Analysis of Cocaine and Heroin Market Structure

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ABSTRACT

Economic theory can play an important role in the analysis of illicit drug enforcement. Drugs, like other commodities, are bought and sold in markets. Enforcement seeks to reduce the consumption of drugs, in part by raising their price and reducing their availability.

Most theories of drug enforcement are based on very rudimentary microeconomic analysis, often the basic comparative statics approach one would find in an introductory text. But drug markets are hardly models of the perfect competition (rational consumers, perfect information, price taking firms, free entry and exit) assumed by elementary theory. As a result, many of the important features of drug markets are overlooked, or at least oversimplified.

This paper attempts to move beyond basic theory, borrowing ideas from several areas of economics, particularly industrial organization. Using the structure–conduct–performance paradigm as a framework, the paper discusses a number of aspects of the cocaine and heroin industries, focussing where possible on policy implications. The issues addressed include the following:

- The nature of the aggregate demand curves for cocaine and heroin, including the effects of addiction.
- The vertical structure of the cocaine and heroin industries, with particular focus on the way in which vertical integration affects retail prices.
- Different theories of vertical pricing relationships, and what they imply about the efficacy of certain enforcement strategies.
- The extent of oligopolistic coordination in the drug trade, especially involving the Colombian cocaine organizations.
- The possible connections between market structure and violence and corruption.
- The effects of product differentiation, and how the cocaine and heroin trades differ on this score.

In assessing the policy implications of these analyses, the paper suggests that enforcement should focus less on destroying or capturing the raw materials of the drug trade, and more on preventing the formation of large, vertically integrated organizations. This argues against interdiction and source control efforts, as well as asset seizures and forfeitures. It argues instead for street-level enforcement and undercover operations.

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THE STRUCTURE–CONDUCT–PERFORMANCE PARADIGM

It is not surprising that policy analysts readily apply ideas from economic theory when studying and evaluating drug enforcement. For one thing, drug enforcement is not simply a moral crusade on the part of society; it is also an effort to influence, through public policy, the price, availability, and consumption of goods in particular markets. Also significant is the dearth of reliable data.[1] Since drugs are illegal, and because much drug use is socially isolated, it is difficult to obtain credible facts and figures on the workings of drug markets. In the absence of such information, there is little choice but to rely heavily on theory.

Most theories about drug enforcement are based on very rudimentary microeconomic analysis, generally the basic comparative statics approach one would find in an introductory text. But drug markets are hardly models of the perfect competition (rational consumers, perfect information, price–taking firms, free entry and exit) described in elementary economic theory. Nor, on the other hand, are drug markets examples of the other kind of elemental market structure—monopoly.

To the extent that markets for drugs resemble those described in economics texts, they are perhaps closest to some combination of monopolistic competition and oligopoly. Yet even these descriptions are strained; drug markets are illegal, and are, as such, characterized by poor information, legally unenforceable contracts, rampant violence, intensive law enforcement, and stiff criminal penalties.

This does not render economic theory completely worthless in analyzing drug markets. It does require, though, moving beyond the assumptions of basic theory. Particularly useful in this regard is industrial organization—the branch of economic theory that is specifically concerned with analyzing markets that are more complicated than the simple cases of perfect competition or monopoly.[2]

In studying industries and markets, industrial organization economists generally refer to the structure–conduct–performance paradigm (see depiction below). Structure refers to relatively stable features of the market, like cost structures, barriers to entry, and vertical integration. Conduct involves the behavior of firms towards each other—pricing and marketing policies, for instance. Performance is a normative appraisal of the industry's production and allocation

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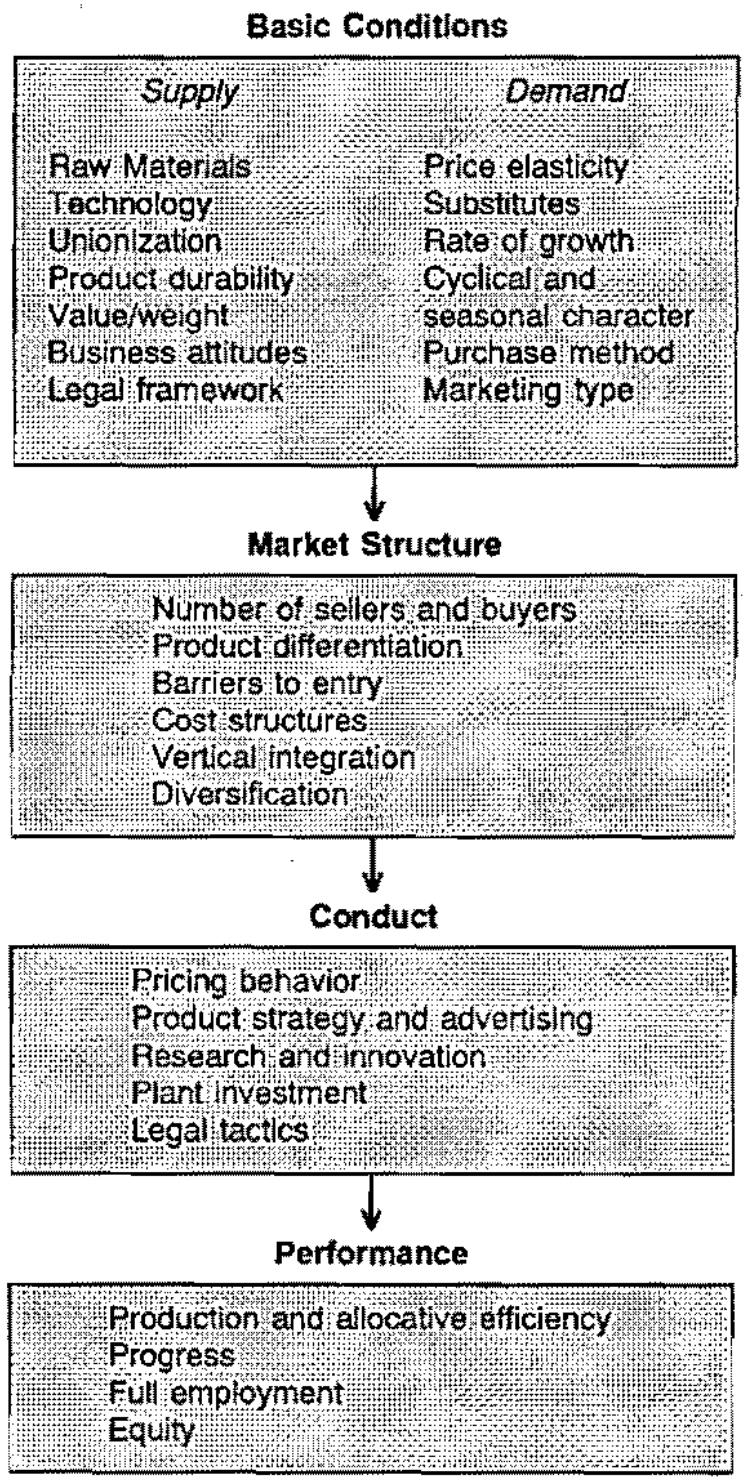
[1] See Max Singer, "The Vitality of Mythical Numbers," *The Public Interest* 23 (Spring 1971):3–9; Peter Reuter, "The (Continuing) Vitality of Mythical Numbers," *The Public Interest* 78 (Spring 1984):135–47; Mark A. R. Kleiman, "Data and Analysis Requirements for Policy Toward Drug Enforcement and Organized Crime, Appendix G in *America's Habit: Drug Abuse, Drug Trafficking and Organized Crime*, President's Commission on Organized Crime (Washington, DC: USGPO, 1986); Jonathan P. Caulkins, "The Distribution and Consumption of Illicit Drugs: Some Mathematical Models and Their Policy Implications" (Ph.D. diss., Massachusetts Institute of Technology, 1990), 29–74;

[2] See Stephen Martin, *Industrial Economics* (New York: MacMillan, 1988), 1.

The Stucture–Conduct–Performance Paradigm



Source: Adapted from F. M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Boston: Houghton Mifflin, 1990), 5.

of goods. The underlying idea is that performance in a particular industry depends on the conduct of buyers and sellers; conduct in turn depends on market structure; and market structure is in turn influenced by a variety of basic conditions.

With a few revisions, the structure–conduct–performance paradigm provides a valuable framework for thinking about drug industries and society's objectives in attacking them. As Mark Moore has pointed out, the traditional paradigm must be modified in two key respects.[3] First, in traditional industrial organization, structure and conduct are of interest primarily to the extent that they influence performance. Where drugs are concerned, however, structure and conduct are important, independent of how they affect an industry's ability to supply drugs.

In terms of structure, the development of large criminal organizations is the chief worry. One concern is that they have the capacity to efficiently supply great quantities of drugs. Another concern is that organized crime groups have the manpower, experience, and financial resources to resist law enforcement, corrupt government officials, diversify their activities into other illicit ventures, all the while possessing the potential to unleash frightening levels of violence. Violence, of course, is one of the main reasons that drug policy must also concern itself with conduct in drug industries.

The second modification to the structure–conduct–performance paradigm relates to performance. With licit products, good performance is generally associated with an industry offering consumers a plentiful supply at a low price. In terms of drug markets, this is usually considered terrible performance. Performance is judged by just the opposite standard; the objective is the restriction of supply, so that drugs are difficult and expensive to purchase.[4]

This paper discusses several aspects of the basic conditions, market structure, conduct, and performance of the cocaine and heroin industries, and also attempts to draw some implications for drug enforcement policy.

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[3] Mark H. Moore, "Drug Abuse and Organized Crime," in *America's Habit: Drug Abuse, Drug Trafficking, and Organized Crime*, President's Commission on Organized Crime (Washington, DC: USGPO, 1986), 20–22.

[4] Many—especially those who advocate the legalization of drugs—believe that drugs should be cheap. They typically claim that higher prices do little to restrain consumption, but do a lot to breed crime. At the risk of belittling what is a serious, and in many respects appealing, argument, it is assumed here that our society has rejected this line of reasoning and instead adopted a drug policy that aims to keep prices high.

DEMAND

The "Normal" Demand Curve

The elasticities of demand for cocaine and heroin are of great importance. If demand is highly inelastic, even successful efforts to restrict supply will have only a moderate effect on consumption. Moreover, such enforcement will boost prices significantly, thus increasing total expenditures on drugs, and the revenues of those involved in the drug trade. This may escalate crime as well; not only do users need more money to support their habits, but the criminal organizations that escape enforcement grow in wealth and power.

If, on the other hand, the demand for drugs is elastic, effective supply reduction will have more positive consequences. Consumption will decrease substantially, and although prices will still rise, the increases will be more modest. As a result, overall expenditures on drugs, and overall revenues from sales, will fall, perhaps bringing about a reduction in crime.

To date, most research on and discussion of illicit drug demand curves has focused on heroin, the bulk of the work dating from the 1960s and 1970s, during or following the last heroin epidemic.[5] At that time, many researchers assumed that demand for heroin was—inherently—almost perfectly inelastic.[6] Accepting the stereotype of the "dope fiend," they reasoned that the addictive nature of heroin made it impossible for addicts to reduce their consumption.

Perhaps because the stereotype of the "dope fiend" lingers on, this view of illicit drug demand curves is still accepted by many. In academic and political circles, it finds a home among legalization advocates who argue that higher prices do little to curtail use, and that the drastically lower prices that would prevail in a legal regime would not significantly increase consumption.

In fact, however, the basic shape of the demand curves for illicit drugs must be "normal," with an inelastic range at lower prices and an elastic range at higher prices. At low enough

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[5] See, e.g., Arthur D. Little, Inc., *Drug Abuse and Law Enforcement* (Washington, DC: Arthur D. Little, 1967); Edwin T. Fujii, "Public Investment in the Rehabilitation of Heroin Addicts," *Social Science Quarterly* 55 (1974):39–51; Roger D. Blair and Ronald J. Vogel, "Heroin Addiction and Urban Crime," *Public Finance Quarterly* 1 (1973):457–66; George F. Brown and Lester P. Silverman, "The Retail Price of Heroin: Estimation and Applications," *Journal of the American Statistical Association* 69 (1974):595–606; James Roumasset and John Hadreas, "Addicts, Fences, and the Market for Stolen Goods," *Public Finance Quarterly* 5 (1977):247–72; Lester P. Silverman and Nancy L. Spruill, "Urban Crime and the Price of Heroin," *Journal of Urban Economics* 4 (1977):80–103; Michael D. White and William A. Luksetich, "Heroin: Price Elasticity and Enforcement Strategies," *Economic Inquiry* 21 (1983):557–64.

[6] A 1967 report by analysts at Arthur D. Little, Inc., as well as a paper by Edwin Fujii, note that past estimates of the elasticity of demand range between −0.0067 and −0.09. See Arthur D. Little, Inc., *Drug Abuse*; Edwin T. Fujii, "Public Investment."

prices, the demand for cocaine and heroin must be inelastic. Not only is there, at some point, diminishing marginal utility with respect to consumption,[7] but at very low prices drugs will absorb only a small portion of a purchaser's income. Suppose milk cost 2 cents a gallon: how much more would a typical family drink if the price declined to 1 cent?

It should be equally clear that there must also be an elastic price range for cocaine and heroin. If the price of a drug is sufficiently high, it becomes nearly impossible to obtain the income necessary to support a habit, while at the same time substitute commodities—like alcohol, other illicit drugs, and detoxification and treatment programs—become more attractive alternatives. Consider the stereotypical addict who commits crimes to support his habit. To such a user, the marginal benefit of committing crimes is increased drug consumption. So as the price of a drug rises, the marginal benefit of crime falls, especially in the case of heroin when the amount of drug gained is too small to stave off withdrawal symptoms. Eventually, if the price of a drug continues to rise, the marginal benefit of crime must fall below its marginal cost (risk of arrest, incarceration, opportunity cost of time, etc.), and the addict will begin to reduce his criminal activities.

Empirical Evidence

While it is important to recognize that the overall shape of the cocaine and heroin demand curves is normal, this still leaves many questions unresolved. At what prices are demand for cocaine and heroin elastic and inelastic? Most importantly, what are the current price elasticities for cocaine and heroin?

For a variety of reasons, these questions are empirically difficult to answer. The most obvious problem is poor data. If one were estimating the elasticity of demand for gasoline, for instance, one could easily find accurate figures on gasoline prices and consumption. But with illicit drugs, prices are not reliably or consistently measured, and quantity, since it is not an observable variable, must be indirectly estimated.

It is important to point out, however, that at least where heroin is concerned, historical evidence generally suggests that the demand is more elastic than many assume. Consider, for instance, the heroin supply reduction of the late 1970s. During this period, at the behest of the United States, the Mexican government stepped up its efforts at poppy eradication. The effect: it is estimated that in 1976, 4 metric tons of Mexican heroin were available for use in the U.S., fully two-thirds of total U.S. supply; two years later, in 1978, the amount had been cut in half.[8]

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[7] If this were not the case, then the only barrier to overdose would be financial.

[8] National Narcotics Intelligence Consumers Committee, *The Supply of Illicit Drugs to the United States from Foreign and Domestic Sources in 1980* (Washington, DC: Drug Enforcement Agency, 1981), fig. 9.

The consequence was a substantial rise in U.S. heroin prices. Adjusted for inflation, retail heroin prices in the U.S. rose by an average of 37 percent from 1976 to 1979.[9] The apparent effect on consumption was hardly what a highly inelastic demand curve would have predicted. During the same period, emergency room reports linked to heroin overdoses declined by 45 percent,[10] medical examiner mentions (heroin deaths) by 65 percent,[11] and heroin-related treatment admissions by 33 percent.[12]

Addiction Asymmetry

While the addictive nature of cocaine and heroin is more often than not overstated, it is important not to ignore it.[13] For cocaine and heroin are, by most reasonable standards, addictive commodities.[14] Part of what this means is that it is easier to acquire a habit for the drugs than it is to abandon it. The economist Tibor Scitovsky has termed this

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[9] Drug Enforcement Administration, *Performance Measurement System* (December 1979), 20, 22.

[10] National Institute on Drug Abuse, *Trends in Drug Abuse Related Hospital Emergency Room Episodes and Medical Examiner Cases for Selected Drugs: DAWN 1976–1985*, Series H, Number 3; DHHS Publication No. (ADM) 97-1524 (Rockville, MD: Department of Health and Human Services, 1987).

[11] Ibid.

[12] National Institute on Drug Abuse, *Trend Report, Data from the Client Oriented Data Acquisition Process*, Series E, Number 20; Jan. 1976 – Sept. 1979 (Rockville, MD: National Institute on Drug Abuse, 1980); *Annual Summary Report, 1979*, Client Oriented Data Acquisition Process (Rockville, MD: U.S. Department of Health and Human Services, 1981).

[13] Some, like Ernest van den Haag and Thomas Szasz, argue that "addiction," if it is defined as causing involuntary and irrational behavior (a definition Szasz vehemently objects to), does not really exist; individuals use drugs because they like them. According to Szasz, "Why many people use such drugs ... cannot be because the drugs are 'addictive.' It is the other way around: we call certain drugs 'addictive' because people use them—just as we call ether and gasoline 'flammable' because they are easily ignited." See Thomas S. Szasz, *Ceremonial Chemistry*, rev. ed. (Holmes Beach, FL: Learning Publications, 1985), 3; Ernest van den Haag, "How to Get a Handle on the Addiction Problem," *The Wall Street Journal*, 10 May 1983, 30.

[14] While heroin is generally acknowledged to be addictive, there is much dispute about cocaine and marijuana. For a detailed discussion, see Robert Byck, "Cocaine, Marijuana, and the Meanings of Addiction," in *Dealing with Drugs: Consequences of Government Control*, ed. Ronald Hamowy (Lexington, MA: Lexington Books, 1987), 221–45. Byck argues that disagreement results from the acceptance of overly strict pharmacological definitions of the term "addiction," and that by the standards of "ordinary English" the two drugs are addicting.

"Marijuana and cocaine can to some degree fulfill the most rigid requirements for addicting drugs. They are rewarding, they will support self-administration, there is demonstrable tolerance and physical dependence. ... Each of these drugs can, in some populations, produce drug dependencies that meet all the commonly accepted attributes of addiction." Ibid., 233–35.

phenomenon "addiction asymmetry."[15] Its consequence is a demand curve that is, in effect, kinked at the current price such that demand is comparatively inelastic with respect to price increases and comparatively elastic with respect to price declines. It is worth noting that econometric studies have demonstrated such a phenomenon with coffee demand. Using data on the price and consumption of coffee in Great Britain from 1969 to 1979, Trevor Young tested two slightly different addiction asymmetry models. The implied elasticities from the first model were −0.69 with respect to a price increase and −1.15 for a price decline; for the second model the calculated elasticity was −1.26 in response to falls in price below previous minimum levels, and −0.55 with respect to other price changes.[16]

From a social perspective, the possibility that the demand curves for illicit drug markets might exhibit addiction asymmetry is not welcome news. For the inevitable price fluctuations in drug markets will bring about a growth in the user population. When prices fall, new users will acquire the consumption habit or addiction of drug use. And when prices subsequently rise, the class of addicts will be larger than it was previously.

In terms of policy, this cautions against those enforcement efforts that bring about temporary, but unsustainable, increases in drug prices. Addiction asymmetry implies that this kind of price volatility can have dangerous consequences; the price decreases will expand the user population more than the price increases will shrink it. In practice, this seems to argue against crop eradication, a strategy which at best creates brief shortages in supply.[17]

Time Horizon

Discussions about the demand curves for illicit drugs often ignore the issue of time horizon. Strictly speaking, a demand curve is a snapshot. It relates price and consumption of a commodity in a single period of time; it does not describe sequential purchases over time.[18]

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[15] See Tibor Scitovsky, *The Joyless Economy* (New York: Oxford Univ. Press, 1976); "Asymmetries in Economics," *Scottish Journal of Political Economy* 25 (1978):227–37.

[16] Trevor Young, "Addiction Asymmetry and the Demand for Coffee," *Scottish Journal of Political Economy* 29 (1982):89–98.

[17] The occasional short-lived supply reductions that result from international efforts are not devoid of benefit. As Mark Moore has argued: "Typically, the shortage lasts no longer than a year or two as the illicit industry adjusts to the new conditions. But even so, that shortage is worth producing. That is particularly true for drugs that are unusually dependence producing, for the shortage means that a cohort of children in the ages of maximum vulnerability squirts through that period of relative shortages with much lower probabilities of dependence or addiction." Moore, "Drug Abuse," 69.

[18] See A. J. Culyer, "Should Social Policy Concern Itself with Drug Abuse?" *Public Finance Quarterly* 1 (1973):450.

Unfortunately, a snapshot does not necessarily tell us very much. For the purposes of drug policy, we are interested in how price affects consumption over time, not just instantaneously.

One option is to redefine the concept of elasticity, making it an intertemporal measure. In this way, it could capture the important fact that drug consumption is much more sensitive to price changes in the long-run than it is in the short-run. In the long-run, users have the opportunity to discover and habituate themselves to substitute drugs, enter and complete treatment programs, and so on. Moreover, small changes in initiation and quit rates can, over time, significantly alter the size of the user population.[19]

But this approach of making elasticity intertemporal is problematic. Suppose that the price of a drug rises over the course of a year from X to 2X. Because of addiction asymmetry, it makes a big difference *how* prices went from X to 2X, since each change in price causes the demand curve to shift. Consider two cases. Case 1: prices rise from X to 4X and then fall back to 2X; Case 2: prices fall from X to 0.5X and then subsequently rise to 2X. According to the addiction asymmetry hypothesis, observed elasticity would be greater in Case 1, since in Case 2 the interim lower prices would have fostered new habits.

Other Limitations of the Demand Curve

The demand curve for an illicit drug shows, for each price, the quantity that consumers would be able and willing to buy. It is sometimes forgotten that the demand for a drug also depends on factors other than its price—like the level of police enforcement or the incomes of purchasers. Perhaps this is because a demand curve, since it is defined as holding other influences constant, cannot capture these effects. Whatever the reason, it is essential not to overlook or ignore these other variables, for some of them are centrally connected to key policy issues. While in theory there are an endless number of factors that can affect the demand for cocaine and heroin, three groups of influences seem particularly important.

The first is the price of other drugs. Clearly, the primary goal of supply reduction efforts is to keep the prices of all illegal drugs as high as possible. Yet, since to some extent these drugs are substitutes—in economists' terms, there are positive cross elasticities of demand—relative, and not just absolute, prices are also of concern. As a result, an important, but rarely mentioned, objective of supply reduction efforts must be to make sure that the

[19]. Prices may have a significant effect on the formation of new habits. Gary Becker, for one, has argued that a rational person considering whether or not to take an addictive drug should be more strongly influenced by a change in price than he would be if the drug were not addictive, because the effect of the drug's price on his lifetime budget is greater. See Gary S. Becker, Michael Grossman, and Kevin Murphy, "Rational Addiction and the Effect of Price on Consumption," *American Economic Review* 81 (2) (1991):237–41. On the general topic of rational addiction, see Gary S. Becker and Kevin M. Murphy, "A Theory of Rational Addiction," *Journal of Political Economy* 96 (1988):680–85.

prices of the most harmful and addictive drugs are very high vis-à-vis the prices of the less dangerous ones.[20]

Second are those factors that Mark Moore identifies in explaining his concept of "effective price."[21] As he describes it, the demand for a drug is not simply a function of its price, but rather its "effective price," a measure that includes, in addition to its dollar price, purity, toxicity of adulterants, the user's search time, and risks of getting ripped off or arrested.

As noted earlier, the fact that drug prohibition and enforcement raise the price of drugs poses a policy dilemma. On the one hand, higher prices discourage use and abuse, and lower their costs to society. On the other hand, higher prices may engender great costs—in crime, income to criminals, and so on. Moore's concept of effective price may a offer a way of softening this dilemma.

Imagine that a change in enforcement strategy caused the effective price of a drug to rise, but left the dollar price unchanged. In other words, only the non-dollar elements of the effective price increased. The result would be a fall in consumption (since the effective price has risen), but at the same time a reduction in expenditures on drugs and in criminal revenues (less is purchased at the same dollar price).

The logic of this thought experiment suggests that enforcement strategy should be reworked with the goal of increasing the risks and search times facing potential drug buyers. What this means, in practice, is more enforcement directed at users, and greater efforts designed to disrupt the workings of retail drug markets.

The third important factor influencing the demand for cocaine and heroin is the population of new users. Research indicates that drug users are most likely to initiate others when they themselves are new users, typically within their first year of use.[22] (Contrary to the popular image of the "drug pusher" who hooks new addicts in a premeditated and calculating fashion, users are generally initiated by friends and peers.) One implication of this is particularly ominous—that the population of new users of a drug is susceptible to periods of explosive growth. Suppose, for whatever reason, that there is in increase in new users. This creates more new users, who in turn initiate even more new users, and so on. In short order, an epidemic can develop.

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[20] See Mark H. Moore, "Limiting Supplies of Drugs to Illicit Markets," *Journal of Drug Issues* 9 (1979):293. Most importantly, the price of marijuana should be low in comparison (which does not necessarily mean in absolute terms) to the prices of cocaine and heroin. For a discussion, see Mark A. R. Kleiman, *Marijuana: Costs of Abuse, Costs of Control* (New York: Greenwood Press, 1989), 101-102.

[21] Mark H. Moore, "Policies to Achieve Discrimination on the Effective Price of Heroin," *American Economic Review* 63 (1973):270-77.

[22] See Leon G. Hunt and Carl D. Chambers, *The Heroin Epidemics: A Study of Heroin Use in the United States, 1965-1975* (New York: Spectrum, 1976).

This epidemic phenomenon—which underscores the importance of deterring the development of new users—is precisely what appears to have happened with heroin during the late 1960s. The figure below shows the year of first use among first admissions to treatment programs from 1960 to 1974. Two things are important to note. First, the rapidity with which the incidence of new use accelerated; in five years, from 1964 to 1969, incidence of new use more than quadrupled. Second, the incidence of new use began to decline sharply in 1971, before the 1972 heroin shortage. What this indicates is the significance of the size of the susceptible non-user population. As incidence, and then prevalence rise, the susceptible non-user population shrinks. Eventually, the susceptible population is almost fully depleted, and incidence of new use falls off dramatically.

VERTICAL STRUCTURE

The Effects of Vertical Integration

According to the Drug Enforcement Administration (DEA), cocaine sells in Colombia for $750–$1350 per kilo.[23] When diluted and sold at the retail level in the United States, a kilo of cocaine yields about $100,000, suggesting markups on the order of 10,000 percent. A kilo of heroin sells for $6,000–$10,000 in Bangkok, $4,000–$5,400 in Karachi, and $6,500 in Istanbul.[24] The same product, diluted and sold at retail in the U.S., would yield about $1,000,000. The implied aggregate markups here are between 10,000 and 25,000 percent.

Were cocaine and heroin legal commodities—and essentially unregulated and untaxed—these markups would be a fraction of their present level. Transportation, packaging, and distribution are all fairly cheap—when a commodity is legal.

Of course, cocaine and heroin are illegal,[25] and there are stiff, actively enforced criminal penalties attached to their distribution and sale. This has two important consequences for the structure of the supplying industries, consequences that together account for the extraordinary markups noted above. One effect is that those who traffic in cocaine and heroin receive high incomes to compensate for the risks they incur. The other effect is that, in order to protect themselves—not just from the law, but from unreliable and dangerous colleagues, competitors, and customers—those in the drug trade generally do business with very few

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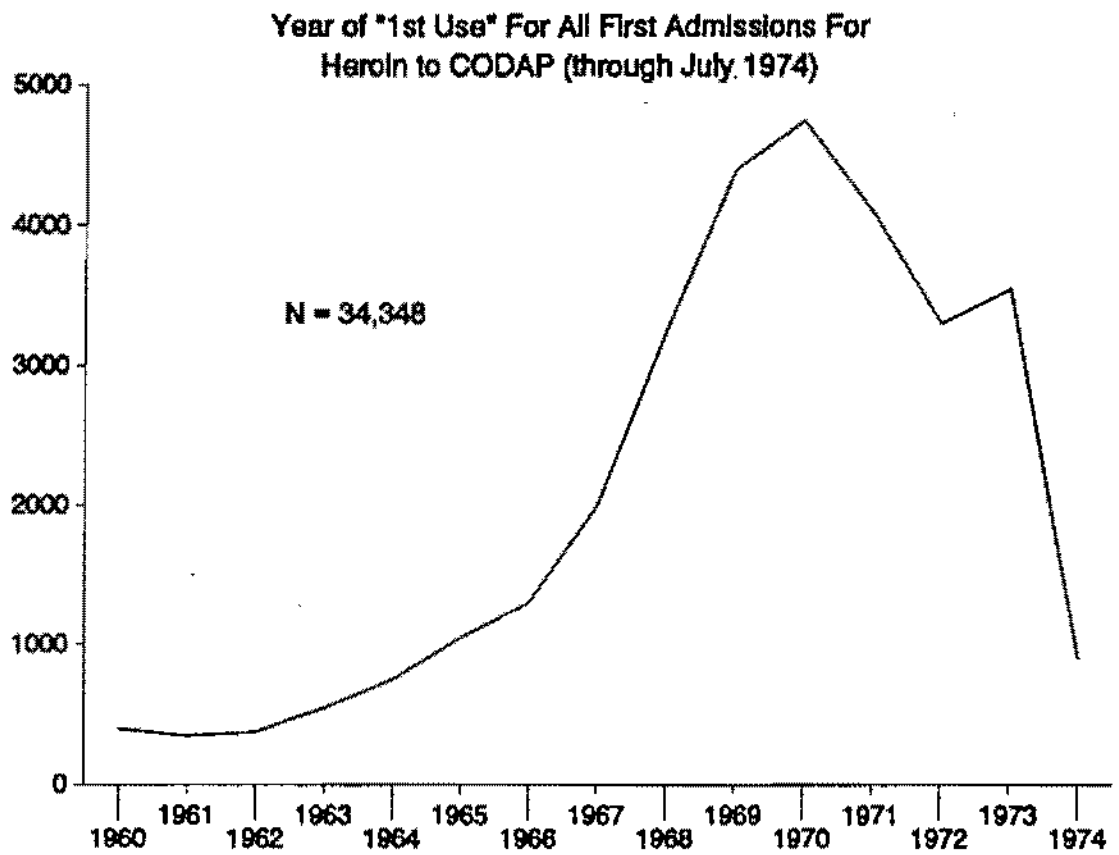
[23] Drug Enforcement Administration, *Source to the Street: Mid-1992 Prices for Cannabis, Cocaine, Heroin* (Washington, DC: U.S. Department of Justice, October 1992), 6.

[24] Ibid., 8–9.

[25] In 1970, the Comprehensive Drug Abuse Prevention and Control Act (Public Law 91–513) established five schedules according to which drugs are categorized. Heroin is in Schedule I, meaning that it is illegal except for limited research purposes; it is not considered to have any "recognized medical use." Cocaine, on the other hand, is under Schedule II, which classifies it as a drug with high abuse potential, but allows for restricted medical use.



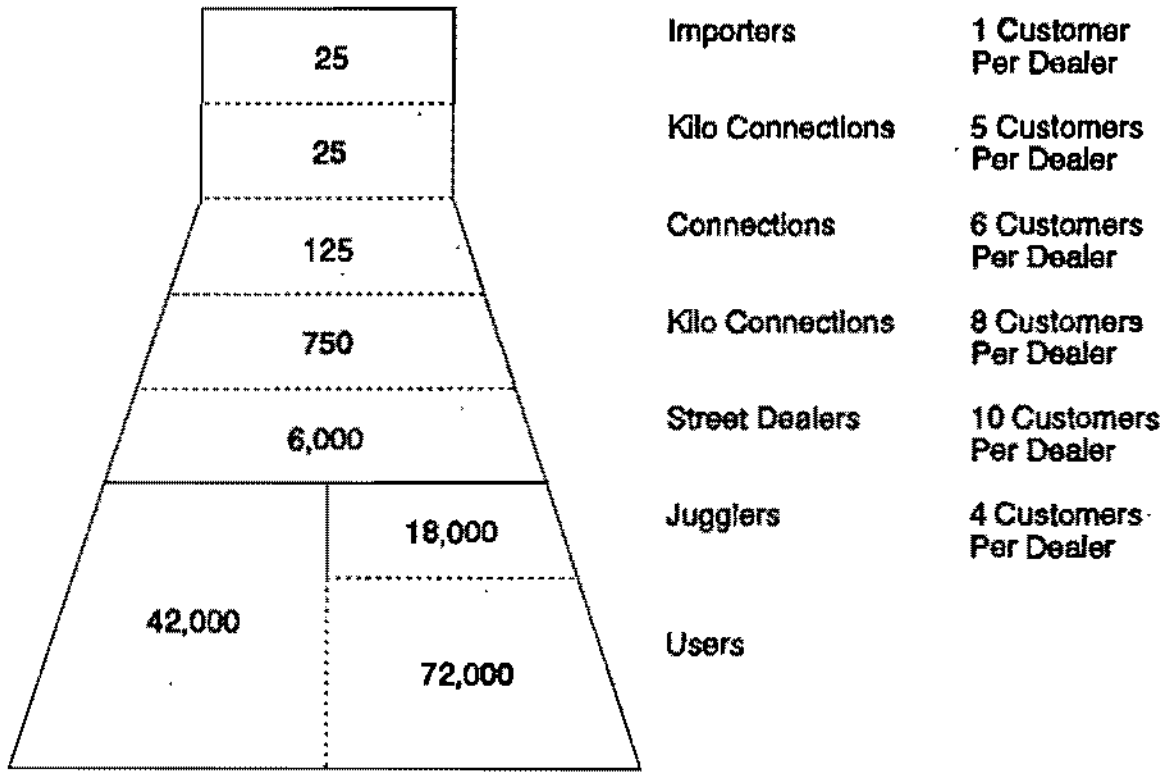
Source: Leon Gibson Hunt and Carl D. Chambers, *The Heroin Epidemics: A Study of Heroin Use in the United States, 1965-1975* (New York: Spectrum Books, 1976), 63.

buyers and sellers.

Consider the figure below, which shows a model, developed by Mark Moore, depicting the New York City heroin business during the early 1970s. Note that no dealer has more than ten customers. Yet, because heroin passes through several transactions on the way from import to retail, the customer base expands geometrically and the industry is able to supply 100,000–150,000 users.

Many have argued that drug enforcement encourages monopolization. They claim that enforcement breeds organized crime, since large criminal organizations have a comparative advantage over small firms in their ability to resist enforcement; the greater the enforcement,

Model of New York City Heroin Distribution System (100,000–150,000 Users)



Source: Mark H. Moore, *Buy and Bust* (Lexington, MA: Lexington Books, 1977), 100.

the greater the comparative advantage.[26] But enforcement creates pressures that may reduce size as well. Not only will a large organization expose itself by having more connections, but it also has more employees, each of whom might be apprehended and "turned" into an informer.

Overall, it appears that the various pressures in the cocaine and heroin industries have led to small firms more than they have to large ones, to less vertical integration and concentration rather than more. A few years ago, Peter Reuter estimated that cocaine passed through an

[26] See Schelling, "Economics and Criminal Enterprise," chap. 7 in *Choice and Consequence* (Cambridge, Harvard Univ. Press, 1985), 173; Kleiman, *Marijuana*, 123–32; Richard Bookstaber, "Risk and the Structure of the Black Market for Addictive Drugs," *American Economist* 20 (1976):27–28.

average of six stages of transactions between import and retail.[27] Six stages is not an indication of concentration, however. As Robert Michaels has pointed out: "The stages are fewer than six between manufacturer and ultimate retailer for most legal consumable items, and the general trend in household goods has been toward a reduction in the number of stages. The chain grocer and drugstore displaced smaller independent retailers and jobber in part because of cost advantages they were able to secure by acting as their own middlemen."[28]

The number of stages of transactions (or links) in the distribution chain appears to be particularly important in determining overall price markups. Intuitively, one would expect this to be the case, since each transaction exposes a buyer and a seller to risks for which they receive compensation. And the more links in the distribution chain, the greater the total compensation, and the higher the final retail price.

Some of the strongest evidence in support of this logic comes from comparing the current New York City heroin business to the one Moore depicted in his model. Using DEA figures, the average wholesale price of heroin on the East Coast (which at the time primarily meant New York) over the two years 1973–1974 was $260,000 per kilo.[29] The average retail price was $2,650,000.[30] This represents a ten-fold increase, or a markup of $2,390,000 per kilo. Today, by contrast, the wholesale price of a pure kilo of heroin in New York is roughly $100,000–$150,000;[31] at retail, a kilo yields $430,000.[32] This is a three- or four-fold increase, or a markup of only about $300,000 per kilo.

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[27] Cited in Mary H. Cooper, *The Business of Drugs* (Washington, DC: Congressional Quarterly, 1990), 28.

[28] Robert J. Michaels, "The Market for Heroin Before and After Legalization," in *Dealing with Drugs: The Consequence of Government Control*, ed. Ronald Hamowy (Lexington, MA: Lexington Books, 1987), 297.

[29] Drug Enforcement Administration, *Drug Enforcement Statistical Report* (Washington, DC: U.S. Department of Justice, March 1975), 33–35.

[30] John R. Bartels, Jr., and Robert L. DuPont, Statement before the Subcommittee of Future Foreign Policy Research and Development, House Committee on International Relations, 23 April 1975, Table 7; Lee P. Minichiello, John B. Lawson, Kathleen A. Gardner, Frederick Parsons, Lynne N. Seekamp, and James A. Winters, *Trends in Heroin Indicators: January to September 1974*, Paper P-1108 (Arlington, VA: Institute for Defense Analyses, 1975), 15.

[31] DEA estimates the wholesale price of Southeast Asian heroin at $90,000–$240,000 per kilo. Southwest Asian heroin is estimated at $80,000–$200,000 per kilo. See *Source to the Street: Mid-1992*, 8–9. One assumes that prevailing prices in New York City would fall at the lower end of these ranges.

[32] In the most recent quarterly report from DEA's Domestic Monitor Program, agents in New York City purchased a total of 2,560 mg of pure heroin through eleven purchases of $100 each. This implies an average price of $430,000 per kilo. See Drug Enforcement Administration, *Domestic Monitor Program: Quarterly Report on the Source Areas, Cost, and Purity of Retail-Level Heroin, April–June 1992* (Washington, DC: U.S. Department of Justice, October 1992), 35.

What has changed? In the early 1970s, the New York City heroin business was controlled primarily by traditional organized crime (TOC) groups. As Moore's model shows, the distribution chain was long, with five or six transactions separating importers from users. Today, TOC groups have largely been displaced, and the New York heroin trade is dominated by ethnic Chinese traffickers. According to DEA officials interviewed for this report, the Chinese have vertically integrated, eliminating many of the middlemen that characterized TOC distribution. In fact, Chinese importers often sell directly to street dealers. It is now typical for heroin to pass through only two or three transactions between import and consumption.

This short distribution chain suggests that Chinese trafficking organizations deal with many more customers than did TOC groups. At first glance, one might think this a very dangerous way of doing business. Evidently, however, differences in ethnicity, culture, and language make it exceedingly difficult for enforcement agents to infiltrate ethnic Chinese organizations. Moreover, violence between Chinese and Blacks or Hispanics—the two ethnic groups that control retail heroin dealing—has always been rare, and so the Chinese feel fairly secure in doing business with them.

Connections between Cocaine and Heroin Distribution

In terms of basic structural aspects, there is no reason to think that the domestic cocaine industry differs markedly from the domestic heroin industry. The table below, which was constructed in 1986, traces the path of cocaine from production in Colombia to middle class consumption in Atlanta. Note that the description implies the same kind of pyramidal distribution system that Moore depicted for heroin.

Interestingly, the cocaine distribution system has become, in many major cities, more vertically integrated, mirroring developments in heroin distribution. In Boston, for instance, many of the gangs that bring cocaine into the area are also directly involved in retail selling. What is more significant (and worrying), however, is that the distribution systems for cocaine and heroin are showing signs of integration.

Nearly every DEA official interviewed in connection with this report cited an increase in the number of dealers who peddle both cocaine (or crack) and heroin. And the practice does not appear limited to retail selling. Federal agents have recently seized for the first time large caches containing both drugs.

At least three developments suggest that the cocaine and heroin industries will continue to integrate. First, Mexico has become the principal transshipment route for cocaine destined for U.S. markets. The Mexican border is now the point of entry for as much as two-thirds of the

Path of Cocaine from Colombia to Atlanta

Location	Distribution	Accounting	Gross Profit On Transaction
Colombia	Colombian *refiner* produces a load of 300 kg at an average cost of $3,000/kg.	Cost to refiner: $900,000	
	Refiner agrees to pay a *pilot*, who doesn't take possession, $3,000/kg to transport the load to the Bahamas by air and from there to Miami by yacht and car.	Cost to refiner: $900,000	
Miami	Pilot delivers shipment to the Colombian's Miami-based *wholesaler*, who divides the 300-kg load into packages of 5-10 kg. He sells one 5-kg package to a buyer from Atlanta for $23,500/kg, receiving a commission of $2,000/kg, which may be split with the person who arranged the transaction.	300 kg at $23,500 = $7,050,000 for refiner, less costs of $2,400,000	*Refiner*: $4,650,000 *Pilot*: $900,000 *Wholesaler*: $600,000
Atlanta	The Atlanta *distributor* dilutes each kg to 42 oz from 35 and sells it in multi-ounce packages for an average of $1,500/oz.	210 oz at $1,500/oz = $315,000, less $117,500 for purchase	*Distributor*: $197,500
	A *dealer* in an office building buys 4 oz from the distributor. He dilutes each ounce to 36 grams from 28 and sells each gram for $60.	144 grams x $60 = $8,640, less $6,000 for purchase	*Dealer*: $2460
	A *consumer/dealer* buys 5 grams from the dealer, sells 4 grams to co-workers for $75 per gram, and consumes 1 gram.	4 grams at $75 each = $300, less $300 for each purchase	*Consumer/dealer*: $0

Source: Rensselaer W. Lee III, *The White Labyrinth*, 33.

cocaine smuggled into this country.[33] Many of the Mexican traffickers who have established relationships with South American sources are not limiting their activities to cocaine, but are involved in the heroin trade as well. Second, all evidence indicates that Colombia will grow as a source of heroin. To date, Colombian heroin has been smuggled by itself, primarily via individual couriers.[34] However, if the business flourishes, traffickers will probably begin using the cocaine networks, given their capacity to efficiently handle larger shipments. Third, the use of cocaine (or crack) and heroin in combination is reported to be on the rise in many major U.S. cities.[35] If users demand cocaine and heroin together, one can bet the distribution system will oblige them.

The Overseas Distribution Chain

Overseas, the vertical structure of the cocaine and heroin industries also follows a basic pyramid-like design. In this case, however, one might say that the pyramid is inverted, for drugs start at the bottom and ascend to the top. Within the U.S., the distribution chain passes drugs from a small number of importers to millions of users. Overseas, the process reverses itself. The distribution chain begins with tens or hundreds of thousands of growers, and then makes its way through various processing and trafficking stages to relatively few exporters. With this in mind, the figure below illustrates the structure of the Bolivian cocaine industry in the mid-1980s.

VERTICAL PRICING RELATIONSHIPS

Drug enforcement raises the retail prices of cocaine and heroin. It does this by imposing costs on drug businesses—by seizing drugs and assets, by imprisoning offenders, and by forcing traffickers and dealers to spend time and money on avoidance. Precisely how much these enforcement efforts affect retail prices is not certain. One complication is that the bulk of these costs—incarceration, the violence of competitors—are not directly monetary in nature and are thus difficult to estimate. (It should be noted that drug firms must, in effect, translate these costs into monetary terms, for they have to balance the compensation they receive against the risks they incur).

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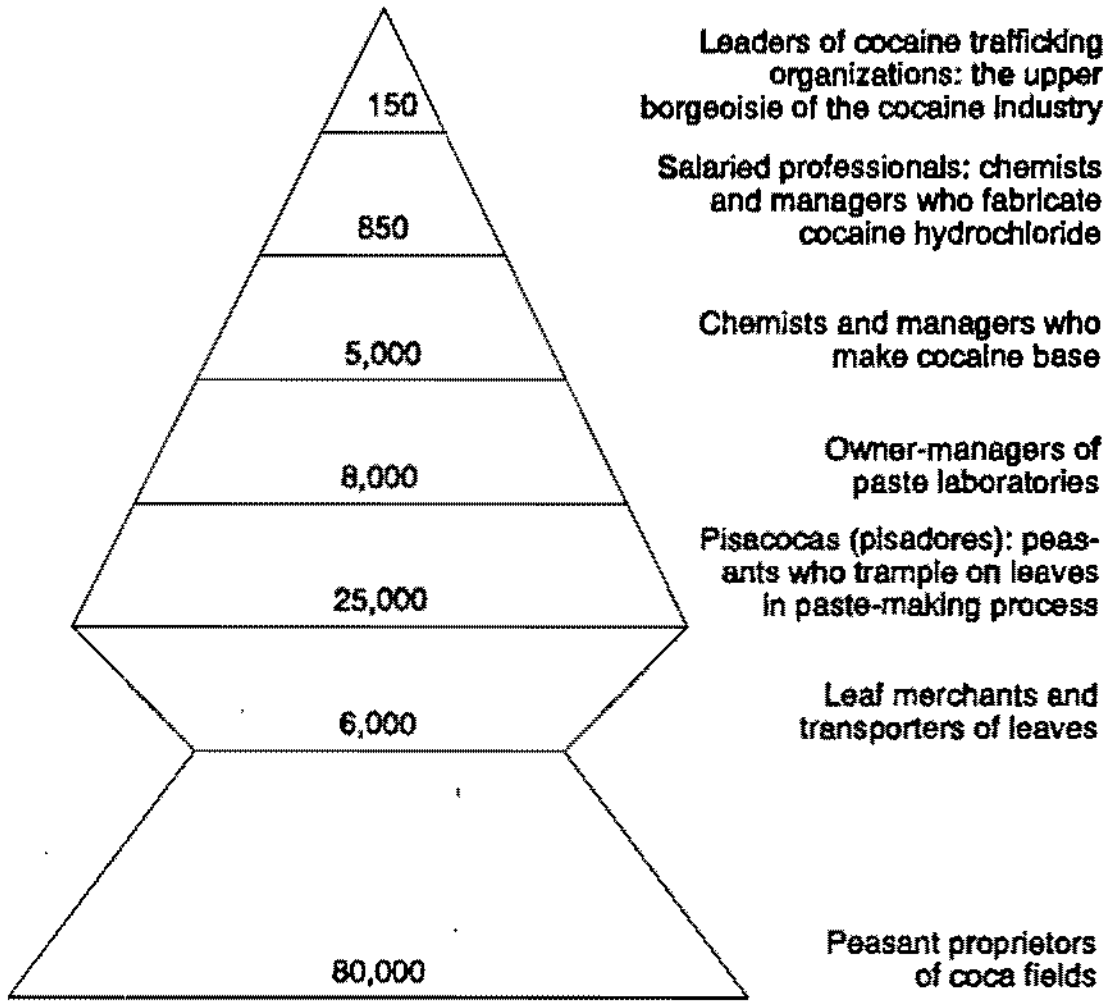
[33] Drug Enforcement Administration, *Mexico: A Country Profile* (Washington, DC: U.S. Department of Justice, December 1991), 5.

[34] Most of the couriers carry the heroin internally, usually by swallowing small plastic capsules containing the drug. Interestingly, many of the couriers are told they are smuggling cocaine.

[35] See National Institute on Drug Abuse, *Epidemiologic Trends in Drug Abuse: Community Epidemiology Work Group*, June 1992 (Rockville, MD: U.S. Department of Health and Human Services, 1992).

Structure of the Bolivian Cocaine Industry



Source: Rensselaer W. Lee III, *The White Labyrinth: Cocaine Trafficking and Political Power in the Andean Countries* (New Brunswick, NJ: Transaction Publishers, 1989), 45.

A second problem is that it is unclear how changes in price at one stage of production or distribution affect prices at subsequent stages. For instance, suppose that a kilogram of cocaine sells for $X per kilogram at import in Miami and $10X at retail in New York. Now imagine that more successful overseas enforcement or interdiction boosts the import price to $2X. How much would this effect the retail price of cocaine?

This question is a crucial one for drug policy, because the answer determines the potential efficacy of enforcement aimed at higher stages of the market, in particular the value of interdiction and source control efforts. To be sure, some would argue that the question of vertical price relationships is beside the point, since the purpose of interdiction and source control is not to impose costs on the supply system, but rather to remove drugs from commerce. However, this reasoning—that drugs destroyed or seized are drugs not consumed—is at best myopic.[36] In many ways, the salient feature of the illicit drug trade is that it supplies commodities to consumers through markets. And like most markets, the illicit drug trade is rapidly and dynamically adaptive. If drugs are seized, this imposes a cost on traffickers, who will then adapt their behavior accordingly, by shipping more drugs or switching to safer routes and methods of conveyance. If crops are destroyed, this also imposes a cost; growers will move to more guarded locations or plant and harvest extra crops as insurance. These costs are then passed on to consumers in the form of higher prices that in turn reduce consumption.

The Additive Model

One theory of vertical price relationships, which has been termed the "additive model,"[37] argues that the import price (or for that matter any price in the distribution chain) is basically a raw material cost.[38] Thus the wholesaler who previously bought cocaine at $X and now pays $2X has had $X added to his per-kilo costs. (Or slightly more than $X, since if any of his drugs are seized, stolen, or lost, the out-of-pocket cost is now higher.) None of his other costs or risks have changed, however.

In a competitive market, the wholesaler will simply pass his increased costs along to the next stage of the distribution chain.[39] The buyer at this stage will thus face an increase of $X in his costs, which he too will pass along. Eventually, the $X cost increase reaches consumers; the end result is that the retail price of cocaine increases by $X (or a little more—perhaps $2X—when all the losses and seizures along the distribution chain are factored in). Overall,

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[36] See Kleiman, *Marijuana*, 52–53.

[37] Caulkins, "The Distribution and Consumption of Illicit Drugs," 84–87.

[38] See Peter Reuter and Mark A. R. Kleiman, "Risks and Prices: An Economic Analysis of Drug Enforcement, in *Crime and justice: An annual review of research*, vol. 7, eds. Michael Tonry and Norval Morris (Chicago: Univ. of Chicago Press, 1986), 289–340.

[39] Price competition may not operate as smoothly in drug markets as the additive model assumes. In licit markets, the invisible hand works its magic through the mechanism of bankruptcy. In Darwinian fashion, businesses survive when they earn a profit, and fail when they do not. In the drug trade, however, the bankruptcy constraint does not hold; drug dealers do not go out of business because they sell drugs below cost. Drug dealers go out of business because they get caught, injured, killed, or because they deem the risks of the trade unacceptable.

then, a doubling in the import price has effected only a 10 or 20 percent increase in the retail price.[40]

Not surprisingly, those who accept the logic of the additive model are generally skeptical of the benefits of interdiction and source control. As Mark Kleiman has argued:

> Of the five dollar retail price of a rock of crack cocaine, only about fifty cents goes to growers, processors, and importers. The rest—ninety percent of the total—is added after the drug reaches the United States. That $4.50 in wholesale and retail markups isn't much influenced by conditions in the Andes or by seizures on the high seas or at points of entry. Even a doubling of import prices wouldn't much change the drug scene as viewed from the streets of Los Angeles, New York, or Washington.[41]

The Multiplicative Model

While the additive model is conceptually compelling, it does not jibe very well with some of the historical price movements in the cocaine and heroin industries. With heroin, for instance, the increase in prices from 1972–1974, and again from 1976–1979, casts some doubt on the additive model. In the first period, the Turkish Opium Ban, combined with the closing of French processing laboratories and smuggling networks (the "French Connection"), caused a significant shortage of heroin on the East Coast, the principal U.S. destination for Turkish heroin. One result was a dramatic rise in the retail price of heroin on the East Coast, an increase of roughly $2000 per gram from the beginning of 1972 to the end of 1974.[42]

What is remarkable, though, is that price increases at the wholesale level of the market were, by comparison, quite modest. DEA quarterly estimates of wholesale prices vary widely over this period; but even if one takes the extreme low and high figures ($130 per gram in the second quarter of 1972 and the third quarter of 1973, $480 in the first quarter of 1974), the wholesale price increased by at most $350.[43] It is unclear how the additive model can connect an increase of $350 in the wholesale price of heroin with a $2000 rise at the retail level.

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[40] Analysts at the RAND Corporation have estimated that, for cocaine and marijuana, each $1 dollar increase in import price produces a $2 increase in retail price. Peter Reuter, Gordon Crawford, Jonathan Cave, *Sealing the Borders: The Effects of Increased Military Participation in Drug Interdiction* (Santa Monica: RAND Corporation, 1988), 19.

[41] Mark A. R. Kleiman, "Snowed In," *The New Republic*, 23 Apr. 1990, 16.

[42] Bartels and Dupont, *Statement*, Table 7; Minichiello, et al., *Trends in Heroin*, 15.

[43] Drug Enforcement Administration, *Drug Enforcement Statistical Report* (March 1975), 33–35.

From 1976–1979, the U.S. experienced another heroin shortage, as Mexican production was cut in half. Here again, the additive model fails to explain the connection between wholesale and retail price movements. From the first quarter of 1976 to the third quarter of 1978, the average retail price of heroin in the Western U.S. rose by about $2000 per gram, from just over $1000 per gram to just over $3000 gram.[44] Over the same period, wholesale prices increased by at most $130, from $160 per gram in the third quarter of 1976 to $290 in the third quarter of 1978.[45]

With respect to cocaine, Jonathan Caulkins has compared, for the period 1982–1989, DEA data—adjusted for inflation—on wholesale and retail prices.[46] Caulkins constructed several regression equations (one using nationwide data, the others limited to particular cities), with wholesale and retail prices as the independent and dependent variables, respectively. The strength of the linear relationships is striking. In each case r^2 is greater than 0.95; for the national data, which represents the largest and most geographically comprehensive data set, $r^2 = 0.987$. What the coefficients of the least-squares lines suggest is that each one dollar change in the wholesale price is associated with a greater than three dollar change in the retail price.

Caulkins' data clearly raise further questions about the additive model.[47] In fact, Caulkins notes that the regression equations lend support to what he terms the "multiplicative model" of vertical price relationships, a theory which holds that a change (of a certain percentage) in price at one stage of production or distribution brings about a similar percentage change at subsequent stages [48] Thus the multiplicative model predicts that when the import price of cocaine doubles from $X to $2X, retail prices will also double, from $10X to $20X. Needless to say, this provides a much more bullish assessment of interdiction or overseas enforcement.

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[44] Drug Enforcement Administration, *Performance Measurement System* (December 1979), 22.

[45] Drug Enforcement Administration, *Drug Enforcement Statistical Report*, quarterly reports, March 1976 – September 1978.

[46] Caulkins, "The Distribution and Consumption of Illicit Drugs," 105–113.

[47] Mark Kleiman has suggested that Caulkins' data are not so revealing, that they may simply reflect broad trends in cocaine prices throughout the distribution chain. According to his alternative explanation, "both wholesale and retail prices fell due to the same cause. Until the end of the decade, the physical volume of the cocaine traffic seems to have grown considerably more quickly than did the enforcement resources directed at it; this was true at all levels of the traffic. A falling ratio of enforcement to physical volume would be expected to lead to falling prices. Thus retail prices might have fallen *along with* wholesale prices without falling *because* wholesale prices were falling." Mark A. R. Kleiman, *Against Excess: Drug Policy for Results* (New York: BasicBooks, 1992), 121.

[48] Ibid., 94–95.

Drugs as Risky Assets

Although the multiplicative model is consistent with some important price data, it lacks convincing theoretical underpinnings. As Caulkins notes, "there is no 'story' to justify" it.[49] The model seems to imply that the costs (including risks) facing dealers are principally a function of the value of drugs dealt, rather than the quantity. At least where large organizations or international smugglers are concerned, this is doubtful. According to DEA officials, Colombian traffickers are paying $2800–$4500 per kilo for vessel transportation of cocaine from Colombia to Florida. (For loads of 1000 kilos or more, the fee is reduced to about $2200 per kilo.) Given that these traffickers pay only $1000 per kilo for the cocaine they buy, it is clear that their total costs are not heavily influenced by the price of cocaine in Colombia.

In the case of small organizations or individuals, however, it may be possible to "justify" something like the multiplicative model.[50] Imagine a dealer who has been buying drugs for $X a unit and selling them for $2X. Circumstances change, and now the dealer must pay $2X for each unit, which he then sells for $3X. This development is perfectly consistent with the additive model; in each situation the dealer earns a gross profit of $X per unit.

Now consider the same story from a slightly different vantage point. Before the price increase, the dealer was "investing" $X in what he considered a very risky asset—drugs. If all went according to plan, he sold the asset for $2X, earning a 100 percent return on his investment. After the price increase, the dealer invests $2X in drugs, which he sells, if all goes well, for $3X. But this only represents a 50 percent return on his investment. So the dealer is now risking *twice* the capital for *half* the rate of return.

In contrast to larger organizations, smaller groups and individual dealers have little capacity to spread their risks. For them, the failure of a single venture can be a catastrophic financial setback. Given this, it is not inconceivable that they would consider buying drugs more like investing in a risky asset than purchasing a raw material. Nor, in turn, is it unimaginable that they would assess the profitability of their business more from the perspective of rate of return than profit per unit.

Now, if this were the case, then the hypothetical dealer, when forced to buy drugs at $2X per unit, would not be satisfied selling them at $3X. It is far more likely that he would insist on $6X a unit, which would match his previous rate of return. Note that this scenario implies a vertical price relationship that is perfectly consistent with the multiplicative model.

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[49] Ibid., 95.

[50] For a detailed discussion, see David Boyum, "Reflections on Economic Theory and Drug Enforcement," (Ph.D. diss., Harvard University, 1992), 159–239.

Whether there is any truth to this theory of vertical pricing relationships is unclear. It is simply not known how many dealers, if any, view the economics of the drug business in the manner described here. Unfortunately, the kind of detailed ethnographic studies that might shed light on the issue have not directly addressed it.[51] Nevertheless, the theory has some plausibility, and so it is worth pondering some of its policy implications.

The theory only applies to individuals or small groups. What this means, in practice, is that it is only relevant at the retail or near-retail levels of the market. Further upstream, both the cocaine and heroin trades are dominated by larger organizations. This suggests that the theory is consistent with the multiplicative relationships Caulkins observed between wholesale and retail cocaine prices. For transactions between wholesale and retail are generally carried out by small organizations or individuals. The theory would not be consistent, however, with multiplicative price relationships at higher levels of the market.

Consider once again the example of import and retail cocaine prices, where the first price off the boat in Miami was assumed to be $X, and the New York street price $10X. What happens when interdiction or overseas enforcement causes the import price to double to $2X? According to the additive model, the retail price rises to $11X. According to the multiplicative model, the retail price doubles to $20X. According to the theory being discussed here, retail prices would end up somewhere in between. From import to wholesale, transactions are handled by large organizations, and so the additive model would apply. But between wholesale and retail, where smaller firms and individuals are more common, something like the multiplicative model would hold. Employing Caulkins' estimate of a roughly three-to-one wholesale to retail markup, the New York street price would be $13X.

OLIGOPOLISTIC COORDINATION

It is often assumed that large drug businesses collude to raise prices and increase their profits. It is worth making several observations about this common claim.

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[51] There is an occasional hint from these studies that suggests drug dealers often think in terms of return on investment. For instance, in reporting the results from their pathbreaking study of the New York heroin market, Edward Preble and John Casey present a table showing the vertical structure of heroin prices. The table does not list prices at each stage of distribution, nor absolute markups between them; rather, the "Rate of Return on Investment" is given for each transaction. See Edward Preble and John Casey, "Taking Care of Business—The Heroin User's Life on the Street" *International Journal of the Addictions* 4 (1969): 12. Given that Preble and Casey's findings were based on extensive interviews with addicts, one wonders if they report return on investment because the addicts described the financial side of their business in these terms.

Similarly, in his story of New Haven cocaine dealers, William Finnegan recounts the following: "They made regular trips to New York, buying four or five ounces of cocaine each trip, and paying five or six hundred dollars an ounce, then returning to New Haven, where they mixed the cocaine with lactose, packed it into small glassine bags, and sold it in the Mudhole for profits that ranged from a hundred and fifty to two hundred percent." William Finnegan, "A Street Kid in the Drug Trade," *The New Yorker*, 10 September 1990, 84.

First, collusion is difficult to identify. Not only can firms enter into covert agreements, but supra-competitive pricing can occur without any direct communication among firms. Most commonly in such situations, a dominant firm leads others in pricing.[52]

Second, if drug businesses collude, it is not evident that they do so particularly well. As Rensselaer Lee notes in discussing the cocaine cartels:

> Apparently, no effective cocaine cartel is operating in Colombia; that is, the leading organizations seemingly cannot restrict production or maintain prices. (The U.S. wholesale price of cocaine dropped from $55,000–$60,000 per kilo in 1980 to $10,000–$15,000 per kilo in 1988.) Competition, especially intercity competition, clearly operates in the system.[53]

More generally, if drug firms at any stage of production or distribution colluded effectively, they would together behave like a monopoly. A monopoly, unless it is keeping its prices low to deter competitors from entering the business, will always find its optimal price in the elastic range of the demand curve. Although there is disagreement about the elasticity of demand for cocaine and heroin, few suggest that demand is elastic at current prices.

It is important to note that, in theory, a firm does not enhance its monopoly power by vertically integrating into other competitive stages of the market. It can be shown that if a firm has a monopoly over the supply of any indispensable input, it can fully extract monopoly profits from downstream suppliers and consumers.[54]

Finally, it is not entirely bad if drug businesses collude. To be sure, collusion is more likely among, and will tend to breed, large criminal organizations, an undesirable result. But if collusion restricts output and raises prices, drug consumption will fall.

VIOLENCE AND CORRUPTION

Violence and corruption are the most worrisome aspects of drug firm conduct. Regrettably, drug enforcement can encourage and reward these activities. Enforcement both increases the risks of selling drugs and—unless demand is elastic—the total revenues of sellers. This makes it more worthwhile to buy off the authorities, while at the same time providing the illicit industry with additional resources to do so.

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[52] In industrial economics, the two most prominent theories are von Stackelberg's leader-follower model and Forchheimer's dominant firm model. See Scherer and Ross, *Industrial Market Structure*, 221–26.

[53] Lee, *The White Labyrinth*, 100.

[54] See Scherer and Ross, *Industrial Market Structure*, 538–39.

Enforcement can also foster violence. When drugs are expensive and dealer revenues high, theft and betrayal become more attractive. (This partly explains the relative lack of violence in the marijuana business.[55]) Enforcement also drives selling into hidden or isolated locations, where the rule of law is less apt to rule. Finally, enforcement removes traffickers and dealers from the drug trade. While on balance this is beneficial, those who escape enforcement are likely to be meaner and nastier than those who are caught.

The connections between market structure and violence and corruption are not entirely clear. Where corruption is concerned, it seems that larger organizations are more dangerous; smaller groups have the capacity to threaten or bribe a few individuals, but not to thoroughly compromise the law enforcement or criminal justice systems. In terms of violence, things are less straightforward.

Consider the fact that the heroin business has historically been less violent than the cocaine business. Some have suggested that this is because the heroin industry is more concentrated and therefore less competitive.[56] But this explanation is probably inadequate. For one thing, it is not evident that the heroin industry is now more concentrated than the cocaine industry. For another, violence in the drug trade is most prevalent at the lowest levels of the distribution chain, where neither the cocaine or heroin industries is particularly concentrated.

Nor does competition seem to offer a sufficient explanation, although undoubtedly some of the violence in the drug trade stems from competition, especially over retail dealing locations. During the late 1980s, the heroin industry experienced unprecedented competition, with prices plunging as Southeast Asian heroin flooded markets. In 1985, 14 percent of samples tested by DEA's Heroin Signature Program proved to be Southeast Asian in origin. By 1989, the figure was 56 percent.[57] Yet this heightened competition did not generate the kind of violence seen in the cocaine industry.

Unfortunately, there has been little research exploring the violence connected with drug selling.[58] Perhaps the most thorough work has been done by Jeffrey Fagan, whose efforts

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[55] Also key is the lack of attractive targets. Marijuana dealing is more clandestine than cocaine or heroin dealing.

[56] See, e.g., Moore, "Drug Policy and Organized Crime," 56.

[57] National Narcotics Intelligence Consumers Committee, *The NNICC Report 1990: The Supply of Illicit Drugs to the United States* (Washington, DC: The Committee, 1991), 14.

[58] See, e.g., P. J. Goldstein, "The Drugs–Violence Nexus: A Tri-partite Conceptual Framework," *Journal of Drug Issues* 15 (1985):493–506; Goldstein, "Drugs and Violent Crime," in *Pathways to Criminal Violence*, eds. N. A. Weiner and M. E. Wolfgang (Newbury Park, CA: Sage Publications, 1989), 16–48; M. de la Rosa and B. Gropper, eds., *Drugs and Violence*, Research Monograph 103, National Institute on Drug Abuse, (Rockville, MD: U.S. Public Health Service, 1990); Ansley Hamid, "The Political Economy of Crack-Related Violence," *Contemporary Drug Problems* 17 (1990)(1):31–78.

include a survey of over 1,000 suspected drug dealers in the Washington Heights and Central Harlem neighborhoods of New York City.[59] Based on this survey and other research,[60] Fagan has found that higher levels of violence are associated with those dealers who belong to groups that have more formal organizational structures. There is an important caveat, however. "Evidently," Fagan notes, "violence is not specific to the context of drug selling."[61] Those dealers who reported relatively high levels of drug-related violence also reported high levels of violence outside of their drug-selling activities, as well as high levels of non-drug crime. "[I]t appears that processes of self- and social selection result in the participation of generally violent and criminally active people in drug selling."[62]

PRODUCT DIFFERENTIATION

In the previous section, it was noted that from 1985 to 1989, the percentage of heroin samples tested by the Heroin Signature Program that proved to be Southeast Asian in origin rose dramatically, from 14 percent to 56 percent. Most of this increased market share came at the expense of Southwest Asian heroin. Over the same period, the percentage of samples that were Southwest Asian fell from 47 percent to 17 percent. The percentage that were Mexican fell only from 39 percent to 27 percent.

It would seem from these figures that Southwest Asian heroin was more vulnerable to competition than was Mexican heroin. One possible explanation for this is product differentiation.[63] No illicit drug is a homogeneous product. At a minimum, sellers differ in location and have established relationships with customers (who know them to be reliable).[64]

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[59] Jeffrey Fagan, "Drug Selling and Licit Income in Distressed Neighborhoods: The Economic Lives of Street-Level Drug Users and Dealers," in *Drugs, Crime, and Social Isolation: Barriers to Urban Opportunity*, eds. Adele V. Harrell and George E. Peterson (Washington, DC: Urban Institute Press, 1992), 99-146.

[60] J. Fagan, "The Social Organization of Drug Use and Drug Dealing among Urban Gangs," *Criminology* 27 (1989):633-69; J. Fagan and K. Chin, "Violence as Regulation and Social Control in the Distribution of Crack," in *Drugs and Violence*, eds. de la Rosa, et al.

[61] Fagan, "Drug Selling and Licit Income," 118.

[62] Ibid., 117.

[63] There are four basic aspects of product differentiation: 1) differences in location; 2) physical differences in product attributes; 3) differences in quality of service; 4) differences in product image. See Scherer and Ross, *Industrial Market Structure*, 571.

[64] Economists often differentiate products into three groups according to the ease of determining quality. With "search goods," the quality of a product can be ascertained before purchase. The wattage, average lumens, and average life of a lightbulb, for instance, can be read off the package. The quality of "experience goods," however, can only be determined upon consumption. Canned tuna fish would presumably fall into this category. For "credence goods," quality is difficult, and sometimes impossible, to determine even after consumption. The

But heroin a particularly heterogeneous commodity. Because of the variety of refining processes, heroin differs dramatically in its physical qualities. From Mexico, there is brown heroin (which appears in varying shades) and "black tar." From Southwest Asia, there is highly refined white heroin (produced in the European/Mediterranean area) and less refined tan heroin (produced in Turkey, Iran, Pakistan, and Afghanistan). From Southeast Asia, there is Southeast Asian #4, usually a fine white powder, and Southeast Asian #3, which is less refined and ranges in color from tan to off-white.

Users develop strong preferences for a particular type of heroin, and this has important effects on heroin markets. One consequence is the extensive use of brand names in retail selling.[65] (A brand name denotes the trafficking organization or cutting house where the drug was diluted and repackaged.) A more significant effect of product differentiation is the niche it creates for Mexican supplies.

Southeast and Southwest Asian heroin can be quite similar, sufficiently alike that users easily switch from one source to the other. By comparison, Mexican heroin is unique. As such, there is strong product loyalty among its users; a consumer of black tar, for instance, would only in the most extreme circumstances even consider using white or tan powder.

The result of this is that markets dominated by Mexican heroin are much less vulnerable to source area competition than markets supplied by Southeast or Southwest Asian sources. Consider the major West Coast markets of San Diego, Los Angeles, San Francisco, and Seattle. These cities are now the principal points of entry into the country for Southeast Asian heroin. Yet, the consumption of Southeast Asian heroin is almost nonexistent in these parts; imports are immediately transshipped to New York for distribution in Eastern and Central cities. Evidently, Mexican supply has long been the heroin of choice on the West

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amount of fluoride in a toothpaste is an example. See Philip Nelson, "Information and Consumer Behavior," *Journal of Political Economy* 78 (1970):311–29; M. Darby and E. Karni, "Free Competition and the Optimal Amount of Fraud," *Journal of Law and Economics* 16 (1973):67–68; examples of search, experience and credence goods are taken from Jean Tirole, *The Theory of Industrial Organization* (Cambridge, MA: MIT Press, 1988), 102, 106.

Drugs are clearly experience goods, and indeed some aspects of quality may be more like credence goods. It is, of course, difficult to determine purity level before purchase. And the mix of adulterants may never be known. But the key "experience" aspect of drugs involves uncertainty about the reliability of the seller (whether he is a cop or whether he will rip the buyer off). However, a user who has previously purchased from a particular dealer (and was not arrested or ripped off or sold inferior quality drugs) is more confident that the connection is reliable. As a consequence, he is willing in the future to pay higher prices rather than risk buying from a new and unknown supplier.

[65] According to DEA: "Within the heroin trade, the use of brand names has become so extensive that some organizations conduct businesses using counterfeit brandnames. When the counterfeit products begin to erode the business of a group, they will change the name of their product, conduct an advertising campaign, and begin again." *Domestic Monitor Program: A Quarterly Report on the Source, Origin, Cost, and Purity Level of Heroin*, October – December 1991 (Washington, DC: Drug Enforcement Administration, 1992), 9.

Coast, and users are unwilling to switch. In economists' language, the barriers to entry are high.

Although markets dominated by Mexican heroin are less vulnerable to source area competition, they are at the same time more vulnerable to reductions in supply. Users in New York consume heroin imported from a variety of overseas sources: Burma, Laos, Thailand, Afghanistan, Pakistan, Lebanon, Iran, Colombia. Users in cities like San Diego, Phoenix, and Denver primarily consume heroin produced in one foreign country—Mexico. If there were a reduction in supply from several Southeast Asian or Southwest Asian source countries, the New York heroin market would quickly adapt. Not only are there established trafficking networks from other supply sources, but users can easily switch to different brands. By contrast, a shortage in Mexican heroin supply would have a major effect on West Coast, Southwest, and Rocky Mountain markets. There are few, if any, alternative supply networks. More important, users in these areas do not, by and large, consider Southeast or Southwest Asian heroin acceptable substitutes.

POLICY IMPLICATIONS

It has been pointed out by some observers that monopolies in the supply of commodities like drugs or pornography[66] will tend, as monopolization does, to reduce supply.[67] This inevitably raises the question posed by the Nobel prize-winning economist James Buchanan: "If monopoly in the supply of 'goods' is socially undesirable, monopoly in the supply of 'bads' should be socially desirable, precisely because of the output restriction."[68]

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[66] The crimes of buying and selling drugs are often referred to, along with offenses like prostitution, pornography, and gambling, as "crimes without victims." See Edwin M. Schur, *Crimes Without Victims* (New York: Prentice-Hall, 1965). These crimes involve commodities that society has chosen to prohibit; so it can be said that the parties involved generally view the proscribed transaction as mutually beneficial. This distinguishes them from the two other categories of crime: "crimes against the person" and "crimes against property." See Morgan O. Reynolds, *Crime by Choice* (Dallas: Fisher Institute, 1985), 20–23.

[67] See, e.g., Schelling, "Economics and Criminal Enterprise," in *Choice and Consequence*, 158–78, and "What is the Business of Organized Crime," chap. 8 in *Choice and Consequence*, 179–94; James B. Buchanan, "A Defense of Organized Crime?" in *The Economics of Crime and Punishment*, ed. Simon Rottenberg (Washington, DC: American Enterprise Institute, 1973), 119–32.

[68] Buchanan, "A Defense of Organized Crime?" 119. A possible countering effect is implied by the Dorfman-Steiner condition. See Robert Dorfman and Peter O. Steiner, "Optimal Advertising and Optimal Quality," *American Economic Review* 44 (1954):826–36. Because monopolies have higher profit margins, they spend more on promotion (advertising). The promotion shifts the demand curve, thereby increasing sales.

Fortunately, however, promotion does not appear to be a significant factor in drug markets. There is extensive research which indicates, contrary to the myth of the "pusher," that drug use spreads primarily among friends and peers. See, e.g., Hunt and Chambers, *The Heroin Epidemics*. Moreover, to the extent that monopolies exist in drug industries, it is not at the retail level where promotion would presumably take place.

Buchanan's point is well taken; the possibility that monopolies in the drug industry could reduce drug consumption is undeniable. But setting aside for a moment the benefits that might accrue from such a market structure, large and powerful criminal monopolies are not, in and of themselves, "socially desirable." In other words, the structure of a drug industry is important, independent of its effect on performance.

It is conceivable that the dilemma raised by Buchanan's question can be resolved, however. Information about reliable trading partners is the most important resource in the drug trade. Enforcement increases the value of this resource by making it riskier to do business with new buyers or sellers. This gives sellers at each stage in the business (and to a lesser extent buyers, since there is generally more than one buyer for each seller) considerable market power. A buyer is reluctant to go to a new seller in whom he has little trust, even if his current seller is charging high prices. If enforcement is high enough, existing relationships may, in effect, become monopolized. Enforcement can thus promote *de facto*, rather than *de jure* monopolization.

Producing *de facto* monopolization would require the right kind of enforcement. Different types of enforcement create different sorts of pressures; some approaches will foster large criminal organizations, others will encourage smaller firms. Consider two enforcement strategies. Strategy 1 essentially attacks raw materials, focusing on destroying and interdicting drugs—through interdiction and crop eradication—and confiscating physical and financial capital—through asset seizures and forfeitures, investigations of tax-evasion and money laundering. Strategy 2 targets organizations and their transactions—through intensive retail policing and the widespread use of informants, undercover agents, and clandestine investigations. By itself, Strategy 1 would tend to breed large organizations, for wealth, diversification, and financial and legal expertise are key to avoiding its tactics. In contrast, Strategy 2 would promote a drug industry of smaller firms, since they can more easily hide themselves and their transactions.

There is another important argument in favor of Strategy 2. As noted earlier, one the key ways in which enforcement can raise drug prices is by encouraging an inefficient vertical chain, with as many stages of transactions as possible. This suggests that enforcement should strongly discourage vertical integration. Fortunately, this idea blends well with the goal of promoting *de facto* monopolization. For one thing, enforcement that attacks organizations and transactions, thereby giving smaller firms a comparative advantage over larger ones, will both promote *de facto* monopolization and deter vertical integration. Moreover, effective monopolization magnifies the benefits of an unintegrated vertical structure; piling one monopoly on top of another in a vertical chain can only lead to higher, not lower, prices.[69]

[69] This is one of the "Chicago" propositions. See Joseph J. Spengler, "Vertical Integration and Antitrust Policy," *Journal of Political Economy* 58 (1950):347-52.

How could enforcement best promote market structures that are vertically unintegrated yet *de facto* monopolized at each stage of production and distribution? In other words, how could Strategy 2 be operationalized? First, with intensive street level enforcement. Because retail transactions are the simplest to locate and thus put pressure on, it should be easier to create *de facto* monopolization at that stage than any other. Second, enforcement should actively target large organizations, especially those that are vertically integrated. In pursuing the largest groups, this requires specially focused teams of agents, like the Central Tactical Units (CENTACs) DEA employed in the 1970s and early 1980s. Third, enforcement should expand efforts designed to hinder the capacity of traffickers and dealers to reliably complete transactions—the use of informants and undercover agents.[70] Fourth, enforcement should deemphasize strategies that principally attack raw materials, like crop eradication, interdiction, and drug and asset seizures, thereby freeing up resources for more valuable efforts.

[70] There is an additional argument in favor of such an approach. As Mark Moore has noted, the supply of raw materials is more elastic over time than the supply of safe connections. See Mark H. Moore, "Drugs: The Problem and the Options," Working Paper #87-01-09, John F. Kennedy School of Government, Harvard University.

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Measuring Heroin Availability: A Demonstration

Conducted for
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BOTEC Analysis
CORPORATION

Measuring Heroin Availability: A Demonstration

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The Boston Police Department Drug Control Unit also assisted us in learning about the mechanics of heroin buying in Boston. The Deputy Superintendent in charge of the Drug Control Unit and his officers volunteered their time for a series of semi-structured interviews and two tours of heroin-dealing sites.

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The Massachusetts Department of Public Health provided us with important demographic data about heroin users in Boston and purity data from various local police departments' seizures. The Drug Enforcement Administration granted us a Certificate of Confidentiality to protect our research participants.

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Our greatest appreciation is given to the interviewers who succeeded in the difficult assignment of maintaining contact and rapport with the heroin users in the study. They also provided us with feedback on various parts of the study and practical insight into the lives of heroin users. Finally, we would like to thank the interviewees for their willing and eager participation in the study. Their stories and responses provide the data which comprises the substance of this report.

EXECUTIVE SUMMARY

I came out of the bank at ten past twelve, had to get to the "call back" phone; there are no call back phones that I know of in Everett. Took bus to Sullivan Station (ten minutes) train to Downtown Crossing and used the phone outside Jordan Marsh. Waited fifteen minutes. Then it was 1:00 (pm). At 1:15 the phone rang. It took me fifteen minutes to get to Auditorium station. And he was there in a store waiting for me.

—Thirty-five year old white male from downtown Boston

Rising heroin imports and falling heroin prices may lead to growth in the number of new heroin users. Lack of retail availability is a possible barrier to heroin initiation. But unlike price and purity, availability is not routinely measured.

One possible measure of availability is "search time": the time required to purchase heroin once the user has the money in hand. The longer the search time, the less available heroin is. Search time may vary from city to city, from week to week, and from user to user. The objective of this project was to develop and test a method of measuring search time in a single city.

Even if search time proved to be measurable, it might turn out to be so small as to pose only a trivial barrier to initiation and continued use. Ethnographers and users interviewed in advance of this study believed that observed search times would be negligible.

As it turned out, weekly interviews with heroin users demonstrated that search time is measurable, and that, at least for this sample, it was not trivial. Search time ranged from zero, being approached and asked to buy heroin, to inability to secure heroin after a prolonged search. Mean total search time was 48 minutes (median 39 minutes). About 39 percent of that was travel time to the purchase location; another 41 percent was time spent waiting for the seller; the final 20 percent was time spent connecting with the dealer and completing the actual transactione. Since the sample consisted entirely of experienced, current heroin users, these figures tend to understate the availability barrier for new users. In fact, new users often had to employ experienced users as purchasing agents, due to the difficulty the new users have in buying heroin.

In addition to the search time measurement, we collected detailed information regarding the mechanics of purchasing heroin through extensive preliminary interviews, weekly follow-up interviews, and focus groups with female users and users vacillating between occasional and regular use. While most participants had connections with two or more dealers, they generally chose to rely on one dealer because of his dependability, convenient location, and consistent presence. Methods of contact included copping corners, beepers, and middlemen. The preferred method of administration was intravenous injection and the most commonly reported methods of financing heroin use were larceny and public assistance. Search time tended to be longer for the users who were single, had extensive heroin use experience, were white, resided in non-drug dealing locations, used heroin infrequently, and relied on one dealer or lacked a consistent connection. No correlation was found between search time and gender; both the focus groups

and weekly interviews reflected no significant difference in the way women and men purchase heroin.

Now that the existence and measurability of non-trivial search times has been established in one city, this research could usefully be extended. Continuing it in a single city for an extended period would begin to characterize seasonal and secular variability in search times. Extending the sample to several cities, including some heroin centers and some where heroin was less available, would provide data about city-to-city variability. More ambitiously, search time measurement could become a routine data-collection activity, like DAWN emergency room counts, DUF arrestee testing, or the National Household Survey. Changes in search times could then be used to evaluate retail-level enforcement efforts.

Extension over time, expansion to other cities, and conversion to routine data collection could be accomplished using the interview approach demonstrated here. Alternatively, including search time questions in DUF interviews might be able to provide both wider geographic coverage and a better-defined sampling frame, at modest cost.

BACKGROUND

Heroin prices have fallen significantly in the last five years, from an average of $2.00 per pure milligram from 1979 to 1988 to the current price of $0.90 per pure milligram (BOTEC Analysis Corporation, 1992). Drug Enforcement Administration (DEA) and US. Customs heroin seizures also rose dramatically, from a total of 1,443 pounds seized in 1987 to 3,192 pounds seized in 1988. If these data represent an increase in heroin use by established addicts, and if the increase remains confined to that group, then falling heroin prices will cause only limited social damage. Unfortunately, lower prices also make heroin more affordable for new users, and thus threaten to expand the user base. Given the damage heroin addiction inflicts on users, their families, and their neighbors, such a spread would constitute a significant problem. Whether this threat becomes a reality will depend largely on the availability of heroin to retail purchasers.

Compared to cocaine, heroin appears to have far fewer retail sellers, and they appear to be far more geographically concentrated. Thus, retail availability may constitute an important barrier to the initiation and continuation of heroin use.

The "effective price" of any drug is comprised of several factors: the dollar price of the drug, the likelihood of arrest or mugging during the transaction, the uncertainty about quality, the risk of overdose, and "the search time required to locate a willing seller" (Moore, 1973b, p. 415).

The last factor, "search time", is a possible quantitative measure of retail availability (Moore, 1973a, 1977; Kleiman and Smith, 1990; Kleiman and Young, 1992). As "search time" increases, so does the effective price of heroin (other factors of effective price being equal); and as the effective price rises, some potential users are deterred from buying it.

Current measures of the heroin problem — the National Institute of Justice's (NIJ) Drug Use Forecasting (DUF) data and Drug Abuse Warning Network (DAWN) data for instance — are lagging indicators. They reflect an increase in heroin availability only when addicts are committing more crimes to pay for their habits or are overdosing in greater numbers. By comparison, search time data, if they were available, could serve as leading indicators of change in the user population, offering an "early warning" of increased availability.

At the policy level, there appear to be trade-offs between attempts to influence price and attempts to influence search time. High-level enforcement primarily affects price, while retail enforcement often increases search time. There are theoretical reasons to believe that, given the choice, decreases in heroin consumption due to increases in search time will generate fewer unwanted side effects than would equivalent decreases in consumption brought about by increases in price (Kleiman and Young, 1992).

While the concept of search time has been explored extensively, no one has attempted to measure the distribution of search times over time and location. Indeed, relatively little has been written about the mechanics of heroin-buying and dealing. The extant research in this area comprises

primarily ethnographic studies that attempt to understand the lifestyle and community of heroin users (e.g., Agar, 1973) and the role of crime in the heroin economy (Johnson et al., 1985).

This project combines ethnographic techniques, survey research and micro-economic analysis to shed light on the mechanics of heroin-buying in general, as well as attempting to empirically assess the availability of heroin to street buyers. This methodology could prove to be useful in future analyses of drug and other criminal markets.

The project has two goals:

(1) to learn more about the mechanics of retail heroin purchases; and

(2) to demonstrate the feasibility of two methods of measuring the availability of heroin to street buyers:

(a) by using interviews to measure "search times" for Boston area heroin users, and

(b) by observing the volume of activity at heroin-dealing locations in Boston.

Insofar as either approach to measuring availability proves out, it could be expanded to a national scale to generate a time series comparable to the time series of prices that can be computed from STRIDE (System to Retrieve Information from Drug Evidence, DEA 1992).

METHODOLOGY

OVERVIEW

This study was conducted in three phases: planning, data collection, and analysis. The planning phase included an extensive literature review, interviews with ethnographers and law enforcement officials, analysis of drug seizures, and focus groups. Data collection consisted of individual interviews and focus groups with current heroin users, and direct observations of heroin-dealing locations. The individual interviews and focus groups were very successful in that we were able to elicit detailed descriptions of heroin purchasing behavior, as well as demographics and drug use history from the 32 heroin users in the study. The observation of heroin dealing locations was less successful because heroin dealing remained underground in most areas and was difficult to distinguish from other activity in those few open market areas. The analysis phase included computations from numerical data and compilation of interview and focus group responses.

LAW ENFORCEMENT INFORMATION

Information was gathered from the Boston Police Department through a series of semi-structured interviews and tours of heroin-dealing sites given by the Deputy Superintendent in charge of the Drug Control Unit and his officers. Interviews focused on police knowledge of the mechanics of heroin buying in Boston, characteristics of users and dealers, locations of heroin-dealing sites, recommendations for safe data collection and official drug control strategy. Two tours of heroin-dealing sites focused on those areas in Boston where the bulk of overt heroin dealing takes place.

Heroin purity data from various local police departments' seizures were furnished by the Food and Drug Laboratory of the Massachusetts Department of Public Health. It is the laboratory's policy to analyze seizures made by state and local police that weigh 28 grams or more (the quantity which constitutes the offense of "trafficking" under Massachusetts law), and selected smaller seizures. During the study period (November 2, 1992 through December 27, 1992) the Food and Drug Laboratory analyzed 28 seizures ranging in size from one to 230 packets, with each packet averaging 21 milligrams of a mixture containing heroin. The average heroin purity level of these seizures was 78 percent, significantly higher than the purity levels of heroin seized eight to ten years back, which often ran in single digits.

FOCUS GROUPS

We conducted two preliminary focus groups to learn about the basic mechanics of heroin purchase and to help develop the interview and observation methodologies. The first group consisted of seven participants from the city of Cambridge, five who were active heroin users and two who were in recovery. They were recruited by one of our interviewers. The second focus group was conducted at the minimum security facility of the Massachusetts Correctional

Institution (MCI) at Shirley. Eight former heroin users were recruited by MCI-Shirley staff from Cottage Nine, an in-house residential drug treatment unit. Discussion in both focus groups centered around typical heroin-using days, as well as availability factors such as dealers, prices, and market changes.

Questions raised during the preliminary interviews led us to convene two additional focus groups. The first was conducted at MCI-Framingham, a medium security state correctional facility for women. Five former female heroin users were recruited by MCI-Framingham staff from the Key Program, an in-house residential drug treatment unit. The focus group targeted issues specifically related to women (e.g. prostitution for drugs), and highlighted the differences in the ways men and women buy heroin.

The final focus group was conducted to explore the differences, if any, in heroin-buying behavior between daily and occasional/new users. New and/or occasional heroin users proved difficult to locate. Instead, five current and one former user were recruited, most of whom vacillate between daily and occasional use. Discussion focused on their introduction to heroin, the process of becoming a daily user, and the buying-behavior differences between daily and occasional users.

Although the level of discussion varied among participants, most were forthright in discussing their heroin purchasing behavior and their theories about heroin use. The focus group participants were paid $40 each for their (approximately two hour) participation. Each session was tape-recorded and notes were taken as well.

INTERVIEWS

Interviews were conducted over a three-month period with a panel of 32 current heroin users. Each participant was given a preliminary interview which lasted 1-1/2 to 2 hours covering demographic characteristics, drug use history, and heroin-buying patterns.

The follow-up interviews, which averaged 15 minutes, were conducted once per week for eight weeks. Participants were asked to describe, step by step, what they did the last time they bought heroin. They were also asked about their search time — that is, how long it was from the time they had the money in hand and decided to buy heroin, to the time they had actually acquired it. Finally, there were a number of questions relating to purchases that week, as well as questions about how and why they began using heroin and their current use patterns.

Interviewers

Five interviewers were recruited for the project. All were recovering heroin addicts with solid recovery histories and extensive contacts among current heroin users. One of the five also served as the interview supervisor. Each week, he distributed participants' payments and interview materials to the interviewers, and collected completed interviews and tapes. To determine the quality of the interviewers' questioning, he listened to numerous taped interviews; this allowed

him to detect interview bias, problem questions, and interviewer mistakes, and to provide timely feedback to the interviewers. Along with a research assistant, he also compared the tapes to the notes taken by the interviewers. This cross-check assured both that mistakes in written records were caught and that detailed stories were preserved. Finally, the interview supervisor acted as a liaison between the interviewers and the project director and aided in the interviewer training sessions.

Each interviewer was responsible for recruiting six active heroin users. Together they recruited users who "copped" and used heroin in various sections of Boston, including South Boston, Dorchester, the North End, the South End, Charlestown, downtown Boston, and various parts of Roxbury such as Mission Hill and Dudley Station.

The interviewers were paid $10/hour for the time they spent in training or at mandated meetings. Interviewers completed three two-hour training sessions which included basic interviewing tips, logistics of the project, review of the questions and sample interviews. Otherwise, they were paid per interview --- $40 for each preliminary interview they completed and $20 for each follow-up interview. These fees included their payment for recruiting the interviewees, as well as any time they spent tracking down the interviewees for appointments. As an incentive to complete as many of the follow-up interviews as possible, they were also paid a small bonus based on their completion rates.

Throughout the data collection period, as expected, there were quality control issues and logistical problems. Our interview monitoring system was designed to catch errors or misrepresentations in data collection. At the end of the data collection period, this system of cross-checks revealed a serious problem with one of our interviewers. When he was unable to locate a participant, he would make up the information, filling out the questionnaire as if he had conducted the interviews. As one of the interviewers whose participants were paid in cash, he simply pocketed their payment and forged their receipts of payment. We were able to contact one of his interviewees who confirmed that she was not interviewed during various weeks. In all, thirteen of his interviews without corresponding back-up tapes were counted as missing data for the study. Although this problem was disruptive and time-consuming, it had minimal impact on study results in that we still had 218 legitimate interviews on which to do the analysis.

Interview Participants

The study was initiated with 30 participants who were replaced if they missed more than one week. "Drop-outs" who returned in subsequent weeks were re-integrated into the study. Two additional participants were recruited during week six and were given both preliminary and follow-up interviews that week. This resulted in an overall sample of 32 participants.

The interview participants were paid $25 for completing the preliminary interview and $15 for completing each follow-up interview. They also received bonuses of $20 for completing the first four interviews and another $20 for completing the final four interviews. Depending on the interviewer and the location of their interviews, two methods of payment were utilized. Cash

was disbursed to those interviewers who felt relatively safe carrying it and whose recruited participants were more concerned about their anonymity. However, for the two interviewers who feared carrying cash, a local bank agreed to cash checks for interview participants without requiring identification.

To assist them in keeping track of time, participants were given inexpensive digital watches at the completion of the initial interview, regardless of whether they initially carried timepieces. As an incentive to wear the watch, they were told they would be paid an extra $10 bonus if they were wearing that watch on the day of their final interview.

As with the focus groups, all interviews were taped in order to monitor interview quality and to capture as much detail as possible. We took a number of steps to protect ourselves and our research subjects, especially to preserve confidentiality and field-staff safety. (The procedures are described in Appendix D.)

Utilizing human subjects in a research study is always a sensitive topic; particularly in this one in which we recruited and paid active heroin users. Our concerns were two-fold: 1) that we were paying active heroin users to participate in the study, thus indirectly contributing to the financing of their heroin habits and 2) that in order to maintain participation in the study, the recruits had to be actively using heroin. We took a number of steps to address these concerns. The interviewers that we hired were former heroin users who were knowledgeable about recovery issues and resources. We provided them with information on treatment resources to assist those participants who expressed interest in discontinuing their heroin use. We also ensured that the interviewers did not pressure reluctant participants to remain in the study and set up a system of replacements for study participants who dropped out. More discussion regarding the utilization of human subjects in this type of study would be required should a long-term study be undertaken.

Participant Characteristics

Broad targets for participant demographics and the sampling plan for the study were based on two studies of heroin users in treatment in the Boston area (Krakow et al., 1992; Nardone, 1990). The studies showed that heroin users in treatment were 53 percent Caucasian, 23 percent African-American, 22 percent Hispanic and 2 percent in the "other" category; two-thirds were male and one-third female; age varied, but most were in their thirties. We asked interviewers to roughly follow these numbers when choosing interviewees and to recruit some relatively new users, in addition to the experienced users. With only two exceptions, these demographic targets were maintained. Interviewers recruited more blacks (44 percent) and fewer Hispanics (12.5 percent) than the targets called for and all of the participants recruited were experienced heroin users, as interviewers were unable to find and recruit new heroin users. Women were recruited by all of the interviewers and were not treated as a special group. The median age of the study participants was 37.5 years old, with a range of 30 to 61 years old. (For a more complete discussion of user characteristics and the associated tables, see Appendix A.)

Two-thirds of the participants had graduated from high school, half of whom had gone on to further education. Few participants worked; instead they relied on public assistance and/or illegal activity to support themselves and their heroin habits.

Most participants reported prior poly-drug use, and half reported use of a variety of drugs during each of the eight weeks of interviews. Alcohol was the most widely used, followed by cocaine which was either used alone or in combination with heroin ("speed balling"). Participants also reported high current usage of tranquilizers. Most of the heroin users in this study had participated in some type of formal substance abuse treatment. Three-fourths had been arrested on drug charges and half had been incarcerated.

OBSERVATIONS

The original proposed research methodology included observation of heroin-dealing locations in order to directly monitor activity as an alternative way of measuring street heroin availability. However, after interviews with the Boston police officers and discussions with the interviewers, potential observers, and the focus groups, it became clear that such direct observation on a large scale would be unreliable, difficult to replicate, and dangerous. Instead, observations were conducted on a smaller scale to supplement the information we received from the interviews, but not as a potential replacement of the interview process. Rather than hiring a number of observers as originally planned, the interview supervisor conducted the scaled-down observations himself.

After two tours of heroin-dealing locations in Boston, a handful of sites was selected for observation. Two methods of observation were used. The first was to drive through the selected sites at various times of the day. During the first two weeks, the observer drove through the sites each day, including weekends. However, at most of the sites, no drug activity was observed. In fact, it did not appear that there was much activity at all. The second method was to park in a selected site and observe for as long as possible, returning at various times of the day. The observer concentrated on the most promising site, Mission Hill in Roxbury, where police had reported very high heroin activity and where the observer had seen many loiterers during his drive-through observations. According to the police, there were a number of people dealing heroin in and around the housing projects there. Observations from a parked car were made several times a week, at various times of the day including early morning, late morning, afternoons and evenings. Over about four weeks, there appeared to be someone dealing in the area at all times, with the exception of a rainy afternoon and a Sunday morning. The observer saw numerous people drive up in their vehicles, make a quick exchange and leave immediately. Numerous exchanges also were seen between the people hanging around in the area (purportedly the dealers) and others walking into the area. The observer was approached once and asked if he was looking for something. Other times he was waved at or acknowledged with a nod. After a few weeks, the observer believed that he was drawing suspicion, especially after having been approached and declining to make a drug purchase; one time, bottles were thrown at his car as he was driving away . Due to the potential danger, observation was halted at this site. During the weeks he spent at this site, the observer found that it was sometimes difficult to distinguish

the dealers from the many other people hanging out on the street. There were also no public places where one could observe less obtrusively. Overall, the observer found it impossible to discern whether he was observing heroin deals or sales of some other drug or merchandise.

Observations subsequently were begun at two new sites near Boston City Hospital and near the Veteran's Administration (VA) building in North Station. The area around Boston City Hospital was so densely populated that it was impossible to determine whether there were dealers among the crowd. Within the VA building, there is a methadone maintenance clinic. Although there is often heroin/methadone dealing near methadone clinics, no such activity was distinguishable among the many people gathered in front of or around the building. After about two weeks of fruitless observation at these two sites, observation was abandoned. From our experience, we have concluded that observation as a method of measuring heroin availability is difficult in the Boston area. With the exception of one dangerous area, much of the heroin dealing is underground. However, observation may be feasible in other cities with more open heroin markets.

FINDINGS

MECHANICS OF PURCHASING HEROIN

Overview

Each week, participants were asked to describe their most recent buy, with particular emphasis on their "search time." They were instructed to include the time it took to make telephone calls, solicit advice about where to buy heroin, travel to the dealing location, waiting time, and the actual transaction. They were not to include the amount of time it took for them to secure the money needed to buy heroin, nor return traveling time from the purchase location. The average search time of study participants was 48 minutes. Various factors influenced the ease or difficulty of purchasing heroin: time of day, day of week, weather, police presence, mode of transportation, quality and quantity of dealer's heroin, availability of dealer and type of connection (copping corner, beeper service, etc.). Search times ranged from zero, being approached and offered heroin, to failing to make any connection after a prolonged search.

Interviewees usually purchased heroin from one main source whom they had used for a median of eight months. They relied on one dealer for a variety of reasons including the quality of his heroin and the dealer's dependability, convenient location, and consistent presence. However, most participants had "back-up" dealers to turn to if their main source was unavailable. Dealers were contacted at copping corners or through a beeper or middleman. Once the interviewees connected with a source, they purchased an average of almost three bags at an average price of approximately $18/bag. If these bags were similar to those tested by the Food and Drug Laboratory which averaged 21 milligrams of 78 percent pure heroin, then the price per pure milligram would have been just over one dollar. This is consistent with current national reports, but reflects a substantial price decrease from the 1979-87 period when heroin sold for more than $2 per pure milligram.

"Shooting" heroin was cited as the exclusive method of administration for a majority of the participants. The respondents also reported using heroin in combination with a variety of other drugs, most frequently with cocaine. The two predominant methods of financing heroin use were larceny and public assistance. Almost two-thirds of the participants had attempted to stop using heroin at least once in the past year. The average age of first heroin use was just under 19 years old; duration of heroin use averaged 20 years. The average frequency of use was 6.5 days per week.

Search Times

> *At 8:15(am) I got off at Government Center. My clinic is open on Sunday early at 9:00 and my dealer does tend to close at 12:00 on Sundays— this one particular dealer. I called him around 8:15; he beeped me back in approximately ten more minutes so it would be 8:25. I got on the train I went to Hynes Auditorium. That was a ten minute ride on Sunday. So now it's 8:35. I met the dealer at approximately 8:45. And I had the dope in my hand 8:55, I'd say 9:00.*
>
> *—Thirty-five year old white male from downtown Boston*

Search times, including travel, wait and transaction times, were computed for each participant and averaged over the eight-week study period. This enabled us to obtain the average total search time for each participant. The mean of all participants' average search times was 48 minutes; the median was 39 minutes. The lowest quartile of the participants' average search time was less than 30 minutes; the upper most quartile averaged almost an hour (57 minutes).

We asked participants about the time they had to wait for their dealer; whether waiting for him on the street, waiting for a delivery, or waiting for a return phone call. This waiting time accounted on average for 41 percent of the total search time. The percentage of search time spent waiting for the dealer ranged from 0 percent to 73 percent, with a little over half of the participants spending 20 percent or less of their search time actually waiting. The mean of all of the participants' waiting time was 20 minutes. Two-thirds of the participants waited an average of 15 minutes or less.

Travel time was the next largest component, accounting on average for 39 percent of total search time. The mean of all of the participants' travel time was 18.5 minutes; the median was 16 minutes. The lowest quartile of the participants' average travel time was 12 minutes or less; the upper most quartile was 22 minutes or more.

The transaction time, the time during which the users connected with a dealer and actually purchased the heroin from the dealer, accounted on average for 20 percent of total search time. Participants' mean transaction time was just under ten minutes. Transactions included telephone calls to dealers, discussions with fellow users about the quality and price of the product, and perhaps some bargaining, in addition to the actual exchange of money for the heroin.

These findings are contrary to what many ethnographers and heroin users predicted in discussions prior to the study. They believed that search time would be negligible, or at most, would simply represent travel time. However the interviews, in breaking down search time into components and asking for details, revealed that the travel and waiting time added substantially to overall search time and that even the actual transaction was far from instantaneous.

Difficult vs. Easy "Cops"

> *Monday I had called four different beepers at 4:00 in the afternoon. By 5:30 I had gotten one response from the four beepers; one return call and they were still waiting for the stuff. Now I had to call a person who I had just met, didn't really trust, didn't know that well, to see if they could get something. Now it was 6:00; two hours had already gone by. They said they could get something in Lynn gave me a big price like $24 for the bags, a ridiculous price for today's standards. Well I did it. He came and picked me up and took me to Lynn. By the time I got in my hand the dope it was 7:30; an hour and a half more driving in Lynn to different spots. All my sources were empty; I had to go to a stranger... to almost a stranger, not a stranger but almost. I thought I was going to get ripped off also.*
>
> *—Forty-five year old white male from downtown Boston*

Table 1: Participants Mean Search Time in Minutes

	Mean	Median	Std Dev	Range	% of Mean Search Time
Participants' mean travel time	18	16	12	5–69	39
Participants' mean time waiting for the dealer	20	8	25	0–101	41
Participants' mean transaction time	10	7	7	1–25	20
Participants' mean total search time	48	39	28	12–124	100

Note: 32 valid cases for all of the above

Table 2: Search Times for Difficult and Easy Heroin Purchases in Minutes

	Mean	Median	Std Dev	Range	Valid n
Search time for difficult heroin purchase	111	87	91	36–445	30
Time spent traveling to difficult buy location	30	22	20	5–90	30
Percent of travel time to difficult buy of total search time	40%	39%	21%	6%–88%	30
Search time for easy heroin purchase	24	22	14	10–61	30
Time spent traveling to easy buy location	12	12	6	3–23	30
Percent of travel time to easy buy of total search time	53%	50%	18%	17%–100%	30

Note: The n is only 30 for this and other "difficult/easy" search time tables because two participants reported no easy purchases and two reported no difficult ones.

Table 3: Reasons for Difficult and Easy Purchases

Why Was Difficult Heroin Purchase so Defined?

	Count	%
Dealer not on street	49	24
Couldn't reach dealer	29	14
No money	11	5
Quality problems	7	3
Bad weather	6	3
Sunday/holiday	23	11
Had to find new dealer	15	7
Police in area	9	4
Dealer out of dope	19	9
Travel problems	36	17
Other	4	2
Total responses	208	100
Valid cases	30	

Note: Multiple responses are included

Why Was Easy Heroin Purchase so Defined?

	Count	%
Dealer on street	87	40
Dealer contacted easily	13	6
Travel time easy	57	26
Had the money	22	10
Dealer expecting them	7	3
Delivered	9	4
Other	23	11
Total responses	218	100
Valid cases	30	

Note: Multiple responses are included

Yesterday I got up; got on the bus; got off the bus. The first person I saw was the person I was looking for. Did my business, got in the cab, came home. When I stepped off the bus it was like "bing"—turn right around. I didn't have to walk no where; wait.

—Forty-three year old black father from Roxbury

To gauge the factors that affect search time, we asked participants about their most difficult and easiest heroin buys of the week. Two-thirds of the participants described "easy" cops every week. In contrast, only nine participants, less than one-third, reported "difficult" cops every week. The other two-thirds reported difficult cops most weeks or for a few of the weeks.

The mean of the participants' average easy cops was 24 minutes; the median was 22 minutes. The range was wide from an average of 10 minutes for one participant to 61 for another. One-third of the participants had average easy cops of 15 minutes or less. The mean of the participants' average difficult cops was 111 minutes, or almost two hours. The median was 86 minutes. The range was 36 minutes to almost 7.5 hours. Almost three-fourths of the participants spent an average of two hours or less searching for heroin during their most difficult heroin buys of the week. The ultimate in search time is failure to make a purchase at all. In the preliminary interviews, over half reported having failed at some time, most within the previous two months. Indeed, during the eight weeks of the study, there were two participants who reported being unable to "make a connection." (See Table I in Appendix B.) In the preliminary interview, the most frequently reported reason for the failure was dealer unavailability. A few cited police activity. When asked how they had managed the experience, the majority reported doing nothing. A handful of others reported having used other drugs.

Each week participants were asked why a heroin buy was "easy" or why it was "difficult." Overall, there were three prominent reasons that determined whether heroin purchases were defined as difficult or easy: availability of the dealer, travel logistics and market conditions. The first, availability of the dealer, accounted for 38 percent of the reasons for "difficult" buys, and 46 percent of the reasons for easy buys. Depending on the participant, availability of the dealer could either mean: (1) that he could/could not be located on the street, or (2) that he could/could not be reached by phone or beeper. Failure to locate a dealer usually resulted in increased waiting time or a need to locate another dealer. Indeed, almost three-fourths of the reported easy heroin buys were from the participant's main heroin source, while only 44 percent of the difficult buys were from the main source. No appreciable differences between easy and difficult buys were found with respect to dealer location. (See Tables F, G, and H in Appendix B.)

Travel logistics accounted for 17 percent of the difficult responses and 26 percent of the easy responses. The participants' average travel time to their most difficult cop was 30 minutes, compared to only 12 minutes for the easiest cop. This might indicate that the travel time was the important factor for the participants when defining a "difficult" or "easy" heroin buy. However, the mean percentage of search time spent traveling to the difficult heroin buys was only 40 percent, compared to 50 percent for the easy buys.

Search times were similar for most modes of transportation, such as driving, taking a taxi, or getting a ride. However, two modes of transportation deviated from this pattern. For easy heroin buys there was a higher percentage of people walking (39 percent) than riding public transportation (21 percent). For the difficult heroin buys, more people rode public transportation (34 percent) than walked (29 percent). Participants often complained about having to take the bus to buy heroin, especially if they had to travel to more than one area or had to make a number of bus connections. Thus, both travel time and mode of transportation are factors that affect the ease or difficulty of purchasing heroin.

The final reason for defining heroin purchases as "difficult" or "easy" is really a cluster of factors having to do with market conditions. For the difficult buys the most prominent of these was buying on a Sunday or holiday, when most dealers were "closed" (11 percent). Time of day, although not mentioned by participants, also played a role. Two-thirds of the easy heroin buys were made in the morning when heroin dealers are most accessible. In contrast, slightly less than half of the difficult buys were made in the morning; most of the remainder took place during the afternoon and a few in the evening. Other poor market conditions included bad weather, poor product quality, too many customers, and arguments with the dealer. Nine percent of the difficult buys were attributed to the dealer being out of heroin. Police presence accounted for only 4 percent of the difficult buys. Market conditions that made buys easy included having the heroin delivered by the dealer and being extended credit. Finally, some participants listed their financial situation at the time of the buy as a factor in determining the ease of the purchase.

Heroin Purchase Logistics

> *It was raining; ran into girlfriend. A lot of people don't stand out when it is raining. We went to Dudley, there wasn't nobody out there; we went to Mission Hill—nobody was out there. We went to Orchord Park, nobody was out there. Then we back tracked so it took us about two hours to finally get something. We copped at Hammond Street, Roxbury.*
>
> *—Forty year old black mother from Jamaica Plain*

Morning (45 percent) and afternoon (35 percent) appeared to be the time when most of the heroin purchases were made. This is probably due to a combination of factors including that heroin users feel "dope sick" in the morning and need to cop, and the selling time restrictions that heroin dealers reportedly maintain. One-third of the participants walked to copping locations, one-third took public transportation or a taxi, and one-third drove themselves or got rides from dealers or friends.

Heroin buys made during the most recent day of "copping" were split evenly between inside and outside locations. Ten participants always purchased heroin in outside locations, five always made their purchases inside. Specifically, half of the heroin users went to a "copping corner," an outside location where their dealer could usually be found. One-fourth of the participants reported going to a house or apartment to buy. A similar number contacted their main source through a beeper, after which a meeting location was arranged. Sometimes dealers delivered to participants' homes. (See Table J in Appendix B.)

Sixty percent of the "most recent" heroin buys occurred in Roxbury, in either Mission Hill or near the Dudley Station area. At least 3 percent of the purchases were made each in Dorchester, the South End, Charlestown, downtown Boston and South Boston. The remaining nine percent of the purchases were made outside of Boston in Quincy, Lowell, Lynn, Brookline, Cambridge, Brockton, Arlington, Everett, Revere and Providence, Rhode Island. However, when multiple daily purchases are controlled, the number of purchases decreases slightly in Mission Hill, Dorchester, and Roxbury, and increases slightly in most other locations, especially in Charlestown, downtown Boston, South Boston and Lowell. (See Table K in Appendix B.)

User–Dealer Relationship

> *I have to call a beeper number and wait for their return call which could be anywhere from fifteen minutes to four or five hours. I woke up sick, drug sick. Fortunately I had the money already that I had borrowed. I called the dealer; that was about 11:00 (am)... waited for the return call around 12:00 (pm). He called back and then the heroin was delivered around 2:00 (pm).*
>
> —Sixty-one year old white mother from South Boston

Most of the heroin users in this study purchased heroin for much of the time from one main source. Throughout the study however, it became evident that the participants did not rely solely on one source; they knew other dealers from whom they could purchase heroin if necessary. When asked why they liked buying from their main source, over one–fourth of the respondents highlighted the quality of "dope" that their dealer sold. Others cited the convenient location of their main source, as well as their perception that their dealer was dependable, consistent and reliable. These appear similar to the factors important to consumers of licit goods as they make their daily judgments in retail markets.

Two–thirds of the respondents had been using their main source for less than one year. The remaining one–third had been with their dealers for two to 10 years. The median length of time with the same dealer was eight months. Thirty of 32 participants said they could get heroin from other sources if their preferred source was unavailable. Though two–thirds of the respondents used only one or two dealers on a regular basis, usually their main dealer and a back–up, the median number of dealers known to the respondents was ten. A handful reported knowing fifty or more. Participants reported making a majority of their purchases directly from their dealer, with less than 11 percent using a runner or middleman.

In the preliminary interviews, one–third of the respondents said they could contact their main source through a beeper, and over half knew other dealers that they could contact through a beeper. However, during the follow–up interviews, when asked if they had used a beeper to contact their dealer the previous day, 91 percent said no. Seven participants never reported using a beeper on the day prior to the interview, and only one participant used it consistently all eight weeks. Thus, it appears that while some of the participants' dealers did have beepers, the users we interviewed did not rely heavily on them to make contact. It also appears that on the whole, participants perceive their dealers as readily available. Participants reported few time restrictions, although police and others reported that dealers come out in the morning, close shop for a few

hours, and then deal again in the afternoon. Almost half reported no restrictions whatsoever, while a similar number reported that their main source was unavailable late at night. A handful reported other restrictions, such as lack of availability on Sunday or being available mornings only. (See Table L in Appendix B.)

We also inquired about the frequency with which participants were approached and asked to buy heroin. More than 40 percent had not been approached at all in any given week. Of those who were approached, the median number of approaches per week was four. Participants were (almost) never approached by strangers; the median number of approaches by acquaintances was two approaches per week. One-fourth of the participants had been approached each week to buy drugs. Only one was not approached throughout the eight weeks.

Frequency, Quantity and Cost of Heroin Purchases

> *Now being winter and with daylight savings time setting the clocks back, it's dark at 5:00 (pm). I wanted to get there before dark at 5:00 (pm) and before I had a chance at getting beat because, you know, the younger kids they run around and take money. I walked into the courtyard of Orchard Park, and I saw one of the fellows I knew. And I said to him, "What's happening?" And he said he had O.P.P. double sealed bags, the eagle sealed. I said, "Beautiful, let me get three." And he put three fingers up to his boy and he said that's $45. I said let me get them for $40; he said, "I can't do that." I said, "I'm getting three bags." He said, "I don't care whether you get ten bags." He says, "I can't go short." So to make a long story short, I just went ahead and gave him the $45 for three bags. Then the other fellow came over and gave me three bags; they were yellow bags with O.P.P. on them and they were glassine bogs.*
>
> *—Forty-three year old black male from Mattapan*

Each week, we asked the participants how many times they had purchased heroin during the previous week. Averaging the number of weekly heroin purchases for each participant, we found that half of the participants copped seven times per week or less. Twenty-eight percent copped between eight and fourteen times per week, or about twice daily. The remainder copped multiple times per day. The mean number of buys per week for the participants was nine.

The average purchase was almost three bags of heroin; the median was two bags. Almost half of the participants averaged less than two bags per purchase. The average price paid per bag of heroin was $17.58. While the majority of the participants' average price clustered around that figure, the average price for individual participants ranged from $12.85 per bag to $33.33 per bag. On average, participants were carrying $67 at the time of purchase. They spent an average of $45 per purchase.

Looking at the last full day of buys, the median expenditure per buy was $30. Respondents rated the quality of the heroin purchased in these "cops" to be "good" 50 percent of the time. Forty-five percent of the heroin purchased was rated fair and, only 5 percent was rated as "bad." During the preliminary interview, participants reported spending an average of $17.50 per bag. The median was $20 per bag. When asked to compare current price to the price a year before, over half reported the price had increased; one-third said they were spending less now per bag

Table 4: Dealer Information

	Mean	Median	Std Dev	Range	Valid n
Length of use of same source (in months)	19	8	25	1–120	32
Number of sources used in past week	3	2	4	1–20	32
Number of dealers known	29	10	55	1–300	32

Why Use Main Source?

	Count	%
Quality is good	11	26
Dealer always has it/is there	12	28
Convenient/easy to get to	8	19
Dealer is dependable/reliable	9	21
Other	3	7
Total responses	43	100
Valid cases	29	

Note: Multiple responses are included

Table 5: Frequency of Heroin Purchases per Week

	Mean	Median	Std Dev	Range	Valid n
Participants' average number of weekly purchases of heroin as reported during follow ups	9	7	8	1–30	32

Table 6: Quantity and Cost of Heroin

	Mean	Median	Std Dev	Range	Valid n
Mean number of bags purchased during most recent purchase	3	2	2	1–10	32
Mean price per bag during most recent purchase	$18	$18	$4	$13–33	32
Mean % of $ spent on heroin of total $ had during most recent purchase	86%	88%	12%	56%–100%	32
Average price of a bag of heroin reported in preliminary interview	$18	$20	$4	$7–25	32

and a handful reported paying the same price but that the quality had improved. One-half reported that the heroin they are buying is less pure now than it was last year. Again, a handful reported higher purity. These reports of lower purity both in interviews and focus groups contradict the reality of heroin purity, which is much higher than in the past. Perhaps this can be attributed to rising tolerance levels among users. (See Table M in Appendix B.)

Heroin Use Behavior

> *What happened is um, yesterday, right, I beat somebody with some kind of money. I stole some people's money, right. And this morning I had my money already; thinking about getting high buying a bog of dope and everything. So I set him up myself and say, "Look I am going to the Blackstone Park and I'm going to buy me two bags of dope because I got the money and I can cover it up." So I went down to Blackstone Park, you know, I went out to the main man, he was out on the bicycle. He don't have nothing. And then another guy come, you know, and he said he got the coffee strong and fresh. And I bought it, you know, it was a bullshit dope so I shoot it.*
>
> —Thirty-one year old Hispanic father from Lynn

The average age of first heroin use was just under 19 years old. Based on current age and age at first heroin use, we calculated length of heroin use. Almost all of the participants in this study could be categorized as very experienced users, averaging 20 years.

During the eight weeks of follow-up interviews, all but one of the 32 participants used heroin every week. Almost half averaged daily use; the median number of days that participants used heroin was 6.5 days per week. Participants reported using more often during the preliminary interviews than they reported week-to-week in the follow-ups; this may suggest a tendency to "telescope" and exaggerate, which weekly interviews counteract.

"Shooting" heroin—intravenous injection—was cited as the exclusive method of administration for 26 of the 32 participants. Three reported both injection and snorting; three reported snorting alone. More than half of the participants reported using heroin in combination with cocaine. However many variations in drug combinations were reported by the participants, including heroin in combination with alcohol, marijuana, tranquilizers and methadone, as well as methadone in combination with tranquilizers.

Most of the participants reported two or three sources of income. When asked how they supported their heroin use, almost two-thirds reported that they committed some type of larceny. A similar proportion reported receiving some sort of public assistance or disability payments on a regular basis. About one-third said they made money by dealing drugs. Only seven respondents, less than one-third, reported employment as one of their sources of income. A handful of women reported prostitution as a means of income.

Almost two-thirds had tried to stop using heroin at least once in the past year; of those, half had tried three or more separate times to quit. During their most recent attempt to stop, half had

Table 7: Characteristics of Heroin Users

	Mean	Median	Std Dev	Range	Valid n
Length of heroin use in years	20	21	8	5–33	32
Mean number of days in week using heroin	5	6	2	1–7	32
How many bags used to get high (from Preliminary Interview)	3	2	4	1–20	32
How often got high each day	3	2	1	1–5	21
How much spent per day on heroin	$100	$60	$95	$20–400	$31
Number of times tried to stop in last year	4	1	9	0–50	32
Number of days stopped in most recent stop attempt	28	18	32	1–120	18

Frequency of Heroin Use in Last 3 Months

	n	%
More than once a day	19	59
Once a day	4	12
1 – 6 times/ week	6	19
1 – 3 times/month	1	3
Once a month	2	6
Valid cases	32	100

Count of Responses to Combinations of Drugs Used

	Count	%
Heroin & cocaine	18	53
Heroin & crack	4	12
Heroin & other*	7	21
Methadone & other	5	15
Total responses	34	100
Valid cases	28	
*Other includes alcohol, marijuana, tranquilizers, and methadone	28	

Note: Multiple responses are included

Comparison of Previous Use to Current Use

	n	%
Use more now than before	17	53
Use same now as before	12	38
Use less now than before	3	9
Valid cases	32	100

Count of Responses to Source of Support for Heroin Use

	Count	%
Public assistance	15	25
Workmen's compensation	2	3
Stealing	18	30
Prostitution	5	8
Dealing drugs	11	18
Working	7	12
Other	3	5
Total responses	81	100
Valid cases	32	

Note: Multiple responses are included

Table 8: Characteristics of Heroin Use Behavior

	Mean	Median	Std Dev	Range	Valid n
Participants' mean time in minutes between buying and using heroin during most recent purchase	22	18	16	3–88	32
Participants' mean travel time in minutes from purchase location to use location during most recent purchase	12	11	9	1–33	32
Percent of use time spent traveling	53%	51%	18%	4%–87%	32
Participants' mean number of bags of heroin bought during most recent purchase	2	2	1	1–4	32
Participants' mean weekly number of wake-up shots saved	1	0	2	0–7	32

Heroin Use Location

	Count	%
Home	131	60
On street/outside	25	12
Other persons' house	25	12
In the car	7	3
Hallway/random building	16	7
Other	14	6
Total responses	218	100
Valid cases	32	

Note: Multiple responses are included

Use Heroin Alone (Most Recent Day of Purchases)?

	Count	%
No	79	26
Yes	231	74
Total responses	310	100
Valid cases	32	

Note: Multiple responses are included

Purchased Heroin Alone (Most Recent Day of Purchases)?

	Count	%
No	70	22
Yes	244	78
Total responses	314	100
Valid cases	32	

Note: Multiple responses are included

sought treatment. The median number of days that the participant did not use heroin during these quit attempts was 18 days, with a range from one day to four months.

Each week, we asked participants how and where they used heroin after their most recent buy. Sixty percent of the time, respondents went home to use their heroin. Twelve percent used it outdoors, near where they copped. Other locations for heroin use included other people's houses, random buildings, restaurants, bars, parked cars or at work. The median time before use for participants was 18 minutes, while the median travel time to their use location was 11 minutes. Traveling consumed 51 percent of the time between purchase and use.

During the preliminary interview, one-quarter of the participants each reported using one, two and three bags of heroin per session. The overwhelming percentage of the time (83 percent), participants reported they did not save a "wake-up shot" for themselves. Only three participants reported saving wake-up shots at all.

Finally, we attempted to determine whether "copping" and using heroin were private behaviors or were shared with others. When speaking about the last full day of heroin purchases, participants copped alone 78 percent of the time and administered it alone 75 percent of the time. In the preliminary interview, participants reported using heroin with others a median of two times per week. This is notable, considering that most participants use heroin at least daily and some many times per day. A handful of participants claimed that they never used heroin with anyone else.

CORRELATION BETWEEN SEARCH TIME AND USER CHARACTERISTICS

Overview

With participants' mean search times ranging from 12 minutes to just over two hours, we wanted to explore user characteristics to shed light on what factors affect search time. First we conducted two focus groups: one with females who were former heroin users to discuss differences in the way men and women purchase heroin, and a second with current heroin users whose patterns vacillated between occasional and regular use. In addition, we correlated two measures of search time with a number of user characteristics. Each of the tables that follow contains a mean and standard deviation for the user characteristic of total search time and search time less travel time.

Contrary to general belief, we found no correlation between search time and gender. Discussion during a focus group of female heroin users concluded that there were no large differences in the copping behavior of men or women. There were correlations between search time and both marital status and whether participants lived with their children, in that those who were married and those who lived with their children had the lowest search times. A curious correlation between search time and age was found—that is the older the participant, the longer the search

time. A similar positive correlation existed between search time and years of heroin use, leading us to believe that extensive years of use most likely leads to increased inefficiency and isolation from the heroin network of users and dealers. The final two personal characteristics, race and residence, correlated similarly to search time. It became clear that those minorities living in drug-dealing areas of the city had search times that were significantly less than those whites living in other city neighborhoods.

Analysis of most of the variables associated with frequency of use showed that participants who used more heroin reported shorter search times. These included frequency of weekly use, frequency of weekly purchases, and total money spent on heroin. Interestingly, poly-drug users who always used other drugs more than heroin had heroin search times that were significantly shorter than those who only used other drugs more than heroin on an occasional basis. As expected, those who used mostly heroin had the shortest search times.

Looking at the user-dealer relationships, it appears that participants with two or three regular heroin dealers had lower search times than either those with one main dealer or those with no stable connections. Copping outside, especially on "copping corners" appeared to be the quickest way to buy heroin. Using beepers and arranging meeting times/places resulted in longer search times.

Personal Characteristics

> *I bumped into a boy that had an automobile and he was like, "Oh man, I'm uptight; I need to cop. Can you cop for me? Do you know where there is something good?" I said, "Sure." He said, "I'll take you anywhere you got to go." I said "Beautiful." So I had something for him and he had something for me.*
>
> *—Forty-three year old black male from Mattapan*

It is as much the absence of correlations between search time and various personal characteristics as their presence that is interesting. No correlations were found between search time and gender or education, while correlations were found between search time and race, residence, age, marital status, and whether or not participants resided with their children.

Prior to the research, several ethnographers suggested excluding women, or at least treating them as a separate group, since their copping behavior was very different from that of men. They believed that most women purchased their heroin through a man, usually their spouse or current mate, and that their search times would be rendered incomparable. We did not find this to be the case. Women purchased their heroin directly from dealers with the same frequency of men. There were times when women purchased their heroin through a middleman, similarly to men, and other times when they accompanied their spouse or mate to make the purchases. In our female focus group, there was overwhelming agreement that the process of "copping" heroin was no different for women than men, with a few minor exceptions. Most of these women recalled times in their heroin use careers when they had been with a mate or even a "sugar daddy" who either purchased heroin for them or with them. They reported, however, that these periods were

usually limited and that for most of their heroin careers, they purchased it themselves. Some of the focus group participants would not allow men to purchase for them due to distrust. As one woman put it, "I don't want to give up my hard-earned money to give to someone else .... no, I don't think so. I want to make dammed sure that I'm getting what I worked for, cause I can go to jail for how I got this money, and then not to get my dope?...."

When the female focus group participants were asked if it was easier or more difficult for women to purchase heroin than men, there were mixed responses. A couple of the participants believed that a woman was more apt to "get beat," that is , be sold poor quality heroin. However, others disagreed, saying it was the personality of the individual, not gender, that was the issue. They believed that if a woman was assertive and demanded a taste of the product, the likelihood of "getting beat" was low. One woman reported regularly carrying a gun or machete when she purchased heroin. All agreed that their chances of "getting beat" rose significantly when their main sources were unavailable and alternative sources in other locations were used.

Some of the women believed that they had an advantage over men in purchasing heroin, either because they were given a lower price or more apt to be extended credit when needed. Finally, there was discussion that overall heroin use was more degrading for women because society looks down on female heroin addicts, especially those who are mothers, more than male addicts. They also referred to the degradation associated with prostitution that was sometimes necessary to support their habit.

The "copping" behaviors of the women in the focus group were very similar to those of the female participants we interviewed. When their main sources were available, their search times were relatively short and consisted mostly of travel time. However, just like men, they were forced to go to alternative sources on a regular basis which always took much longer. As mentioned previously, there was no correlation between search time and gender. Although the consequences of regular heroin use, such as prostitution, loss of custody of children, complicated health problems and domestic abuse, are surely different for women and men, there appears to be no significant differences in their copping behaviors.

There was no correlation between search time and education, despite the broad range of formal education (7th grade to college graduate). Apparently becoming streetwise and connected into the heroin network is not a function of formal education.

Looking at the marital status of participants, there is not much difference in search times for the two largest groups—those who are single (46 minutes) and those who are separated or divorced (51 minutes). However, the group with the lowest search times were the married participants (37 minutes). Perhaps the differences can be explained by looking at the relationship between search time and whether one resides with children, since married participants are the most likely ones to be living with their children.

Those participants with no children had the highest search time (62 minutes). On the other hand, participants who had children living with them had the lowest search time (32 minutes). In

Table 9: Analysis of Search Time by Gender

		Search Time		Search Time less Travel Time	
Gender	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Female	12	52	30	32	31
Male	20	48	29	28	23

Table 10: Analysis of Search Time by Education

		Search Time		Search Time less Travel Time	
Education Level	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
< High school grad	8	41	14	27	15
High school grad	11	53	38	36	38
> High school grad	13	51	28	25	17

Table 11: Analysis of Search Time by Marital Status

		Search Time		Search Time less Travel Time	
Marital Status	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Single	17	46	28	25	20
Divorced/Separated	8	51	28	33	26
Married	5	37	9	23	14
Widowed	1	131	0	116	0
Live-in lover	1	58	0	24	0

Table 12: Analysis of Search Time by Children

		Search Time		Search Time less Travel Time	
Children	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Yes, and live with	6	32	9	13	6
Yes, but don't live with	17	49	29	30	27
No	9	62	33	40	26

between were those who had children but were not living with them. Presumably those with children living with them do not have the time to shop around for quality and price, but must be quick in their heroin search. Perhaps the lives of those who never had children revolve more around the purchase and use of the drug, thus accounting for longer search times.

There is a positive correlation between search time and age: the older the participant, the longer was the search time. Since there is a similar correlation between search time and years of heroin use (described in a later section), we believe that age is related to search time via years of heroin use. At first glance, the findings run counter to logic, since a more experienced user should also be a more experienced searcher, having had plenty of practice over the years, presumably resulting in an established network of heroin users/dealers. However, we heard from several older users who have abandoned the heroin network and culture, preferring to keep their heroin use to themselves. Perhaps also, years of heroin use debilitates a person, resulting in both physical and psychological inefficiency and estrangement from others.

Non-whites had search times that on average were over half an hour shorter than those of whites. Hispanics, with average search times of 31 minutes, had the shortest search times in our sample. We believe that race is related to search time via residence; almost all of the black and Hispanic participants in this study lived in either Roxbury or Dorchester, both areas where participants had search times under 40 minutes. None of the study's white participants lived in these areas, but instead resided in other areas of the city where the average search times were over one hour. Thus, it is clear that minorities living in drug-dealing areas of the city had search times that were substantially less than those whites living in areas where drug-dealing is either non-existent or at least underground.

Heroin Use Behavior

> *I left the house. I had $25. I walked to Dudley Street from my house. I ran into someone else who was getting ready to cop. We got down; we got two bags of dope and a bag of coke together. We walked to the gallery around the corner and we got high. I came out of the gallery and I came around here to get my money so I can cop again.*
>
> *—Thirty-eight year old black father from Roxbury*

As we expected, participants who used more heroin reported shorter search times. Analysis of most of the variables associated with frequency of use supported this hypothesis. Participants who used heroin daily had the shortest average search times (38 minutes), compared to those who used four to six times a week (62 minutes) or those who used less (53 minutes). Similarly, those participants who "copped" 11 or more times per week had shorter search times (32 minutes) than those copping less than four times weekly (63 minutes). Besides frequency of use and purchase, the amount purchased was also significant. There was an inverse relationship between the value of heroin purchased by participants and the time it took to make a purchase. Users who purchased less than $50 worth took well over an hour on average to make a purchase. Users who purchased more than $100 of heroin, on the other hand, took closer to half an hour.

Table 13: Analysis of Search Time by Age

		Search Time		Search Time less Travel Time	
Age	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
34 and under	9	33	6	15	7
35 to 39	10	44	17	27	17
40 and over	13	64	38	42	34

Table 14: Analysis of Search Time by Years of Heroin Use

		Search Time		Search Time less Travel Time	
Years of Heroin Use	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Less than 18 years	10	43	16	24	17
18 – 24 years	13	46	24	28	24
25 years or more	9	61	43	38	35

Table 15: Analysis of Search Time Variables by Race

		Search Time		Search Time less Travel Time	
Race	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
White	12	69	37	47	34
Black	14	39	15	21	12
Hispanic	4	31	2	12	5
Other	2	34	5	23	6

Obviously, people who purchase heroin frequently or who purchase a lot of it have solid dealer connections and are also probably more driven by their addiction to make timely purchases.

There were two variables describing heroin use behavior that did not fall into the higher use/shorter search time pattern. The first, years of heroin use, showed that participants who had used heroin the longest also had the longest search times, as discussed previously. The other one, incidence of poly-drug use, was not clear-cut. Participants who never used other drugs more than heroin had the shortest search time (33 minutes). One would expect that a user who was partial to heroin would have shorter search times than someone who uses heroin with the same or less frequency than other drugs. One might then hypothesize that those participants who always used other drugs more than heroin would have the highest search times. This did not prove to be true since this group had shorter search times (42 minutes) than those who sometimes used other drugs more than heroin (58 minutes). Perhaps heavy poly-drug users who always used other drugs more than heroin, may simply have been very experienced and connected drug users who generally found it easy to purchase any type of drug.

Prior to the commencement of the interviews, we were told that search time for heroin was negligible or at best was equivalent to travel time. We then refocused part of the study to look at new versus experienced users by adding a focus group. While new users proved impossible to recruit, we conducted a focus group of heroin users who vacillated between regular and occasional use. Among other topics, there was much discussion about initiation into heroin use and the process of purchasing heroin for new users. All of the focus group participants believed that if one knew someone who used heroin, it was relatively easy to purchase heroin, either through that person (usually at first) or to be introduced by that person to a dealer. Most of the group's participants related that they had purchased heroin through someone the first several times, perhaps the first week or month of use, then were able to make the purchase themselves. While search time increases dramatically (perhaps by hours or even days), while the new user purchases through a middleman, the new user status is so transient, as to make it difficult to study.

User-Dealer Relationships

> *I got a new dope connection, as a matter of fact a couple of new ones now in Southie. I got another one the past week but I haven't been following up on it... but I got it anyway. I called them and they shoot out and grab it for me. It's a middleman so I don't use it really or I make a call to my main source and I walk down it takes me ten minutes to get there and I'm all set.*
>
> *—Thirty-eight year old white male from South Boston*

One might expect that persons who always obtained heroin from the same source would be able to obtain heroin more quickly than those who used multiple sources. However, there is little relationship between using one main source and the time needed to travel and/or obtain heroin. In fact, participants who reported using lots of sources seemed to be able to obtain heroin about

twenty minutes more quickly on average than others. This might be because those with multiple sources were not stuck waiting if their main source was unavailable.

There was a curvilinear relationship between the number of dealers participants actually frequented and the time it took them to purchase heroin. Users with one source needed an average of about an hour to find heroin. Users with two or three regular sources took closer to half an hour. Users who frequented many dealers required an average of over three quarters of an hour. It was probably advantageous to have several regular sources: if one was not available another would be easy to find. On the other hand, users with one source may have had to exert themselves on occasion to find him while users with many sources may actually have had no regular ones and always had to engage in a search to find a dealer.

Overall it appears that having two or three steady heroin connections is preferable. Always using the same dealer over a long period of time necessitates taking the time to track him down when he is unavailable since there is no other source. Indeed, analysis of search time by duration of connection reveals that the longer a person used his dealer, the longer it took him to purchase heroin. Having no regular connections however, adds to search time, because one must constantly shop around and deal with the issues of trust, quality and price. Focus group participants preferred having two or three regular sources since they often lost dealers for a variety of reasons. They reported that it usually took about a week to develop a new heroin connection through other users.

Heroin was obtained most quickly by those who bought it from "copping corners" (38 minutes), next most quickly by those who bought it from indoor locations (45 minutes), and least quickly by those who purchased from someone using a beeper system (75 minutes). The amount of travel needed to reach heroin selling locations had no impact on this relationship. Dealers who sell on the streets or on "copping corners," are probably always out during their "regular" hours. Those who deal inside presumably have to be phoned first so that a meeting time and place can be designated. Use of a beeper prolongs this process because the participant must wait for the dealer to call back. Copping outside was quicker for study participants than copping inside, presumably because the user-dealer relationship of the former were more business-like while the relationship of the latter less formal since it involves a much higher level of trust and probably kinship with the dealer.

Table 16: Analysis of Search Time by Residence

		Search Time		Search Time less Travel Time	
Place of Residence	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Roxbury	12	34	12	20	12
Dorchester	4	38	7	18	6
South End	2	62	72	51	62
Mattapan	1	47	0	31	0
Charlestown	3	64	34	47	22
North End	1	80	0	69	0
Downtown	3	74	32	30	12
South Boston	3	71	52	53	54
Jamaica Plain	1	67	0	20	0
Lynn	1	32	0	5	0
Mission Hill	1	38	0	19	0

Table 17: Analysis of Search Time by Frequency of Heroin Use

		Search Time		Search Time less Travel Time	
# of Days Used Per Week	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Less than 4 days	11	53	22	32	22
4 - 6 days	8	62	39	40	33
7 days	13	38	24	21	23

Table 18: Analysis of Search Time by Number of Purchases Per Week

		Search Time		Search Time less Travel Time	
Number of Purchases Per Week	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Less than 4 purchases	12	63	31	39	27
4 - 10 purchases	10	50	32	32	32
11 or more purchases	10	32	7	16	6

Table 19: Analysis of Search Time by Total $ Spent During Most Recent Purchase

		Search Time		Search Time less Travel Time	
Total Dollars Spent	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Less than $50	9	69	40	49	36
$50 - $100	11	46	25	29	19
$100 or more	11	37	12	16	7

Table 20: Analysis of Search Time Variables by Incidence of Poly-drug Use

		Search Time		Search Time less Travel Time	
Uses Other Drugs More Than Heroin	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Never	7	33	7	14	7
Sometimes	18	58	34	36	30
Always	7	42	22	30	20

Table 21: Analysis of Search Time by Use of Main Source

		Search Time		Search Time less Travel Time	
Use a Main Source?	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Always	8	42	15	24	11
Most of the time	15	60	37	40	33
Sometimes	6	46	12	22	10
NA—Use lots of sources	3	21	8	9	3

Table 22: Analysis of Search Time by Number of Heroin Sources

		Search Time		Search Time less Travel Time	
Number of Heroin Sources	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
1 source	11	62	34	42	36
2-3 sources	11	38	26	17	11
4+ sources	10	48	23	29	19

Table 23: Analysis of Search Time by Duration of Connection

		Search Time		Search Time less Travel Time	
Duration of Connection	**n**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Less than 6 months	9	35	11	18	10
6 - 12 months	10	47	15	27	12
12 months or more	13	61	40	40	36

Table 24: Analysis of Search Time by Type of Heroin Connection

How Connects with Main Source?	n	Search Time Mean	Search Time Std Dev	Search Time less Travel Time Mean	Search Time less Travel Time Std Dev
Copping corner	15	38	16	22	13
Inside house/apartment	8	45	29	27	28
Through a beeper	7	76	38	47	35
Dealer on bike/in car	1	32	0	5	0
Meet at restaurant	1	80	0	69	0

Table 25: Analysis of Search Time by Inside/Outside Purchase Location

Purchase Heroin Inside/Outside	n	Search Time Mean	Search Time Std Dev	Search Time less Travel Time Mean	Search Time less Travel Time Std Dev
Inside	7	57	30	39	30
Outside	23	47	30	28	25
Both	2	41	17	19	7

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APPENDIX A. User Characteristics

Demographics

Most of the 32 participants in the study were African-American, just over one-third were Caucasian, and one-eighth were Hispanic; about one-third of the respondents were female. The participants ranged from 30 to 61 years in age. The median age was 37.5 years. Over one-half of the participants were single; the remainder were either divorced/separated, married, widowed, or living with a lover/mate. Of the 23 respondents who reported having children, more than half did not live with their children.

Over one-third of the participants lived alone, one-quarter lived with a spouse or mate, and another quarter lived with family or friends. Two-thirds reported paying rent. Roxbury was home to a little over one-third of the sample; the other most frequently reported places of residence were Dorchester, Charlestown, downtown Boston and South Boston.

Formal education ranged from 7 to 16 years. Over one-third of the participants had completed 12 years of education or received a G.E.D. Another third of the sample had completed more than 12 years of education. Only one-eighth of the participants were employed either full or part time. A little under one-fourth was recently unemployed. Another fourth of the sample was not looking for work. Almost half of the participants received public assistance, either SSI/General relief, AFDC, or SS disability/workmen's compensation. (See Table A.)

Substance Abuse History

More than half of the study participants began drinking alcohol prior to their initial illicit drug use. Although two of the participants never drank, the majority began drinking before the age of 17, the average age being 16 years old. The average age of first illicit drug use was slightly higher, 17 years old, with the majority having started drug use by their eighteenth year. For half of the participants, the first drug used was marijuana. Heroin was the first illicit drug used by six of the participants. The remainder of the drugs reported as first used varied evenly among a number of other drugs. Smoking marijuana and drinking alcohol were the most prevalent, but many had experimented with harder drugs including cocaine, amphetamines, depressants, and opiates before they began using heroin.

The average age of first heroin use was just under 19 years old; while the median was 18 years old. While over two-thirds of the heroin users began in their teenage years (eight under the age of 16), there were three users who didn't begin until they were over 28 years old. Over half of the heroin users began snorting heroin and over a third by injection, with most doing so intravenously and a few "skin-popping" it. One participant initially smoked it. It appears that once the participants had experimented with heroin, they immediately began somewhat regular usage. Only six people said that following initiation they used it less than weekly. The remainder used heroin at least weekly, with 12 participants using it daily right from the beginning. (See Table B.)

Table A: Demographics

Age		
Mean		39
Median		38
Range		30-61
Standard deviation		7
Race/Ethnicity	**n**	**%**
Black	14	44
White	12	38
Hispanic	3	12
Other	5	6
Gender	**n**	**%**
Male	**20**	**62**
Female	**12**	**38**
Years of Education Completed		
Mean		12
Median		12
Range		7-16
Standard deviation		2
Note: GED=12		
Employment Status	**n**	**%**
Not looking for work	8	25
Recently unemployed	7	22
SSI/General relief	6	19
SS disability/workmen's	4	12
Employed full time	3	9
AFDC	3	9
Employed part time	1	3
Marital Status	**n**	**%**
Single	17	53
Divorced/separated	8	25
Married	5	16
Widowed	1	3
Live-in lover/mate	1	3

Children	N	%
Yes, living with	6	19
Yes, not living with	17	53
None	9	28

Living Arrangements	n	%
Alone	12	38
With spouse/mate	8	25
With family	5	16
Homeless/shelter	4	12
With friends	3	9

How Pay For Living Arrangement	n	%
Pay rent	21	66
Live rent-free	6	19
Other/Homeless	5	16

Residence	n	%
Roxbury	12	38
Dorchester	4	12
Charlestown	3	9
Downtown	3	9
South Boston	3	9
South End	2	6
Mattapan	1	3
North End	1	3
Jamaica Plain	1	3
Lynn	1	3
Mission Hill	1	3

Table B: Substance Abuse History

Ever Been Drunk ?	n	%
Yes	30	94
No	2	6
Age When First Drunk		
Mean		16
Median		15
Standard deviation		5
Range		8-30
How Often Drink Now ?	n	%
more than once a day	5	16
once a day	4	12
1 - 6 times/week	5	16
1 - 3 times/month	5	16
once a month	2	6
Not at all	11	34
Age When First Used Illicit Drugs		
Mean		17
Median		16
Standard deviation		5
Range		9-29
First Illicit Drug Used	n	%
Marijuana/hashish	16	52
Heroin	6	19
Opiates	2	6
Amphetamines/crys.meth	2	6
Cocaine	1	3
Hallucinogens	1	3
Inhalants	1	3
Tranquilizers	1	3
Other	1	3
Note: 1 missing case		
Age First Used Heroin		
Mean		19
Median		18
Standard deviation		5
Range		10-33

Shoot Heroin?	n	%
Yes	29	91
No	3	9

Snort Heroin?	n	%
Yes	6	19
No	26	81

Level of Use When First Using	%	
More than once a day	5	16
Once a day	7	22
1-6 times/week	14	44
1-3 times/month	6	19

Besides heroin, the most frequently used drug was cocaine, which was used by nearly 80 percent of the participants, followed by tranquilizers and crack. All but one of the participants had smoked marijuana, although less than one-third still consume it. While there had been a lot of experimenting with other drugs, most were no longer being used. (See Table C.)

Substance Abuse Treatment History

Most of the heroin users in this study had participated in some type of formal substance abuse treatment. Over two-thirds had been admitted into a detox center; and half of them had been admitted into detox four or more times. Two-thirds had also been placed on methadone maintenance, though most of those had only been on methadone maintenance once. Nine heroin users had entered a therapeutic community or halfway house for their addiction. Many of the heroin users participated in self-help groups such as Alcoholics Anonymous (AA) or Narcotics Anonymous (NA). (See Table D.)

Criminal History

As a result of their heroin use, many of the heroin users had encounters with the criminal justice system. Three-fourths had been arrested on some type of drug charge, including possession of a drug or syringe, forging false prescriptions, or drug dealing. While we did not inquire about the number of arrests for other drug-related offenses (such as armed robbery and larceny), we did learn that half of the participants had served time as a result of some criminal conviction.

Current Drug Use Patterns

In the preliminary interviews, all but two of the participants reported getting drunk at some point in their lives, though one-third said that they no longer drink at all. However, a similar number of participants did report daily drinking and five reported drinking more than once a day. These results were confirmed by questions concerning alcohol use that we asked during weekly follow-up interviews. In fact, after heroin, alcohol was the most readily used substance, with two-thirds of the participants reporting its use during the eight weeks (see Table E).

All of the participants reported use of illicit drugs other than heroin at some point during the eight weeks of interviews; 17 participants, over half, reported using other drugs all eight weeks. Overall, after heroin, cocaine was the most widely used illicit drug; 18 of the participants reported its use in combination with heroin, most often in the form of "speed balling." In fact, when asked what their favorite drug or drug combination was, the use of heroin in combination with cocaine came in second to heroin alone, with over one-third listing it as one of their two favorite drugs or drug combinations. In addition, eight participants reported using it as much or more than heroin alone during some weeks. Although cocaine was cited as being frequently used in both the preliminary and follow-up interviews, that was not the case with crack. One-third of the participants reported current use of crack in the preliminary interview; but during the follow-up interviews, crack use was only reported six times.

Table C: Specific Drug Use History

Used Heroin?	n	%
Yes, before and now	32	100
No, never used	0	0

Used Opiates?	n	%
Yes, before and now6	19	
Yes, before, but not now	23	72
No, never used	3	9

Used Cocaine?	n	%
Yes, before and now	25	78
Yes, before, but not now	6	19
No, never used	1	3

Used Crack?	n	%
Yes, before and now	11	34
Yes, before, but not now	11	34
No, never used	10	31

Used Amphetamines?	n	%
Yes, before and now	2	6
Yes, before, but not now	17	53
No, never used	13	41

Used Marijuana?	n	%
Yes, before and now	9	28
Yes, before, but not now	22	69
No, never used	1	3

Used PCP?	n	%
Yes, before and now	0	0
Yes, before, but not now	16	50
No, never used	16	50

Used LSD?	n	%
Yes, before and now	1	3
Yes, before, but not now	18	56
No, never used	13	41

Used Inhalants?	n	%
Yes, before and now	0	0
Yes, before, but not now	13	41
No, never used	19	59

Used Tranquilizers?	n	%
Yes, before and now	12	38
Yes, before, but not now	16	50
No, never used	4	12

Used Barbiturates?	n	%
Yes, before and now	4	12
Yes, before, but not now	17	53
No, never used	11	34

Table D: Treatment and Criminal History

Times In Methadone Maintenance		
Mean		2
Median		1
Standard deviation		3
Range		0–9
Times In Detox		
Mean		4
Median		2
Standard deviation		7
Range		0–40
Times In a Therapeutic Community		
Mean		1
Median		0
Standard deviation		1
Range		0–4
Times In Individual Counseling		
Mean		1
Median		1
Standard deviation		1
Range		0–5
Participate In AA		
	n	%
Participate now	3	9
Did, but not now	19	59
Never participated	10	31
Participate In NA	n	%
Participate now	1	3
Did, but not now	22	69
Never participated	9	28
Arrested On Drug Charges		
	n	%
Arrested for dealing drugs	8	25
Arrested for possession of drugs	6	19
Arrested for needle possession	3	9
Arrested for false prescription	1	3
Arrested multiple reasons	6	19
Never on drug charges	8	25
Prison Time	n	
		%
Served prison time	16	50
Never served prison time	16	50

Table E: Reported Drug Use

Number of Weeks Reported Use	Cocaine		Tranquilizer		Barbiturates		Marijuana		Methadone		Opiates		Clonodine	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0	16	50	18	56	20	62	23	72	24	75	26	81	26	81
1	1	3	2	6	5	16	2	6	2	6	3	9	1	3
2	2	6	2	6	0	0	3	9	0	0	0	0	2	6
3	0	0	1	3	4	12	1	3	3	9	2	6	1	3
4	1	3	2	6	0	0	0	0	0	0	0	0	1	3
5	4	12	4	12	2	6	0	0	0	0	0	0	1	3
6	4	12	1	3	1	3	1	3	0	0	1	3	0	0
7	2	6	1	3	0	0	1	3	3	9	0	0	0	0
8	2	6	1	3	0	0	1	3	0	0	0	0	0	0

Number of Weeks Reported Use	Alcohol	
	n	%
0	10	31
1	4	12
2	2	6
3	2	6
4	2	6
5	2	6
6	2	6
7	4	12
8	4	12

Number of Weeks Used > Heroin	Cocaine		Tranquilizer		Barbiturates		Marijuana		Methadone		Opiates		Clonodine	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0	24	75	21	66	32	100	29	91	26	61	32	100	32	100
1	1	3	4	12	0	0	0	0	1	3	0	0	0	0
2	4	12	2	6	0	0	0	0	1	3	0	0	0	0
3	1	3	0	0	0	0	0	0	1	3	0	0	0	0
4	1	3	2	6	0	0	1	3	0	0	0	0	0	0
5	0	0	2	6	0	0	0	0	1	3	0	0	0	0
6	0	0	1	3	0	0	1	3	0	0	0	0	0	0
7	0	0	0	0	0	0	1	3	1	3	0	0	0	0
8	1	3	0	0	0	0	0	0	0	0	0	0	0	0

Following cocaine, tranquilizers were most frequently used, with Zanax and Valium topping the list. Although only a few participants listed tranquilizers as one of their favorite drugs, almost half used them regularly, and half of them reported using tranquilizers as much or more than heroin. Other types of depressants, such as barbiturates and clonopin, were also frequently used. One-third reported smoking marijuana.

Finally, participants reported using several drugs that are not controlled substances. Of these, Clonadine, an anti-hypertensive, and Elavil, an anti-depressant, were cited most often. Pharmacists and other experts explained that these and other similar drugs were used by heroin users to boost the effects of heroin or methadone. Eight participants used methadone during the eight weeks, some of whom were currently enrolled in methadone maintenance clinics.

APPENDIX B. Additional Tables

APPENDIX B

Table F: The Effect of Time of Day on Difficult and Easy Purchases

Time of Day of Difficult Heroin Purchase

	Count	%
Morning 6am–11:59am	74	48
Afternoon 12:00–4:59pm	72	46
Evening 5:00pm–9:59pm	9	6
Total responses	155	100
Valid cases	30	

Time of Day of Easy Heroin Purchase

	Count	%
Morning 6–11:59am	127	67
Afternoon 12:00–4:59pm	52	27
Evening 5:00–9:59pm	10	5
Late night 10:00–5:59am	1	1
Total responses	190	100
Valid cases	30	

Note: the Total Number of Responses for the variables describing both difficult and easy heroin purchases varies due to missing information and multiple responses.

Table G: Mode of Transportation for Difficult and Easy Purchases

Mode of Transportation for Difficult Heroin Purchase

	Count	%
Own car	14	9
Bus/subway	55	34
Walk	46	29
Taxi	14	9
Got a ride	21	13
At home/no travel	10	6
Total responses	160	100
Valid cases	30	

Mode of Transportation for Easy Heroin Purchase

	Count	%
Own car	19	10
Bus/subway	41	21
Walk	76	39
Taxi	17	9
Got a ride	28	14
Other	1	1
At home/ no travel	13	7
Total responses	195	100
Valid cases	30	

Table H: Purchase Source for Difficult and Easy Purchases

Difficult Heroin Purchase Made From Main Source?

	Count	%
No	86	56
Yes	69	45
Total responses	155	100
Valid cases	30	

Easy Heroin Purchase Made From Main Source?

	Count	%
No	50	26
Yes	140	74
Total responses	190	100
Valid cases	30	

Table I: Ability to Make Heroin Connection

Have You Ever Not Been Able to Make a Connection?

	n	%
Yes	18	56
No	14	44
Valid cases	32	

Number of Months Since Could Not Make a Connection

Mean	9
Median	1
Std Dev	25
Range	0–108
Valid cases	18

Table J: Heroin Purchase Logistics

Time of Day Heroin Purchased (Most Recent Day of Purchases)

	Count	%
Morning 6:00am–11:59pm	138	45
Afternoon 12:00pm–4:59pm	107	35
Evening 5:00pm–9:59pm	53	17
Late night 10:00pm–5:59am	9	3
Total responses	307	100
Valid cases	32	

Type of Transportation Used (Most Recent Day of Purchases)

	Count	%
Own car	26	8
Bus/subway	88	28
Walk	119	38
Taxi	23	7
Got a ride	34	11
Other	2	1
Delivered	23	7
Total responses	315	100
Valid cases	32	

Indoor vs. Outdoor Purchase (Most Recent Day of Purchases)

	Count	%
Inside	153	49
Outside	159	51
Total responses	312	100
Valid cases	32	

What Type of Connection Is Main Source?

	n	%
Copping corner	15	47
Inside house/apartment	8	25
Through a beeper	7	22
Other	2	6
Valid Cases	32	100

Table K: Heroin Purchase Location

Buying Location (Most Recent Day of Purchases)

	Count	%
Dudley (section of Roxbury)	48	22
Mission Hill (section of Roxbury)	41	19
Other sections of Roxbury25	12	
Downtown	16	7
Charlestown	14	6
Dorchester	13	6
South End	13	6
South Boston	10	5
Quincy	8	4
Lowell	7	3
Brookline	3	1
Cambridge	3	1
East Boston	3	1
Boston	2	1
North End	2	1
Jamaica Plain	2	1
Mattapan	1	1
Lynn	1	1
Brockton	1	1
Arlington	1	1
Everett	1	1
Rhode Island	1	1
Revere	1	1
Total responses	217	100
Valid cases	32	

Table L: Source Availability/Convenience

Main Source Uses Beeper?

	n	%
Yes	12	38
No	20	63
Valid cases	32	100

Number of Times Beeper Used (Most Recent Day of Purchases)

	Count	%
0	197	91
1	11	5
2	5	2
3	2	1
5	1	1
28	1	1
Total responses	217	100
Valid cases	32	

Others Sources Use Beepers?

	n	%
Yes	18	56
No	13	41
NA - no other source	1	3
Valid cases	32	100

Main Source Have Time Restrictions?

	Count	%
No restrictions	14	41
Open mornings only	1	3
Closed mornings	1	3
Closed morn./late night	2	6
Closed late night	12	35
Closed evening/late night	2	6
Other	2	6
Total responses	34	100
Valid cases	32	

Table M: Characteristics of Heroin Purchased

Quality of Purchases (During Most Recent Day of Purchases

	Count	%
Good	155	50
Okay/mediocre	140	45
Bad	16	5
Total responses	311	100
Valid cases	32	

Is Price the Same as Last Year?

	n	%
More now than before	17	57
Less now than before	11	37
Same as before	1	3
Quality better	1	3
Valid cases	30	100

Has Purity Changed In Last Year?

	n	%
More pure	6	19
Equally pure	9	28
Less pure	17	53
Valid cases	32	100

APPENDIX C. Advisory Panel

BOTEC assembled a panel of researchers to advise us on study design, research methodology, construction of the focus group guide and interview instruments, and management issues. They also advised us on data collection issues and analysis, and provided feedback on the interim report.

The Advisory Panel members were: John French, Director of the Data Analysis and Epidemiology Unit, Division of Alcohol, Drug Abuse, and Addiction Services, New Jersey Department of Health; Gerard Garrett, Ph.D., Professor of Sociology, University of Massachusetts–Boston; Janet Wilson Knight, Ph.D., Director of Research, Massachusetts Department of Correction; Richard LaBrie, Ed.D., Research Director, Project Outreach; Mark Moore, Ph.D., Professor of Criminal Justice Policy and Management, John F. Kennedy School of Government, Harvard University; and Wayne Wiebel, Ph.D., Associate Professor of Epidemiology, School of Public Health, University of Illinois at Chicago.

APPENDIX D. Confidentiality Issues and Procedures to Ensure Field Staff Safety

Confidentiality Certificate

We received a confidentiality certificate from the Drug Enforcement Administration (DEA) that authorized us "to withhold the names and other identifying characteristics" of our study participants. We "may not be compelled in any Federal, State, or local civil, criminal, administrative, legislative, or other proceeding to identify the subjects of (our) research" (21CFR 1316.23).

Informed Consent

We required that all participants read and sign informed consent forms. (A copy of this form follows.) To protect their confidentiality and privacy, we asked them to sign a pseudonym or their initials. While we offered our research subjects a copy of the informed consent form, we also suggested that they not keep a copy of it for their own safety.

Coding of data

To project the confidentiality and privacy of our participants, we assigned each participant a number that was used on all data collected from them. Although we have a master list of the names and the code numbers, this list will be destroyed at the completion of the study. Similarly, any payment checks that are made out to the participants will have all identifying information removed from them.

Limited Access to Paper and Computer Files

We also stored all data for this study in a locked desk. Only the Project Director and Research Assistant had access. Similarly, we limited access to computer files to those working directly on the project.

Procedures to Ensure Field Staff Safety

We prepared laminated identification cards for all interviewers. These cards included a picture, the bearer's name and indicated that the bearer of the card was working on BOTEC's Heroin Availability Project.

We also prepared slips of paper on BOTEC letterhead indicating briefly what our study was about and what our field staff were doing. Such documents were created to be presented to the police and to heroin buyers and dealers as well, if needed. A copy of the ID card and a list of field staff were provided to the Boston Police. We requested that the police call us if any of our field staff were arrested.

APPENDIX E. Respondent Stories

During the analysis phase of the study, participant responses were coded and analyzed quantitatively. However, participants often answered questions with detailed "stories" that gave a qualitative flavor to what purchasing heroin was like. The following "stories" were selected from the first few weeks of interviews before participants became familiar with the weekly questions and ceased giving us such detailed responses. We are including these "stories" in this appendix and throughout the study to add qualitative depth to the study and to demonstrate the numerous circumstances, factors and personalities that come into play during the purchase of heroin.

What happened the last time you copped?

I had the money in my hand. I left my house around 11:30 (am) I went down, you know, to the area where, you know the dealers be. In this case the dealers I deal with live in Roxbury where I do. Once I got to the actual spot it took about 15 minutes to get to the actual spot where these particular dealers are. Once I copped, I immediately left. No hanging around, no nothing. I went home.

—Thirty-seven year old black mother from Roxbury

I met somebody in the West End who had a car and he asked me to got to Lowell with him to cop. I said "sure." Got in the car took us about 35-40 minutes to get up there. I knew the house to go to. I went and copped and we were on our way home.

—Forty-five year old white male from downtown Boston

I got up. I called my son and I went down and got $40. And then I came back on the train, and I got off at Dudley.

—Forty-nine year old black father from Roxbury

I left work at lunch time [11:30 am]. I hopped on a bus; went over to Boston. I walked up Tremont Street. Ran into a few people; they didn't have nothing. Finally someone came along and I got something at quarter past twelve.

—Forty year old white male from Charlestown

Because I am sick I had to go through a friend. I called her. Then she had to contact her contact. And then she came over, got the money from me, and went back to where she gets it and then she came back to my house. Started at nine and she got back to my house at 10:30(am).

—Thirty-five year old white female from the North End

It was about 10:30 (am). I decided I wanted to buy a couple of bags, so I had to hop on the Orange Line and I had to take a train to Central Square. When I got to Central Square, took about half an hour to get there, I was there no more than five minutes when I bumped into a few people that I know that I do business with. We decided to catch the bus to go over the bridge to go into Boston. That was about 11:30 (am) by the time we got to Boston. I usually give him the money and I usually wait on the corner or wait at the bus stop and he will go take care of business. Took him about 20-25 minutes to come back. Then he met me and we got on the bus with the dope around 11:55/12:00(pm).

—Forty-eight year old white father from Charlestown

I got up at 6:30(am). I left the house at 6:45. I waited for a bus until 7:45. There was a bus but it was on holiday schedule. I must have just missed it. So I finally caught a cab with no money and I went out to Harbor Point. I got there about 8:00, 8:05. Ten more minutes I talked to the people about doing me a favor because I had no money. I got credit; I have to pay him back this afternoon.

—Fifty-three year old black mother from Dorchester

I was standing on the corner in North Station waiting for a couple of friends to show up as we had made plans the night before to meet and go to a specific place to get this dope that we all liked. We met at about 8:20(am). We bickered around a bit to see how much money we had totaled; decided how many bags we were going to get and proceeded to go about 25 miles to get this. When we went to Lowell it was about one minute; we went right to the house—went in, came out with over a bundle, with about fourteen bags.

—Forty-five year old white male from downtown Boston

I just made a phone call and the fellow was there and he left and came here... and was here in 10 minutes. That's not a usual thing.

—Sixty-one year old white mother from South Boston

Why is this time longer or shorter than other times you have copped?

Longer:

I had to take a bus. My usual contact wasn't there. I had to wait around for a secondary.

—Forty year old white male from Charlestown

Shorter:

Because I knew where I was going and I didn't have to look or hunt and peck; you know, get a read out on who had what bags. Whatever they had I was going to take because I was given credit at the time. It took me about ten extra minutes to talk to the people about doing me a favor because I didn't have any money. But if I had been in the street I would have been looking... you know checking out different things; who got what talking to different people; getting a readout.

—Fifty-three year old black mother from Dorchester

Because normally I do see my man, and I have to read the paper; shoot the shit while he serves this one, that one. And he comes down and never brings anything with him so I have to wait there; tell him what I want; give him my money and he sends one of his runners. But on Sunday they had that price special in Dorchester at $10 per bag and they like to keep the people moving; keep the traffic moving.

—Forty-three year old black male from Mattapan

Where do you go to shoot up?

I made another stop to get some powder cocaine, and then I took the bus to Forest Hills then from there I took a cab home to shoot it.

—Forty-three year old black male from Mattapan

I went back; took the train back to Beacon Hill... the Metro Deli. They have a bathroom; a restaurant on Cambridge Street. Used some hot and cold water and about a quarter bleach.

—Thirty-five year old white male from downtown Boston

I went into the projects and I got off because I had no time for no playing.

—Forty-nine year old black father from Roxbury

What happened the last time you were approached?

They just said that they had something and they said what it was and I kept on stepping because I was already going to somebody else. I heard about what they had and it wasn't nothing; I was going to somebody else.

—Thirty-two year old Hispanic mother from Roxbury

I was at the clinic yesterday morning. I got in the subway station and was using the phone. A guy comes by and he like nods to me, meaning do I want any? I said no.

—Thirty-five year old white male from downtown Boston

It was morning, 10:00 (am), got off at Government Center, ready to go have a cup of coffee... as I got the newspaper an acquaintance walked by and asked if I was going north, that meant Lowell. I said no. He said he had it on him because he just got back from Lowell.

—Thirty-five year old white male from downtown Boston

Yesterday, I was standing on the corner, and they said, "What's happening, man? What brings you in our part of town?" I said, "you know." "Boy's got that! I can bring you to him. It's good and all that." I said, "No. I've already given my money to this cousin of mine that lives right there and the people in the house are doing it."

—Forty-three year old black male from Mattapan

[They said] the usual, you know, "You're looking, I got it."

—Forty-eight year old white father from Charlestown

He just came up to me and asked me if I was straight. I said I was fine. He said "okay." And he went on about his business and I went on with mine.

—Forty-five year old white male from the South End

Yesterday, I was standing down there on Mission and um a fellow came up, told me what he had and asked me was I looking. Well yesterday I had like four or five people approach me.

—Thirty-six year old black father from Roxbury

I was at Government Center in the restaurant having a coffee and someone already copped from a different city and they had extra bags on them and they offered to sell me some and actually, I bought some.

—Thirty-five year old white male from downtown Boston

Yesterday he came in the restaurant and told me what he had. I said, "No, I'm cool." I didn't know him.

—Thirty-two year old Cape Verdian father from Dorchester

Could you describe for me the easiest cop of the week?

Friday, I copped about 9:00 in the morning. I got right down to the spot in Roxbury where most people cop. I took the bus from my house. Once I got the bus, I got off. And in the area, the person that I copped from was right there. I had to do no waiting, no talking. I gave him $40; he gave me two bags and I started walking back over to take the bus home.

—Forty-three year old black male from Mattapan

Because, like I said, they knew I was coming; they was waiting for me. I didn't have to do nothing but get there, give them the money, get what I was going to get and go on.

—Thirty-two year old Hispanic mother from Roxbury

I had a ride and my main connection was right there. So everything was beautiful; it worked out good.

—Forty year old white male from Charlestown

I was home, had just gotten a $100. I called friend in Lowell; asked what was good up there and if he could get it quick. He said, "I'll call you when I get to Lowell." Then I turned around and called a friend of mine who had a car. I said I could afford to buy him a bag for the ride up and back. He lives three minutes from my house. He came right over and picked me up. We went up to Lowell; I called my friend and he picked him up. It was a matter of five minutes I had the dope in my hand and him dropped off at his house and was heading home. It was all set up for me; I didn't even have to go into the house and see the people. That's what I like when I don't have to go in case there is a bust, I am not there.

—Forty-five year old white male from downtown Boston

As soon as I got out there he was there.

—Forty-nine year old black father from Roxbury

There was no traffic and it was there when I got there.

—Thirty-five year old white female from the North End

What about the most difficult time you had trying to cop?

Sunday I started making calls at 10:00 (am) and didn't wind up copping until about 8:00 that night. I couldn't reach him and when he finally came he said he had just returned from out of state. I tried two others and one has been disconnected and the other one I just couldn't get an answer.

—Sixty-one year old white mother from South Boston

I had to sit and listen to the music. People and runners would come out and explain to us that they were "so and so after this guy; don't pull up in front of the cop spot or you blow your turn." People were pretty cool with that.

—Forty-three year old black male from Mattapan

I got to the spot... wasn't nothing out there. What was out there couldn't find the guy because the police was all over. The police was out there... there wasn't nothing really out there and the guy was laying low 'til the police left.

—Thirty-two year old Hispanic mother from Roxbury

Two days ago. The police was out real heavy. A lot of people that had something was afraid to bring it out. It wasn't dry; it was extra hot and what was there we didn't want because we'd had it; you know. So we got to Dudley and the police pulled us out of the cab. I said, "Man, why don't you all leave so we can get some."

—Forty–three year old black father from Roxbury

I tried to get something stronger that I heard about. I left at 11:10; I remember the time specifically. I was at North Station; I went out of the city for this. I took the train to Lowell; and as I went to the house in Lowell which was at about 12:10 plus fifteen minutes; around 12:30; they were not home. So I went back six times within an hour. I heard the stuff was potent and I got the address from a friend. They were not home; there was a note on the door saying he would be back but he never showed up. It was a wasted trip. I went back to Boston and copped. I got tired of waiting.

—Thirty–five year old white male from downtown Boston

Sunday afternoon. Nothing out there. There was like fifty people out there looking; Sunday and Monday was bad days. Everything back to normal now.

—Forty–three year old black father from Roxbury

The Relationship between Drug Prices and Crime

Prepared for
The Office of National Drug Control Policy

BOTEC Analysis

The Relationship between Drug Prices and Crime

By:
David Boyum

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Executive Summary

One of the primary objectives of current drug policy is to raise the prices of illicit drugs. The logic is simple economics: the demand for heroin, cocaine, or marijuana, like the demand for any commodity, is influenced by its price. Other things being equal, one expects lower prices to be accompanied by greater use, and higher prices to go with less consumption.

Drug policy attempts to raise drug prices through the vigorous enforcement of laws prohibiting the sale and possession of drugs. Imprisoning traffickers and dealers, seizing their drugs, money, and physical assets—all of these actions impose costs on the drug trade, costs which are presumably passed on to consumers in the form of higher prices.

But any reduction in drug use that is obtained in this manner is purchased at a high cost. Prohibitory drug laws create illicit markets, and illicit markets foster violence and corruption. And higher drug prices brought about through enforcement can amplify these black market side effects. Enforcement shrinks the size of the drug trade (in terms of quantity sold, not necessarily revenues), but in the process makes the business more lucrative for those who survive. This increases the incentive for dealers to engage in violence and corruption to protect themselves and their livelihood. High prices can have another unwanted effect: users, whose habits become very expensive to support, may turn to crime and prostitution as a source of income.

This report explores the details of the relationship between drug prices and crime. A thorough look at the issues and evidence indicates that we simply do not know whether our current drug policy increases or decreases crime By driving up prices, drug enforcement curtails drug consumption and the crime that is attributable to drug abuse. But higher prices may also increase violence among dealers and crime committed by users to obtain drug money. The net effect is uncertain. Moreover, there is no reason to assume that there is a consistent relationship between drug prices and crime. More likely, the connection is context-specific, different for different drugs, cities, time periods, and price levels. To take one example: higher heroin prices might lead to lower crime in cities where methadone treatment is readily available, and higher crime where methadone treatment is scarce.

Given this uncertainty, it would seem that drug policy ought to emphasize strategies that reduce drug use while keeping potentially damaging side effects to a minimum. Several areas of focus appear to stand out.

Prevention

Logically, only two things can cause a decline in drug use: a reduction in supply (causing an increase in prices) or a reduction in demand. If drug consumption falls as the result of a supply reduction—that is, a price increase—the benefits of reduced drug use will be partially or perhaps completely offset by the negative side effects stemming from higher prices. In contrast, if drug use falls as the product of a reduction in demand, there is no trade-off.

Thus, from a policy perspective, successful prevention programs are a clear winner. Unfortunately, few prevention programs have demonstrated that they can consistently reduce the number of their subjects who use drugs. And the positive results that have accompanied some programs have often proved difficult to replicate in other settings. Despite these difficulties, prevention programs deserve continued research and evaluation.

Treatment of Drug-Involved Offenders

Like prevention, treatment offers the potential to reduce drug consumption without negative side effects. And if targeted at drug-involved offenders, whose criminal activity drops considerably during periods of abstinence or reduced use, treatment can significantly reduce crime.

Evaluation studies indicate that all the major drug treatment modalities—therapeutic communities, methadone maintenance, outpatient drug-free programs—are successful in reducing criminal activity, particularly during the period of treatment. A small number of prison therapeutic communities (TCs), with strong linkages to community based treatment programs—such as the Stay'n Out program in New York—also appear to work.

Increasing the availability of treatment for drug-involved offenders is important, but not sufficient. Many addict-offenders will only enter treatment if forced to do so; simple availability is often not an adequate enticement. Significantly, research shows that those who are coerced into treatment by the criminal justice system fare as well as, if not better than, those who enter programs voluntarily.

Disrupting Retail Drug Markets

The demand for a drug is not simply a function of its cash price. To buy drugs, users must spend time looking for a willing seller, and risk being arrested, ripped off, and poisoned by adulterated drugs. These nonmonetary costs of buying drugs, which have been called "search time," may be as much of a factor in the decision to buy drugs as the dollar price.

In principle, if enforcement could increase the search time for a drug without increasing its dollar price, we would get the benefits of a price rise without the costs. In practice, enforcement cannot choose its effects so neatly and cleanly, but some types of enforcement do a better job of increasing search times than others. The important distinction is between high-level and street-level enforcement. High-level enforcement (including interdiction and source country eradication efforts) boosts the prices of drugs, but has no direct impact on search time. In contrast, street-level enforcement can affect search time.

There is a more important argument in favor of street-level enforcement. Retail drug markets are central to much of the violence and declining quality of life in inner city communities.

By scaling back the retail drug trade, and thereby diminishing the violence that goes with it, effective enforcement might reclaim for law-abiding citizens large areas of their neighborhoods.

Admittedly, the record of local crackdowns is mixed. Lynn, Massachusetts and Tampa, Florida are success stories—both cities achieved notable reductions in drug selling and drug-related crime—but there are also many failures. Still, the victories have provided not only hope, but some important lessons about the components of a successful strategy.

What appears to be key is a shift away from the traditional approach of simply seizing drugs and arresting dealers towards a comprehensive and integrated strategy of market disruption. The basic game plan of such a disruption scheme is to coordinate active community involvement with the resources of multiple government agencies in order to shower the drug market with a barrage of measures, which together make it so difficult for the market to operate that it literally collapses. Tampa's much heralded QUAD program was something of a model operation. Where six months of conventional enforcement had failed to curtail street trafficking, six months of the QUAD program virtually eliminated public drug dealing, bringing considerable reductions in violence, disorder, and fear

Introduction

One of the primary objectives of current drug policy is to raise the prices of illicit drugs. The logic is simple economics: the demand for heroin, cocaine, or marijuana, like the demand for any commodity, is influenced by its price. Other things being equal, one expects lower prices to be accompanied by greater use, and higher prices to go with less consumption.

Drug policy attempts to raise drug prices through the vigorous enforcement of laws prohibiting the sale and possession of drugs. Imprisoning traffickers and dealers, seizing their drugs, money, and physical assets—all of these actions impose costs on the drug trade, costs which are presumably passed on to consumers in the form of higher prices.

But any reduction in drug use that is obtained in this manner is purchased at a high cost. Prohibitory drug laws create illicit markets, and illicit markets foster violence and corruption. And higher drug prices brought about through enforcement can amplify these black market side effects. Enforcement shrinks the size of the drug trade (in terms of quantity sold, not necessarily revenues), but in the process makes the business more lucrative for those who survive. This increases the incentive for dealers to engage in violence and corruption to protect themselves and their livelihood. High prices can have another unwanted effect: users, whose habits become very expensive to support, may turn to crime and prostitution as a source of income.

That drug prohibition and enforcement have these unintended consequences illustrates that drug policy cannot be single-minded in its aims. Reducing drug abuse, and all the social ills that go with it, is the top priority, but due weight must be given to minimizing the harm done by black markets. The challenge is to design policies that properly balance these two objectives.

This report examines one, particularly important, aspect of this issue, the relationship between drug prices and crime. In addition to exploring the myriad connections between drug prices and crime, and surveying what empirical evidence is available on the subject, the report discusses policy implications.

The Drugs–Crime Connection

There seem to be three possible connections between drugs and crime, each of which may be influenced by drug prices. The first two, which were noted in the introduction above, stem from policies of drug prohibition and enforcement. There are the crimes that attend the workings of the black market: violence among dealers and the corruption of law enforcement. And there are the crimes committed by users to obtain drug money. It is plausible that higher drug prices could increase both of these types of crime.

The third drugs–crime connection focuses on the effect of drug use, rather than drug policy. Drug use can be a catalyst for all sorts of delinquent behavior (crime being the most serious), both through the inhibition-reducing effects of intoxication and the character-destroying consequences of long-term substance abuse. This implies a different connection between drug prices and crime. By making drugs more expensive, prohibition and enforcement discourage drug abuse and the crime that results from it.

There is almost certainly some, if not a lot, of significance to all three of these links between drugs and crime. What is also certain is that the drugs–crime connection, and hence the drug prices–crime connection, is more complicated than it is often portrayed.

Crime Attributable to Drug Markets

In many cities, there is rampant violence among drug dealers. It seems likely that our current drug policies play a role in encouraging or facilitating this violence. Because selling drugs is illegal, business arrangements among dealers cannot be enforced by law. Territorial disputes among dealers, the enforcement of rules or codes within organizations, punishment for stealing, informing, or not paying debts, disagreements over the price, quantity, and quality of drugs are all likely to be settled by force. Moreover, perpetrators of violence are unlikely to be apprehended: enforcement drives transactions into locations that are hidden from the police, and victims, themselves involved in illegal behavior, are unlikely to file a report.

All of this is probably made worse by higher drug prices. Higher prices reduce drug consumption, which most likely means fewer jobs for dealers.[1] At the same time, the drug trade becomes more profitable for those who are not squeezed out (or removed from) the business. With more profits to protect, there is a greater incentive for dealers to bribe law

[1] To the extent that drug enforcement encourages an inefficient distribution system—which it almost certainly does—it is possible that increased enforcement could boost both drug prices and drug industry employment. It seems more likely, however, that heightened enforcement would cause the distribution system to become only slightly more inefficient, such that employment would fall, but by less, in percentage terms, than the decline in the size of the market.

enforcement officers, especially if the higher prices reflect stepped-up enforcement. The more important effect of higher prices is intensified competition among dealers, who are now contending for fewer, but more lucrative jobs. And in the drug trade, competition often translates into violence. (At some point, very stiff enforcement would shrink the market enough so that even if violence in the residual business were higher than it is now per unit of drugs sold, total violence would be less. It does not appear we have reached that point.)

What is not known is how much of the violence among drug dealers is attributable to the drug trade itself, as opposed to the character of the individuals employed in it, or the economic, political, social, or cultural conditions of drug-involved communities. For instance, many ethnographers and journalists who have studied the inner-city drug trade feel that violent incidents among dealers are often falsely labeled as "drug-related." (Homicides involving dealers, or taking place at a site where drugs are sold, are almost always considered drug-related.[2]) Frequently, the pretext for a dispute has little or nothing to do with business, and observers note that the combatants are easily provoked, especially when they themselves are chronic crack abusers.

Other researchers stress the role of an inner-city culture where backing down from a confrontation is the ultimate humiliation. Still others note that those involved in violent incidents typically have a history of delinquency (including violence) dating back to early childhood. While data on these kinds of factors are difficult to assemble, Jeffrey Fagan did find some evidence in a survey of over 500 active drug dealers in the Central Harlem and Washington Heights neighborhoods of New York City. Fagan found among these dealers an association between violent activity within the drug trade and violence and criminal activity outside of the drug business. "[I]t appears," he concluded, "that processes of self- and social selection result in the participation of generally violent and criminally active people in drug selling."[3]

That drug dealers are frequently armed, and no doubt more often and more heavily armed than they would be in other lines of work, may also contribute to violence. In homicides that were considered drug-related in New York City in 1984, 80 percent of the victims were killed with a handgun, compared with only 47 percent in homicides that were not considered

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[2] Paul J. Goldstein, Henry H. Brownstein, Patrick J. Ryan, and Patricia A. Bellucci, "Crack and Homicide in New York City, 1988: A Conceptually Based Event Analysis," *Contemporary Drug Problems* 16 (1990):651-687.

[3] Jeffrey Fagan, "Drug Selling and Licit Income in Distressed Neighborhoods: The Economic Lives of Street-Level Drug Users and Dealers," in *Drugs, Crime, and Social Isolation*, eds. Adele V. Harrell and George E. Peterson (Washington, D.C.: Urban Institute Press, 1992), 117.

drug-related.[4] While guns can be a deterrent, perhaps reducing the number of violent encounters, their presence tends to raise the lethality of incidents that do take place. The net effect is probably an increase in homicides, a decrease in non-fatal injuries.

It is clear that individual and social factors are partly to blame for violence among drug dealers. As a thought experiment, imagine that the drug trade somehow suddenly disappeared. We would still expect to see violence among ex-dealers; too many of them are violence-prone individuals living in violence-prone communities. Nevertheless, it is evident that drug enforcement and high illicit market prices are also culpable. Consider another thought experiment: suppose that drugs were prohibited, but the laws were rarely enforced and the penalties were trivial. The drug trade would bear little resemblance to its current state. It would probably look something like the market for knock-off Rolex watches, where New York dealers set up tables on 5th Avenue to sell their "illegal" goods. In short, it is hard to imagine that the business would be terribly violent.

Economically-Motivated Crime Among Users

The proposition that drug abusers commit crimes to get money to buy drugs is straightforward. Drugs are habit forming and expensive, and for many heavy users crime is the only feasible source for significant income.

There is plenty of circumstantial evidence of economically-motivated crime among users. Fred Goldman found that among heroin addicts, ninety cents of each criminally earned dollar was spent on heroin.[5] In studying New York City heroin addicts, Bruce Johnson and his colleagues found a close match between criminal income and drug expenditures.[6] Yet, like

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[4] Paul J. Goldstein and Henry H. Brownstein, *Drug Related Crime Analysis—Homicide*, report to the National Institute of Justice Drugs, Alcohol, and Crime Program (Washington, D.C.: U.S. Department of Justice, July 1987).

[5] See Fred Goldman, "Drug Markets and Addict Consumption Behavior," in *Drug Use and Crime: Report of the Panel on Drug Use and Criminal Behavior*, ed. Robert Shellow (Washington, D.C.: National Technical Information Service, 1976), 273–96; "Narcotics Users, Narcotics Prices, and Criminal Activity: An Economic Analysis," in *The Epidemiology of Heroin and Other Narcotics*, ed. J. Rittenhouse, NIDA Research Monograph Series 16 (Rockville, Md.: National Institute on Drug Abuse, 1977), 30–36; "Drug Abuse, Crime and Economics: The Dismal Limits of Social Choice," in *The Drugs-Crime Connection*, ed. James A. Inciardi (Beverly Hills, Calif.: Sage, 1977).

[6] Bruce D. Johnson, Paul J. Goldstein, Edward Preble, James Schmeidler, Douglas S. Lipton, Barry Spunt, and Thomas Miller, *Taking Care of Business: The Economics of Crime by Heroin Users* (Lexington, Mass.: Lexington Books, 1985); Bruce D. Johnson, Kevin

many conjectures about the drugs–crime connection, the idea that users commit crime for drug money is hard to prove. What we know is that there is a clear association between heavy drug use and income–generating crime, and that this relationship holds for individual users, who commit more crime during periods of heavy use, and less crime during periods of lower use or abstinence.

But what makes inferences from this evidence difficult is that there are other possible explanations for the observed relationship between drug use and crime. Perhaps drug use causes crime, or perhaps there are other factors that cause both drug abuse and crime.

Despite this methodological difficulty, common sense leads one to believe that a non–trivial amount of crime among addicts is economically motivated. Moreover, there is some evidence from self–reports. According to a 1989 survey of convicted jail inmates, 39 percent of cocaine and crack users claimed to have committed their current offense to get money to buy drugs.[7]

What can also be said, probably with more certainty, is that economic motivation is an incomplete theory of crime among heavy drug abusers. First, the survey of jail inmates just cited also implies that 61 percent of cocaine and crack users committed their current offense for reasons *other* than drug money. Second, there is a substantial body of research indicating that, while drug use does appear to intensify and perpetuate criminal behavior, it usually does not initiate it. Most street drug users appear to have been involved in crime before drug use.[8]

Anderson, and Eric D. Wish, "A Day in the Life of 105 Drug Addicts and Abusers: Crimes Committed and How the Money Was Spent," *Sociology and Social Research* 72 (1985) (3):185–191.

[7] U.S. Department of Justice, Bureau of Justice Statistics, *Profile of Jail Inmates, 1989*, Special Report NCJ–129097 (Washington, D.C.: U.S. Department of Justice, April 1991).

[8] The supporting literature on this is by now quite large. See, e.g., M. Douglas Anglin, and George Speckart, "Narcotics Use, Property Crime, and Dealing: Structural Dynamics Across the Addiction Career," *Journal of Quantitative Criminology* 2 (1986):355–75; "Narcotics Use and Crime: A Multisample, Multimethod Analysis," *Criminology* 26 (1988):197–233; John C. Ball, "The Hyper–Criminal Opiate Addict," in *Crime Rates and Drug Abusing Offenders*, eds. Bruce D. Johnson and Eric Wish (New York: Narcotic and Drug Research, Inc., 1986); John C. Ball, Lawrence Rosen, John A. Flueck, and David N. Nurco, "The Criminality of Heroin Addicts: When Addicted and When off Opiates," in *The Drugs–Crime Connection*, ed. James A. Inciardi (Beverly Hills, Calif.: Sage Publications, 1981), 39–65; "Lifetime Criminality of Heroin Addicts in the United States," *Journal of Drug Issues* 12 (1982):225–39; John C. Ball, John W. Shaffer, and David N. Nurco, "The Day–to–Day Criminality of Heroin Addicts in Baltimore: A Study in the Continuity of Offense Rates," *Drug and Alcohol Dependence* 12 (1983):119–42; James A. Inciardi, "Heroin Use and Street Crime," *Crime and Delinquency* 25 (July 1979):335–46; "Youth, Drugs, and Street

So while the need for drug money may be a motivating factor for some crime among criminally-active users, it did not, in most cases, cause them to become criminals. Third, most street crime, even among drug addicts, appears to be opportunistic rather than planned, a complicating fact for a theory that assumes some level of economic planning. Fourth, more crimes—and especially violent crimes—are committed under the influence of alcohol than under the influence of all illegal drugs combined.[9] Are all of these crimes committed to get money to buy booze?

If some crime among drug users is economically motivated, do higher drug prices increase or decrease this type of crime? The answer depends on many factors, but above all on how sensitive the demand for drugs is to changes in price, or what economists call the elasticity of demand. If demand for a drug is inelastic, then higher prices will reduce consumption by an amount comparatively smaller than the price increase, which means that total expenditures will go up. In other words, if the demand for cocaine were inelastic, then a 10 percent jump in the price of cocaine would result in a drop in cocaine consumption of less than 10 percent, the net effect being an increase in total spending on cocaine. Since users are now spending more money to support their habits, we would expect an increase in economically motivated crime among users.

If, in contrast, demand for a drug is elastic, the effects are quite different. Higher prices will reduce consumption by more, in percentage terms, then the increase in price. Total spending on the drug falls, as well as economically motivated crime among its users.

In a later section of this report, the elasticity of demand for illicit drugs is explored in detail.

Crime, in *Drugs and the Youth Culture*, eds. Frank R. Scarpitti and Susan K. Datesman (Beverly Hills, Calif.: Sage, 1980), 175–203; James A. Inciardi, Ruth Horowitz, and Anne E. Pottieger, *Street Kids, Street Drugs, Street Crime: An Examination of Drug Use and Serious Delinquency in Miami* (Belmont, Calif.: Wadsworth, 1993); Johnson et al., *Taking Care of Business*; Duane C. McBride and Clyde B. McCoy, "Crime and Drugs: The Issues and the Literature," *Journal of Drug Issues* 12 (Spring 1982):137–52; David N. Nurco, John C. Ball, John W. Shaffer, and Thomas F. Hanlon, "The Criminality of Narcotics Addicts," *Journal of Nervous and Mental Disease* 173 (1985):94–102; David N. Nurco, Timothy Kinlock, and Mitchell B. Balter, "The Severity of Preaddiction Criminal Behavior Among Urban, Male Narcotic Addicts and Two Nonaddicted Control Groups, *Journal of Research in Crime and Delinquency* 30 (1993):293–316; Richard Stephens and Duane C. McBride, "Becoming a Street Addict," *Human Organization* 35 (1976):87–93.

[9] U.S. Department of Justice, Bureau of Justice Statistics, *Profile of State Prison Inmates 1986*, Special Report NCJ-109926 (Washington, D.C.: U.S. Department of Justice, January 1988); U.S. Department of Justice, *Profile of Jail Inmates, 1989*.

Abuse-Related Crime

That alcohol use is implicated in much crime suggests that substance abuse itself, and not just economic motivation or the perverse effects illicit markets, can play a significant role in crime.[10] Drugs often appear to lower inhibitions and raise levels of aggressiveness, which suggests that drug use would sometimes directly cause crime. Yet this too is a hotly debated supposition. Skeptics point to evidence from experiments showing pacific, rather than aggressive pharmacological effects from some illicit drugs, like heroin and marijuana. They also claim that broad generalizations about intoxication and aggression do not withstand scrutiny, that the purported relationship only holds for certain people, with certain types of personalities (or genes), using certain substances, in certain circumstances.[11] There is, of course, also plenty of evidence that more consistently links intoxication to aggression.

The trouble with much of this discussion is that it focuses on the immediate, short run effects of intoxication. What is more relevant, and probably more significant in its impact, is the long-term effects of substance abuse on the lifestyle and character of certain individuals. Whether or not substance abuse makes one more of a criminal while under the influence, it certainly debases lives. Substance abuse routinely hurts school and job performance, makes its victims more present-oriented and less likely to delay gratification, and damages relationships with friends and family. Furthermore, because drugs are illegal and widely disapproved-of, heavy drug use tends to isolate addicts from law-abiding society and immerse them in a criminal subculture. All of this, one assumes, makes violent and other criminal behavior more likely.

Higher drug prices should reduce this sort of crime. By how much? Once again, many factors are relevant, particularly the nature of the demand for illicit drugs.

The Limits of Classifying Drug-Related Crime

It has become common for researchers to classify drug-related crime according to a highly influential typology of drug-related violence advanced several years ago by P. J. Goldstein (Goldstein 1985). Goldstein offered three models: the psychopharmacologic, the economically compulsive, and the systemic. The psychopharmacologic model suggests that drug abuse will cause some individuals, either in the short run or long run, to be more prone to violent behavior. The economically compulsive model accounts for behavior that is economically motivated (violence with the objective of obtaining drug money). The systemic model captures the violence intrinsic to the drug trade.

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[10] Among criminals, alcohol is often referred to as "liquid courage."

[11] See Jeffrey Fagan, "Intoxication and Aggression," in *Drugs and Crime*, ed. Michael Tonry and James Q. Wilson, (Chicago: Univ. of Chicago Press, 1990), 241-320.

The framework, which is broadly similar to the categories outlined above, is a good starting point for thinking about the drugs-crime connection. But it has some important limitations. What seem to be logical categories are less neat and clean when one attempts to identify them with empirical observations. The killing of one crack dealer by another in a business dispute appears systemic, but may in fact stem from the effects on both of them of their chronic cocaine abuse and their consequent irritability. Moreover, there are apt to be important contributory causes that are not captured at all by Goldstein's framework (and may have nothing to do with drugs). That both participants are armed may be the key factor in converting what would have been a simple assault into a homicide. Or perhaps the key factor is an inner-city culture that does not allow either to walk away from a confrontation and maintain self-respect.

Along these lines, some scholars have pointed out the great variability in drug trade violence, noting that it is difficult to generalize across time and drug, and emphasizing the role of context-specific factors.[12] Ansley Hamid, for one, has argued that "the rate, type and volume of violence attaching to the use or distribution of any particular drug result from its unique impacts upon particular neighborhoods."[13] Hamid stresses that much violence we are now witnessing in inner-city neighborhoods is peculiar to the particular circumstances surrounding the growth of crack. In addition to the economic and social deterioration of inner city communities, he points to aspects of the crack trade that are not typical for other illegal drug businesses—very young dealers, centralized retail distribution operations, curbside sales.

In terms of the relationship between drug prices and crime, these issues suggest caution in making generalizations. Not only are the connections between drug prices and crime too complicated to completely sort out, but the links may vary across time, drug, and location. For example, the effects of higher drug prices on crack-related crime may be different than the effects on heroin-related crime. And what is true for New York City is not necessarily true for Los Angeles.

Differences Across Drugs

It is common to talk about illicit drugs as if they were a single substance. While this is convenient, it often obscures important differences. Illicit drugs vary in pharmacological effects, patterns of use, prices, and availability, to name but a few distinctions.

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[12] See John K. Watters, Craig Reinarman, and Jeffrey Fagan, "Causality, Context and Contingency: Relationship Between Drug Abuse and Delinquency," *Contemporary Drug Problems* 12 (1985):351-373.

[13] Ansley Hamid, "The Political Economy of Crack-Related Violence," *Contemporary Drug Problems* 17 (Spring 1990), 32.

Presumably, the nature of the connection between drugs and crime varies across drugs. Of the three major illicit drugs of abuse (marijuana, cocaine, and heroin), one would expect marijuana to be the least implicated in crime. Although marijuana is the most widely used illicit drug, it shows up less often than cocaine in arrestee urine samples, and in many cities less frequently than opiates.[14] Marijuana is cheap compared to cocaine and heroin, and so there is probably much less economically motivated crime committed by its users. Marijuana dealing is comparatively peaceful, in part because marijuana users make few purchases. (Because they do not binge, marijuana smokers are able to buy in bulk and hold an inventory.) Finally, marijuana does not appear to generate much abuse-related crime. Those high on marijuana are not typically violent, and marijuana is less likely to bring its users into a criminal subculture.

The differences between cocaine and heroin are less clear. Although there are some indications that heroin use is on the rise, active criminals are still much more often using cocaine or crack. Violence is more common in the cocaine business, but this may be change as Colombian organizations enter the heroin trade and as retail dealers are beginning to sell both drugs. Pharmacologically, cocaine is more likely to increase aggression, but if abuse-related crime comes primarily from lifestyle changes, then it is hard to pick a winner.

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[14] See National Institute of Justice, *Drug Use Forecasting 1992 Annual Report* (Washington, D.C.: U.S. Department of Justice, 1993).

Crime and the Demand for Drugs

Elasticity of Demand

The elasticity of demand for illicit drugs is obviously important. If demand is highly inelastic, then enforcement efforts that successfully drive up the price of drugs will have only a moderate impact on consumption, bringing only a slight reduction in those crimes that are attributable to drug abuse. Moreover, higher prices may fuel violent competition among dealers, and because total drug expenditures go up, we would expect to see users committing more crimes for drug money. This does not necessarily mean that crime overall would increase. It is possible that the fall in abuse-related crime would be greater than the combined increases in crime committed by dealers seeking competitive advantage and crime perpetrated by users looking for drug money.

If, on the other hand, the demand for drugs is elastic, effective drug enforcement will have more positive consequences. Higher prices will cause a big drop in consumption, lowering total expenditures on drugs. This should cause a decline in crime connected to abuse and in crime motivated by economic need.

Accurately estimating the elasticity of demand for a legal commodity is very difficult. There are countless factors other than price that influence demand, and distinguishing these—in effect, holding non-price factors constant—is a methodological challenge. Estimating the elasticity of demand for illicit drugs is considerably harder. The usual problems are magnified by the lack of reliable data. If one were estimating the elasticity of demand for gasoline, for instance, one could easily find accurate figures on gasoline prices and consumption. But with illicit drugs, prices are not reliably or consistently measured, and quantity, since it is not an observable variable, must be indirectly estimated.

As a result, most of the research and discussion on the demand for illicit drugs has been speculative rather than empirical. Principally focused on heroin, the bulk of the work dates from the 1960s and 1970s, during or following the last heroin epidemic.[15] At that time, many

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[15] See, e.g., Arthur D. Little, Inc., *Drug Abuse and Law Enforcement* (Washington, DC: Arthur D. Little, 1967); Edwin T. Fujii, "Public Investment in the Rehabilitation of Heroin Addicts," *Social Science Quarterly* 55 (1974):39–51; Roger D. Blair and Ronald J. Vogel, "Heroin Addiction and Urban Crime," *Public Finance Quarterly* 1 (1973):457–66; George F. Brown and Lester P. Silverman, "The Retail Price of Heroin: Estimation and Applications," *Journal of the American Statistical Association* 69 (1974):595–606; James Roumasset and John Hadreas, "Addicts, Fences, and the Market for Stolen Goods," *Public Finance Quarterly* 5 (1977):247–72; Lester P. Silverman and Nancy L. Spruill, "Urban Crime and the Price of Heroin," *Journal of Urban Economics* 4 (1977):80–103; Michael D. White and William A.

analysts assumed that demand for heroin was—inherently—almost perfectly inelastic.[16] Accepting the stereotype of the "dope fiend," they reasoned that the addictive nature of heroin made it virtually impossible for addicts to reduce their consumption.

This view, which is still widely accepted,[17] is almost certainly wrong. Consider, for instance, evidence from the heroin supply reduction of the late 1970s. During this period, at the behest of the United States, the Mexican government stepped up its efforts at poppy eradication. The effect: it is estimated that in 1976, 4 metric tons of Mexican heroin were available for use in the U.S., fully two-thirds of total U.S. supply; two years later, in 1978, the amount had been cut in half.[18]

The consequence was a substantial rise in U.S. heroin prices. Adjusted for inflation, retail heroin prices in the U.S. rose by an average of 37 percent from 1976 to 1979.[19] The apparent effect on consumption was hardly what a highly inelastic demand curve would have predicted. During the same period, emergency room reports linked to heroin overdoses declined by 45

Luksetich, "Heroin: Price Elasticity and Enforcement Strategies," *Economic Inquiry* 21 (1983):557–64.

[16] A 1967 report by analysts at Arthur D. Little, Inc., as well as a paper by Edwin Fujii, note that past estimates of the elasticity of demand range between –0.0067 and –0.09. See Arthur D. Little, Inc., *Drug Abuse*; Edwin T. Fujii, "Public Investment."

[17] Advocates of drug legalization commonly argue that higher prices do little to curtail use, and that the drastically lower prices that would prevail in a legal regime would not significantly increase consumption.

[18] National Narcotics Intelligence Consumers Committee, *The Supply of Illicit Drugs to the United States from Foreign and Domestic Sources in 1980* (Washington, DC: Drug Enforcement Agency, 1981), fig. 9.

[19] Drug Enforcement Administration, *Performance Measurement System* (December 1979), 20, 22.

percent,[20] medical examiner mentions (heroin deaths) by 65 percent,[21] and heroin-related treatment admissions by 33 percent.[22]

There is also evidence that the consumption of cocaine is responsive to price. In a report prepared for the Office of National Drug Control Policy, Raymond Hyatt and William Rhodes analyzed the relationship between the price of cocaine and several indicators of cocaine use: cocaine-related emergency room episodes, cocaine-related deaths reported by medical examiners, and cocaine-positive urine tests among arrestees.[23]

Using a time-series model that controlled for possible city-specific effects, Hyatt and Rhodes found that higher cocaine prices were correlated with fewer emergency room visits, fewer deaths, and a lower percentage of arrestees testing positive for recent cocaine use. Lower cocaine prices were correlated with the opposite effects.[24]

Few studies have actually estimated elasticities of demand for drugs. In fact, only two have been widely regarded as methodologically respectable. Both were conducted at the Center for Naval Analyses during the early and mid-1970s, one by George Brown and Lester Silverman, the other by Silverman and Nancy Spruill.[25] Interestingly for the purposes of this report, both

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[20] National Institute on Drug Abuse, *Trends in Drug Abuse Related Hospital Emergency Room Episodes and Medical Examiner Cases for Selected Drugs: DAWN 1976-1985*, Series H, Number 3; DHHS Publication No. (ADM) 97-1524 (Rockville, MD: Department of Health and Human Services, 1987).

[21] Ibid.

[22] National Institute on Drug Abuse, *Trend Report, Data from the Client Oriented Data Acquisition Process*, Series E, Number 20; Jan. 1976 – Sept. 1979 (Rockville, MD: National Institute on Drug Abuse, 1980); *Annual Summary Report, 1979*, Client Oriented Data Acquisition Process (Rockville, MD: U.S. Department of Health and Human Services, 1981).

[23] Raymond Hyatt and William Rhodes, *Price and Purity of Cocaine: The Relationship to Emergency Room Visits and Deaths, and to Drug Use Among Arrestees*, report prepared for the Office of National Drug Control Policy (Washington, D.C.: Office of National Drug Control Policy, October 1992).

[24] All of these correlations were statistically significant.

[25] Brown and Silverman, "The Retail Price of Heroin,"; Silverman and Spruill, "Urban Crime."

examined the link between heroin prices and crime, and only indirectly looked at elasticity of demand.

Using data from undercover heroin purchases by Bureau of Narcotics and Dangerous Drugs (BNDD) agents, Brown and Silverman constructed a monthly time-series of standardized prices for nine cities for the period July 1970 through June 1972. Data on reported offenses from the FBI Uniform Crime Reports were used as a measure of crime.

For New York City, which had the most BNDD purchases, Brown and Silverman found a positive correlation between the price of heroin and rates of different types of crime. Significantly, the association was generally stronger for the revenue-raising crimes (like robbery, burglary, auto theft) that addicts would commit to finance drug purchases than it was for violent crimes.

Data for the other eight cities did not provide much support for the New York City findings. Some cities (e.g., Houston) revealed a positive relationship between drug prices and crime, while other cities (e.g., Boston) showed a significant negative relationship. In still other cities (Chicago, Detroit, Miami), results were mixed.

The Silverman and Spruill study performed a similar, but more detailed, analysis for Detroit alone, covering the period November 1970 through July 1973. The data showed a strong association between heroin prices and crime, especially for property crimes. Overall, Silverman and Spruill estimated that a 50 percent increase in the price of heroin would result in a 14 percent increase in total property crime.

Several important points are raised by these two studies. One is worth noting here: that the association between drug prices and crime was positive in some cities, negative in others, and unclear in most, underscores that a variety of factors other than drug prices affect crime levels, and that some of these factors may affect the relationship between drug prices and crime.

Particularly important in this regard is the availability of treatment. In a careful study of heroin use in Washington, D.C. in the early 1970s, Robert DuPont and Mark Greene found that heroin use declined in conjunction with a rise in heroin prices and a fall in reported crimes.[26] Their analysis suggests that the crime rate fell because of a decline in heroin addiction, just as the crime rate had increased over the previous decade due to a growth in addiction. A sharp increase in heroin prices, the result of vigorous law enforcement efforts, was instrumental in reducing heroin use, but only, in their view, because treatment was made

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[26] Robert L. DuPont and Mark H. Greene, "The Dynamics of a Heroin Addiction Epidemic," *Science* 181 (1973):716–22.

available. In effect, DuPont and Greene argue that the association between heroin prices and crime is negative when treatment is available, positive when it is not:

When heroin is scarce and treatment is not available, the addict is forced to make more desperate efforts to support his habit, and society pays the price in terms of increasing social disruption. When heroin is scarce and treatment is available, addicts have both a disincentive to heroin abuse and an alternative to an increasingly desperate criminal life-style.[27]

Evidence from Alcohol and Tobacco

In the absence of reliable elasticity estimates for illicit drugs, it might be useful to look at evidence from licit addictive substances. Tobacco and Alcohol are the obvious choices, although, as suggested later on, studies on coffee demand are also instructive.

A number of studies have estimated, or reviewed other estimates of, the elasticity of demand for different types of alcoholic beverages.[28] Given the variety of methodological approaches employed, it is not surprising the estimates vary widely. A few studies conclude that the demand for alcoholic beverages is highly inelastic, but most research suggests that demand is

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[27] Ibid., 722.

[28] K. Clements and E. Selvanathan, "Alcohol Consumption in Applied Demand Analysis: Results from System-Wide Approaches," *Journal of Business* 56 (1987):273-304; Douglas Coate and Michael Grossman, "Effects of Alcoholic Beverage Prices and Legal Drinking Ages on Youth Alcohol Use," *Journal of Law and Economics* 31 (1988):145-172; Phillip Cook and George Tauchen, "The Effects of Liquor Taxes on Heavy Drinking," *Bell Journal of Economics* 13 (1982):379-390; J. Fitzgerald and H. Mulford, "Consequences of Increasing Alcohol Availability: The Iowa Experience Revisited," *British Journal of Addiction* 87 (1992):267-274; Dale Heien and Greg Pompelli, "The Demand for Alcoholic Beverages: Economic and Demographic Effects," *Southern Economic Journal* 55 (1989):759-770; D. Levy and N. Sheflin, "New Evidence on Controlling Alcohol Use through Price," *Journal of Studies on Alcohol* 44 (1983):929-937; D. McCormac and R. Filante, "The Demand for Distilled Spirits: An Empirical Investigation," *Journal of Studies on Alcohol* 45 (1984):176-178; H. A. Mulford, J. Ledolter, and J. L. Fitzgerald, "Alcohol Availability and Consumption: Iowa Sales Data Revisited," *Journal of Studies on Alcohol* 53 (1992):487-94; Stanley I. Ornstein, "Control of Alcohol Consumption through Price Increases," *Journal of Studies on Alcohol* 41 (1980):807-818; Ornstein and Dominique M. Hanssens, "Alcohol Control Laws and the Consumption of Distilled Spirits and Beer," *Journal of Consumer Research* 12 (1983):200-213; E. A. Selvanathan, "Cross-Price Alcohol Consumption Comparison: An Application of the Rotterdam Demand System," *Applied Economics* 23 (1991):1613-1622; Noel Uri, "The Demand for Beverages and Interbeverage Substitution in the United States," *Bulletin of Economic Research* 38 (1986):77-85.

only moderately inelastic,[29] while several analyses claim that demand is elastic, at least for some beverages, among certain groups of users.

Research on the elasticity of demand for cigarettes has also generated a wide range of estimates.[30] As with alcohol, most of the studies indicate moderately inelastic demand.

Overall, studies of alcohol and tobacco consumption indicate that the demand for these commodities is fairly responsive to price, especially considering that alcohol and tobacco are for many users addictive. While this does not prove anything about the demand for illicit drugs, the findings are suggestive. (One might also want to consider the fact that illicit drugs are much more expensive than alcohol and cigarettes, and that other things being equal, demand for a good is more elastic at higher prices, since price changes then have a greater impact on disposable income.)

What research on alcohol and cigarette use also suggests is that the elasticity of demand is not the same for all categories of users (including non-users). Particularly important are the findings from many of the cigarette studies that demand is more elastic among teenagers than adults. The reason this is so important is that individuals do not suddenly become heavy drug users. Rather, they appear to go through a sequence of use, often drawn out over many years, that takes them from licit to illicit drugs, and from lighter to heavier use.[31] If demand is more elastic when users are earlier in their substance use careers, it gives promise to the idea that higher drug prices can help interrupt the progression to heavy drug use.

Elasticity in the Short run vs. Long run

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[29] Elasticity of demand greater than, but close to –1.

[30] For current estimates, see Congressional Budget Office, *Federal Taxation of Tobacco, Alcoholic Beverages and Motor Fuels* (Washington, D.C.: USGPO, 1990), 71; Eugene Lewit, Douglas Coate, and Michael Grossman, "The Effects of Government Regulation on Teenage Smoking," *Journal of Law and Economics* 24 (1981); Eugene Lewit and Douglas Coate, "The Potential for Using Excise Taxes to Reduce Smoking," *Journal of Health Economics* 1 (1982):121–145; Michael Grossman, "Health Benefits of Increases in Alcohol and Cigarette Taxes," Working Paper No. 3082 (Cambridge, Mass.: National Bureau of Economic Research, August 1989); Grossman, "The Demand for Cigarettes," *Journal of Health Economics* 10 (1991):101–103; J. Wasserman, W. Manning, J. Newhouse, and J. Winkler, "The Effect of Excise Taxes and Regulations on Cigarette Smoking," *Journal of Health Economics* 10 (1991):43–64.

[31] See, e.g., Kazuo Yamaguchi and Denise B. Kandel, "Patterns of Drug Use from Adolescence to Young Adulthood: Predictors of Progression," *American Journal of Public Health* 74 (1984):668–672.

If elasticity of demand differs across age groups, it also differs across time. Drug consumption, like the consumption of any commodity, is much more sensitive to price changes in the long run than it is in the short run.[32] In the long run, users have the opportunity to discover and habituate themselves to substitute drugs, enter and complete treatment programs, and so on.

Studies like Brown and Silverman's can only measure the elasticity of demand in the short run. However, for the purposes of drug policy, we are primarily interested in the long run elasticity of demand. The reason why is that more important than the behavior of current users is the size of the user population over time. And the size of the user population is a function of long run initiation and quit rates.

It is quite possible that the demand for illicit drugs is inelastic in the short run and elastic in the long run. In the short run, demand is above all a function of consumption among current addicts. Their demand is unlikely to respond quickly to a price increase; not only is it difficult for them to immediately adjust their habits, but they know that most jumps in illicit drug prices reflect temporary interruptions in supply and are not indicative of a lasting trend. If the higher price persists, thereby maintaining and giving credibility to the economic pressure, it becomes more worthwhile to invest in alternative choices. At the same time, the higher price reduces both initiations and progressions from initiation or moderate use to heavy use. Over time, these changes in initiation and quit rates, even if small, can significantly alter the size of the user population.

If the demand for drugs is more elastic in the long run than in the short run, we should expect time horizon to affect the connection between drug prices and crime. Specifically, it is conceivable that higher drug prices increase crime in the short run (current users commit more offenses to finance their now costlier habits), but decrease crime in the long run, (due to the smaller user population).

Substitutes and Complements

In urinalyses administered in 1992 by Drug Use Forecasting Program (DUF), 29 percent of male arrestees in Manhattan, and 35 percent of female arrestees, tested positive for multiple illicit drugs.[33] This is not surprising; it reflects the well-known fact that many heavy drug users are polydrug users. They often use drugs together, and they often switch among drugs

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[32] Strictly speaking, the demand curve for a commodity, which defines the elasticity of demand at different prices, relates price and consumption in a single time period; it does not describe sequential purchases over time. See A. J. Culyer, "Should Social Policy Concern Itself with Drug Abuse?" *Public Finance Quarterly* 1 (1973):450.

[33] National Institute of Justice, *Drug Use Forecasting 1992*, 18.

depending on which are available and affordable. In other words, illicit drugs are both substitutes and complements.

To the extent that drugs are substitutes—meaning, in economists' terms, that there are positive cross elasticities of demand—drug policy should concern itself with the relative, and not just the absolute, prices of illicit drugs. In particular, we would want to make sure that the prices of most harmful and addictive drugs (heroin and cocaine) are very high vis-à-vis the prices of the less dangerous ones (marijuana).[34]

Empirical evidence of interdrug substitution is hard to come by, but there is some. In research done at the RAND Corporation, John DiNardo found that raising the legal drinking age appears to increase marijuana use.[35] Comparing states that decriminalized marijuana in the 1970s with those that did not, Karyn Model found that marijuana decriminalization tends to increase the frequency of marijuana-related visits to hospital emergency rooms, but to decrease the frequency of emergency-room incidents involving other drugs.[36]

What complicates this analysis is that while marijuana and other drugs may be substitutes, marijuana may also be a "gateway" drug. That is, marijuana use could tend to lead to the use of other, more dangerous substances. (In other words, marijuana and other drugs could be short-term substitutes and long-term complements.) Since marijuana is by far the most widely used illicit drug, even a minor gateway effect would mean that small percentage increases in marijuana use would translate into significant increases in the use of more dangerous drugs.

That drugs can be substitutes and complements further complicates the analysis of drug prices and crime. It implies that one cannot consider the impact of a change in the price of one drug without considering the effects on consumption of other drugs. Without substitutability or complementarity, an increase in the price of marijuana would have a negligible impact on

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[34] Mark H. Moore, "Limiting Supplies of Drugs to Illicit Markets," *Journal of Drug Issues* 9 (1979):293.

[35] John DiNardo, "Are Marijuana and Alcohol Substitutes? The Effect of State Drinking Age Laws on the Marijuana Consumption of High School Seniors," (Santa Monica, Calif.: RAND, 1991).

[36] Karyn Model, "The Effect of Marijuana Decriminalization on Hospital Emergency Room Drug Episodes: 1975–1987," unpublished paper (Cambridge, Mass.: Harvard University Department of Economics, 1991). It should be noted that in a separate study, Eric Single came to a different conclusion about the effects of marijuana decriminalization. Eric W. Single, "Impact of Marijuana Decriminalization: An Update," *Journal of Public Health Policy* 10 (1989).

crime. As noted above, a marijuana habit is not terribly expensive to support, marijuana dealers rarely shoot each other in turf battles, and marijuana users are not typically violent or criminal. However, with cross-price effects, an increase in the price of marijuana could materially influence crime. Users might switch to, or increase their consumption of, cocaine and heroin, which would tend to increase crime. At the same time, reduced marijuana use might mean fewer initiations to cocaine and heroin. The net effect is unclear.

Addiction Asymmetry

Illicit drugs are, by most reasonable standards, addictive.[37] Part of what this means is that it is easier to acquire a habit for the drugs than it is to abandon it. The economist Tibor Scitovsky has termed this phenomenon "addiction asymmetry."[38] Its consequence is a demand curve that is, in eff ct, kinked at the current price such that demand is comparatively inelastic with respect to price increases and comparatively elastic with respect to price declines.

It is worth noting that econometric studies have demonstrated such a phenomenon with coffee demand. Using data on the price and consumption of coffee in Great Britain, Trevor Young

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[37] While heroin is generally acknowledged to be addictive, there is much dispute about cocaine and heroin. For a detailed discussion, see Robert Byck, "Cocaine, Marijuana, and the Meanings of Addiction," in *Dealing with Drugs: Consequences of Government Control*, ed. Ronald Hamowy (Lexington, Mass.: Lexington Books, 1987), 221–45. Byck argues that disagreement results from the acceptance of overly strict pharmacological definitions of the term "addiction," and that by the standards of "ordinary English" the two drugs are addicting. "Marijuana and cocaine can to some degree fulfill the most rigid requirements for addicting drugs. They are rewarding, they will support self-administration, there is demonstrable tolerance and physical dependence. ... Each of these drugs can, in some populations, produce drug dependencies that meet all the commonly accepted attributes of addiction." Ibid., 233–35.

Others, like Ernest van den Haag and Thomas Szasz, argue that "addiction," if it is defined as causing involuntary and irrational behavior (a definition Szasz vehemently objects to), does not really exist; individuals use drugs because they like them. According to Szasz, "Why many people use such drugs ... cannot be because the drugs are 'addictive.' It is the other way around: we call certain drugs 'addictive' because people use them—just as we call ether or gasoline 'flammable' because they are easily ignited." Thomas Szasz, *Ceremonial Chemistry*, rev. ed. (Holmes Beach, Fla.: Learning Publications, 1985), 3; Ernest van den Haag, "How to Get a Handle on the Addiction Problem," *The Wall Street Journal*, 10 May 1983, 30.

[38] Tibor Scitovsky, *The Joyless Economy* (New York: Oxford Univ. Press, 1976); "Asymmetries in Economics," *Scottish Journal of Political Economy* 25 (1978):227–38.

found that demand was only half as sensitive to price increases as it was to price decreases.[39] For what it is worth, tobacco companies appear aware that changing dosage levels can increase tolerance. Reportedly, cigarette manufacturers deliberately vary the nicotine content of different packaging versions (e.g., box vs. soft pack) of the same brand.[40]

What addiction asymmetry implies is that fluctuations in the price of drugs will bring about an increase in use, and in turn crime. When prices fall, new users acquire the consumption habit, and existing users accustom themselves to higher tolerance. When prices rise, the increase is only partly reversed.

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[39] Trevor Young, "Addiction Asymmetry and the Demand for Coffee," *Scottish Journal of Political Economy* 29 (1982):89–98.

[40] David Segal, "The Filtered Truth," *Washington Monthly* (September 1993):22–26.

Policy Implications

James Q. Wilson has suggested that "it is not clear that enforcing laws against drug use would reduce crime. On the contrary, crime may be caused by such enforcement because it keeps drug prices higher than they would otherwise be."[41] Wilson is correct: we simply do not know whether our current drug policy increases or decreases crime. By driving up prices, drug enforcement curtails drug consumption and the crime that is attributable to drug abuse. But higher prices may also increase crime committed by users to obtain drug money and violence among dealers. The net effect is uncertain. Moreover, there is no reason to assume that there is a consistent relationship between drug prices and crime. More likely, the connection is context-specific, different for different drugs, cities, time periods, and price levels.

Despite this uncertainty, our drug policy must still decide whether to pursue a strategy of high or low prices. Mark Moore has pointed out that ideally we would like to have two completely separate drug markets.[42] In one market, which would only be open to confirmed addicts, drugs would be sold at low prices. This would reduce the need for addicts to commit crimes. In the second market, drugs would be expensive with a high "search time," thus deterring the initiation of new users. In practice, of course, we can only have one market. Our current policy has chosen high prices, a decision which Wilson has eloquently defended. "We have chosen to have a single, high-price market. We have done so because we are more interested in preventing the recruitment of new addicts than in improving the lives of confirmed ones. It is a difficult choice, but I think the right one."[43]

However, the difficulty of the choice suggests that the goal of high prices, though important, should not be the primary focus of drug policy. Instead, it would seem that drug policy ought to emphasize strategies that reduce drug use while keeping potentially damaging side effects to a minimum. Several areas of focus appear to stand out.

Prevention

Logically, only two things can cause a decline in drug use: a reduction in supply (causing an increase in prices) or a reduction in demand. If drug consumption falls as the result of a supply reduction—that is, a price increase—the benefits of reduced drug use will be partially

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[41] James Q. Wilson, "Drugs and Crime," in *Drugs and Crime*, ed. Michael Tonry and James Q. Wilson (Chicago: Univ. of Chicago Press, 1990), 521.

[42] Cited in James Q. Wilson, *Thinking About Crime*, rev. ed. (New York: Vintage Books, 1985), 220.

[43] Ibid.

or perhaps completely offset by the negative side effects stemming from higher prices. In contrast, if drug use falls as the product of a reduction in demand, there is no trade-off.

Thus, from a policy perspective, successful prevention programs are a clear winner. Unfortunately, few prevention programs have demonstrated that they can consistently reduce the number of their subjects who use drugs. And the positive results that have accompanied some programs have often proved difficult to replicate in other settings.[44]

Despite these difficulties, prevention programs deserve continued research and evaluation. Their focus should also be broadened to include prevention of drug dealing. On average, it is much more valuable to convince a youth not to sell drugs than to convince him not to try them. Many youths recover from drug use and go on to lead productive lives. Fewer, especially in inner-city neighborhoods, do well when they have sold drugs.

Treatment of Drug-Involved Offenders

Like prevention, treatment offers the potential to reduce drug consumption without negative side effects. And if targeted at drug-involved offenders, treatment can significantly reduce crime. The most active criminal offenders are disproportionately drug abusers, and these individuals commit considerably fewer crimes during periods of abstinence or reduced use. Moreover, many drug-involved offenders sell drugs in addition to using them, and some may exit the drug trade if they gain control over their own habits.

Evaluation studies indicate that all the major drug treatment modalities—therapeutic communities, methadone maintenance, outpatient drug-free programs—are successful in reducing criminal activity, particularly during the period of treatment. Research also shows that those who are coerced into treatment by the criminal justice system fare as well as, if not better than, those who enter programs voluntarily.[45] This latter finding is important, since many drug-involved offenders will only enter treatment if forced to; simple availability is often not a sufficient enticement.

Interestingly, despite having a captive clientele, most prison-based drug treatment programs have not been shown to reduce recidivism rates. However, a small number of prison

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[44] Abt Associates, *Substance Abuse Prevention: What Works, and Why*, prepared for The Office of National Drug Control Policy (Washington, D.C.: Office of National Drug Control Policy, 1993).

[45] M. Douglas Anglin and Yih-Ing Hser, "Treatment of Drug Abuse," in *Drugs and Crime*, eds. Michael Tonry and James Q. Wilson (Chicago: Univ. of Chicago Press, 1990), 393-460; Dean R. Gerstein and Henrick J. Harwood, eds., *Treating Drug Problems, Vol. I* (Washington, D.C.: National Academy Press, 1990).

therapeutic communities (TCs), with strong linkages to community based treatment programs—such as the Stay'n Out program in New York—appear to work.[46]

Together, these findings argue for more prison-based TCs (modeled on the better programs), and an expansion in the legally coerced treatment of criminal justice system identified users. (The former is actually relatively inexpensive, since housing, which is a major cost of TCs, is already paid for. Typically, an in-prison TC adds only a few thousand dollars to the annual cost of prison alone.)

Disrupting Retail Drug Markets

A number of years ago, Mark Moore pointed out that the demand for a drug is not simply a function of its cash price. To buy drugs, users must not only spend time looking for a willing seller, but risk being arrested, ripped off, and poisoned by adulterated drugs.[47] These nonmonetary disincentives, which Moore lumped together as "search time," may be as much of a factor in the decision to buy drugs as the dollar price.

In principle, if enforcement could increase the search time for a drug without increasing the dollar price, we would get the benefits of a price rise without actually having one. In practice, enforcement cannot choose its effects so neatly and cleanly, but some types of enforcement do a better job of increasing search times than others. The important distinction is between high-level and street-level enforcement. High-level enforcement (including interdiction and source country eradication efforts) boosts the dollar price of drugs, but has no direct impact on search time. In contrast, street-level enforcement can affect search time. By threatening retail sellers, street-level enforcement can shrink their numbers, restrict their locations, and generally make them more cautious. All of this should increase the nonmoney price of drugs.

A more crucial advantage of street-level enforcement is that retail drug markets are responsible for much of the violence and declining quality of life in inner-city communities. By scaling back the retail drug trade, and in turn the violence that goes with it, effective street-level enforcement might reclaim for law-abiding citizens large areas of their neighborhoods.

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[46] Gerstein and Harwood, *Treating Drug Problems*.

[47] Mark H. Moore, "Policies to Achieve Discrimination on the Effective Price of Heroin," *American Economic Review* 63 (1973):270–77.

In practice, the results of intensive retail drug enforcement efforts are mixed. Lynn, Massachusetts and Tampa, Florida are success stories, but failures are far greater in number.[48] Still, the victories have provided not only hope, but some important lessons about the components of a successful strategy.

What appears to be key is a shift away from the traditional approach of simply seizing drugs and arresting dealers towards a comprehensive and integrated strategy of market disruption. The basic game plan of such a disruption scheme is to coordinate active community involvement with the resources of multiple government agencies in order to shower the drug market with a barrage of measures, which together make it so difficult for the market to operate that it literally collapses.

Tampa's much heralded QUAD program was something of a model operation. With targeted enforcement, the police pressured sellers to continually change their venues, and scared away buyers by seizing their cars in "reverse stings" where the police posed as dealers. Citizen information was used to identify and seize drug stashes. With the cooperation of other city authorities, abandoned houses were razed, bars and small stores implicated in drug dealing were closed down, and local ordinances were employed to clear crowds from known trafficking sites. Where six months of conventional enforcement had failed to curtail street trafficking, six months of the QUAD program virtually eliminated public drug dealing, bringing considerable reductions in violence, disorder, and fear

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[48] Mark A. R. Kleiman, Christopher E. Putala, Rebecca M. Young, and David P. Cavanagh, *Heroin Crackdowns in Two Massachusetts Cities*, prepared for the office of the district attorney for the eastern district, Commonwealth of Massachusetts, the Honorable Kevin M. Burke, under National Institute of Justice Grant no. 85-JJ-CX-0027 (Cambridge, Mass.: BOTEC Analysis Corporation, 1988); David M. Kennedy, "Closing the Market: Controlling the Drug Trade in Tampa, Florida," National Institute of Justice Program Focus, NCJ 139963 (Washington, D.C.: U.S. Department of Justice, April 1993).

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