kallong Knight *et al.*, 1995). Though also contradictory, there is a consensus that that the two extremes of over protective and unsupportive, as well as poorly defined and combative, parental relationships can be associated with drug use, including problem use (Van der Feen, 1990; Kandel, 1990; Foxcroft & Lowe, 1995; Emmelkamp & Heeres, 1988). For example, one Spanish study comparing children of drug-using parents ($n = 30$) to those of non-drug using parents ($n = 30$) concluded that the twin factors of an absence of ambiguity and an openness in parental relationships were protective against drug use (Padrino, 1994). An Italian study (which compared thirty-three opiate users and fifty-nine cocaine and cannabis users with twenty-two non-drug users) and a Dutch study (forty-three treatment-recruited drug users against one hundred and eleven controls) associated problematic use with an absence of 'intimacy' and 'emotional warmth' in family relationships (Emmelkamp & Heeres, 1988; Baraldi & Ravenna, 1994). In contrast, and predictably, positive reports of traditional family life—including 'open', 'trusting' and 'caring' relationships with parents—emerge as factors which delay or protect against drug experimentation and problem use (Van der Feen, 1990; Stoker & Swadi, 1990; Emmelkamp & Heeres, 1988; Baraldi & Ravenna, 1994; Duncan *et al.*, 1995).

Parental Drug Use

Parental drug use is an often-quoted risk factor, with studies variously indicating that parental problematic use of tobacco, alcohol, tranquillisers, and illicit drugs, increases the likelihood of problem drug use (Van der Feen, 1990; Van Pelt, 1986; Swadi, 1988; Merikangas *et al.*, 1992; Smith & Fogg, 1978; Gilli & Cairo, 1990). Some show sibling drug use to have the similar effects (Merikangas *et al.*, 1992; Brook *et al.*, 1988; Luthar *et al.*, 1992). One London survey ($n = 3333$), for example, found young people who perceived any member of their family to have taken or to be taking drugs were three-times more likely to have ever used drugs, and five-times more likely to have engaged in repeated use (Swadi, 1988). Another London study among one hundred and fifty opiate users seeking drug treatment found that 41% had parents who had a history of alcohol or drug problems (Sheehan *et al.*, 1988). One North-American study among two hundred and one opiate users,

found that 69% of respondents' siblings had a history of problem alcohol or drug use (Merikangas *et al.*, 1992).

Contrary to many etiologic studies, recent research suggests that parental drug use may act as a risk factor for problem use even in the context, and perhaps because, of 'healthy' parental relationships (Andrews *et al.*, 1997). Other studies have noted that positive associations between parental and offspring drug use tend to be slight (Orford & Velleman, 1990). There is a recognized need for future risk factors research to better describe how parental alcohol or drug use intersects with the quality of communication within familial relationships, as relationship quality may be more important than parental substance use per se (Swadi, 1988; Angel & Angel, 1989).

Peer Influence

There is little contention that peer factors play a role (Sengers, 1990; Hansen, 1995; Baraldi & Ravenna, 1994; Dinges & Oetting, 1993; Kandel, 1985). It has been said that that 'peer-related factors are consistently the strongest predictors' of alcohol and drug use (Kandel, 1980). Of the North-American studies, arguably the most significant are those by Kandel. Her longitudinal survey of a representative sample of students in New York State constituted a formative attempt to unravel the processes of peer influence in adolescent drug use (Kandel, 1985). The survey sample comprised 4033 'adolescent-parent' dyads, 1879 'adolescent-best friend' dyads, and 1112 'adolescent-best school friend-parent' triads. The study pointed to both peer selection and socialization as key factors in influencing how young people seek out others with similar attitudes at the same time as cultivating these attitudes during subsequent peer interactions, including attitudes concerning cannabis and illicit drug use. Whereas the study found peers to be the most important influence with regard to initiation, parental factors were said to indirectly influence transitions to other drugs by shaping the type of peer groups that individuals select. Peer imitation and modelling emerged as key features of peer influence.

Arguing that the parental-adolescent dyad is not as predictive in influencing transitions towards problem drug use as Kandel suggested, Oetting and colleagues promoted 'peer cluster' theory, positing that all drug use is directly influenced by the social milieu of the young person regarding peer selection and interaction (Dinges & Oetting, 1993; Oetting & Beauvais, 1987). All other interpersonal factors are viewed as important only as mediators of the types of peers that individuals cluster with (Dinges & Oetting, 1993). The authors' hypothesis that the drugs used by an individual will be the same as those used by their peers is confirmed. Like others (Steinberg *et al.*, 1994), their studies indicate that as an individual's drug use escalates, there is less difference between their own and their peers' drug use. Those using cannabis were twice as likely to have friends who used other drugs rather than non-users, and as more problematic drugs are used, so the proportion of peers also using problematic drugs increases. Peer clusters act as 'gateways' to different forms of drug use (Oetting & Beauvais, 1987).

Taken together, evidence emphasizes the three dimensions of peer modelling, availability of drugs, and norms governing the social acceptability of drug use, to be important. Accordingly, studies associate drug-use initiation and escalation

with peers' drug-use patterns, time spent with peers, the number of peers who use drugs, and peer encouragement to use drugs (Brook *et al.*, 1991; Duncan *et al.*, 1995; Dinges & Oetting, 1993; Oetting & Beauvais, 1987; De Wit *et al.*, 1997). Longitudinal and cross-sectional studies tend to support the contention that peers' drug use is one of the most important predictive factors of initiation and experimentation as well as continued use (Brook *et al.*, 1991; Baraldi & Ravenna, 1994; Duncan *et al.*, 1995; Dinges & Oetting, 1993; Oetting & Beauvais, 1987; De Wit *et al.*, 1997; Stein *et al.*, 1987; Menares *et al.*, 1997; Swadi & Zeitlin, 1988; Lachnit & Kampe, 1996). One London study ($n = 3333$) found that young people who perceived their peers to be using drugs were four-times more likely to have ever used drugs, and thirteen-times more likely to use drugs repeatedly (Swadi, 1988). A similar survey in Spain found students who perceived their peers not to use drugs were five-times more likely to be non-drug users themselves (Gil Carmena, 1998). A four-year cohort study in Spain found that peer factors were associated with a variety of forms of drug use, including the use of tobacco, cannabis, cocaine and heroin (Luengo *et al.*, 1994), while research in Milan indicated that peer factors were important in shaping initiation into, as well as the controlled use of, a variety of drugs, including heroin (Palmonari & Ravenna, 1988). Dutch studies of cocaine use also associate peer factors with both initiation and controlled use (Cohen, 1989). Some studies conclude that interventions should target changes in peer-group norms as a means of drugs prevention (Sengers, 1990; Hansen, 1995).

Peer Selection and Socialization

Despite attempts to characterize peer influence as an interplay between selection and socialization (Krausz *et al.*, 1999; Block & Block, 1988; Kandel, 1985), it is commonplace for studies to conceptualize peer influence as peer pressure (Advisory Council on the Misuse of Drugs, 1998). The role of peers as a risk factor for drug use is often conflated as one of pressurizing or luring individuals into experimenting with drugs. One illustration of this can be found in the ethnographic account of initiation into heroin and solvent use in London produced by O'Bryan (1989). Drug use is portrayed as a means of achieving masculine identity and status within peer networks. O'Bryan found machismo and bravado linked to heroin use: 'being able to take it'. Most had been given the drug by, and had used it with, friends. Peer pressure was evident, reported O'Bryan, in that group leaders were seen as 'trendsetters' who 'defined taking the substances as a test of courage and certainly exerted pressure on others to follow their lead'. For this pressure to work, he argues, the taking of heroin must be considered by an individual as an activity corresponding to their self-image.

In a similar fashion, risk factor research commonly notes the role of 'group pressures' and 'peer pressure' in drug use (Ramsey & Spiller, 1997). The idea of peer influence constituted as peer pressure is a key concept in risk factors research, as well as of drugs prevention. As the UK Government Strategy on Tackling Drugs asserts: 'most young people who take drugs do so out of curiosity, boredom, or peer pressure' (Department of Health, 1995). Though their work concentrates on initiation rather than transitions in problem use, Bauman & Ennett (1996) note that peer-influence models assume drug use to be an outcome

of friendships formed, whereas peer-selection models suggest friendships are determined by drug use. They argue that current research exaggerates peer influence and under-estimates peer selection.

Two papers are illustrative of the current debate on peer influence. The first, by Coggans and McKeller (1994), notes that most studies citing peer pressure as a key factor are based on cross-sectional designs which obtain measures of perceived peer pressure and drug use. The concept of peer pressure—which fits within more general psychiatric discourses pertaining to lack of individual agency and self-control—proffers the notion that individuals are unable to resist pressures applied by others, and thus provides opportunities for drug use to be attributed to others. Responsibility (and blame) for drug use rests with drug users themselves, who may be envisaged as have a corrupting influence on new recruits. There is a need to ‘reassert the role of the individual in their own development’; to shift from simple depictions of peer influence as peer pressure to an appreciation of the process of peer assortment and preference.

A second paper, by Hopkins (1994), argues that interventions seeking to bolster an individual’s armoury to resist drug use have had very limited success. In response, there is a need to exploit the collective forces shaping drug-use beliefs and behaviours. Interventions focusing on group identities, which see drug use in this context, help to re-define individuals’ drug use and health behaviour as an expression of context-based peer norms and lifestyle (Swadi, 1988). Peer interventions, which target group-mediated change, have greater capacity for acknowledging the cultural resources (and constraints) which different social groups rely upon when formulating their group (and drug use) identities. This emphasizes drug use as a situated product, not so much of pressure, but of active lifestyle decisions in keeping with group norms within social contexts of constraint and opportunity (Advisory Council on the Misuse of Drugs, 1998; Swadi, 1988). A parallel concern is shared by the ACMD in the UK, which asserts the need to view ‘peer networks as being less concerned with “pressure” than with the interpretation and meaning of drug effects and lifestyles’ (Advisory Council on the Misuse of Drugs, 1998).

Recognizing the limits of portraying initiation and use as primarily a product of ‘peer pressure’ and accepting an alternative portrayal of drug use as intentional, as a choice within the constraints of social relations, casts doubt on the capacity of interventions promoting ‘individualistic’ strategies of risk avoidance (Perri *et al.*, 1998; Coggans & McKeller, 1994; Hopkins, 1994). We suggest that the reluctance of many researchers and interventionists to shift beyond a ‘peer pressure’ model of drug use is because alternative approaches inevitably recognize drug use, and particularly recreational drug use, as an outcome of ‘peer preference’, and to varying extent, of individual agency and choice. Prevention interventions designed to encourage individuals to resist peer pressure may be misguided in contexts where drug use is viewed as a preference and associated with pleasure.

Social Activity

An active involvement in a variety of social activities is said to be protective against initiation into drug use as well as transitions towards problem use (Davis & Dawson, 1995). Many drugs-prevention interventions promote ‘diversion’ from

social activities or contexts associated with drug use, and studies associate a less-active and creative use of leisure time, as well as boredom, with drug use (Davis & Dawson, 1995; Recio *et al.*, 1989). Conversely, some claim that an active interest in cinema, theatre and museums, as well as participation in religious activities, is protective against drug use (Recio *et al.*, 1989). Yet drug use is a social activity itself, and obviously strongly implicated in a range of social and leisure activities beyond those of cinema, theatre, museums or religion (Measham *et al.*, 1998; Wright & Pearl, 1990; Schuster *et al.*, 1998). Quite apart from an assumptive logic which conflates drug use as problematic, in our view a remarkable failing of many risk factor studies is that they fail to capture adequately the social and recreational functions of drug use.

If drug use is in some way dependent on the social situations and networks within which it occurs then the functions and effects of drug use, and the rationale for taking them, are to some extent also social (Wright & Pearl, 1990; Becker, 1963). This may be explicitly the case when drugs are used as part of leisure and recreation, and when their continued use may be determined less by physical or medical dependency than by participation in social activities. Studies show the social and cultural settings of drug use to be an important determinant of whether, which, how and why drugs are used, as well as how their effects are made manifest (Wright & Pearl, 1990; Navarro Botella & Gómez, 1998; Schuster *et al.*, 1998; Redhead, 1993). Ecstasy, for example, is often used for the first time at a social occasion, among peers, and the most common method of introduction is via a friend (Van de Wijngaart *et al.*, 1998). In the UK, participation in 'rave culture' has been described as a 'key factor in determining experimentation with LSD, ecstasy, and other Class A drugs' (Henderson, 1993). Ecstasy is almost exclusively a 'dance drug', associated with recreation in 'rave' or 'dance-club' settings in the UK, Netherlands and Germany, though in European countries where its use is emergent, its pattern of use remains less clearly situationally defined (Merzagora *et al.*, 1996; Schuster *et al.*, 1998; Van de Wijngaart *et al.*, 1998; Calafat *et al.*, 1998). While the weight of scientific opinion suggests that recreational drug use, including ecstasy, is unlikely to provide a 'gateway' to heroin or cocaine use, there is recent anecdotal evidence indicative of increased heroin use in young people's recreational drug-use networks (Parker *et al.*, 1998). How drug use functions as a social activity may be a key factor influencing use initiation and transition.

Macro-environmental Factors

We refer to the macro-environment as the broader structural and cultural context in which micro-social relations take place. There is a marked absence of emphasis on the macro-environment in North American risk factors research (Bourgois, 1989; Marzuk *et al.*, 1997; Clayton, 1991), leading some to comment that the field has suffered for its lack of sociological and ethnographic emphasis (Clayton, 1991). Notions of environment, however, and an interest in related macro-factors such as poverty and social exclusion, are gaining greater prominence in policy research and debate (Advisory Council on the Misuse of Drugs, 1998; Pearson, 1987; Jansen, 1996).

Social and Economic Deprivation

Most risk factors research tends towards individual-level analyses. This is also true of attempts to study environmental factors associated with drug use (Dembo *et al.*, 1986). One such study among 1045 students in the South Bronx sought to better understand how the macro-environment shapes drug use by investigating individuals' perceptions of neighbourhood factors on drug transitions (Dembo *et al.*, 1986). Individual-level analyses, however, may inhibit description of the geographic contexts in which social and economic deprivation clusters. Drawing on sociological traditions in area-based analyses of the inner city or urban environment, European research, notably in the UK, has focused on the specific urban clustering effects of social-economic inequalities, drug use and other social problems (Pearson, 1987; Parker *et al.*, 1987). Whereas most research envisages factors associated with multiple problem behaviours (including drug use) as endogenous to individuals or specific population groups, notions of the 'risk environment' encourage analyses of geographical variations in how multiple social problems emerge.

The diffusion of drug problems often occur in urban areas of social and economic deprivation (Advisory Council on the Misuse of Drugs, 1998; Pearson, 1987; Parker *et al.*, 1987; Crum *et al.*, 1996; Pearson & Gilman, 1994; Haw, 1985; Farrell *et al.*, 1998). One longitudinal study among 1416 school students in Baltimore, for example, found the more disadvantaged the neighbourhood, the greater the likelihood of exposure to a variety of drugs, including cocaine (Crum *et al.*, 1996). While this study focused on availability, others investigating the relationship between neighbourhood and current problem use have yielded similar results. Research by Parker and colleagues in north-west England, for example, found variations in the prevalence of heroin use to correlate with multiple indicators of social and economic deprivation (Parker *et al.*, 1987). Pearson and colleagues produced similar findings in a study of heroin use in north England (Pearson, 1987). Taken together, studies of the macro-environment emphasize that deprivation provides a stronger indication of problematic use, including heroin, cocaine and crack, than of drug use per se, and that an increased risk of problematic drug use is associated with indicators of poverty, unskilled employment, unemployment, educational disadvantage, bad housing or over-crowding, and crime (Pearson, 1987; Parker *et al.*, 1987; Crum *et al.*, 1996; Bourgois, 1989; Marzuk *et al.*, 1997; Clayton, 1991; Navarro Botella & Gómez, 1998; Newburn, 1998; Sheehan *et al.*, 1988; Crawford *et al.*, 1983). Recent research in the UK, for example, highlights an increased risk of problematic drug use among homeless young people (Wade & Barnett, 1999; Desai *et al.*, 2000; Craig & Hodson, 2000). Based on drug-treatment samples, research also associates drug users' place of residence with areas of deprivation (Jones *et al.*, 1995).

The risk environment is produced, and changed, by an interplay of micro and macro factors. Such factors are often difficult to distinguish, particularly in predictive or causal terms. A number of studies point to peer networks, for example, as a key source of availability increasing the likelihood of exposure to drug use (see above). Yet the nature of peer networks, and the availability of drugs within them, are at least in part shaped by the macro-environment. Studies by Gamella (1994) and Pearson (1987) provide examples. Pearson argues that the role of friendship networks in the diffusion of heroin use in the UK was to a large extent shaped by social and economic factors, particularly unemployment and

housing. He argues that social and economic shifts, and the impact of these on housing policies and unemployment, created the population shifts necessary to create the local networks which provided the route for the diffusion of heroin and a social context for its use.

As with intrapersonal and interpersonal factors, the causality of associations between deprivation and drug use cannot be assumed. It is the case, for example, that evidence of the links between economic status and problem behaviours, including drug use, are mixed (Clayton, 1991; Hawkins *et al.*, 1992; Faupel, 1988; Kaestner, 1991; Muntaner *et al.*, 1995). Indeed, some studies show associations between increased income and drug use, or increased productivity at work and drug use (Faupel, 1988). Yet such findings are themselves context dependent, with drug use—particularly recreational drug use—associated with an availability of disposable income among largely middle-class students and adolescents (Coams, 1990; Gil Carmena, 1998; Sanz *et al.*, 1995). Just as the relative balance between peer selection and socialization remains unclear, so too does the balance between social deprivation as a consequence, and a cause, of drug use. The strength of association nonetheless merits national policy developments which hinge on the risk environment as a primary unit of analysis in risk factors research and intervention:

We thus assert without any of the familiar hedging with 'on the one hand but on the other', that on strong balance of probability deprivation is today in Britain likely often to make a significant causal contribution to the cause, complications and intractability of damaging kinds of drug misuse. (Advisory Council on the Misuse of Drugs, 1998)

Social Diffusion in Drug Cultures

In addition to mapping increased levels of youth drug use over the past decade, studies have noted a tendency for recreational drug use to transcend social, gender and class differences (Measham *et al.*, 1998; Kaestner, 1991). These findings have led to the suggestion that a 'social transformation' in patterns of drug use is underway, in which recreational use has become an increasingly normalized and socially acceptable feature of youth lifestyles (Parker *et al.*, 1995; Measham *et al.*, 1994). Accordingly, a number of studies note that recreational drug use functions as part of youth cultures and development more generally (Parker *et al.*, 1995; Wright & Pearl, 1990; Orte, 1994; Schuster *et al.*, 1998). Innovations in drug use may become symbols of youth culture as much as drug culture, particularly if they cross over into the mainstream (Room, 1994). This raises the question of whether there is scope within risk factors research for capturing factors associated with macro-social changes in perceptions of the social acceptability of drug use. Studies of macro-factors, and of macro-diffusion, have almost universally been defined in geographical rather than cultural terms. If recreational drug use, as with alcohol use, is becoming an increasingly acceptable part of the 'rites de passage' of youth, it may be useful to capture factors associated with cultural shifts in new ideas of drug use, as these may also come to have a bearing on use patterns. One possible factor includes the growing consumerization of youth culture, in which drugs are among several symbolically important items of consumption along with music, clothes and other appurtenances which display 'youthfulness'. With a parallel disintegration of 'formal' rites de passage

(economic independence, starting work, marriage), the integrative nature of drug use across youth lifestyles may increasingly function as a symbolic marker of youth development between youthfulness and adulthood (Furlong & Cartmel, 1997). Broad cultural shifts in ideas about drug use may have consequences for use patterns.

Discussion

In his review of risk factors research, Clayton (1991) maintained that 'untangling the 'causes' of drug abuse is absolutely essential'. In contrast, we contend that untangling the causes of problem drug use is not absolutely essential for the development and targeting of interventions. We arrive at this position aware that the search for causality has become something of a 'holy grail' for academic researchers, which for practitioners, has become increasingly dubious as far as its relevance for intervention development is concerned. We maintain that a more appropriate question is whether we have evidence enough to develop policy and intervention to prevent or reduce the harmful consequences of drug use. We conclude that the balance of effort in resource input and political commitment should favour practical harm-reducing interventions within the limits of the evidence-base, while at the same time encouraging new models of risk factors research.

Causality and Practicality

Risk factors are predictive, not necessarily causative. Additionally, there is the possibility that some risk factors may constitute indicators of other risk factors for problem drug use which have yet to be properly theorized or measured (Daugherty & Leukfeld, 1998). One example of this is age at initiation. This is one of the most frequently quoted factors said to be predictive of problem drug use, which also finds support in gateway theories of drug use (Kandel *et al.*, 1978, 1992). There is an attractive simplicity associated with the idea that age at initiation is predictive of problem drug use. Yet on closer inspection we find age at initiation may be a confounder of other factors, which when taken together, may account for most of the elevated risk (Daugherty & Leukfeld, 1998; Stein *et al.*, 1987; Lachnit & Kampe, 1996). Delaying the age of onset may have little impact in preventing drug use, if an interplay of factors associated with early drug use are more important. If the predictive value of risk factors is inconclusive, it becomes unwise—and potentially harmful—to plan interventions as if they were causative.

In the face of potentially limitless confounding permutations, it is our view that the search for causality, and even predictive certainty (such as a consensus in judgements of relative risk across different risk factors), has become something of an academic 'black-box' which is not necessarily useful for practical intervention development. The increased interest in 'multiple risk factor' approaches emphasizes less the need for an understanding of the predictive value of specific factors than an appreciation of how their interplay is indicative of 'high risk' behaviours and contexts (Lloyd, 1998; Clayton, 1991; Farrell & Danish, 1993; Bry *et al.*, 1982). A consistent clustering of factors constitutes evidence enough for intervention targeting (Advisory Council on the Misuse of Drugs, 1998; Lloyd, 1998).

We need to focus on practicalities rather than causalities. Concentrating on problem drug use, which is pragmatic and cost-effective (Lloyd, 1998), vulnerability factors associated with youth development—such as school exclusion, truancy, offending, peer network involvement in drug use—indicate potential targets as well as delivery sites for intervention. Not only may interventions seek to ‘target’ those excluded from school, for example, but peer networks may also provide an appropriate ‘site’ of intervention and unit of behaviour change. Additionally, the focus on clusters of factors pointing to ‘high risk’ behaviours inevitably invites consideration of context or environment. We have noted that social problems are often embedded within—or cluster around—wider environmental factors at both micro and macro levels. The strength of associations between problem drug use and the risk environment merits, we believe, envisaging the risk environment as a primary unit of analysis in future risk factors research.

Paradigm Debates

We began this paper by noting that the cat suggested to Alice that her direction of travel very much depended on where she wanted to end up. The direction research takes depends on the theoretical, scientific and political proclivities and assumptions which guide it. Models of interpretation as to what can and should happen with regard to people’s drug use are paramount. There is a tendency for the ‘intrapersonalists’ to lament the increasing shifts towards context as an explanatory variable (Block & Block, 1988), and similarly, a tendency for ‘environmentists’ to lament the predominance of individualistic units of analysis.

Crucially, these competing explanatory models also differ in their assumptions vis-à-vis the role of research, drugs prevention and risk reduction. In risk factors research, the over reliance on the individual—particularly intrapersonal factors—has encouraged a scientific naïvety as to causality (belatedly recognized by multifactorial approaches), as well as interventions misguided in their presumed capacity to implement change (Perri *et al.*, 1998). It is clearly not the case that drug use, or problem drug use, is simply an outcome of any one individual’s volition any more than it is an outcome of any one specific risk factor or environment. It is also the case, however, that individualistic models of interpretation dominate, as do analyses which tend towards what may be termed a ‘deficit model’ of drug use. Individualistic models tend towards an explanation of drug use as a ‘problem’ of individuals requiring individualistic solutions. It is therefore striking that most research which takes the environment or context as its unit of analyses is less inclined to depict drug use as an outcome of ‘dysfunction’, ‘disorder’ or ‘pressure’. Instead, it may envisage drug use as an interaction between choice and constraint, wherein individual and group pleasures associated with drug use may be recognized. In the context of constraints on choice—as can be the case in situations of social exclusion or economic deprivation—drug use may provide a means of status, achievement, and income (Parker *et al.*, 1987; Becker, 1963; Crawford *et al.*, 1983; Craig & Hodson, 2000; Sanz *et al.*, 1995). European research links an involvement in drug use with a variety of pleasures and achievements, both emotional and functional (Schuster *et al.*, 1998; Henderson, 1993). The place of pleasure and preference is conspicuous by its absence in

most risk factors research. A broadening of vision in the methodological units of study may be paralleled by a more inclusive appreciation of drug use aetiology and effects.

Conclusion: Environmental Risk Factors Research

Where does this leave risk factors research? The increased focus on the risk environment in European welfare policy, and in public health in particular, has been paralleled by an increasing uneasiness about the future of risk factor epidemiology (Susser & Susser, 1996). The lack of environmental grasp in risk factor epidemiology, which predominates the health and drug field, has led to calls for paradigm shifts (Susser & Susser, 1996). In some fields—such as HIV prevention—it has been argued that there is evidence of ‘paradigm drift’ from risk factor to environmental approaches (Rhodes *et al.*, 1999).

Rather than attempting to graft environmental concepts onto individualistic approaches—by focusing on analyses of individuals’ perceptions of social relationships and environments—future risk factors research needs to give greater weight to analyses which begin with theoretically informed concepts of the micro- and macro-environment. This implies giving greater weight simultaneously to theoretical purposive sampling—by type of social relationship or environment rather than by individual—as well as to inductive approaches as a means of generating appropriate hypotheses, theoretical concepts of environment, and grounded understandings of drug use. With evidence of increased interest in how risk environments shape social and individual problems, including drug use, opportunities exist for envisaging the risk environment as the theoretical and analytical locus of future risk factors research.

Additionally, we conclude by noting that the irony of the search for causality among a largely undifferentiated population of young people, is that it has blurred the need for targeted research oriented to intervention development. The search for causality is elusive and will doubtless continue to be so. But this does not prevent the opportunity for developing social welfare interventions designed to bring about social environments conducive to risk reduction and protective against harm. Within the inherent limits and contradictions of the risk factors evidence-base, we have evidence enough to develop risk-reduction interventions in the environments, and among the populations, most vulnerable to harm associated with drug use. Directing research and intervention resources towards reducing the risk of harm associated with problem drug use should be considered the primary priority of national drug policy.

Acknowledgements

This research was funded by the European Monitoring Centre for Drugs and Drug Addiction (Project: CT.97.EP.12). We thank Lucas Wiessing for his comments on an earlier draft of this paper. The Centre for Research on Drugs and Health Behaviour at the Department of Social Science and Medicine, Imperial College, is core funded by the North Thames Region.

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