

Evidence-based Drug Crime Policy: Moving Beyond the Moral/Medical Dichotomy to a Multi-level Model of Addiction

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Abstract

The moral and medical models, the dominant paradigms of drug addiction, disagree on the question of responsibility. The moral model views drug addiction as an autonomous person's choice. The medical model views it as the behavior of a 'hijacked' brain. Amid efforts to decarcerate American prisons, the relative merits of these two models are being weighed. Which raises the question of whether policy-makers must be resigned to choosing one side of the moral/medical dichotomy. In this commentary, the moral and medical models will be critically evaluated, and an alternative 3rd way, a multi-level model, suggested.

Keywords: Drug crime policy; Moral; Medical; Multi-level model; Addiction

Introduction

The moral and medical models, the dominant paradigms of drug addiction, disagree on the question of responsibility. The moral model views drug addiction as an autonomous person's choice. The medical model views it as the behavior of a 'hijacked' brain. During the last several decades, drug policy in the United States has been premised on the moral model of addiction: drug-involved offenders are assumed to exercise choice in committing a crime, are viewed as blameworthy, and punishment is justified for primarily retributive reasons. However, recently the brain-based medical model of addiction has gained ascendance, as evidenced by the proliferation of Drug Courts which aim to treat rather than punish. According to this understanding, a drug addict's behavior is not freely chosen but is the result of biological processes. Thus, blaming a drug addict for his or her conduct, or imposing punishment without addressing its cause, would be misplaced.

Amid the chorus of calls to reduce incarceration levels, drug crime policies have come in for heightened scrutiny. Critics of punitive drug policies point to research showing them to be not just counterproductive in terms of recidivism but cost-ineffective [1]. As reformers consider ways to decarcerate, the relative merits of the two models are being weighed. Which raises the question of whether policy-makers must be resigned to choosing one side of the moral/medical dichotomy? Or are there other evidence-based options available? In this paper I will highlight the important features of the moral and medical models of drug addiction, with emphasis on empirical evidence of their limitations. That these two models are based on an understanding of just one level of the addiction problem—the sociological in the case of the moral model and the biological in the case of the medical model—will be shown to be a common weakness. I will then explore some potential elements of a broader multi-level model of addiction which integrates evidence from three levels of understanding: biological, psychological and sociological.

Next, I will turn to legal questions concerning addiction treatment in the criminal justice setting. I will argue that conceptualizing drug addiction as a problem with levers of change on three levels can provide a useful legal criterion for criminal justice interventions. By analogy, I will show that the liberty interest at the center of the debate over informed consent and the 'right to refuse' treatment corresponds to these three levels, with biological interventions posing the least restrictive

threat to liberty, psychological interventions posing a moderate threat, and sociological interventions posing the greatest threat. In this way, conventional views about compelled drug addiction treatment within the criminal justice system are turned on their head: biological interventions like methadone maintenance treatment present the easiest case to justify, require the least due process protections, and would be the most readily employed; sociological interventions such as incarceration present the hardest case to justify, require the greatest due process protections, and would be employed only as a last resort. Although this seems to have it backwards, a similar example from public health—the spectrum of interventions employed to address epidemics, from vaccines to quarantine—will show that the logic applied here is familiar and firmly established in law.

Drug-crime Link

Substance abuse in the United States is pervasive and problematic. Roughly twenty-four million Americans, or about 10% of the population, used an illicit drug or abused a psychotherapeutic medication in the past month [2]. In 2012, an estimated twenty-three million Americans needed treatment for a problem related to drugs or alcohol. Every day, roughly 100 Americans are likely to die from a drug related overdose. And the economic costs of substance abuse to the nation are staggering: overall, substance abuse exacts more than 700 billion annually in costs.

That substance abuse is a significant public health problem is clear. But the nexus between drug addiction and criminal justice is less obvious. The criminal justice system's connection to drug addiction can be divided into three categories. First, the possession of an illicit drug, by definition, is a crime. In this respect, it's worth noting that this was not always so. As recent as one hundred years ago, for instance, cocaine

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was lawfully distributed and readily available. Any problem associated with the use or abuse of such drugs was managed not as a crime but as a public health problem. Interestingly, it has been suggested that the original motivation away from this approach towards criminalization was tinged with racial animus [3]. As we shall see, race appears to still play a significant role in the enforcement of contemporaneous drug policies.

Second, substance abuse is posited to be causally related to violent crime. Research shows that the association between substance abuse and violent crime is robust. For example, a systematic meta-analysis of twenty-five years of research showed that the odds of offending were 3 to 4-fold greater for drug users compared to non-drug users [4]. Further, more than 20% of inmates for violent crime reported that they were under the influence of alcohol when acting violently [5]. Research on state and federal prisoners showed that half of all prisoners reported alcohol or drug use at the time of their first offense [6]. That said, the association does not hold across all substance of abuse types. For example, the relationship between marijuana and violent crime is primarily negative and relatively strong. Also, the relationship between heroin and violent crime is weak and inconsistent.

Third, substance abuse is associated with drug-seeking property crime. Research shows that 19% of state prisoners and 16% of federal prisoners reported that they committed their first offense to get money for drugs. The relationship between substance abuse and property crime tracks those for violent crime: the link between cocaine and property crime, for instance, is mostly positive; the relationship between marijuana and property crime, by contrast, is mostly negative; and the relationship between heroin use and property is inconsistent [7].

Moral Model

As we have seen, the problems of substance abuse and crime are closely intertwined. What has been the criminal justice system's response to this multifaceted problem? After all, the principal function of criminal justice is to dispense punishment, so it should come as little surprise that it has largely disregarded the public health elements of the problem in favor of punishment. Starting in the 1980s, at the national and state level drug policy-makers waged a muscular "war" on drugs with the aim of solving the problem through punishment. The changes to criminal justice policy during this time were dramatic. As Jensen and Gerber observed, the 'war on drugs' ushered in "some of the most extensive changes in criminal justice policy and the operations of the justice system in the United States since the due process revolution of the 1960s [8]."

Predictably, the most significant consequence of the 'war on drugs' was an explosion in imprisonment. Between 1980 and 2001, the number of persons in state and federal prisons for drug offenses increased by approximately 1,300% [9]. This increase in drug-related incarceration has been a chief driver of the overall trend in the federal and state prison population, which exploded from roughly 500,000 in 1980 to greater than 2 million. Moreover, the impact has not been evenly distributed. Although the prevalence of drug use is only slightly higher among blacks than whites for some illicit drugs and slightly lower for others, drug-related arrests have been three to four times higher than those for whites [10]. Just in the late 1980s, the rates were six times higher for blacks than for whites [11].

What's more, incarcerating drug-involved offenders has merely

relocated part of the public health crisis to the prison system. Research shows that an estimated one-half of all prisoners -including some sentenced for crimes other than drug offenses-meet the criteria for diagnosis of drug abuse or dependence [12]. Even so, less than 20% of inmates with substance abuse problems receive formal treatment.

At least three major problems of incarceration without treatment have been identified. First, while in prison, roughly half of all inmates report continued use of illicit drugs [13]. Second, upon release from prison, evidence suggests drug involved offenders are at heightened risk of mortality. For example, in a study of mortality rates in the first two weeks after release from Washington State prison, researchers found that the risk of death among former inmates was thirteen times greater than that of non-incarcerated state residents [14]. One of the leading causes of death among former inmates in the study was overdose: posited to result from the loss of physiological tolerance to a drug while in prison. Third, in a study of craving after drug discontinuation, researchers revealed an 'incubation period' of drug craving in response to drug cues; that is, craving after withdrawal incubates, growing stronger over time [15]. This suggests that drug craving may increase progressively during periods of abstinence. Drug addiction researchers have suggested that this may explain why many drug-addicted individuals rapidly return to drug use following long periods of abstinence during incarceration. Overall, this body of evidence-based research on the effect of incarceration without treatment suggests three likely outcomes for drug-involved inmates: 1) continued drug use; 2) abstinence leading to increased risk of mortality upon release; 3) abstinence leading to increased risk of relapse upon release.

Medical Model

The medical model of addiction is premised on a growing understanding of the neurobiology of the addicted brain. The following are the basic axioms of the medical model: drug addiction is a disease of the brain; addiction "hijacks" control over the brain [16]; addiction is a chronic but treatable condition; relapse is frequent but with failure rates comparable to those who fail to adhere to treatment for other medical conditions [17]; the perception that addiction is a moral failing is mistaken; that simply incarcerating someone does not constitute effective treatment; that without medical treatment individuals are prone to relapse to drug use and criminal behavior.

Simply stated, the medical model of addiction proposes a group of four brain functions involved in addiction: 1) reward, 2) motivation/drive, 3) memory, and 4) control [18]. Converging lines of evidence suggest that the group normally works like a well-managed government that cooperates, learns, and changes together; and has various built-in checks and balances to enhance functioning. Each part of the group has its own distinct and important role. Reward is involved in assigning values to positive and negative stimuli. Motivation or drive is involved in incentive motivation. Memory is involved in general learning via association and conditioning. Control, located in the prefrontal cortex, works like the brain's diplomat, resolving disputes among the various members. In individuals with drug addiction, the balance among the group is lost: the enhanced value of the drug in the reward, motivation/drive, and memory areas proves too high for the prefrontal cortex to inhibit. As a result, a deleterious feedback loop is set into motion, with progressive drug consumption leading to ever more enhanced value of the drug and ever weaker inhibitory control.

This neuroanatomical understanding of addiction is supported by research on the neurochemistry of the addicted brain. Studies of the neurochemistry of addiction focus on the brain's dopamine

system, for drugs of abuse are posited to exert most of their influence via dopamine reinforcement. The reinforcing effects of drugs via the dopamine system are potent: even more so than natural reinforcers like sex and food. Imaging studies have revealed that acute and chronic drug consumption have different effects on proteins involved in the dopamine synaptic transmission: in the short run, drug administration increases dopamine transmission; in the long run, drug administration decreases dopamine transmission. Fmri studies of the effects of various drugs, including cocaine, methamphetamine, alcohol, and heroin, show a marked reduction in dopamine 2 receptors. This is the result of a process known as receptor down-regulation, whereby a surfeit of transmitter molecules floods a receptor; and in response the number of receptors decreases. This process is one of the explanations of drug tolerance: as the number of receptors decreases, the post-synaptic neuron becomes de-sensitized; as a result, increased amounts of a drug are required to achieve the same effect. This is further supported by animal studies showing that an *increase* in dopamine 2 receptors in the nucleus accumbens significantly decreases drug consumption.

The brain-based medical model, to be sure, has contributed a great deal to the understanding of the problem of addiction. However, training focus exclusively on the brain has perhaps come at the expense of a more powerful explanatory model that encompasses a wider range of considerations.

Drug addiction researchers exploring outside of the brain have identified a number of explanatory factors of drug addiction. Genetic researchers, for example, estimate that 40-60% of the vulnerability to addiction can be attributed to genetic factors. These estimates include the percentage of variance attributed to genes as well as gene-environment interactions. Sociological research has also revealed a number of environmental factors known to contribute to addiction: the availability of drugs tends to increase rates of addiction; low socio-economic class has been found to be strongly associated with illicit drug use; poor parental support has been linked to drug use. Moreover, research suggests that the effect of such social factors on addiction may be mediated by a common pathway: stress. For example, research on non-human primates shows that social context can have profound stress-induced effects on brain dopaminergic function; specifically, dominant high status monkeys were found to be resistant to cocaine's reinforcing effects, whereas subordinate low status monkeys were shown to be susceptible to cocaine's reinforcing effects [19].

The insight that environmental factors may contribute to addictive behavior has also been used to cast doubt on some of the foundational support of the brain-based medical model of addiction. Some of the earliest evidence to support the proposition that addiction is a brain-based disorder comes from animal studies in which rats are conditioned to carry out novel behavior like pressing a lever. By using, for example, direct electrical brain stimulation to condition rats, such studies have elucidated the reward mechanism pathway of positive reinforcement [20]. Similar studies have also been conducted to explore the reinforcing properties of drugs. For example, rats and monkeys have been shown to self-administer stimulants—to the point of severe weight loss and even death [21]. The lesson that has been drawn from these studies is that a drug's effect on the reward mechanism pathway of the brain is responsible for the self-destructive behavior exhibited by drug addicts.

However, serious questions have been raised about the construct validity of this line of evidence. The criticism runs as follows. The rats in the studies were tested in an abnormal environment, a so-called skinner box, which is isolated, stimulus impoverished, and highly

stressful. It is these environmental features that can account for the unusual propensity the rats exhibited to self-administer drugs. On the basis of this critique, the research question became whether rats would show the same propensity for drugs in stimulus rich environments. In his now famous "rat park" study, Bruce Alexander found that rats in a stimulus rich environment exhibited nearly no signs of addiction and used just one quarter of the drug used by rats in the skinner box [22].

But is this finding generalizable to humans? Of course, replicating the "rat park" study in humans would be neither practical nor ethical. However, quasi-experimental evidence from a study of returning Vietnam War veterans does suggest its validity. During the war, drug use by service members had reached epidemic proportions: roughly 20% of soldiers had returned from war addicted to heroin [23]. Was their addiction-like the rats in the Skinner box-attributable to the highly stressful environment of war? That 95% of the same soldiers recovered from addiction, without treatment, strongly suggests that the change in environment had a strong role in their recovery.

So far, we've seen evidence that drug addiction is attributable to biological as well as sociological factors. Does this mean that drug addicts are either slaves to biology or slaves to their environment or some combination of the two? Evidence of the ongoing capacity for choice in drug-addicted individuals complicates the picture of drug addiction even further. In a classic study of the everyday lives of drug addicts, criminologists Preble and Casey found that, for the most part, drug addicts do not act like slaves to their addiction at all [24]. In fact, they found that drug addicts tend to spend most of their day not getting high but either working or "hustling." The notion that drug addicts are irrational slaves to their addiction is also belied by a number of controlled behavioral studies. For instance, researchers tested whether giving individuals addicted to crack cocaine a choice from a variety of alternative reinforcers that included crack, cash vouchers, or merchandise vouchers, would decrease crack self-administration. Researchers found that the addicts faced with a choice from alternatives did not lack the capacity to turn down crack in favor of other positive reinforcers.

Multi-level Model

As we have seen, a number of factors have been shown to have a role in drug addiction: from the biological, to psychological, to sociological. One question that may arise is whether there exists a way to organize and understand the relationship between these various dimensions of drug addiction. Michael Gazzaniga, a pioneer of research on split-brain patients, provides a useful way of thinking about the problem. Gazzaniga begins by reasoning that there are three important levels of understanding problems related to the brain: 1) the brain 2) the mind and 3) society. He then posits bidirectional relationships across the three, whereby brains constrain minds and minds constrain social processes; and, conversely, social processes constrain minds and minds constrain brains. Considered in this light, the above-stated limitations of the "moral" model, a purely social solution, and the medical model, a purely brain-based solution, would be partial at best in that they ignore other important levels of the problem and the interactions among them. Optimally, a solution to the problem of addiction would be multi-level: addressing the problem at the level of the brain, mind and society.

The following is a sketch of some possible elements of a multi-level approach. On the biological level, a number of promising interventions are available. The most well-established of these is medically assisted treatment (MAT). This approach seeks to re-establish the balance of power in the brain by limiting the effect of drugs. For the treatment

of heroin addiction, for example, several FDA approved interventions exist. Methadone, a partial agonist, binds to the opioid receptor site and activates it to a lesser degree than heroin or potent prescription pain medications. The benefits of this are three-fold: feelings of euphoria are not elicited; withdrawal symptoms are blunted by the presence of the agonist on the receptor site; and the risk of abuse is low. Naltrexone, an antagonist, works by occupying the opioid receptor site and thereby blocking drugs' euphoric effects. Immunotherapies are another promising approach. These anti-drug vaccines work by harnessing the body's immune system to block drugs from crossing the blood-brain barrier and reaching the brain. The cocaine vaccine, for instance, attaches cocaine to a large protein from the cholera bacterium that then triggers an immune response against the bacteria and the drug. A number of promising interventions are also available on the level of the mind. Of these, cognitive behavioral therapy (CBT) models are the most extensively evaluated and robustly supported [25]. This approach targets cognitive and affective triggers of substance abuse. This often includes: identifying intra- and inter-personal triggers for substance abuse; coping-skills training; drug refusal skills training; promoting non-drug use alternatives. A number of promising interventions are also available on the level of society. Contingency management (CM) has proved effective for the treatment of substance use disorders [26]. Contingency management treats drug use and addiction as a form of operant conditioning by which behavior is shaped by its reinforcing consequences. Thus, substance abuse is assumed to be amenable to influence by manipulation of potential contextual reinforcers. Finally, criminal punishment presents another potential social response. Notwithstanding the above-stated caveats, as well as the limited empirical support, the threat of punishment may prove to be an indispensable tool if used in conjunction with other interventions.

Addiction, Liberty and the Law

Broadly speaking, therapeutic criminal justice interventions aimed at drug-addicted offenders pit citizens' liberty interests against the state's interest in promoting health and safety. Citizens' liberty interests are embodied in the 5th and 14th amendments' due process clauses. And the principal vehicle for protecting liberty interests in this domain is the legal right to self-determination, which encompasses the doctrines of informed consent and the related right to refuse treatment. The informed consent doctrine provides that a physician may not perform any medical procedure on a competent adult in a non-emergency situation without explaining the risks and benefits. The doctrine can be traced from the Nuremberg codes to contemporary international ethics codes, federal regulations, common law of torts, and state statutes. The general standard for giving 'informed' consent includes two inquiries: is the consenting person competent; and if so, did he or she give consent knowingly and voluntarily. Following the same logic, those who meet these standards are also afforded the right to refuse treatment [27]. With regard to addicted persons in the criminal justice setting, the major points of debate concern the degree to which addicts are competent-some contend that they are per se incompetent [28] - and the extent to which consent can be regarded as voluntary in a coercive prison setting.

But determining that a person has a liberty interest under the due process clause does not end the inquiry. As the Supreme Court has ruled, whether a person's constitutional right to self-determination has been violated must be determined by balancing his liberty interests against the relevant state interests [27]. Broadly speaking, the state's interests stem from the 10th amendment's reservation clause of the constitution, under which powers not specifically conferred by the constitution to the federal government are preserved to the states; combined with a state's police power, under which the enclave of power reserved to the

states is loosely defined to include acts that promote the health, safety, morals, and general well-being of its citizens.

Thus, the constitutionality of a compelled treatment for addiction turns on whether the state's interest outweighs an individual's liberty interest. In *Sell v. United States*, the Supreme Court further clarified the standard for deciding whether a state's interest is sufficient to tip the scales in favor of intervention: a state's interest must be compelling, forced treatment must significantly further that interest, and there must be no less intrusive treatment available. However, beyond this the courts have provided scant guidance on the *types* of treatment likely to pass constitutional muster.

One potential way to approach the problem is to consider the concept of liberty in terms of Gazzaniga's proposed three dimensions of analysis. To recall, Gazzaniga suggests that problems that relate to the brain can be thought of on three levels: brain, mind, and society. Applying this approach to, for instance, the concept of responsibility, Gazzaniga argues:

"The place to look for the answer to what responsibility is not in the brain, but it's in the social group. One way to kind of come at it is that if you're the only person in the world, the idea of personal responsibility doesn't mean much. You're responsible to others, and so, when we move into the social group, what we're doing is we're now having a relationship with other people and we have rules and laws and what-have-you. And so, that's where we look for responsibility, and people can follow rules in 99.99% of cases, so we look for responsibility there, we don't look for it in the brain [29]."

Similarly, the place to look for the answer to what liberty is, not in the brain but rather in the social group. It follows that the interventions with the greatest potential to deprive liberty occur at the social level; for example, incarceration, which leaves the brain and mind free, but cuts people off from the social world; and the least potential to deprive liberty at the biological level; for example, a pharmacological intervention, which could be administered without any significant restraints to social freedom. In weighing liberty against states' interest, this insight could supply a rough criterion assigning weight on liberty's side of the balance. Moreover, this approach enjoys legal support in the analogous context of public health law concerning epidemics.

Under public health law, quarantine-a parallel to prison-is generally authorized as a last resort only *after* less restrictive options such as vaccinations either fail or are refused [30]. This reflects the intuition that biological based interventions like vaccines pose less of a threat to liberty than social interventions like quarantine. In the same way, the law should take into the level of a drug addiction intervention-biological, psychological or social-in determining its potential to deprive liberty; and authorize social interventions like incarceration only as a last resort.

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