RESEARCH REPORT

Heroin smoking by ‘chasing the dragon’: origins and history

JOHN STRANG, PAUL GRIFFITHS & MICHAEL GOSSOP

National Addiction Centre (The Maudsley/Institute of Psychiatry), Denmark Hill, London, UK

Abstract
The history of heroin smoking and the subsequent development and spread of ‘chasing the dragon’ are examined. The first heroin smoking originated in Shanghai in the 1920s and involved use of porcelain bowls and bamboo tubes, thereafter spreading across much of Eastern Asia and to the United States over the next decade. ‘Chasing the dragon’ was a later refinement of this form of heroin smoking, originating in or near Hong Kong in the 1950s, and refers to the ingestion of heroin by inhaling the vapours which result when the drug is heated—typically on tin-foil above a flame. Subsequent spread of ‘chasing the dragon’ included spread to other parts of South East Asia during the 1960s and 1970s, to some parts of Europe during the late 1970s and early 1980s, and to much of the Indian sub-continent during the 1980s. At the time of writing, ‘chasing the dragon’ has now been reliably reported from many parts of the world but not from others with an established heroin problem—such as the United States and Australia. The significance of this new form of heroin use is examined, including consideration of the role of the different effect with this new form of use, the different types of heroin, and changing public attitudes to injecting.

Introduction
Forty years ago, ‘chasing the dragon’ developed as a local outbreak in Hong Kong but attracted little attention internationally. ‘Chasing the dragon’ involves ingestion of the heroin by inhaling the vapours produced when the drug is heated to a level at which it sublimes: this is typically achieved by heating the drug on creased tin-foil above a flame. Over the last quarter of a century the practice has become greatly more widespread, and is now the main method of using heroin in many countries in South East Asia, South West Asia and more recently in much of western Europe.

Data have not previously been presented on the origins, adaptation and geographical spread of this practice, nor on the possible implications of the behaviour. In this paper, information is presented on the original development and spread of heroin smoking in the Far East from the 1920s onwards, followed by a description of the appearance of ‘chasing the dragon’ in its modern-day form in Hong Kong in the 1950s. Its subsequent geographical spread throughout

Correspondence to: Professor John Strang, National Addiction Centre, Addiction Sciences Building, 4 Windsor Walk, Denmark Hill, London SE5 8AF, UK.
Submitted 25th January 1996; initial review completed 29th April 1996; final version accepted 30th July 1996.

0965–2140/97/060673–11 $9.50 © Society for the Study of Addiction to Alcohol and Other Drugs
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much of South East and Southern Asia and western Europe is then charted.

The early development of heroin use by smoking
The smoking of heroin in the Far East has been described from the 1920s onwards. This emerged and coexisted alongside the longer-established use of opium both by swallowing and by smoking. Early accounts of heroin smoking involved the use of heroin pills and accounts of smoking heroin pills were reviewed in the Bulletin on Narcotics (1953). The first seizures of heroin pills were probably in Shanghai in 1921, at which time they were being taken orally. The League of Nations arranged for investigation of the heroin pills and the extent of recovery when smoked, from which it was concluded that, in the combustion of the heroin pills, no heroin passed into the smoke (reported in the Bulletin on Narcotics, 1953).

Contemporary purity analyses of seized supplies of these heroin pills typically found the heroin to be in the salt form at a purity of between 1% and 3% (Bulletin on Narcotics, 1953), frequently with the remainder including more than 5% caffeine. Little attention was paid to the caffeine content, apart from the suggestion by Valaer (1935) that the sublimate from caffeine from the heroin pills may carry along some of the heroin—an effect demonstrated half a century later in the laboratory by Huizer (1988).

Descriptions of the paraphernalia for smoking the heroin pills were contained within reports to the League of Nations from Hong Kong (1928 and 1933), Shanghai (1932) and Macau (1933). The smoking of the heroin pills involved the use of a small china jar or porcelain vase into which a hole had been drilled and through which the heroin pill was heated gently so that the heroin smoker could inhale the fumes from the pill through a bamboo tube. The use of such heroin pills became extensive so that, in the first year in which seizures of heroin pills took place in Hong Kong (1928), a total of 200,000 pills were seized. Seizures of the pills continued to increase in Hong Kong with approximately four million pills seized annually between 1937 to 1939.

Heroin pills were briefly manufactured in the United States, as well as being imported illicitly from China (Bulletin on Narcotics, 1953), and seizures of heroin pills in the United States occurred from 1932 onwards (Valaer, 1935). Seizures of these new ‘red pills’ of heroin occurred in various US cities including Chicago, Detroit and New York. Valaer (1935) identified several features which linked this heroin use with the Shanghai illicit heroin manufacture. Although this use of heroin by smoking appeared to have spread to several US cities Valaer later reported that, within 3 years of these first seizures of ‘red pills’ in the United States, supplies of this form of heroin had been completely eliminated from the United States (Valaer, 1951).

A decline in the use of heroin pills was seen in Shanghai and elsewhere from 1933 onwards, and there were no further reports of use of heroin pills from the US after 1938 (Bulletin on Narcotics, 1953). While the use of heroin smoking pills continued in Hong Kong beyond this time, the extent of heroin smoking was reported in annual United Nations returns from Hong Kong to be considerably less and seizures also reduced considerably.

Early reports of ‘chasing the dragon’
An early account of ‘chasing the dragon’ (Bulletin on Narcotics, 1958) described how the smoking heroin was mixed with a base powder known as daai fan, which contained barbiturates. The powdered heroin pill and the daai fan were placed half an inch apart on a creased piece of tin-foil, heat was applied to the base of the tin-foil beneath the daai fan until it liquified and mixed with the heroin, after which the liquified mixture of heroin and daai fan ran along the crease in the tin-foil as heat was applied to the base of the tin-foil while it was tilted back and forth. The heroin addict would then inhale the fumes that came off from the heated mixture of heroin and daai fan.

The significance of the daai fan base powder was explored by Gruhzit (1958), who investigated the daai fan, noting the barbiturate content. Four samples of daai fan were analysed and found to be relatively pure barbitone base, with effects in laboratory animals which were indistinguishable from those resulting from an equivalent amount of sodium barbitone. Gruhzit (1958) reported that Hong Kong heroin addicts indicated that a 4:1 ratio of base powder to heroin was usually used, and he also observed that this was the approximate ratio of base pow-
Use of heroin by injection was not common in Hong Kong in the 1950s and 1960s. A history of intravenous injection of heroin was found among only seven of the 500 addicts in a 1961 study (Hess, 1965) and, in a records search, among only 51 of the 5000 addicts received by Tai Lam prison in Hong Kong (Hess, 1965). Hess also reported on Way’s description in 1963 of the frequent provision of packets of barbitol along with packets of black market heroin in Hong Kong, thereby providing further support for the extent to which heroin was being taken in combination with daai fan by ‘chasing the dragon’ (barbitol being the constituent of the base powder daai fan—see above).

A later report from Hong Kong by Mo & Way (1966) described use of heroin (salt) both by ‘chasing the dragon’ and by smoking of heroin in cigarettes. It is unclear whether the heroin smoking in a cigarette described by Mo and Way should be considered as smoking by burning (as in a heroin ‘joint’) or should alternatively be considered as a crude variant of ‘chasing the dragon’ as it seems likely that the heroin was not burnt in the same manner as the tobacco; the quantity of heroin was placed on the powdered ash on the end of the cigarette to be heated (but apparently not actually burnt) while the heroin user held the cigarette upright or at an upwardly inclined angle with the head tilted backwards—a procedure known as ‘ack-ack smoking’ or ‘firing the aircraft gun’.

The subsequent spread of ‘chasing the dragon’

The different countries in which ‘chasing the dragon’ has become firmly established are shown in Fig. 1, which also indicates the decade in which this practice first became widespread in these countries. The map indicates that the diffusion of ‘chasing’ appears to be determined partly by time and distance from its place of origin, Hong Kong.

Further spread of ‘chasing the dragon’ in South-East Asia

Use of heroin by ‘chasing the dragon’ was later reported from other countries in South East Asia. Suwanwela & Poshychinda (1980) noted that the earliest evidence of the introduction of heroin into Thailand was in 1959, and that many heroin addicts subsequently seen at treatment centres and correctional institutions were taking heroin by ‘chasing the dragon’. Usually these were former opium users, aged between 30 and 50 years. In contrast, they noted that the subsequent epidemic of heroin use in the 1970s (which began in 1968 or 1969) increasingly
involved younger heroin users who were either smoking their heroin or injecting it intravenously, and who had usually started by smoking their heroin.

The spread of 'chasing the dragon' from Hong Kong to Singapore during the 1970s has been described by Leong (1980). Until 1974, heroin comprised less than 1% of the drug arrests by the Central Narcotics Bureau. However, by 1976, 79% of arrests were for heroin. By 1977, the number of heroin addicts in Singapore had grown to an estimated 13,000. This heroin use involved smoking the drug in spiked cigarettes, with the white heroin powder (salt) being inserted into the cigarette by a metal spike. For those heroin users who were more sophisticated, the drug would be used by 'chasing the dragon' which Leong described as 'following the Hong Kong style'. The heroin used was identified by Leong as heroin No. 3, which he identified as suitable for smoking, in contrast to the South East Asian heroin No. 4 more commonly found in New York, which he described as injectable.

The spread of the use of heroin in Malaysia occurred as part of a new drugs epidemic among the young since the late 1960s (Navaratnam, 1980; Navaratnam et al., 1994). Navaratnam's 1980 report noted that many drug users had recently changed to 'chasing the dragon', which he described as heroin warmed on tin-foil and inhaled through a straw. In their 1994 report, Navaratnam and his colleagues (1994) reported on the persistence of the 'Malaysian tradition to inhale or smoke heroin rather than inject it'.

Over a similar period, reports of the spread of use of heroin by 'chasing the dragon' were published from further west. In a report on 1114 heroin addicts treated between 1975 and 1977 in Rangoon, Burma (Khart & Ne Win, 1980), 61% of the heroin addicts were using the drug by smoking, while the remainder injected intravenously.

**Spread of 'chasing the dragon' to the Indian subcontinent**

Reviews of the extent of drug addiction in India found no evidence of heroin use (Mohan & Arora, 1976; Wig & Verma, 1977) and Mohan (1980) specifically noted that heroin had not appeared in India. Similarly, in their comparison of rural and urban patterns of opium use in Pakistan, McGlothlin et al. (1978, 1980) made no mention of any heroin use at that time. However, by the mid to late 1980s, an epidemic of use of heroin by 'chasing the dragon' had occurred in many parts of the Indian subcontinent (Saxena & Mohan, 1984) with three-quarters of the new heroin addicts seen in Delhi (India) taking their heroin by 'chasing the dragon' (Mohan et al., 1985). By the late 1980s, Gossop reported on the change in Pakistan from virtually no heroin addicts prior to 1980 to an estimated 700,000 heroin addicts by 1988 (Gossop, 1989), although the main method of use here was by smoking with a cigarette. By the early 1990s, reports from clinical populations of heroin addicts in Calcutta indicated that all heroin addicts had been initiated into heroin use by 'chasing the dragon' (Chowdhury & Sen, 1992).

**Virtually no 'chasing the dragon' in the United States**

No unambiguous report of 'chasing the dragon' has been identified from the United States. Des Jarlais, Courtwright & Joseph (1991) observed that 'no subculture of heroin smoking has ever developed in the United States'. Neither the Des Jarlais et al. (1991) nor other authoritative reviews of heroin use in the United States (e.g. Musto, 1973, 1974) make any mention of heroin smoking having occurred in the United States. The only reports indicating an awareness of the potential for smoking heroin prior to the 1990s have been the passing reference in the chapter from Smith (1981) and within the report by Wesson & Washburn (1990), in which they described the use in the early 1970s of Persian heroin (heroin base) by cocaine free base users on the West Coast who used it as a drug to attenuate the cocaine-induced anxiety, agitation or paranoia, or occasionally concocted a similar mix with methamphetamine and heroin base.

The arrival of 'chasing the dragon' in New York was apparently described in the letter from Kramer et al. (1990) who described how, over the previous year, 40% of the patients at a detoxification unit reported that they had used heroin by 'chasing the dragon': however, as Gossop et al. (1991) pointed out, it was unclear whether this represented the real appearance of 'chasing the dragon' in the same form as described from South East Asia, India, Pakistan and Europe as Kramer and his colleagues went.
on to describe this practice as the use of heroin mixed with crack cocaine and smoked in a crack pipe, while also describing the term ‘chasing the dragon’ as traditionally used to refer to the practice of snorting heroin after snorting cocaine (Kramer et al., 1990).

Spread of ‘chasing the dragon’ in Europe: the Netherlands

The arrival and spread of ‘chasing the dragon’ in the Netherlands has been studied during the 1980s (Kaplan et al., 1986; Hartgers et al., 1991; Grund, 1993; Grund & Blanken, 1993) and had become widespread by the end of the 1980s. Grund & Blanken (1993) found that three-quarters of their sample were using heroin by smoking—mainly by ‘Chinezen’ (‘Chinesing’ or ‘chasing the dragon’). Hartgers et al. (1991) also reported on the increased extent to which ‘chasing the dragon’ was the most common route of heroin use in Amsterdam when examining changes between 1985 and 1989.

Previous reports from Amsterdam (Buning et al., 1986) and national reports from the Netherlands (Kaplan et al., 1986) also noted the extensive use of heroin by chasing the dragon. These authors date the introduction of ‘chasing the dragon’ to the expansion of heroin markets in the Netherlands in the early 1970s, particularly involving a new, largely young male, Surinamese population who had moved to the Netherlands at the time of the declaration of independence of Surinam (1975). From the early 1970s onwards, the middle and lower levels of heroin distribution in the Netherlands were primarily controlled by the Surinamese (Kaplan et al., 1986). Grund & Blanken considered it probable that the first Surinamese heroin users were taught to ‘chase the dragon’ by Chinese contacts from whom they obtained the heroin, hence allegedly the development of the term ‘Chinezen’. While smoking (with tobacco or marijuana) was briefly used as a route of heroin use, as was snorting (Grund & Blanken, 1993), ‘chasing the dragon’ soon became the main route of heroin use for the new immigrant Surinamese heroin users, and Kaplan et al. (1986) have suggested that the strong cultural taboo against injecting among the Surinamese may have helped to maintain non-injecting routes of heroin use. The Surinamese chasing ritual is then believed to have passed to the white Dutch youth via another immigrant group, the Moluccans, who had overlapping friendship networks with both the Surinamese and the white Dutch (Grund & Blanken, 1993).

Early forensic reports from the Netherlands had noted the arrival and spread of a new form of black market heroin (Huizer et al., 1977; Huizer, 1983) which was suitable for smoking (Eskes & Brown, 1975).

The arrival and spread of ‘chasing the dragon’ in the United Kingdom

The first reports of ‘chasing the dragon’ in the United Kingdom are from the early to mid 1980s. Sociological and ethnographic studies of such heroin use were published from 1987 onwards, by which time the practice had become widespread. Parker and colleagues described the new heroin users in the Wirral, Merseyside, amongst whom ‘chasing the dragon’ was the only method of use for four-fifths of their sample drawn from three agencies, while injection was the sole route of use for less than 4% of the sample (Parker et al., 1987, 1988). Nevertheless, even in such a ‘chasing’-dominated context, a quarter of the sample had tried injecting heroin on at least one occasion. Pearson and colleagues also observed the emergence of the new heroin users in communities to both the west and the east of the Pennines in the north of England (Pearson et al., 1986; Pearson, 1987), with this new heroin use being by the new method of ‘chasing the dragon’. In London, Burr reported on her ethnographic study of the extensive rapid spread of chasing the dragon among new young heroin users in a South London community (Burr, 1987, 1989).

Reports of the appearance of heroin chasers among treatment samples in the United Kingdom were seen from 1988 onwards. Gossop et al. (1988) gave an early report on the characteristics of these new heroin chasers, seen by a South London treatment centre. Chasers were significantly younger than injectors and had used heroin for a shorter period of time. However, many of the heroin chasers had been using by this route for a considerable period of time—87% had used for more than 2 years and 27% had used for more than 5 years. A later report from the same treatment centre in South London examined the characteristics of 264 heroin addicts who reported a single main route of administration for heroin (Griffiths et al., 1992).
Examination of the heroin users according to current route of use found two equally sized groups—128 chasers and 136 injectors. Nearly half of the heroin chasers (49%) had previously injected, and 36% had injected heroin at least once in the last year. Both chasers and injectors were using similar amounts of heroin. London-born heroin users were more likely to be chasers and black West Indian heroin addicts were mostly chasers. 'Chasing the dragon' was found to be used widely as a route of heroin use among non-treatment samples of heroin users in London (Griffiths et al., 1994), for most of whom 'chasing' had been the first route of heroin use (Strang et al., 1992).

However, it is probable that 'chasing the dragon' was already being practised in London—at least by some Chinese heroin users—as far back as 1967 in which year the Metropolitan Police Drug Squad seized a quantity of illicitly imported brown heroin which was described by Spear (1975) as Chinese heroin No. 3. Analysis of this sample of heroin revealed that it was largely caffeine (pers. comm. from Home Office, cited by Hawks, 1976). Chinese heroin No. 3 was already known to be a form of heroin which was most usually taken by smoking by heroin addicts in or linked to South East Asian communities, and the significance of the high caffeine content (giving a much higher yield of heroin recovery when taken by 'chasing the dragon') was not appreciated at the time of the seizure (not reported until Eskes & Brown, 1975).

Spread of 'chasing the dragon' elsewhere in Europe

'Chasing the dragon' has also been reported from Spain during the 1990s. Spanish reports from clinicians in Seville and Malaga (Lacoste Marin, 1992) describe heroin addicts taking their heroin by fumar un chino ('chasing the dragon') (Lacoste Marin, 1992; Munoz Sanz & Vera Tome, 1993) and identified an extensive increase in the proportion of heroin users in Andalucía who were smoking or inhaling heroin—from 7% in 1985 to 37% in 1989. At the same time, reports appeared of physical complications (acute renal failure) following heroin use by 'chasing the dragon' in Madrid (Gonzalez Parra et al., 1992). Prior to the rapid spread of injecting in the 1980s, snorting of heroin and cocaine was well established among drug users in Madrid (Gamella, 1994) and more recently there has been the development of 'chasing the dragon' as a new route of heroin use in this group. Gamella also described a third group in this sample whose injection was after 1987, many of whom had previously been smoking heroin and had resorted to intravenous use after becoming addicted or when the heroin became too expensive or difficult to obtain. However, while both clinical (San et al., 1993) and anthropological (Gamella, 1994) studies included reference to heroin smokers, no published papers have been identified which explore in detail this particular aspect of the extensive heroin problem in Spain.

Use of heroin by 'chasing the dragon' also occurred in the early 1980s in the Turin area of Italy, among whom several cases of spongiform encephalopathy occurred after using heroin by 'chasing the dragon' which, while not described in the addictions literature, appeared in reports of this complication (Schiffer et al., 1985). Nevertheless, intravenous injecting was the main route of heroin use described in the overview of the Italian drug problem described by Tempesta & Giannantoni (1990).

Evidence of heroin use by smoking and sniffing is contained briefly within a report from Ireland (Dean et al., 1987), which referred in passing to the 'preference of Dublin drug users to inject rather than smoke or sniff heroin', although no more specific data are provided.

Discussion

The arrival and spread of 'chasing the dragon' as a route of heroin use in several parts of the world has gone unstudied by either addictions researchers or clinicians until the behaviour was widespread. Thus, by the time Hess gave one of the earliest accounts of the new 'chasing the dragon', virtually all of his sample were already using by this new method. Similarly, in one of the first studies in the United Kingdom to report this new route of use, 'chasing the dragon' was the only route of heroin use for four-fifths of the heroin users interviewed (Parker et al., 1987, 1988).

Why should there have been such a profound change in route of heroin use in these areas? Three possible influences are considered in the following paragraphs: changes in technology, changes in the drug, and changes in attitudes to the different routes of use.
Changes at the technological level
These have already been identified as causally implicated in the extent of spread of drugs other than heroin. The development of the needle and syringe contributed significantly to the spread of the use of morphine in the late 19th century (Howard-Jones, 1947). The increased use of tobacco in the form of cigarettes became widespread following the development of machinery for large scale production of ready-prepared cigarettes from the mid-19th century onwards (Akehurst, 1981). Subsequently the development of flue-curing in the preparation of tobacco increased the acceptability of inhalation of cigarette smoke, thereby altering the pharmokinetics of the nicotine absorption and contributing to the spread of popularity of the cigarette (Alford, 1973; Goodman, 1993). The exploitation of methods for separating cocaine from its hydrochloride (Strang, 1990) made possible the use of cocaine by smoking—initially as cocaine free base and, shortly thereafter, in the form of crack cocaine. The drug-taking apparatus itself has previously been the subject of control in an attempt to control the drug use associated with the apparatus—for example, the introduction of legal controls over supply of needles and syringes so that, following the Boylan Act (1914) in New York, hypodermic syringes could only be obtained on prescription (Musto, 1973) and, more recently, the widespread introduction of drug paraphernalia laws in the United States, United Kingdom and elsewhere which were intended to curb the public sale of cocaine free base kits, crack pipes and other such apparatus used in use of illicit drugs (UK Drug Trafficking Offences Act, 1986) (Bucknall & Ghodse, 1986; Fortson, 1992).

In examining the changes in route of first heroin use, no change in the legal status of the apparatus can be identified which coincides with the period of change since existing readily available apparatus (i.e. tin-foil) was used for this new form of heroin use. It is unclear whether earlier heroin users were or were not aware of the possibility of ‘chasing the dragon’. On the basis of published reports from UK clinicians and from individual accounts from older heroin users, there appears to have been no widespread awareness among heroin users of the possibility of effective use of heroin by this alternative route. In one of the subsequent paragraphs, attention will be paid to how this knowledge may have spread.

Changes in the black market heroin—base as well as salt
The heroin products available have themselves changed over the period during which ‘chasing the dragon’ has become increasingly popular. Heroin became increasingly available in its base form, whereas it had previously been available as the hydrochloride. Heroin as the hydrochloride is readily water soluble and is consequently particularly suitable for injection. However, as a salt it has a high melting point and decomposes upon melting, so that it does not volatilize readily and is consequently of limited worth as a drug for inhalation. On the other hand, the free base of heroin is poorly water soluble and is hence not suited for injection but, by virtue of the fact that it melts without decomposition at a much lower temperature than the salt, is suitable for use by heating and inhalation.

Published reports of forensic analyses of seized consignments of black market heroin have identified that, from 1977 onwards, South West Asia became a major source of imported heroin in the United Kingdom (O’Neil et al., 1984, 1985) and elsewhere in Europe (Huizer et al., 1977; Huizer, 1987). From the late 1970s onwards, this form of black market heroin not only represented an increasing share of the black market, but was also usually available in the form of heroin base, often mixed with additives such as barbiturates and caffeine (O’Neil et al., 1984; Huizer, 1987), thereby rendering it highly suitable for ‘chasing the dragon’ (Eskes & Brown, 1975; Huizer, 1988; Cooke, 1991).

Extensive work on the significance of these additives was conducted by Huizer (Huizer et al., 1977; Huizer, 1983, 1987, 1988) who arranged a simulation of ‘chasing the dragon’ in the laboratory by heating heroin on tin-foil while analysing the recovery from the sublimate. Huizer identified the marked capacity for increasing heroin recovery from both the base and salt forms of black market heroin when it was mixed with either barbiturate or caffeine which are commonly found in black market samples of heroin (Huizer et al., 1977; O’Neil et al., 1984), and the much greater recovery when the heroin was in the base (i.e. not the hydrochloride) form. Additional work in this area by Cooke & Brine (1985) provided further evidence on the feasibility of this form of heroin use by pyrolysis at 250°C, at which temperature mono-acetylmorphine, diacetylmorphine and triacetylmorphine
were produced. In conclusion, the new forms of black market heroin in the base form with added barbiturate and caffeine would appear particularly well-suited to use by ‘chasing the dragon’.

Changes in attitudes towards use of heroin
The different possible routes of heroin use are associated with different set of values, prejudices and taboos at any particular point in time. These differences have been put forward as an explanation for the spread of heroin use by ‘chasing the dragon’ (Auld et al., 1986; Pearson, 1987; Grund, 1993). Various commentators have attributed the rapid spread of ‘chasing the dragon’, at least partly, to the greater acceptability to the potential new user of a non-injecting route of administration such as ‘chasing the dragon’ (Pearson, 1987; Burr, 1989). Some supportive data for this suggestion can be identified from the interviews of heroin users who have never injected, who identified reasons for not injecting (unpublished data from Drug Transitions Study, 1995). Reasons for not injecting were provided by 127 heroin users who had never injected, of whom 90% identified a dislike of needles and injections as a reason for not injecting, with two-thirds of the total sample identifying this as a major reason. Two other strongly endorsed items were also associated with possible sequelae of injecting—the risk of HIV/AIDS and the health consequences associated with injecting (identified as major reasons for not injecting by three-fifths and half of the non-injecting heroin users, respectively). For these heroin users, it appears that the existence of a non-injecting route of heroin use has made possible their use of heroin which might not have occurred if heroin use had only been possible by injecting. These data would appear to lend support to the assertions that the increasing popularity of ‘chasing the dragon’ contributed to the increase in the overall number of individuals involved in heroin use.

Considering the subsequent spread of ‘chasing the dragon’ after its first appearance
The extensive use of heroin by ‘chasing the dragon’ has been put forward as evidence of adaptation by heroin users to the threat of HIV infection (Farre & Cami, 1991; Des Jarlais & Friedman, 1994). Farre & Cami not only observed the changes that have occurred but asserted a causal relationship:

Severe infections among intravenous opioid addicts, particularly AIDS, have led to increased use of other routes associated with a lower potential of blood transmission: this may explain the use of alternative routes of administration by some communities of drug addicts—i.e. intranasal administration of opioids and smoking of cocaine.

However, for most countries in which ‘chasing the dragon’ has become established, the historical timing of the spread of this practice does not accord with this proposed causal relationship. The spread of ‘chasing the dragon’ as a route of first heroin use occurred extensively during years which preceded widespread public awareness of the risks of HIV from sharing needles and syringes (which largely followed the development of the HIV antibody test in 1984). UK national HIV advertising campaigns started in 1986 and included materials specifically directed at injecting drug users from 1987 onwards. By the mid-1980s in the UK, ‘chasing the dragon’ had already become the main route of first heroin use and continued to be the most widely employed route of use in many of the communities studied (Parker et al., 1987; Pearson, 1987; Burr, 1989). Although Stimson (1990) has described the ‘health-conscious drug user’ who makes changes to his/her behaviour so as to preserve their well-being, specific concerns about HIV infection cannot have formed part of the reason for the extensive spread of ‘chasing the dragon’, as this spread has mostly predated public and professional awareness of the risk of HIV infection. However, it must be acknowledged that more general concerns about the diseases associated with injecting (e.g. tetanus, hepatitis B, malaria) may have led to non-injectable routes being regarded as less hazardous and hence more attractive to current or potential drug users.

The diffusion of innovations has been a subject of study outside the field of drug abuse. Barnett (1953) hypothesized that three factors would determine the extent to which a novelty would be adopted—the relative gain in satisfaction over existing products or practices, the pre-existing attitudes of the adopter, and the existence of pervasive dissatisfaction with the existing practice among those marginal individu-
als who might adopt the novelty. Rogers & Shoemaker (1983) identified key characteristics of innovations, which include the relative superiority of the innovation over alternative products, their compatibility with existing values, an acceptable risk involved in experimental use (trialability), and an ease of observation of use (observability). This model has been applied to the study of the diffusion of cigarette smoking by Ferrence (1989) and has been considered in the study of changing patterns of heroin use in the Netherlands (Kaplan et al., 1986; Grund & Blanken, 1993).

Consideration of the influence on the spread of ‘chasing the dragon’ of the three influences identified by Barnett (1953) might find little evidence to support the first area (relative gain in satisfaction over existing practice) due to the great efficiency of the pre-existing intravenous practice, but might find considerable support for the two remaining areas—the pre-existing attitudes of the potential heroin user, and pervasive dissatisfaction among those on the margins of the drug-taking community.

Furthermore, in those individuals in whom the attitudes against the pre-existing practice were greatest, the extent of adoption of the novelty may be greater. The greater extent to which women (who are only half as likely as men to be found in samples of injecting drug users) exist in samples of heroin chasers may reflect a greater extent of diffusion of the innovation of ‘chasing the dragon’ among women. Similarly, the concentration among the heroin chasers of those from Afro-Caribbean ethnic groups (among whom a strong taboo against injecting appears to have existed in much the same way as for the Surinamese in the Netherlands (Grund, 1993)) may also reflect the greater diffusion of the innovation of ‘chasing the dragon’ among this population who may have held stronger negative attitudes towards injecting.

Examination of the factors identified by Rogers & Shoemaker (1983) may also identify some additional features of this new route of heroin use which may have contributed to its successful diffusion—such as its greater compatibility with existing values among individuals who are already on the margins of the heroin community and may already be involved with smoking of marijuana, and the perceived greater safety of experimental use. However, while ‘chasing the dragon’ has been described as a simple technique requiring little apparatus (Kaplan et al., 1986), the practice requires a moderate degree of skill to maintain the molten heroin within the narrow temperature band at which sublimation occurs. This may explain the anecdotal reports from heroin addicts who, as established injecting heroin users, experimented on their own with ‘chasing the dragon’ (about which they had heard) and which they found to result in no significant drug effect even though high purity heroin was being used (Strang et al., 1989; Battersby et al., 1990).

Concluding observations
The different possible routes of heroin use show varying prevalences across different populations. The coexistence within a community of use of the same drug by different routes provides an opportunity for separate examination of complications related to the drug itself and to the different routes of use, and also provides new opportunities for possible influence on drug-taking behaviour. Future study should include examination of the extent of progression from use of heroin by one route to use by another route, the likelihood of development of dependence, and of the other harms associated with use by these different routes.

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