

RETHINKING ADDICTION: DRUGS, DETERRENCE, AND THE NEUROSCIENCE REVOLUTION©

LINDA C. FENTIMAN*

INTRODUCTION	233
I. A LOOK AT “FETAL PROTECTION” PROSECUTIONS	237
II. THE NATURE OF DRUG DEPENDENCE AND ADDICTION	241
A. Neuroscience Research.....	241
B. Genetic and Environmental Vulnerability	244
C. Does Addiction Involve Choice?.....	246
D. Gender Matters in Drug Dependence and Addiction.....	249
1. Gender Implications for Treatment.....	252
E. Pregnant Drug Users and Addicts.....	255
1. Treatment for Pregnant Drug Users.....	258
III. DETERRENCE.....	259
IV. IMPLICATIONS OF ADDICTION AND DETERRENCE RESEARCH FOR CHANGING THE BEHAVIOR OF PREGNANT DRUG USERS	265
A. The Lessons of Deterrence Research.....	265
B. Lessons of Addiction Research.....	268
V. RECOMMENDATIONS AND CONCLUSIONS: MORE CARROTS, FEWER STICKS.....	269

INTRODUCTION

Today, an estimated ten percent of Americans struggle with addictive drugs.¹ Media attention focuses primarily on illegal drugs, but legal drug use takes a much larger social and economic toll on Americans.² For several decades, a highly visible public debate about the nature

© Copyright 2010 by Linda C. Fentiman.

* Linda C. Fentiman is a Professor at Pace University School of Law, where she specializes in criminal law, health law, and mental disability law. Professor Fentiman received her B.S. from Cornell University, her J.D. from S.U.N.Y. Buffalo Law School, and her LL.M. from Harvard Law School. She gratefully acknowledges the support for this research provided by Dean Michelle Simon of Pace University Law School and Nancy Northup and Diana Hortsch of the Center for Reproductive Rights, where Professor Fentiman was a Visiting Scholar in 2010. Professor Fentiman appreciates the insightful comments of Adele Bernhard, Bridget Crawford, Deborah Denno, Joshua Dressler, Diana Hortsch, Peter Jacobson, Audrey Rogers, and Janet Steverson, as well as the research assistance provided by Heather Deichler, Lynn Donohue, Amanda Evanson, Maria Finocchio, and Corinne Ortega, Pace Law School students and graduates.

¹ Bob Curley, *First Addiction Medicine Specialists Named*, JOIN TOGETHER (May 15, 2009), <http://www.jointogether.org/news/features/2009/first-addiction-medicine.html>.

² Thus, I use the term “drugs” to include alcohol, tobacco, and other legal and illegal substances. More than fifty percent of Americans currently use alcohol, with 23.3% of Americans aged twelve and over engaging in binge drinking and 6.9% of Americans aged twelve and over engaging in heavy drinking within one month of a Department of Health and Human Services national survey. DEP’T OF HEALTH & HUMAN SERV., SUBSTANCE ABUSE & MENTAL

of addiction and America's drug problem has taken place, with participants staking out diametrically opposed positions. Most physicians and addiction specialists assert that addiction is a "chronic, relapsing brain disease,"³ and that drug addicts are essentially choiceless victims of their illness.⁴ Under this view, drug addiction is the domain of medical professionals, and treatment is the most suitable response. In contrast, many law enforcement officers and public officials argue that drug use is solely a matter for the criminal justice system, and that punishment, not treatment, is the only solution.⁵ This group contends not only that addicts and other drug users are responsible moral agents, who have chosen freely to offend and therefore must be punished, but also that the threat of criminal sanctions can deter their drug use.

Recently, a more nuanced view has emerged. Some writers suggest that there is a serious flaw in the current bi-polar approach to the problems of drug abuse, in which enormous bureaucracies use significant public spending to support two fundamentally incompatible solutions.⁶ Some claim that the solution is to place therapeutic services *within* the criminal justice system, such as with drug courts.⁷ While in some ways the drug court "movement" resonates

HEALTH SERV. ADMIN. OFFICE OF APPLIED STUDIES, RESULTS FROM THE 2008 NATIONAL SURVEY ON DRUG USE AND HEALTH: NATIONAL FINDINGS 31-32 (2009) [hereinafter 2008 NATIONAL SURVEY ON DRUG USE], available at <http://oas.samsha.gov>. Alcohol use carries a heavy price tag. It is estimated to cause more than 85,000 American deaths annually, or 3.5% of all deaths. Ali H. Mokdad et al., *Actual Causes of Death in the United States, 2000*, 291 JAMA 1238, 1240-41 (2004). Its other annual social costs, including lost productivity and social harms, are estimated to be \$180 billion. GEORGE F. KOOB & MICHEL LE MOAL, *NEUROBIOLOGY OF ADDICTION 2* (2006). Tobacco use accounts for approximately 435,000 American deaths each year, primarily from cancer, lung diseases, and cardiovascular injury. Mokdad et al., *supra*, at 1239. Second-hand smoke is said to cause an additional 35,000 deaths annually, and maternal tobacco use is said to cause 1,000 infant deaths annually. *Id.* More than twenty-eight percent of Americans use tobacco products—primarily cigarettes, but also cigars, smokeless tobacco, and pipes. 2008 NATIONAL SURVEY ON DRUG USE, *supra*, at 4. Almost fifteen percent of high school students admit to using an illegal drug within a one-month period, while twenty-eight percent admit to alcohol use within a one-month period. LLOYD D. JOHNSTON ET AL., NAT'L INST. ON DRUG ABUSE, *MONITORING THE FUTURE: NATIONAL RESULTS ON ADOLESCENT DRUG USE: OVERVIEW OF KEY FINDINGS, 2009* 48 (NIH Publication No. 09-7401) (2010). Among all Americans over age twelve, eight percent are users of illegal drugs, while less than three percent are dependent on these drugs. 2008 NATIONAL SURVEY ON DRUG USE, *supra*, at 15, 73-74. Among high school students and older Americans, marijuana is the illegal drug of choice. JOHNSTON ET AL., *supra*, at 48; 2008 NATIONAL SURVEY ON DRUG USE, *supra*, at 16. Male and female African-Americans have lower rates of cigarette and alcohol use, but have a higher (10.1% v. 8.2%) rate of illegal drug use. 2008 NATIONAL SURVEY ON DRUG USE, *supra*, at 25, 34, 48. However, this is not true for young African-Americans, whose rates for drug use are lower than their white counterparts. Melissa Weddle & Patricia K. Kokotailo, *Epidemiology of Adolescent Substance Abuse*, in *PRINCIPLES OF ADDICTION MEDICINE* 1371 (Richard K. Ries et al. eds., 2009).

³ GENE M. HEYMAN, *ADDICTION: A DISORDER OF CHOICE* vii (2009); see also KOOB & LE MOAL, *supra* note 2, at 2 (defining drug addiction as a "chronically relapsing disorder").

⁴ Most experts, as well as lay people, include within the concept of addiction the concept of compulsive behavior that persists in spite of adverse consequences. HEYMAN, *supra* note 3, at vii (describing prevailing attitudes but disagreeing that addiction is compulsive); Nora D. Volkow & Ting-Kai Li, *Drug Addiction: The Neurobiology of Behavior Gone Awry*, in *PRINCIPLES OF ADDICTION MEDICINE*, *supra* note 2, at 3.

⁵ See, e.g., Sana Loue, *The Criminalization of the Addictions: Toward a Unified Approach*, 24 J. LEGAL MED. 281 (2003) (discussing the various strategies that are currently used to address drug use in the criminal context). Of course, people in both camps recognize that drug use and abuse is a more complex problem. *Id.*

⁶ HEYMAN, *supra* note 3, at 1.

⁷ See, e.g., Peggy Fulton Hora, *Drug Treatment Courts in the Twenty-First Century: The Evolution of the Revolution in Problem-Solving Courts*, 42 GA. L. REV. 717, 725 (2008) (touting the achievements of drug treatment courts). But cf. James L. Nolan, Jr., *Redefining Criminal Courts: Problem-Solving and the Meaning of Justice*, 40 AM. CRIM. L. REV. 1541, 1550-65 (2003) (summarizing various critiques of both the efficacy and the legality of the many

with the criminal justice system's gradual return to the rehabilitative principle, in other respects drug courts reaffirm the system's coercive, social control aspects, with the judge in charge not simply of sentencing, but of treatment as well.⁸

Others assert that despite addiction's strong biological basis, simply treating excessive drug use as a disease is misguided. They argue that addiction is much more than a matter of brain wiring and biochemistry and should also be analyzed in light of behavioral psychology, including classical conditioning and learning theory.⁹ In this view, addiction treatment is most effective when it offers desirable alternatives to drug use, including financial and social incentives that promote drug abstinence.¹⁰

This article connects the debate about addiction with the fundamental criminal law principle of deterrence. It seeks to bridge the gap between the competing medical and criminal justice approaches by exploring addiction in light of recent research about the brain, gender differences, and what works best from both a treatment *and* justice perspective. To sharpen the issues, the article deliberately focuses on the emotionally freighted subject of pregnant drug users. This approach will illuminate prevailing assumptions about how biological, genetic, cultural, and other environmental factors shape human behavior and challenge conventional understandings of deterrence in light of new research on substance abuse and addiction.

It is important to point out what this article is not. This article is not about criminal responsibility in the age of neuroscience.¹¹ Rivers of ink have been spilled and acres of forests have been destroyed discussing whether our expanded understanding of the biological and environmental factors that shape human decision-making demands a change in the laws of criminal responsibility.¹² In the 1990s much of the debate among academics and public policymakers about criminal responsibility and its scientific and philosophical underpinnings focused on genetic predispositions and predictions about engaging in such behavior.¹³ Since the turn of the twenty-first century, most commentators have couched their arguments in terms of neuroscience.¹⁴ This article does not propose to add to that debate, which is often viewed

coercive features of drug courts).

⁸ Eric J. Miller, *Drugs, Courts, and the New Penology*, 20 STAN. L. & POL'Y REV. 417, 418-23 (2009).

⁹ Helge Waal & Jorg Mørland, *Addiction as Impeded Rationality*, in ADDICTION: ENTRIES AND EXITS 121, 143-45 (Jon Elster ed., 1999) (arguing that neurobiological research cannot completely explain addiction, and suggesting, like Heyman, that addiction involves impeded choice competency, which is influenced by societal factors).

¹⁰ See discussion *infra* Part II. C.

¹¹ As Nicole Vincent wrote recently, "If the question ... asked was 'Is neuroscience relevant to criminal responsibility?' ... [it cannot be answered until we ask] 'Which responsibility?' and 'Which neuroscience?'" Nicole A. Vincent, *On the Relevance of Neuroscience to Criminal Responsibility*, 4 CRIM. L. & PHIL. 77, 85 (2010).

¹² See, e.g., Stephen J. Morse, *Moral and Legal Responsibility and the New Neuroscience*, in NEUROETHICS: DEFINING THE ISSUES IN THEORY, PRACTICE, AND POLICY 33, 36-40 (Judy Illes ed., 2006); see also Patricia Smith Churchland, *Moral Decision-making and the Brain*, in NEUROETHICS: DEFINING THE ISSUES IN THEORY, PRACTICE, AND POLICY, *supra*, at 3, 5 (agreeing with Morse that enhanced understanding of neurological functioning does not lead to the conclusion that humans should no longer be treated as responsible moral agents, although reaching that conclusion from a different disciplinary and ideological perspective).

¹³ See, e.g., Rochelle Cooper Dreyfuss & Dorothy Nelkin, *The Jurisprudence of Genetics*, 45 VAND. L. REV. 313 (1992).

¹⁴ See, e.g., Henry T. Greely, *Law and the Revolution in Neuroscience: An Early Look at the Field*, 42 AKRON L. REV. 687 (2009) (arguing that while an emerging understanding of neuroscience will not lead to "major changes in our view of criminal responsibility," it will change the way one perceives the blameworthiness of certain criminal acts and consequently change the way the system treats the perpetrators of those acts).

simplistically as a choice between accepting free will or determinism as the explanation for human behavior.¹⁵

A Road Map

This article asks whether the classic criminal law principle of deterrence is still viable as a public policy tool in light of our rapidly evolving understanding of addiction, informed by neuroscience, medicine, and psychology. The article begins with a historical review of criminal prosecutions of pregnant drug users for harming “unborn children.”

The article then explains the two distinct ways in which the context of these prosecutions is explicitly gendered. First, the fact that drug-using women, but not men, are prosecuted for placing future children at risk¹⁶ raises important questions about an essentialist view of women and motherhood. There is compelling evidence that male users of licit and illicit drugs also expose their unborn children to potential harm, both directly, by damaging sperm and contributing to cognitive deficits, and indirectly, by physically and psychologically abusing their female partners, but no man has been prosecuted for fetal abuse.¹⁷ Second, neuroscience and other research has disclosed many differences between male and female drug abusers—such as the threshold for addiction, the environmental factors that promote addiction, the biological processes of addiction, and responses to addiction treatment—all of which policymakers have ignored in developing criminal justice and substance abuse treatment policies.¹⁸

This article documents the emerging consensus within the neurological, medical, and social science communities that decisions to use and abuse drugs are complex and multifaceted. Although biology plays a role in addiction (and neuroscience helps us visualize this process), biology is not destiny. Understanding the context in which addiction occurs is critical. In the case of women, that context includes the social constructions of pregnancy and motherhood and,

¹⁵ Cf. Deborah W. Denno, *Criminal Law in a Post-Freudian World*, U. ILL. L. REV. 601, 607, 660-65 (2005) (criticizing “reductionist and behaviorist” views of mens rea and summarizing the evolving thinking of legal theorists, moral philosophers, and scientific researchers on the free will—determinism debate); see also Comm. on Addictions of the Group for the Advancement of Psychiatry, *Responsibility and Choice in Addiction*, 53 PSYCHIATRIC SERV. 707, 707 (2002) [hereinafter Comm. on Addictions] (noting the ongoing tension between those who emphasize “free will or personal choice” as the key to addressing addiction and those who focus on “cognitive and behavioral processes that subvert or at least compromise the capacity for personal choice”).

¹⁶ Since the 1980s, scores of women have been prosecuted for crimes ranging from child abuse and endangerment to murder based on allegations that their use of drugs while pregnant has caused harm to a fetus or a child. See detailed discussion *infra* Part I.

¹⁷ Deborah A. Frank et al., *Forgotten Fathers: An Exploratory Study of Mothers’ Report of Drug and Alcohol Problems Among Fathers of Urban Newborns*, 24 NEUROTOXICITY & TERATOLOGY 339, 340-41 (2002). The impact of paternal drug use on the health of their offspring has been largely ignored by both researchers and the criminal justice system. *Id.* at 339-40, 345.

¹⁸ See discussion *infra* Part II. D. Physicians and others engaged in substance abuse treatment and research have identified many differences in the ways that drugs affect men and women. See, e.g., Sheila B. Blume, *Women: Clinical Aspects*, in SUBSTANCE ABUSE: A COMPREHENSIVE TEXTBOOK 645 (Joyce Lowinson et al. eds., 1997). However, some differences are newer discoveries, as scientists have only recently accepted the full range of sex differences in brain functioning and structure. Larry Cahill, *Why Sex Matters for Neuroscience*, NATURE REV. NEUROSCIENCE, May 10 2006, at 1, 1-7 [hereinafter Cahill, *Why Sex Matters*]; Cora Lee Wetherington, *Sex-Gender Differences in Drug Abuse: A Shift in the Burden of Proof?*, 15 EXPERIMENTAL AND CLINICAL PSYCHOPHARMACOLOGY 411, 413-15 (2007).

in many cases, poverty, homelessness, lack of education, and lack of health care.

The article next reviews the sociological and legal literature on deterrence, exploring how changes in criminal law sanctions and enforcement policy affect human behavior. The article addresses the key question of marginal deterrence—that is, what additional deterrence will result when the severity of a criminal sanction or likelihood of apprehension and conviction increases. It pays particular attention to the literature on “drunk driving,” which evaluates the effectiveness of different strategies used to decrease the harm that driving under the influence of alcohol causes.

The article then applies the empirical research on neuroscience, addiction, and deterrence to pregnant women who use drugs. The article asserts that if governments wish to succeed in limiting drug use by pregnant women, they must implement policies that take into account the complexities of female addiction and use carrots, rather than sticks, to induce pregnant women to change their behavior. Emphasizing a public health perspective, the article concludes with concrete recommendations that are cost-effective and grounded in science, rather than merely slogans, for addressing the problem of drug abuse among pregnant women.

I. A LOOK AT “FETAL PROTECTION” PROSECUTIONS

In the last thirty years, American prosecutors in more than thirty states have indicted scores of American women for using alcohol and other drugs while pregnant, invoking a theory of “fetal protection.”¹⁹ Notably, illicit drugs account for the vast majority of prosecutions, even though women use alcohol and tobacco two to three times as often, respectively, as illicit drugs. Since 1999, more than a dozen women in six states have been charged with homicide under this theory; they have received sentences as long as twenty years in prison based on allegations that their drug use caused their children to be stillborn or die shortly after birth.²⁰ For example, in 2007, Theresa Hernandez pled guilty to second-degree murder based on her admission that she had used methamphetamine while pregnant and delivered a stillborn child. She was held in county jail for three years while awaiting trial.²¹ After her conviction she spent one year in prison. Despite these notorious prosecutions, every state except Alabama and South Carolina has

¹⁹ Notably, illicit drugs account for the vast majority of prosecutions, even though pregnant women use alcohol and tobacco two and three times as often, respectively, as illicit drugs. Steven J. Ondersma et al., *External Pressure, Motivation, and Treatment Outcome Among Pregnant Substance-Using Women*, 107 *DRUG AND ALCOHOL DEPENDENCE* 149, 152 (2010). I have previously reviewed the history of these prosecutions. See Linda C. Fentiman, *The New “Fetal Protection”: The Wrong Answer to the Crisis of Inadequate Health Care for Women and Children*, 84 *DENV. U. L. REV.* 537 (2006) [hereinafter *The New “Fetal Protection”*] (examining three decades of actions to “protect” fetuses in the United States, including criminal prosecutions, civil commitment and other litigation, as well as statutes and regulations dealing with fetal life); Linda C. Fentiman, *Pursuing the Perfect Mother: Why America’s Criminalization of Maternal Substance Abuse Is Not the Answer*, 15 *MICH. J. GENDER & L.* 389 (2009) [hereinafter *Pursuing the Perfect Mother*] (using a comparative law approach to consider America’s uniquely punitive approach to fetal protection); Linda C. Fentiman, *In the Name of Fetal Protection: Why American Prosecutors Pursue Pregnant Drug Users (and Other Countries Don’t)*, 18 *COLUM. J. GENDER & L.* 647 (2009) (arguing that American prosecutors pursue pregnant drug users primarily for political purposes). All three articles discuss the actual, as well as illusory, risks to fetal health and child development posed by women’s use of drugs while pregnant. *The New “Fetal Protection,” supra*, at 542-43; *Pursuing the Perfect Mother, supra*, at 395-97; *In the Name of Fetal Protection, supra*, at 653-56.

²⁰ *Pursuing the Perfect Mother, supra* note 19, at 400-06 (summarizing the prosecutions of the six women).

²¹ *Id.* at 390-91. Her sentence was suspended after she spent one year in prison. Jay F. Marks, *Woman Was Charged in Her Stillborn Son’s Death: Meth Mom Wins Early Release*, *OKLAHOMAN*, Nov. 20, 2008, at 1A.

invalidated or overturned the convictions of pregnant drug users. In these states, prosecutors have been extraordinarily zealous in pursuing high profile criminal cases against pregnant women who used drugs. Since 2005 more than twenty-five women in Alabama have been prosecuted for using drugs while pregnant under the state's chemical endangerment statute, a law developed to protect children from exposure to methamphetamines by their parents' use and/or manufacture of the drug.²² In South Carolina, more than seventy women were charged with crimes based on their use of drugs while pregnant between 1989 and 2003.²³ In 2001, Regina McKnight was convicted of homicide under a theory of reckless child endangerment when she delivered a stillborn child after using cocaine during her pregnancy. She was sentenced to twenty years in prison and the state Supreme Court upheld her conviction.²⁴ Five years later, the court reversed her conviction based on a finding of ineffective assistance of counsel.²⁵ Several other South Carolina women have been charged in South Carolina using similar theories.²⁶

Yet despite the apparent "outlier" status of Alabama and South Carolina prosecutors, criminal prosecutions of women for "risky" behavior while pregnant continue unabated. For example, in 2010, an Iowa woman who miscarried after falling down the stairs was charged with attempted feticide after she sought care at a hospital emergency room and told hospital staff that she was ambivalent about having the child, since her husband had recently left her and moved out of state.²⁷ In addition, state legislators have recently pushed to enact laws that criminalize a broad spectrum of undesirable or "reckless" conduct by pregnant women, including drug use. In March 2010 Utah enacted a law making it homicide for a woman to "recklessly or negligently cause the death of her unborn child," although the law purports to exempt from prosecution abortions, refusals of medical treatment, and other reckless or criminally negligent actions of the mother if she does not commit any intentional or knowing act that causes the death.²⁸ Kentucky legislators have proposed a law, applicable only to women, entitled, "Alcohol or Substance Endangerment of a Child Prior to Birth," which would make it a crime for a woman, "knowing she is pregnant," to

²² Cassandra Burrows, *Health Experts Warn Alabama Court of Criminal Appeals That Prosecuting Pregnant Women as Drug Labs Is Bad for Babies*, NAT'L ADVOC. FOR PREGNANT WOMEN, (July 12, 2010, 2:00 PM), http://advocatesforpregnantwomen.org/blog/2010/07/health_experts_warn_alabama_co.php; See also Dave Parks, *Law Puts Some New Mothers in Jail*, BIRMINGHAM NEWS, Feb. 14, 2008, at 1; Phillip Rawls, *New Moms Pay Price for Drug Use, Law Meant to Punish Parents Who Make Meth*, ROCKY MOUNTAIN NEWS, Aug. 4, 2008, at 33.

²³ Kirsten Scharnberg, *Prosecutors Targeting Pregnant Drug Users; Some Fear Women Will Shun Treatment*, CHI. TRIB., Nov. 23, 2003, at C1.

²⁴ *State v. McKnight*, 576 S.E.2d 168, 171 (S.C. 2003).

²⁵ *State v. McKnight*, 661 S.E.3d 354 (S.C. 2008).

²⁶ Other women prosecuted for homicide in South Carolina based on their drug use while pregnant include Jennifer Arrowood, Jamie Lee Burroughs, and Lorraine Patrick. *South Carolina: Leading the Nation in the Prosecution of Pregnant Women*, NAT'L ADVOC. FOR PREGNANT WOMEN, (July 17, 2006), http://www.advocatesforpregnantwomen.org/issues/punishment_of_pregnant_women/south_carolina_leading_the_nation_in_the_prosecution_punishment.php.

²⁷ The state ultimately decided not to continue the prosecution. John Mangalonzo, *Feticide Charges Dropped; New Information About Pregnancy Emerges*, HAWKEYE, (Feb. 11, 2010), www.thehawkeye.com/story/Fetus-death-021110 (explaining that prosecutors decided not to pursue the case because the fetus was not old enough to be viable); see also Kirk Johnson, *Under Utah Legislation, Seeking Illegal Abortion Would Become a Crime*, N.Y. TIMES, Mar. 1, 2010, at A16 (discussing Iowa case). Under Iowa Code § 707.7, "attempted feticide" is the attempt to "intentionally terminate a human pregnancy, with the knowledge and voluntary consent of the pregnant women, after the end of the second trimester of [a] pregnancy" where the fetus does not die. IOWA CODE § 707.7(2).

²⁸ UTAH CODE ANN. § 76-5-201.

cause her child to be “born . . . with controlled substances or alcohol in its system.” This proposal is at odds with Kentucky’s 1992 Maternal Health Act, which specifically eschews taking punitive action against pregnant women out of a fear that it would discourage pregnant women who use drugs from seeking prenatal care and substance abuse treatment. Indeed, in June 2010 the Kentucky Supreme Court cited the Maternal Health Act with approval in its opinion affirming a trial court’s dismissal of an indictment for wanton endangerment against a woman based on her use of cocaine while pregnant.²⁹

Prosecutors justify their actions as necessary to deter women from using drugs while pregnant and risking the life and health of their fetuses. For example, South Carolina Attorney General Charles Condon celebrated as a deterrence victory Regina McKnight’s murder conviction based on a felony-murder theory that she committed child abuse when she used drugs while pregnant and gave birth to a stillborn child. Condon declared: “[South Carolina is] on the cutting edge of protecting the innocent life of the unborn . . . Today, South Carolina’s unborn children have a much better chance at a long, happy life than they did yesterday [when McKnight was convicted].”³⁰ Other prosecutors have voiced similar child-protective theories.³¹

Do Criminal Prosecutions Deter Pregnant Women from Drug Abuse? Rhetoric v. Reality

Yet it is not clear that these prosecutions are achieving their avowed purposes. This article addresses the critical question of marginal deterrence:³² if existing heavy sanctions for drug use or possession³³ have not dissuaded pregnant women from using drugs, how can the additional threat of a homicide prosecution induce women to change their drug-using behavior? There is no evidence, such as data indicating decreased drug use by pregnant women after highly visible prosecutions, that these prosecutions accomplish either general or specific deterrence.³⁴ Nor is

²⁹ Cochran v. Commonwealth, 2010 Ky. LEXIS 157 (June 17, 2010).

³⁰ See, e.g., Sue Ann Pressley, *S.C. Verdict Fuels Debate Over Rights of the Unborn*, WASH. POST, May 27, 2001, at A07; see also David Firestone, *Woman Is Convicted of Killing Her Fetus by Smoking Cocaine*, N.Y. TIMES, May 17, 2001, at A12; State v. McKnight, 576 S.E.2d 168, 171-73 (S.C. 2003) (summarizing prosecution’s theory of the case).

³¹ See, e.g., Assoc. Press, *Judge Drops ‘Meth Baby’ Charge*, CASPAR STAR-TRIBUNE, Sept. 27, 2005, http://trib.com/news/state-and-regional/article_e76def07-3088-527f-8a9a-18f5f05ea9a6.html (quoting prosecutor who stated, “We stuck our toe in the water on this thing [to gain the public’s attention]”); Lori Kriel, *AG Says Docs Needn’t Report Moms’ Drug Use; Prosecutor Was Using Law to Go After Pregnant Women*, SAN ANTONIO EXPRESS-NEWS, Jan. 7, 2005, at 5B (discussing Amarillo prosecutor who prosecuted pregnant drug users and also threatened physicians with prosecution if they did not report pregnant drug-using patients to her).

³² See, e.g., George T. Stigler, *The Optimum Enforcement of Laws*, 78 J. POLIT. ECON. 526 (1970) (proposing a theory of rational enforcement and describing the distortion of marginal deterrence in regimes that prescribe punishments that are too large for their crimes).

³³ See, e.g., ALA. CODE § 13A-12-212 (authorizing sentence between one year and a day and ten years for unlawful possession of any controlled substance (excluding marijuana)); TEX. HEALTH & SAFETY CODE ANN. § 481.115 (authorizing prison sentences of 180 days to two years for possessing less than one gram of methamphetamine, cocaine, or heroin and sentences of two to ten years for amounts between four and two hundred grams of these drugs).

³⁴ As all first-year law students know, the principle of deterrence encompasses both the concept of general deterrence (the idea that all persons will refrain from particular criminal conduct if they know that it is subject to the criminal sanction and that apprehension, conviction, and a criminal sentence are likely consequences of that conduct) and the concept of specific deterrence (the idea that individual offenders who have been caught, convicted, and sentenced will learn from this experience and refrain from criminal conduct in the future). See, e.g., SANFORD H. KADISH ET AL., *CRIMINAL LAW AND ITS PROCESSES: CASES AND MATERIALS* 92-97 (8th ed. 2007).

there evidence that prosecutions based on maternal drug use induce public health benefits, such as a reduction in stillbirths, low-birth-weight infants, or newborns with drugs in their system.³⁵

In contrast, most physicians, public health groups, and women's advocates assert that criminal prosecutions have a strong *anti*-deterrent effect. They argue:

The imposition of criminal penalties solely because a person suffers from an illness is inappropriate and counterproductive. Criminal prosecution of chemically dependent women will have the overall result of deterring such women from seeking both prenatal care and chemical dependency treatment, thereby increasing, rather than preventing, harm to children and to society as a whole.³⁶

From this vantage point, the criminal prosecution of a pregnant woman risks even greater harm to the fetus and the woman herself.³⁷ These assertions have intuitive and logical appeal, and recent studies support them.³⁸

³⁵ Stillbirth is defined as the death of a fetus at twenty weeks gestation or more. Establishing the cause of a stillbirth is difficult. Some studies show that in more than half of cases the reason for a stillbirth is unknown. Michael B. Brimacombe et al., *Comparison of Fetal Demise Case Series Drawn from Socioeconomically Distinct Counties in New Jersey*, 26 FETAL AND PEDIATRIC PATHOLOGY 213, 213-14 (2007). However, a number of factors are associated with stillbirth, including maternal poverty, maternal smoking, maternal infectious disease, and low levels of maternal education. *Id.* at 214, 219-20. Stillbirth, low birth weight, and prematurity are all associated with a lack of prenatal care, which in turn is associated with lack of health insurance coverage. R. Maupin, Jr. et al., *Characteristics of Women Who Deliver With No Prenatal Care*, 16 J. MATERNAL-FETAL AND NEONATAL MED. 45, 49 (2004); see also Cande V. Anath et al., *Placental Abruption and Adverse Perinatal Outcomes*, 282 JAMA 1646, 1650 (1999). A recent study of the relationship between drug use and low birth weight found that only heavy smoking and heavy drinking were related to low birth weight. The authors concluded that "illicit drug use is a stronger risk marker than a risk factor for adverse birth outcomes." Ashley H. Schempf & Donna M. Strobino, *Illicit Drug Use and Adverse Birth Outcomes: Is it Drugs or Context?*, 85 J. URB. HEALTH 858, 868 (2008).

³⁶ AM. SOC'Y OF ADDICTION MED., PUBLIC POLICY STATEMENT ON CHEMICALLY DEPENDENT WOMEN AND PREGNANCY 47 (1989), available at <http://www.asam.org/ChemicallyDependentWomenandPregnancy.html> (last visited Mar. 7, 2010); see also AM. COLL. OF OBSTETRICIANS AND GYNECOLOGISTS, AT-RISK DRINKING AND ILLICIT DRUG USE: ETHICAL ISSUES IN OBSTETRIC AND GYNECOLOGIC PRACTICE, COMMITTEE OPINION NO. 422 (2008) (outlining a proposal for physicians that includes screening questions, referral to treatment, and brief intervention when a pregnant patient shows signs of drug abuse); Am. Med. Ass'n Bd. of Tr., *Legal Interventions During Pregnancy*, 264 JAMA 2663, 2667 (1990) ("[It] is difficult to imagine a situation in which legal rules would be the best policy choice as legal penalties or liability may be ultimately detrimental, rather than beneficial, to fetal health."); AM. PSYCHIATRIC ASS'N, CARE OF PREGNANT AND NEWLY DELIVERED WOMEN ADDICTS: POSITION STATEMENT (2001) (urging "that societal resources be directed not to punitive actions but to adequate preventive and treatment services for [substance-abusing] women and children").

³⁷ The Supreme Court accepted this theory when it found Charleston City Hospital's undisclosed policy of testing new mothers who were suspected of using drugs invalid under the Fourth Amendment. The Court declared that "an intrusion on . . . [a patient's expectation of privacy in diagnostic tests] may deter patients from receiving needed medical care." *Ferguson v. City of Charleston*, 532 U.S. 67, 85-86 (2001); see also Martha A. Jessup et al., *Extrinsic Barriers to Substance Abuse Treatment Among Pregnant Drug Dependent Women*, 22 J. DRUG ISSUES 285, 291-92, 296-99 (2003) (advocating that health care providers adopt positive and supportive attitudes toward pregnant women in order to facilitate substance abuse treatment); Kriel, *supra* note 31, at 5B (noting that physicians were concerned that reporting drug-using patients would discourage women with substance abuse problems from seeking timely prenatal care, because "[i]t threatens the trust and relationship between a doctor and a patient").

³⁸ See, e.g., SHEIGLA MURPHY & MARSHA ROSENBAUM, PREGNANT WOMEN ON DRUGS 89-96 (1999)

Partisans on both sides of the debate have failed to consider empirical research, from either the “soft” social sciences or the “hard” or “harder” neurosciences,³⁹ which could shed light on the deterrence question. Instead, advocates rely heavily on rhetoric, which helps to rally their base but is less useful in providing either a scientifically grounded analytical framework or well-reasoned policy solutions. This article seeks to fill this analytical and policy gap through an objective examination of the evidence.

II. THE NATURE OF DRUG DEPENDENCE AND ADDICTION

A. Neuroscience Research

In recent years, neuroscience research has provided astounding insight into the biochemical and physical processes through which people become dependent on addictive drugs.⁴⁰ Drugs affect the brain at the most basic levels, causing changes in gene expression, neuronal firing, and brain circuitry, which in turn are linked to subsequent behaviors.⁴¹ All drugs affect neurotransmitters, the chemicals that send messages between individual neurons.⁴² Many scientists see dopamine, a particularly important neurotransmitter, as a key to understanding the puzzle of addiction because all drugs, including alcohol and nicotine, affect it.⁴³ Dopamine plays

(describing different women who were and were not deterred from being candid with their health care providers about their drug use and the varying responses of those providers). *But see* Marilyn L. Poland et al., *Punishing Pregnant Drug Users: Enhancing the Flight from Care*, 31 *DRUG & ALCOHOL DEPENDENCE* 199, 201-03 (1993) (describing a study of low-income women delivering at a Detroit hospital, in which the women declared, in response to questions about what would happen if Michigan enacted a law that would incarcerate women whose babies were born addicted to drugs, that they would be less likely to seek prenatal care, get tested for drug use, and seek drug treatment).

³⁹ Most people accept neuroscience as one of the “hardest” of the hard sciences, but skeptics urge caution. Henry Greely, a noted legal scholar of neuroscience, has commented that “[it] seems likely that many neuroscience predictive tests, with their complicated and expensive machines and their dramatic false color images, may seem more accurate than they actually are,” and thus run the risk of over-persuading a trier of fact. Henry T. Greely, *The Social Effects of Advances in Neuroscience: Legal Problems, Legal Perspectives*, in *NEUROETHICS: DEFINING THE ISSUES IN THEORY, PRACTICE, AND POLICY*, 245, 247-48. Further, because brain structure varies tremendously within the population (and thus causes a broad range of normality), the fact that the brains of two individuals are different does not lead inevitably to the conclusion that one individual’s brain is abnormal. Joseph H. Baskin et al., *Is a Picture Worth a Thousand Words? Neuroimaging in the Courtroom*, 33 *AM. J. L. & MED.* 239, 249 (2007). Finally, the detailed data on brain blood flow provided by neuroimaging techniques are just that—raw data—which are interpreted by scientists using nonstandard techniques and making assumptions that certain measures indicate abnormality or dysfunction. *Id.*

⁴⁰ I will use “addictive drugs” interchangeably with the term “drugs of abuse,” used by Waal & Mørland, *supra* note 9, at 123.

⁴¹ Gail Winger et al., *Behavioral Perspectives on the Neuroscience of Drug Addiction*, 84 *J. EXPERIMENTAL ANALYSIS OF BEHAVIOR* 667, 671-79 (2005).

⁴² Volkow & Li, *supra* note 4, at 4-5; HEYMAN, *supra* note 3, at 40-41. A neuron is a major type of brain cell. Sana Loue & Beatrice Ioan, *Legal and Ethical Issues in Heroin Diagnosis, Treatment, and Research*, 28 *J. LEG. MED.* 193, 197 (2007). Addictive drugs work through the transmitters “released by the sending neuron and received by specialized proteins in the cell membrane of the receiving neuron, the receptors.” Waal & Mørland, *supra* note 9, at 121, 123; *see also* Loue & Ioan, *supra*, at 197-98; KOOB & LE MOAL, *supra* note 2, at 432.

⁴³ Volkow & Li, *supra* note 4, at 4-5. Recently, this “dopamine-centric” view of addiction has been challenged. KOOB & LE MOAL, *supra* note 2, at 447-48 (arguing that dopamine acts as “oil in the machine” of multiple interrelated brain regions and circuits, but that an overemphasis on dopamine has limited research progress, since other brain chemicals and structures are also implicated in addiction).

an essential role in the normal pleasurable sensations humans feel—when eating, falling in love, and having sex—but the quality and quantity of dopamine produced by drug use far surpasses the amounts released in these naturally pleasurable moments.⁴⁴ Many researchers posit that this is precisely *why* drugs are so attractive: they can deliver unique euphoric effects not otherwise achievable.⁴⁵

Scientists are still debating the exact mechanisms by which drugs become addictive. Many researchers have concluded that drug use establishes reward circuits that dopamine and other chemicals mediate,⁴⁶ which become hard-wired into the brain.⁴⁷ This is an example of the more general phenomenon of “neural plasticity:” the idea that portions of the brain change and grow in response to repeated activity.⁴⁸ Environmental stimuli, including stress, also shape brain development, and dopamine and other brain chemicals mediate the impact of stress.⁴⁹

All addictive drugs affect the limbic region of the brain,⁵⁰ which is believed to be the physical site where learning and memory, as well as emotional reactions, occur.⁵¹ That drug reward circuits are centered in the limbic area, a more “primitive” portion of the brain, suggests that they may be harder to change than neurological circuits found in parts of the brain devoted to higher order reasoning and speech. Indeed, there is a very high correlation between drugs that

⁴⁴ Volkow & Li, *supra* note 4, at 5 (explaining that the dopamine increases occasioned by drug use may be five to ten times greater and longer lasting than those caused by normal stimuli); *see also* MARIANNE J. LEGATO, WHY MEN NEVER REMEMBER AND WOMEN NEVER FORGET 35 (2005).

⁴⁵ HEYMAN, *supra* note 3, at 150. Recently, researchers have challenged the assertion that drugs function differently than other reinforcing stimuli. Instead, they argue that drug addiction is largely a behavioral, rather than neurological, phenomenon. For elaboration of this point, *see infra* text accompanying notes 126-145.

⁴⁶ These include other neurotransmitters like serotonin and norepinephrine, as well as chemicals like endorphins, glutamates, and glucocorticoids. KOOB & LE MOAL, *supra* note 2, at 431-32.

⁴⁷ Volkow & Li, *supra* note 4, at 4-5. It appears that these physical changes occur when exposure of brain cells to drugs causes change in gene expression, which in turn causes changes in protein synthesis. Winger et al., *supra* note 41, at 671. Studies of laboratory animals exposed to drugs confirm this theory. Volkow & Li, *supra* note 4, at 5.

⁴⁸ This process is also known as “neuroadaptation,” which refers to the idea that exposure to chemicals, including drugs, leads to changes in brain structure. Waal & Mørland, *supra* note 9, at 124-26.

⁴⁹ Neural plasticity also occurs in response to stress and other environmental changes, including behavioral modification techniques. Stress also affects dopamine in the brain, with the impact varying depending on whether it is moderate or intense. Different brain regions respond differently to stress, by producing more or less dopamine. Eliot L. Gardner, *The Neurobiology and Genetics of Addiction: Implications of the “Reward Deficiency Syndrome” for Therapeutic Strategies in Chemical Dependency*, in ADDICTION: ENTRIES AND EXITS, *supra* note 9, at 59, 63-64; *see also* KOOB & LE MOAL, *supra* note 2, at 397-400, 430-32 (explaining how drugs and neurotransmitters interact in multiple ways to respond to and produce stress).

⁵⁰ Waal & Mørland, *supra* note 9, at 123. The limbic region includes the nucleus accumbens (also known as the ventral striatum) and the amygdala. The limbic region lies at the border between the cerebral cortex (associated with cognition and speech) and the basal ganglia and more “primitive” portions of the brain which are primarily involved with motor activity. The limbic system provides the “major route for information transfer between the neocortex and the hypothalamus.” Garson V. Dobrin & David C.S. Roberts, *The Anatomy of Addiction*, in PRINCIPLES OF ADDICTION MEDICINE, *supra* note 2, at 27, 27-29.

⁵¹ Gardner, *supra* note 49, at 72-73. Thus, the fact that “many drugs of abuse have their sites of action within the limbic system . . . may help explain why decisions surrounding drug seeking and drug taking seem to be driven more by emotion and instinct rather than logic.” Dobrin & Roberts, *supra* note 50, at 28. The process of addiction also takes place in other areas, including the prefrontal cortex, the orbitofrontal cortex, the hippocampus, and the hypothalamus. Koob & Le Moal, *supra* note 2, at 414-16, 432.

humans abuse and drugs that laboratory animals will learn to “self-administer.”⁵²

Different drugs act through different mechanisms and at multiple brain sites, but generally the brain responds to drug administration by either enhancing or diminishing the production and availability of dopamine.⁵³ Drugs such as cocaine, amphetamines, methamphetamines, and ecstasy appear to directly increase the concentration of dopamine in the limbic region, while other drugs, including alcohol, nicotine, opiates, and marijuana, appear to act indirectly by inducing the firing of brain neurons and the release of dopamine to specific drug-sensitive neural receptors.⁵⁴

Leading neuroscience researchers George Koob and Michel Le Moal have hypothesized a three stage cycle of addiction: the “preoccupation/anticipation” stage, the “binge/intoxication” stage, and the “withdrawal/negative affect” stage.⁵⁵ In their view, addiction involves a progression from an “impulsive” to a “compulsive” disorder.⁵⁶ Koob and Le Moal’s theory involves a feedback loop of two “opponent processes,” in which drug use leads both to a short-lived positive response, the dopamine-infused “high,” and a negative response of greater duration, the comedown or “crash” after the high.⁵⁷ These much longer-lasting negative feelings predispose a drug user to take more drugs in order to eliminate the feelings.⁵⁸

Other researchers hypothesize that a drug’s reinforcing power is not due to direct changes in the amount of dopamine available, but to indirect changes in which drug use and exposure *predict* future rewards.⁵⁹ Under these theories, repeated drug use gives certain previously neutral environmental stimuli “salience,” stimulating desire for the drug.⁶⁰ For example, regular cocaine users showed increased brain activity in the limbic system and the prefrontal cortex (the site of “executive functioning”)⁶¹ when they were exposed to images of drugs and drug paraphernalia, even when the exposure was too short to permit them to identify

⁵² Dobrin & Roberts, *supra* note 50, at 31; Waal & Mørland, *supra* note 9, at 123-24.

⁵³ Gardner, *supra* note 49, at 68. Because of its ubiquity, some view dopamine as the key to understanding addiction, while others, like Koob and Le Moal, suggest that it is mere “oil in the machine.” In their view, “[d]opamine allows the appropriate functioning of complex circuits that it innervates [travelling to more than twenty regions of the brain], but itself does not have a functional attribute.” KOOB & LE MOAL, *supra* note 2, at 447.

⁵⁴ Gardner, *supra* note 50, at 59; Volkow & Li, *supra* note 4, at 4.

⁵⁵ KOOB & LE MOAL, *supra* note 2, at 5, 7, 19.

⁵⁶ Neuroscientists have hypothesized that each aspect of the drug addiction process is accomplished through the development of discrete brain reward circuits. *Id.* at 377-428.

⁵⁷ Withdrawal and relapse vary depending on the drug. Because with heroin and other opioids the initial response is a feeling of delicious “nothingness,” the response to withdrawal is often a feeling of depression, accompanied by unpleasant physical symptoms, which are most easily relieved by a new drug “fix.” The pattern is usually one of daily drug use. With cocaine and other stimulant drugs, the taking of the drug leads to one feeling a burst of energy, accompanied by exhilaration and satisfaction, which quickly wanes, prompting the taking of more drugs. The result is a pattern of binge use for several days in a row, followed by a “crash” and longer periods of abstinence. Waal & Mørland, *supra* note 9, at 126-27; HEYMAN, *supra* note 3, at 46-48, 53-54 (discussing the effects of heroin as a stimulant).

⁵⁸ See KOOB & LE MOAL, *supra* note 2, at 14-15; see also Gardner, *supra* note 50, at 67-68.

⁵⁹ KOOB & LE MOAL, *supra* note 2, at 444-46 (discussing the research that supports this view); see also Dennis Coon & John O. Mitterer, INTRODUCTION TO PSYCHOLOGY: GATEWAYS TO MIND AND BEHAVIOR 220-21 (2010) (explaining Pavlovian conditioning).

⁶⁰ Volkow & Li, *supra* note 4, at 5.

⁶¹ Dobrin & Roberts, *supra* note 50, at 35.

the image.⁶²

Neuroscience research has also illuminated multiple contributors to relapse. “Drug-priming” (e.g., taking one drink) after a long period of abstinence quickly reinstates drug cravings.⁶³ In addition, drug users frequently relapse not only in an effort to avoid the negative effects of drug withdrawal (e.g., a Bloody Mary in the morning to cure a hangover),⁶⁴ but also because they are affected by environmental stimuli, including cues associated with drug use, as noted above.⁶⁵ Stress, mediated through brain chemicals, also precipitates relapse, and the limbic system features prominently in this process.⁶⁶ Since the amygdala, and the limbic system generally, is the locus of emotional memory and “fear conditioning,” researchers have speculated that the limbic system plays a role in the process of relapse.⁶⁷

Even as neuroscience research increases our understanding of the neurophysiology of drug addiction, it does not provide a complete picture. Other researchers, particularly psychologists and other behaviorists, have built on neuroscience to develop a theory with a different emphasis. While acknowledging that repeated drug use is involved in the development of reinforcement pathways in the brain, they suggest that drugs work no differently from other reinforcing stimuli.⁶⁸ They assert that drug addiction is merely one kind of learned behavior, which is acquired (and can be extinguished) in the same way as other behaviors.⁶⁹ As Part C will explain, their work relies on principles of classical conditioning, studies showing that humans as well as animals respond to positive rewards, and empirical data showing that many addicts “age out” of excessive drug-taking.

B. Genetic and Environmental Vulnerability

Individuals’ genetic make-up can make them more vulnerable to drug addiction,⁷⁰ as

⁶² *Id.*

⁶³ Gardner, *supra* note 49, at 73-74 (discussing the effectiveness of drug priming in humans and animals); see also Wendy J. Lynch et al., *Biological Basis of Sex Differences in Drug Abuse: Preclinical and Clinical Studies*, 164 PSYCHOPHARMACOLOGY 121, 127 (2002).

⁶⁴ See, e.g., Joris C. Verster, *The “Hair of the Dog”: A Useful Hangover Remedy or a Predictor of Future Problem Drinking?*, 2 CURRENT DRUG ABUSE REV. 1, 2 (2009) (reviewing literature on alcohol use as a treatment for hangover and finding that such use increases the odds of problem drinking in the future).

⁶⁵ Dobrin & Roberts, *supra* note 50, at 35; Gardner, *supra* note 49, at 69, 73.

⁶⁶ Gardner, *supra* note 49, at 74; Volkow & Li, *supra* note 4, at 6-7 (citing George F. Koob, *Stress, Corticotropin-Releasing Factor, and Drug Addiction*, ANNALS N.Y. ACAD. SCI., December 1999, at 27-45).

⁶⁷ The researchers found relationships between the volume of three key structures within the limbic system—the hippocampus, the ventral striatum, and the amygdala—and the likelihood that the research subjects were either alcoholics or relapsers. Jana Wrase et al., *Amygdala Volume Associated with Alcohol Abuse Relapse and Craving*, 165 AM. J. PSYCHIATRY 1179, 1179, 1181-83 (2008).

⁶⁸ See Winger et al., *supra* note 41, at 668, 673 (describing the behavioral approach to drug abuse).

⁶⁹ *Id.* at 668.

⁷⁰ Many researchers suggest that a person’s genetic make-up contributes to about forty percent of the risk factors for becoming addicted. See, e.g., George R. Uhl & Robert W. Grow, *The Burden of Complex Genetics in Brain Disorders*, 61 ARCHIVES GEN. PSYCHIATRY 223, 224 (2004); see also Volkow & Li, *supra* note 4, at 5 (“It is estimated that forty to sixty percent of the vulnerability to addiction is attributable to genetic factors.”) However, this figure necessarily means that forty percent to sixty percent of the vulnerability to addiction is attributable to environmental factors. See *infra* text accompanying notes 123-124. Further, almost all genetic contributions to brain disorders involve multiple genes and complex interactions between genes and environmental factors, making reductionist assumptions or

chronic drug exposure appears to affect gene expression.⁷¹ While scientists have long recognized that alcoholism and other types of substance abuse⁷² seem to run in families,⁷³ today it is clear that the genetic contribution to addiction is highly complex, affecting both an individual's biology and personality – thus one's genes may increase or decrease the risk that one will try drugs, use them frequently, become tolerant of their effects, seek more of them, and relapse.⁷⁴ On the biological side, for example, some genetic risk factors for addiction or substance abuse appear to be physiological. For example, many Chinese people have inherited a gene (ALDH2*2) that affects their ability to metabolize alcohol and increases the likelihood that they will become ill even when consuming small amounts of alcohol.⁷⁵ There are also genetic variations in the extent to which stopping drug use causes dopamine levels to drop, which may prompt relapse.⁷⁶

Other genetic factors appear to be more psychological or behavioral. Thus, one's genes may increase or decrease the risk that one will try drugs, use them frequently, become tolerant of their effects, seek more of them, and relapse.⁷⁷ Some scientists speculate that certain genes predispose people to risk-taking, making them more likely to experiment with drugs and to otherwise live “on the edge.”⁷⁸ Others hypothesize that having genes that make one less likely to be inhibited or more likely to engage in oppositional behavior can increase vulnerability to drug use and abuse.⁷⁹ Researchers have even found a genetic predisposition for “going along with the crowd” when in a group of heavy drinkers.⁸⁰ Behaviorists accept these genetic links, but suggest that it is not only addicts' genetic predispositions but also their prior learning histories and greater exposure to drugs that increase the odds that drugs will be particularly reinforcing to them, particularly if competing reinforcers are less powerful.⁸¹

genetic “quick fixes” both unwise and unlikely. See Uhl & Grow, *supra*, at 224-28.

⁷¹ Comm. on Addictions of the Group for the Advancement of Psychiatry, *Responsibility and Choice in Addiction*, 53 PSYCHIATRIC SERV. 707, 708 (2002) [hereinafter Committee on Addictions].

⁷² It is important to note the significant overlap between those who abuse illegal drugs and those who abuse alcohol. One epidemiological survey found that alcoholics were ten times more likely to abuse illegal drugs than those in the general population. George R. Uhl et al., *Genetic Influences in Drug Abuse*, in PSYCHOPHARMACOLOGY: THE FOURTH GENERATION OF PROGRESS 1793, 1795 (Floyd E. Bloom & David J. Kupfer eds., 1995).

⁷³ HEYMAN, *supra* note 3, at 91; Ming T. Tsuang et al., *The Harvard Twin Study of Substance Abuse: What We Have Learned*, 9 HARV. REV. PSYCHIATRY 267, 269 (2001) (studying over eight thousand male twins and determining that both genes and shared environmental factors substantially influence the probability of becoming addicted to illicit drugs). Studies of laboratory animals also show that certain species, with different genetic make-ups, are more likely to self-administer cocaine and ethanol (the key ingredient in intoxicating liquor) than others. Gardner, *supra* note 49, at 74.

⁷⁴ Uhl et al., *supra* note 72, at 1793, 1795.

⁷⁵ HEYMAN, *supra* note 3, at 26-27; Susan E. Luczak et al., *Binge Drinking in Chinese, Korean, and White College Students: Genetic and Ethnic Group Differences*, 15 PSYCHOL. ADDICTIVE BEHAV. 306, 306-08 (2001).

⁷⁶ Bradley T. Conner et al., *Genetic, Personality, and Environmental Predictors of Drug Use in Adolescents*, 38 J. SUBSTANCE ABUSE TREATMENT 178, 178-79 (2010).

⁷⁷ *Id.*

⁷⁸ Tsuang, *supra* note 73, at 271; Gardner, *supra* note 49, at 81-84.

⁷⁹ See Koob & Le Moal, *supra* note 2, at 8.

⁸⁰ Helle Larsen et al., *A Variable-Number-of-Tandem-Repeats Polymorphism in the Dopamine D4 Receptor Gene Affects Social Adaptation of Alcohol Use: Investigation of a Gene-Environment Interaction*, 21 PSYCHOL. SCI. 1064, 1066-68 (2010) (finding that university students with a particular dopamine-responsive genetic allele were more likely than fellow students without this allele to engage in heavy drinking when “triggered” to do so by other heavy drinkers).

⁸¹ Winger et al., *supra* note 41, at 673.

Environmental factors are also crucial in determining whether people who experiment with alcohol and other drugs will go on to become addicts. A constellation of related factors make drug abuse and addiction more likely. These include neighborhood poverty, physical and sexual abuse, a lack of parental support, lower socioeconomic status, stress, and widespread access to drugs.⁸² Studies have shown a strong correlation between childhood stressors, such as sexual and physical abuse, domestic violence, parental alcoholism and mental illness, and the incidence of many adult health problems.⁸³

C. Does Addiction Involve Choice?

Some researchers question whether a biologically-focused disease model of addiction can completely explain why people do or do not become addicted, and why certain people find it easier to stop using drugs than others.⁸⁴ These researchers accept studies showing that continued drug use causes chemical and structural changes in the brain, but ask whether this necessarily means that drug addiction is involuntary.⁸⁵ As psychologist Gene Heyman notes in his recent book, *ADDICTION: A DISORDER OF CHOICE*,⁸⁶ the majority of substance abuse researchers and clinicians contend that drug abuse is a chronic illness caused by changes in the brain due to drug ingestion, which set up the user to want to use more drugs more frequently.⁸⁷ This group further asserts that because addiction has a biological basis it is most appropriately treated like other chronic illnesses, such as diabetes or Alzheimer's disease.⁸⁸

Heyman and others challenge this view, arguing instead that addiction results, at least in part, from differences in individual decision-making styles.⁸⁹ Heyman notes that epidemiological data shows that most drug addicts decide, at some point, to reduce or give up their drug use, a phenomenon known as "aging out,"⁹⁰ because of the adverse consequences threatened by

⁸² Volkow & Li, *supra* note 4, at 7 (noting that high-status primates are less likely to self-administer cocaine than their lower-status peers); Rosa M. Crum, *The Epidemiology of Substance Abuse Disorders*, in *PRINCIPLES OF ADDICTION MEDICINE*, *supra* note 2, at 13, 17; *see also* Committee on Addictions, *supra* note 71, at 708-09.

⁸³ Vincent J. Felitti, *Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study*, 14 *AM. J. PREVENTATIVE MED.* 245, 251 (1998).

⁸⁴ HEYMAN, *supra* note 3, at 97-99, 112-14.

⁸⁵ *Id.*

⁸⁶ *See generally* HEYMAN, *supra* note 3.

⁸⁷ *Id.* at vii, 17-18; *see also* Committee on Addictions, *supra* note 71, at 708 ("Extended or excessive use of some addictive substances, notably alcohol, may result in permanent cognitive deficits that interfere with treatment planning, insight, and impulse control.").

⁸⁸ HEYMAN, *supra* note 3, at 17-18.

⁸⁹ *See, e.g.*, Waal & Mørland, *supra* note 9, at 121 ("[I]t is fruitful to approach addicted behavior as a consequence of impeded choice competency because we face a type of goal-directed behavior that characteristically leads to suboptimal overall utility. Neurobiological research has come a long way explaining why the addict suffers from impeded choice competency in a way that renders the individual vulnerable to a poor net result."); *see also* Winger et al., *supra* note 41, at 673-74, 679 (contending that neuroscience research provides a beginning, but not a complete, understanding of why certain people who are heavy drug users discontinue that drug use when they get older or change their physical or personal environments).

⁹⁰ *See, e.g.*, Winger et al., *supra* note 41, at 673; Jan Copeland, *A Qualitative Study of Self-Managed Change in Substance Dependence Among Women*, 25 *CONTEMP. DRUG PROBLEMS* 321, 323 (1998).

continued use.⁹¹ In his view, this evidence suggests that people *are* capable of choosing not to use drugs when it becomes apparent that it is in their self-interest.⁹² Heyman further asserts that addiction is but one example of a larger pattern of impaired decision-making, which he describes as the problem of “local” versus “global” choice.⁹³ Local choice is the immediate choice, and most people prefer something that immediately provides a positive reward.⁹⁴ Global choice, on the other hand, involves being able to take a longer-term view, which leads to an outcome more favorable in the aggregate and over time, even if some of the near-term consequences are less desirable.⁹⁵ Heyman argues that those who succeed in quitting do so because they adopt a global choice perspective.⁹⁶ Many make a conscious choice to quit because it is necessary to feed their families, keep their job, or avoid arrest.⁹⁷ In contrast, Heyman observes, those people who continue to use drugs frequently suffer from co-existing mental or physical illnesses which make it harder for them to limit their drug use.⁹⁸

One way to encourage addicts to transition from “local” to “global” decision-making is to provide financial incentives for healthy behavior. Incentive-based programs have been quite successful in encouraging and supporting drug addicts to abstain from or reduce their use of drugs.⁹⁹ Drawing upon classical learning theory and the principles of operant conditioning, these “contingency management interventions” target specific desired behaviors and offer concrete rewards for engaging in them. Not only have these incentives effectively helped addicts refrain

⁹¹ HEYMAN, *supra* note 3 at 67-73. Heyman argues that the focus of most addiction researchers on people who are in treatment is flawed, for several reasons. *Id.* at 67-68, 78-88. First, people who have sought treatment for their addiction are sicker than those who have not. *Id.* They frequently suffer from co-occurring mental or physical disorders, which can make their treatment more complicated and their prognosis more uncertain. *See infra* notes 145-51. Finally, Heyman asserts that it is more productive to look at the vast majority of addicts who do end their addiction at some point, because the majority’s behavior can provide useful lessons about would works best to encourage and support the discontinuation of drug use, and potentially save other addicts considerable time and suffering. *Id.* at 167. *See also* Copeland, *supra* note 90, at 335-41 (discussing the process of women’s “self-managed change” away from addiction”).

⁹² HEYMAN, *supra* note 3, at 67-68, 78-88.

⁹³ *Id.* at 119.

⁹⁴ *Id.* at 117-19.

⁹⁵ *Id.* at 119-22. *See also* Yifat Kivetz & Tom R. Tyler, *Tomorrow I’ll Be Me: The Effect of Time Perspective on the Activation of Idealistic Versus Pragmatic Selves*, 102 ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES 193, 196, 208-09 (2007) (asserting that this theory is consistent with other psychological research showing that people tend to make more instrumental, “pragmatic” choices when the results of their decisions will affect their lives in the near future).

⁹⁶ HEYMAN, *supra* note 3.

⁹⁷ HEYMAN, *supra* note 3, at 56-64, 130. Studies of airline pilots and physicians with serious drug problems have shown that they have high rates of success in treatment. *Id.* at 86. Arguably this is because they have only one chance to stop their drug use and the economic and status costs of addiction are simply too high to continue using drugs. *Id.*

⁹⁸ *Id.* at 82-84. Indeed, considerable research focuses on the best way to treat alcoholics and other drug addicts with co-occurring mental illnesses, who generally need longer and more intensive treatment. *See, e.g.,* A. Thomas McClellan & James R. Kay, *Integrating Evidence-Based Components into a Functional Continuum of Addiction Care*, in PRINCIPLES OF ADDICTION MEDICINE, *supra* note 2, at 361, 368; John W. Finney et al., *Effects of Treatment Setting, Duration and Amount on Patient Outcomes*, in PRINCIPLES OF ADDICTION MEDICINE, *supra* note 2, at 379, 380.

⁹⁹ HEYMAN, *supra* note 3, at 105-08; *see also* Michael Prendergast et al., *Contingency Management for Treatment of Substance Use Disorders: A Meta-Analysis*, 101 ADDICTION 1546, 1547 (2006) (discussing a wide variety of “contingency management” experiments).

from drug use during the critical period at the beginning of drug treatment,¹⁰⁰ but they also have been shown to have an impact long after the intervention has ended.¹⁰¹ The most successful incentive programs do not simply reward desired behavior, such as drug-free urine samples or attendance at substance abuse treatment sessions, but do so in a progressive manner, so that each time program participants meet the behavioral goal, the reward for subsequent compliance increases.¹⁰²

Contingency management interventions are an effective supplement to traditional substance abuse treatment because they enable addicts to abstain from drug use in the early stages of recovery while other aspects of treatment, such as medication, counseling, and skills training, make long-term abstinence more likely.¹⁰³

While contingency management programs have not yet been tried extensively with pregnant drug users, preliminary studies have shown that incentives increase women's participation in prenatal care and contribute to better birth outcomes.¹⁰⁴ One promising study examined the effect of contingent vouchers on pregnant smokers who were interested in quitting.¹⁰⁵ The "contingent" group—those who were given vouchers if, and only if, their urinalysis demonstrated they had not smoked recently—had rates of abstinence that were five times greater than the group who received vouchers whenever they had a clinic visit.¹⁰⁶ Other studies that offered incentives to pregnant women to quit smoking also had positive outcomes, which were particularly impressive because they involved low-income women with little education, a group that has long resisted smoking cessation efforts.¹⁰⁷ Contingent incentive programs that rewarded pregnant heroin and cocaine addicts who attended treatment sessions and provided "clean" urine samples were also successful, although this was true only when the incentives increased in response to each successive positive result.¹⁰⁸ While researchers have

¹⁰⁰ Prendergast, *supra* note 99, at 1547, 1549-50, 1554-55 (asserting that the interventions have been successful with different types of contingencies, with a wide variety of drugs, and over different lengths of time).

¹⁰¹ *Id.* at 1546; see also Stephen T. Higgins et al., *Contingent Reinforcement Increases Cocaine Abstinence During Outpatient Treatment and 1 Year of Follow-Up*, 68 J. CONSULTING & CLINICAL PSYCHOL. 64, 66-69 (2000).

¹⁰² Prendergast, *supra* note 99, at 1546; see also Hendree Jones et al., *The Effectiveness of Incentives in Enhancing Treatment Attendance and Drug Abstinence in Methadone-Maintained Pregnant Women*, 61 DRUG & ALCOHOL DEPENDENCE 297, 303-05 (2001).

¹⁰³ Higgins, *supra* note 101, at 64, 66; Prendergast, *supra* note 99, at 1556; see also Jones et al., *supra* note 102, at 304 (describing pregnant women's involvement in parenting, nutrition, and job training programs as a result of the inducement to engage more in treatment). Drug addicts have been shown to respond favorably to incentives in other health care contexts as well. See, e.g., David C. Perlman et al., *Impact of Monetary Incentives on Adherence to Referral for Screening Chest X-Rays After Syringe Exchange-Based Tuberculin Skin Testing*, 80 J. OF URB. HEALTH 428, 431-36 (2003) (showing that drug addicts screened for tuberculosis were much more likely to obtain a necessary chest X-ray if they received a twenty-five dollar payment; the cost of the incentive was more than offset by the savings achieved through prompt treatment of the patients' tuberculosis once it was documented by the X-ray).

¹⁰⁴ Gregory Brigham et al., *Incentives for Retention of Pregnant Substance Users: A Secondary Analysis*, 38 J. SUBSTANCE ABUSE TREATMENT 90, 91-94 (2010).

¹⁰⁵ Sarah H. Heil et al., *Effects of Voucher-Based Incentives on Abstinence from Cigarette Smoking and Fetal Growth Among Pregnant Women*, 103 ADDICTION 1009, 1009-18 (2008).

¹⁰⁶ *Id.* In addition, the babies born to the contingent group demonstrated greater fetal growth than the controls. *Id.*

¹⁰⁷ Rebecca J. Donatelle et al., *Incentives in Smoking Cessation: Status of the Field and Implications for Research and Practice with Pregnant Smokers*, 6 NICOTINE & TOBACCO RES. S163, S173-75 (2004).

¹⁰⁸ Jones, *supra* note 102, at 302-04.

noted the concern that incentives could be expensive, local merchants and other community groups donated the necessary goods or cash in many studies.¹⁰⁹ In addition, while some might object that it is morally inappropriate to pay people to do what they ought to be doing anyway, the results of contingency management programs—and, indeed, the complicated nature of addiction described herein—suggest that it is prudent to pay for incentives now to prevent future undesired behavior, which will be costly in terms of human suffering and taxpayer dollars.¹¹⁰

Indeed, physicians, health insurers, and policymakers, both in the United States and abroad, are finding that incentives are cost-effective in a wide range of scenarios.¹¹¹ For example, studies have found that American patients who take blood thinners to avoid strokes increase compliance with their medication regimen when they receive small financial payments.¹¹² India recently announced the success of a major initiative that improved maternal and infant mortality by paying mothers to deliver their babies in hospitals rather than at home.¹¹³ Some Mexican cities have successfully implemented dietary incentive programs to help police officers lose weight.¹¹⁴

In sum, it is critical to understand that biology in general, and neuroscience in particular, provides only a partial explanation of why certain people become, and remain, drug abusers and addicts. Behavioral researchers have offered persuasive evidence that changes in the brain caused by drug exposure need not be permanent, and that incentives and other behavioral interventions may encourage addicts to end their dependence on drugs. However, in order to develop effective strategies to reduce addiction and minimize its harmful consequences, researchers must also consider other factors that affect addiction.

D. Gender Matters in Drug Dependence and Addiction

Gender has a tremendous impact on the addiction process: on the biological and environmental factors promoting drug use and dependency,¹¹⁵ on the effect that drugs affect have on the brain and other organs, on the factors that trigger or impede relapse, and on treatment. Some of the differences appear to be based in biology, while others are related to environmental factors, such as culture. In the last decade and a half, neuroscientists have discovered major differences between female and male brain structure, biochemistry, and brain functioning, which have important implications for our understanding of addiction.¹¹⁶ As one neuroscientist notes:

¹⁰⁹ Donatelle, *supra* note 107, at S176-77; *see also* Jones, *supra* note 102, at 304.

¹¹⁰ Donatelle, *supra* note 107, at S175-76.

¹¹¹ Pam Belluck, *For Forgetful, Cash Helps the Medicine Go Down*, N.Y. TIMES, Jun. 14, 2010, at A1.

¹¹² *Id.*

¹¹³ Vinod K. Paul, *India: Conditional Cash Transfers for In-Facility Deliveries*, 375 LANCET 1943 (2010); *see also* Stephen S. Lim et al., *India's Janani Suraksha Yojana, A Conditional Cash Transfer Programme to Increase Births in Health Facilities: An Impact Evaluation*, 375 LANCET 2009, 2016-17 (2010).

¹¹⁴ Marc Lacey & Antonio Betancourt, *Police Department Puts Corpulent Cops on a Diet*, N.Y. TIMES, May 28, 2010, at A7 (describing one city's program, which paid police nearly ten dollars for every kilogram of lost weight, which was discontinued when the city's police force successfully slimmed down).

¹¹⁵ *See, e.g.*, Conner et al., *supra* note 76, at 186-87 (2010) (finding that different environmental factors predicted drug use among male and female adolescents, with the strongest predictor of female adolescent drug use being a large number of "negative life events").

¹¹⁶ Larry Cahill, *His Brain, Her Brain*, SCI. AM., May 2005, at 40, 41 [hereinafter Cahill, *His Brain*]; *see also* Cahill, *Why Sex Matters*, *supra* note 18, at 1-7; Wetherington, *supra* note 18, at 411.

[I]nvestigators have documented an astonishing array of structural, chemical and functional variations in the brains of males and females. These inequities are not just interesting idiosyncrasies that might explain why more men than women enjoy the Three Stooges. . . . [but] raise the possibility that we might need to develop sex-specific treatments for a host of [mental] conditions¹¹⁷

For example, women and men metabolize alcohol differently. Women who consume alcohol have a higher blood-alcohol level than men consuming the same “dose” per unit of body weight.¹¹⁸ This reflects two biological realities: on average, a higher percentage of female body weight is fat (which does not absorb alcohol) rather than water, and women have a much smaller amount of the key gastric enzyme necessary to metabolize alcohol.¹¹⁹ Both of these lead to women having higher percentages of alcohol in their bloodstream, which transports it to the brain, liver, and heart. As a result, women are likely to become alcoholics at much lower levels of consumption than men,¹²⁰ and their progression from non-drinkers to alcoholics, with concomitant organ damage, can happen much more quickly.¹²¹

Gender also affects the initiation and consequences of illegal drug use. Some drugs have longer half-lives in women than men, predicting a longer biological impact.¹²² In addition, female hormones, including estrogen and progesterone, interact with dopamine and other neurotransmitters to enhance some drugs’ addictive effects and make addiction more likely when women try these drugs.¹²³ In one study, women had much higher “feel good” scores (a rating of overall sense of physical and mental well-being) than men in response to equivalent doses of cocaine.¹²⁴ At the same time, women appear to suffer less damage from their ingestion of cocaine than men, a difference that may be attributable to estrogen’s protective effects.¹²⁵

Cultural expectations also contribute to gender differences in alcohol and drug abuse. Historically, societal norms that only “bad” women used alcohol and other drugs meant that

¹¹⁷ *His Brain*, *supra* note 116, at 40.

¹¹⁸ Blume, *supra* note 18, at 645.

¹¹⁹ *Id.* Indeed, alcoholic women have very little of the alcohol dehydrogenase enzyme. *Id.* As a consequence, almost all the alcohol they consume is absorbed into the bloodstream. *Id.*

¹²⁰ *Id.* at 649; *see also* Trine Flensburg-Madsen et al., *Amount of Alcohol Consumption and Risk of Developing Alcoholism in Men and Women*, 42 ALCOHOL AND ALCOHOLISM 442, 444-45 (2007) (asserting that women are at risk of becoming alcoholics when they consume as few as eight drinks a week, compared to twenty-one or more drinks a week for men). Women who drink frequently are also more likely to become alcoholics than are similar men. *Id.*

¹²¹ STEPHANIE S. COVINGTON, WOMEN AND ADDICTION: A GENDER-RESPONSIVE APPROACH, CLINICIAN’S MANUAL 14 (2007) (describing this accelerated process of addiction and organ damage as “telescoping”); *see also* Daniel W. Hommer et al., *Evidence for a Gender-Related Effect of Alcoholism on Brain Volumes*, 158 AM. J. PSYCHIATRY 198, 198, 200 (2001).

¹²² Blume, *supra* note 18, at 645.

¹²³ Wetherington, *supra* note 18, at 411, 414 (summarizing the numerous studies that find gender differences in responses to different drugs, citing one study showing that “women were three to four times more likely than men to become addicted to cocaine within [twenty-four] months of the first time they used it”); *see also* Blume, *supra* note 18, at 646; Lynch, *supra* note 63, at 127-29 (summarizing human and animal studies and noting the particular vulnerability of women to certain, but not all, drugs’ effects during different phases of the menstrual cycle).

¹²⁴ Carl Sherman, *Drugs Affect Men’s and Women’s Brains Differently*, 20 NIDA NOTES, no. 6, July 2006, at 14.

¹²⁵ LEGATO, *supra* note 44, at 193-94.

women were less likely to abuse and become addicted to drugs.¹²⁶ Today these taboos have lessened for alcohol but not drugs, so that women who abuse drugs are more likely to experience stigma and shame than their male counterparts.¹²⁷ This stigma, in turn, leads women to use more drugs as a coping mechanism and decreases the likelihood that they will seek treatment.¹²⁸ Today, women use and abuse alcohol and other drugs at lower rates than men, but this gender gap appears to be closing, particularly among teenagers.¹²⁹ As with alcohol, women who start using cocaine and other drugs are more likely than men to quickly become dependent.¹³⁰

Drug-abusing and drug-dependent women are much more likely than drug-abusing and drug-dependent men to have a co-existing mental illness, particularly depression, anxiety, or post-traumatic stress disorder (PTSD).¹³¹ One study found that females were five times more likely than males of similar ages to develop PTSD in response to trauma or violence.¹³² Females who suffer childhood physical or sexual abuse are much more likely to abuse alcohol or drugs as adults than females who have not suffered such trauma.¹³³ Other studies have found that PTSD is particularly likely to accompany opioid and cocaine dependence.¹³⁴ Both biological and social factors are involved in the intersection of substance abuse and mental illness. Women in general are more likely to suffer from depression than men, due in part to fluctuations in the hormones

¹²⁶ Elizabeth R. Morrissey, *Power and Control Through Discourse: The Case of Drinking and Drinking Problems Among Women*, 10 CONTEMP. CRISES 157, 165 (1986) (asserting that beginning with the ancient Greeks, drinking by women has periodically been proscribed, and public drinking has been particularly stigmatizing); see also Glen R. Hanson, *In Drug Abuse, Gender Matters*, 17 NIDA NOTES, no. 2, May 2002 [hereinafter Hanson, *In Drug Abuse*].

¹²⁷ Lynch, *supra* note 65, at 123; Kathleen T. Brady & Carrie L. Randall, *Gender Differences in Substance Use Disorders*, 22 PSYCHIATRIC CLINICS OF N. AM. 241, 243 (1999).

¹²⁸ SUBSTANCE ABUSE & MENTAL HEALTH SERV. ADMIN., DEP'T OF HEALTH & HUMAN SERV., WOMEN IN SUBSTANCE ABUSE TREATMENT: RESULTS FROM THE ALCOHOL AND DRUG SERVICES STUDY 12 (Thomas M. Brady & Olivia Silber Ashley eds., 2005), available at www.oas.samsha.gov/WomenTX/WomenTX.htm; see also STEPHEN R. KANDALL, *SUBSTANCE AND SHADOW: WOMEN AND ADDICTION IN THE UNITED STATES*, 270 (1996); Shelly F. Greenfield, *Women and Substance Abuse Disorders*, in *PSYCHOPHARMACOLOGY AND WOMEN: SEX, GENDER, AND HORMONES* 306 (Margaret F. Jensvold et al. eds., 1996).

¹²⁹ NAT'L INST. ON DRUG ABUSE, *supra* note 2, at 44, 48.

¹³⁰ Wetherington, *supra* note 18, at 414.

¹³¹ Blume, *supra* note 18, at 647; see also Suniya S. Luthar et al., *Gender Differences Among Opioid Abusers: Pathways to Disorder and Profiles of Psychopathology*, 43 DRUG AND ALCOHOL DEPENDENCE 179, 187 (1996); Sharon C. Wilsnack & Richard W. Wilsnack, *Drinking and Problem Drinking in US Women: Patterns and Recent Trends*, in 12 RECENT DEVELOPMENTS IN ALCOHOLISM: WOMEN AND ALCOHOLISM 29, 46 (Marc Galanter ed., 1995).

¹³² Rochelle F. Hanson et al., *Relations Among Gender, Violence Exposure, and Mental Health: The National Survey of Adolescents*, 78 AM. J. ORTHOPSYCHIATRY 313, 314 (2008).

¹³³ In one study, eighty-four percent of women seeking substance abuse treatment had a history of violent assault or PTSD. Susan R.B. Weiss et al., *Emerging Issues in Gender and Ethnic Differences in Substance Abuse and Treatment*, 3 CURRENT WOMEN'S HEALTH REP. 245, 247 (2003). In a study of twins in the general population, women who had experienced sexual abuse as girls were three times more likely to become alcohol or drug-dependent as adults. Patrick Zickler, *Childhood Sex Abuse Increases Risk for Drug Dependence in Adult Women*, 17 NIDA NOTES, no. 1, Apr. 2002, at 1 (citing K.S. Kendler et al., *Childhood Sexual Abuse and Adult Psychiatric and Substance Abuse Disorders in Women: An Epidemiological and Co-Twin Control Analysis*, 57 ARCHIVES OF GEN. PSYCHIATRY 953, 953-59 (2000)); see also Lisa M. Najavits et al., *The Link Between Substance Abuse and Posttraumatic Stress Disorder in Women: A Research Review*, 6 AM. J. ON ADDICTIONS 273, 274 (1997) (citing rates of PTSD among female substance abusers ranging from thirty to fifty-nine percent).

¹³⁴ Najavits, *supra* note 133, at 274.

estrogen and progesterone.¹³⁵ Many researchers assert that mental illness in women frequently leads to alcohol and drug abuse through attempts to self-medicate, although this theory is not universally accepted.¹³⁶ In contrast, men begin using alcohol and other drugs recreationally, later developing mental illness as a consequence of the drug use.¹³⁷

1. Gender Implications for Treatment

That a large percentage of substance-abusing women also suffer from mental illness has important treatment implications.¹³⁸ Substance abuse and mental health specialists must screen all of their patients for both problems, as well as for the underlying causes, such as trauma.¹³⁹ This screening is necessary to ensure that treatment is individualized, in terms of both appropriate medication¹⁴⁰ and treatment strategy. For example, the standard treatment for substance abuse is abstinence, but abstinence often exacerbates the symptoms of PTSD. The exacerbated symptoms make women particularly vulnerable to substance abuse relapse.¹⁴¹ Finally, treatments that work for men may be counterproductive for women. Traditional approaches to PTSD treatment, such as the confrontational methods used to address the needs of male trauma sufferers (often combat veterans) may cause harm to female PTSD sufferers whose illnesses often spring from sexual or physical violence.¹⁴² Finally, because drugs affect men and women differently at the neuronal level, strategies to prevent relapse must take into account the distinct cues for drug craving that trigger relapse and work to avoid them or ameliorate their affects.¹⁴³ Although women are less

¹³⁵ LOUANN BRIZENDINE, *THE FEMALE BRAIN* 132-33 (2006).

¹³⁶ *Id.*; see also Weiss et al., *supra* note 133, at 246-47; Wilsnack & Wilsnack, *supra* note 131, at 49.; cf. Najavits, *supra* note 133, at 280 (disputing the self-medication theory as the full explanation of women's substance abuse). Elizabeth Morrissey has also noted the tendency of medical and social science writers to construct explanations of women's drinking that reinforce traditional power structures, with women's drinking, and its adverse consequences, being seen as reflective of women's special vulnerable nature. Morrissey, *supra* note 126, at 159, 165.

¹³⁷ BRIZENDINE, *supra* note 135, at 133.

¹³⁸ Covington, *supra* note 121, at 42-43.

¹³⁹ Vivian B. Brown & Lisa A. Melchior, *Women with Co-Occurring Disorders (COD): Treatment Settings and Service Needs*, *J. PSYCHOACTIVE DRUGS* 365, 368 (2008) (discussing integrated trauma-informed substance abuse treatment).

¹⁴⁰ For example, benzodiazapines, such as Valium, are typically given to patients suffering from anxiety disorders, but they would be dangerous for a patient who abuses drugs because of their highly addictive properties. Najavits, *supra* note 133, at 279.

¹⁴¹ *Id.* at 276; Brown & Melchior, *supra* note 139, at 369.

¹⁴² Najavits, *supra* note 133, at 279; see also Weiss et al., *supra* note 133, at 251. Women are much more likely to suffer from PTSD than men, both with and without concurring substance abuse. Substance-abusing women are very likely to have experienced multiple traumas, including both physical and sexual abuse, particularly before the age of eighteen, when they have fewer internal and external coping mechanisms. Najavits, *supra* note 133, at 276-78.

¹⁴³ Lynch, *supra* note 63, at 127 (describing numerous variations in drug cues); see also Wetherington, *supra* note 18, at 415 (“[The] differential pattern of activation of brain regions by cocaine cues suggests that men and women may use and crave cocaine and relapse for different reasons and that they may benefit from different relapse prevention strategies.”); Glen Hanson, *In Drug Abuse*, *supra* note 126, at 55 (“[A]mong men relapse is more likely to be associated with anxiety and positive feelings, while among women depression and negative feelings appear to be more common triggers. All these differences suggest that it may be possible to enhance the effectiveness of treatment by tailoring it for the patient's gender.”); Robert J. Gallop et al., *Differential Transitions Between Cocaine Use and Abstinence for Men and Women*, 75 *J. CONSULTING & CLINICAL PSYCHOL.* 95, 96, 101 (2007) (discussing differential transition rates between

likely to relapse than men, when they do, they tend to be more depressed than men and their relapse tends to last longer than for their male counterparts.¹⁴⁴

But while their need for treatment may be greater, substance-abusing women are less likely to receive it,¹⁴⁵ reflecting cultural, economic, legal, and other structural barriers to receiving care.¹⁴⁶ First, the stigma surrounding alcohol and other drug use makes it hard for women to seek treatment, particularly for members of cultural and ethnic groups in which such use is taboo.¹⁴⁷ In addition, substance-abusing women are more likely than men to be poor, homeless,¹⁴⁸ young, poorly educated, unemployed, and members of racial minority groups.¹⁴⁹ Not only are they less likely to initially access treatment due to the small number of publicly-funded treatment programs,¹⁵⁰ but they also have difficulty succeeding in treatment, due to economic and structural barriers like lack of transportation and drug-free housing.¹⁵¹ Even when women are able to obtain substance abuse treatment, it is frequently not available in the most optimal setting,¹⁵² because

cocaine usage and abstinence for men and women).

¹⁴⁴ Gallop, *supra* note 143, at 95; Lynch, *supra* note 63, at 127.

¹⁴⁵ White men account for forty-two percent of all substance abuse treatment admissions in the United States, while white women constitute eighteen percent of those admissions. In every racial group, women receive much less treatment than men. Black men constitute sixteen percent of treatment admissions, but black women constitute roughly seven percent; Hispanic men constitute nearly seven percent, but Hispanic women only two percent. Native American and Asian men are admitted at even lower rates, although still they occupy more treatment spots than their female counterparts. Weiss et al., *supra* note 133, at 249.

¹⁴⁶ Brady & Ashley, *supra* note 127, at 6, 17; *see also* Weiss et al., *supra* note 133, at 249-50.

¹⁴⁷ Sandra L. Martin et al., *Violence and Substance Abuse Among North Carolina Pregnant Women*, 86 AM. J. PUB. HEALTH 991, 997 (1996). Frequently, the families of addicted women are either in denial that the women have drug problems or contribute to the problem. *See* Covington, *supra* note 121, at 16; *see also* Interview with Peter Bernstein, M.D., Ariela Frieder, M.D., & Evelyn Diaz, L.C.S.W., Montefiore Hosp., N.Y.C., N.Y. (Oct. 21, 2009) (discussing the difficulties that Hispanic women have in gaining the support of their families for mental health and substance abuse treatment); *see also* V.A. Gyarmathy et al., *Drug Use and Pregnancy—Challenges for Public Health*, EURO SURVEILLANCE, Mar. 2009, at 33, 35 (describing problems in attaining treatment success).

¹⁴⁸ One Massachusetts study of substance abuse treatment for pregnant women found that nearly half of those in treatment had been homeless at some time in the past three years. Marilyn Daley et al., *The Impact of Substance Abuse Treatment Modality on Birth Weight and Health Care Expenditures*, 33 J. PSYCHOACTIVE DRUGS 57, 59 (2001).

¹⁴⁹ Weiss et al., *supra* note 133 at 247; *see also* Brady & Ashley, *supra* note 127, at 9.

¹⁵⁰ Interview with Bernstein et al., *supra* note 148; *see also* Claire D. Brindis et al., *California's Approach to Perinatal Substance Abuse: Toward a Model of Comprehensive Care*, 29 J. PSYCHOACTIVE DRUGS 113, 119 (1997). Historically, many drug treatment programs excluded pregnant women. *See* Maureen O. Marcenko & Michael Spence, *Social and Psychological Correlates of Substance Abuse Among Pregnant Women*, 19 SOC. WORK RES. 103, 103 (1995); Vicki Breitbart et al., *The Accessibility of Drug Treatment for Pregnant Women: A Survey of Programs in Five Cities*, 84 AM J. PUB. HEALTH 1658, 1658-61 (1994) (finding, in study of 294 treatment programs in five cities, that while a majority of programs accepted pregnant women, fewer programs accepted Medicaid as payment, which limited access significantly). Often, women face such lengthy delays that they simply give up on treatment and return to drug use. Linda M. Whiteford & Judi Vitucci, *Pregnancy and Addiction: Translating Research into Practice*, 44 SOC. SCI. & MED. 1371, 1371, 1373-74 (1997).

¹⁵¹ Karol Kaltentbach & Loretta Finnegan, *Prevention and Treatment Issues for Pregnant Cocaine-Dependent Women and Their Infants*, ANNALS N.Y. ACAD. OF SCI. 329, 332 (1998); Lauren M. Jansson et al., *Pregnancy and Addiction: A Comprehensive Care Model*, 12 J. SUBSTANCE ABUSE TREATMENT 321, 322 (1996).

¹⁵² The data is mixed as to whether in-patient or out-patient treatment for alcoholism and other substance abuse is more effective, although one study found that women who were given the opportunity to have their children live with them during treatment remained in treatment much longer. *See, e.g.*, Embry M. Howell et al., *A Review of Recent*

women are more likely than men to have child-care and other family obligations that make inpatient care and other intensive treatment options impracticable.¹⁵³ Since longer stays in treatment generally make success more likely,¹⁵⁴ women are again at a disadvantage.

Before the 1970s physicians and addiction researchers did not even consider that women's different physiology and life experiences might require different approaches to treatment than men.¹⁵⁵ Even when government and privately-funded researchers began to examine female addiction, much of the research focused on the impact of women's drug use on fetal and child development. There was little focus on women's own health concerns, including the need to treat mental illness concurrently with drug dependence.¹⁵⁶

Since 2008, Congress has enacted two major health care reforms that have the potential to expand mental health and substance abuse treatment, as well as preventative health care services for women. The Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of 2008 ("MHPAEA") was enacted in October 2008.¹⁵⁷ The law mandates that employers not discriminate between physical and mental illnesses, including substance abuse, when they provide health care to their employees.¹⁵⁸ MHPAEA will make it easier for insured persons to afford substance abuse and mental health treatment. In March 2010, Congress enacted and President Obama signed the Patient Protection and Affordable Care Act ("PPACA"),¹⁵⁹ which provides that enrollees of Medicaid managed care plans, but not individual Medicaid, will be entitled to the same parity-mandated benefits. The law expands Medicaid eligibility to childless adults earning 133% of the federal poverty level or less.¹⁶⁰

Findings on Substance Abuse Treatment for Pregnant Women, 16 J. SUBSTANCE ABUSE TREATMENT 195, 210, 215-16 (1999). Some studies have shown that what most contributes to long-term abstinence from drug and alcohol use is treatment completion, which usually correlates with a longer (more than six months) and more intense period of treatment. Perhaps significantly, the female subjects in these studies were older, with an average age of thirty, which is consistent with the theory that many addicts eventually age out of heavy drug use. Lawrence Greenfield et al., *Effectiveness of Long-Term Residential Substance Abuse Treatment for Women: Findings from Three National Studies*, 30 AM. J. DRUG & ALCOHOL ABUSE 537, 538, 542, 547-49 (2004). Studies also suggest that treatment that addresses both substance abuse and mental illness leads women to stay in treatment longer than women who participate only in substance abuse treatment. Brady & Ashley, *supra* note 127, at 31-35, 37.

¹⁵³ Weiss et al., *supra* note 133, at 250; *see also* Blume, *supra* note 18, at 650-51.

¹⁵⁴ *See, e.g.*, Mary-Lynn Brecht et al., *Coerced Treatment for Methamphetamine Abuse: Differential Patient Characteristics and Outcomes*, 31 AM. J. DRUG AND ALCOHOL ABUSE 337, 350 (2005) ("The strongest predictor [among four different treatment outcome measures], from among the variables used in this analysis, is number of months in treatment, with longer time in treatment associated with more positive outcome.").

¹⁵⁵ Norma Finkelstein, *Treatment Issues for Alcohol- and Drug-Dependent Pregnant and Parenting Women*, 19 HEALTH & SOC. WORK 7, 7 (1994) (describing the historical view of drug abuse as a "men's disease," which neglected female substance abusers and led to a lack of treatment services); *see also* Wetherington, *supra* note 15, at 411.

¹⁵⁶ Wetherington, *supra* note 18, at 411.

¹⁵⁷ Pub. L. No. 110-343 § 512, 122 Stat. 3765 (2008).

¹⁵⁸ Interim final regulations implementing MHPAEA were published in February 2010, making the law applicable to all employer-provided health care plans effective after July 1, 2010. 75 Fed. Reg. 5410-5451 (Feb. 2, 2010); *see also* Sarah Kershaw, *Mental Health Experts Applaud Focus on Parity*, N.Y. TIMES, Mar. 29, 2010, at D5; Allison Bell, *Court Weighs in on Mental Parity Suit*, NAT'L UNDERWRITER, June 23, 2010, www.lifeandhealthinsurancenews.com/News/2010/6/Pages/Court-Weighs-In-On-Mental-Parity-Suit.aspx.

¹⁵⁹ 111 Pub. L. 148, 124 Stat. 119 (2010).

¹⁶⁰ Bob Curley, *Healthcare Reform Law Gives Big Boost to Addiction Treatment and Prevention*, JOIN TOGETHER, Apr. 9, 2010, www.jointogether.org/news/features/2010/healthcare-reform-law-gives.html#print=t; *The New*

PPACA also emphasizes preventive health care, women's health care, and support for at-risk pregnant women, and provides funding to increase training of "behavioral health" professionals, as well as pilot programs.¹⁶¹ It is too soon to tell whether these efforts will translate into increased access to treatment for women who use and abuse drugs, particularly those with public health insurance.

E. Pregnant Drug Users and Addicts

Pregnant drug users come from all races and social classes.¹⁶² It is not coincidental that drug use and pregnancy frequently occur together, since the twenties are the peak years for both drug abuse and childbearing.¹⁶³ Pregnant drug users, therefore, are simply a subset of a large group of women who use drugs¹⁶⁴ and find it difficult or impossible to stop when they discover they are pregnant.¹⁶⁵ The news media has stereotyped them as "monster moms"—women who are so committed to the hedonistic pursuit of their own pleasure that they ignore the risks that their drug use poses for their fetuses¹⁶⁶—but empirical data reveals a more nuanced picture.

Many drug-using women have unplanned pregnancies,¹⁶⁷ which is not surprising given that nearly half of all American pregnancies are unplanned.¹⁶⁸ Addicted women can often take a long time to recognize that they are pregnant because their periods have stopped due to drug

Health Care Reform Law: What It Means for People Living with Mental Illness, NAT'L ALLIANCE ON MENTAL ILLNESS, www.nami.org/Template.cfm?Section=Issue_Spotlights&template=/ContentManagement/ContentDisplay.cfm&ContentID=100489 (last visited Mar. 6, 2011).

¹⁶¹ See 111 Pub. L. 148, §§ 229, 310, 4107, 10211, 124 Stat. 119 (Mar. 23, 2010); see also ANDREW COHEN, CTR. FOR HEALTH LAW & ECON., PATIENT PROTECTION AND AFFORDABLE CARE ACT (H.R. 3590) – PILOT PROGRAMS, DEMONSTRATION PROJECTS, AND GRANTS (2010).

¹⁶² Robert H. Nishimoto & Amelia C. Roberts, *Coercion and Drug Treatment for Postpartum Women*, 27 AM. J. DRUG ALCOHOL ABUSE 161, 175 (2001); Whiteford & Vitucci, *supra* note 150, at 1371. Some authors assert that drug use appears to rise as income decreases. Whether this is a function of greater suspicion and screening of low-income women or reflects actual differences in drug use is open to debate. Ira J. Chasnoff, *The Prevalence of Illicit-Drug or Alcohol Use During Pregnancy and Discrepancies in Mandatory Reporting in Pinellas County, Florida*, 322 NEW ENG. J. MED. 1202, 1206 (1990); HEYMAN, *supra* note 3, at 35-39 (summarizing data).

¹⁶³ About ninety percent of female drug abusers are of reproductive age. Binta Lambert et al., *Ethical Issues and Addiction*, 29 J. ADDICTIVE DISEASES 164, 164 (2010); see also Weiss et al., *supra* note 133, at 247. In 2006, the average American woman who gave birth to her first child was twenty-five years old. More than two-thirds of all first births are to women aged twenty to thirty-four. T.J. MATHEWS & BRADY E. HAMILTON, NAT'L CENTER FOR HEALTH STATISTICS, DEP'T HEALTH & HUMAN SERV., DELAYED CHILDBEARING: MORE WOMEN ARE HAVING THEIR FIRST CHILD LATER IN LIFE, DATA BRIEF NO. 21 (2009), available at www.cdc.gov/nchs/data/databriefs/db21.htm.

¹⁶⁴ Among women aged fifteen to forty-four, fifty-four percent consumed alcohol in 2008, while 6.3% of females over age twelve used illegal drugs and 2.4% used prescription drugs without a prescription. 2008 NATIONAL SURVEY ON DRUG USE, *supra* note 2, at 23, 33.

¹⁶⁵ MURPHY & ROSENBAUM, *supra* note 38.

¹⁶⁶ *Id.* at 9; see also Whiteford & Vitucci, *supra* note 150, at 1373 (describing how policy makers frame pregnant drug users as "bad women" to provide an excuse for judicial intervention).

¹⁶⁷ MURPHY & ROSENBAUM, *supra* note 38, at 50.

¹⁶⁸ Lawrence B. Finer & Stanley K. Henshaw, *Disparities in Rates of Unintended Pregnancy in the United States, 1994 and 2001*, 38 PERSP. ON SEXUAL AND REPROD. HEALTH 90, 90 (2006) (noting that forty-nine percent of all pregnancies to women aged fifteen to forty-four were unplanned). Unplanned pregnancy rates are much higher among women who are poorer, younger, less educated, and African-American or Hispanic. *Id.* at 92-94.

use,¹⁶⁹ and their morning sickness is similar to the nausea that frequently accompanies drug withdrawal.¹⁷⁰ By the time many women realize that they are pregnant, their pregnancies are often too far advanced to obtain legal abortions.¹⁷¹ This is especially true for poor women and women living in rural areas, because of federal and state laws banning the use of Medicaid to pay for abortions, as well as the scarcity of physicians who perform abortions in many parts of the country.¹⁷²

Pregnant drug users have often been shaped by life experiences that lead them to feel choiceless, at the mercy of fate or other people, instead of in control of their fertility or other decisions involving their body.¹⁷³ Understanding this overwhelming sense of lack of agency¹⁷⁴ is essential to developing effective strategies to help pregnant substance abusers reduce their drug use and deliver healthy babies, even though it may be difficult for the well-educated, self-actualized readers of this article to put themselves in the place of pregnant drug abusers.

Many pregnant drug users come from poor, unstable, and abusive families, having been raised by single parents, other relatives, or foster parents.¹⁷⁵ Many girls and teens had significant child-care responsibilities for younger siblings due to their parents' work responsibilities.¹⁷⁶ They frequently were sexually and physically abused as girls by parents, step-parents, or other male relatives.¹⁷⁷ This abuse, which was particularly disturbing because it arose in a close relationship, often had long-term negative effects: it led the girls and women to develop an inability to trust, as well as to lack a sense of control over their bodies and their environment. The result is often depression and other mental illnesses.¹⁷⁸

Many pregnant drug users were exposed to drugs as young girls, either because drugs were readily available in their families or communities¹⁷⁹ or because drugs were part of their sexual abuse.¹⁸⁰ For girls for whom drugs were freely available, using them was not only normal but also an attractive way to escape, at least temporarily, from a chaotic and unhappy home situation or the stress of growing up in a violent urban neighborhood.¹⁸¹ Many pregnant drug

¹⁶⁹ MURPHY & ROSENBAUM, *supra* note 38, at 4, 52.

¹⁷⁰ *Id.* at 53.

¹⁷¹ *Id.* at 54.

¹⁷² See Heather D. Boonstra, *The Heart of the Matter: Public Funding of Abortion for Poor Women in the United States*, GUTTMACHER POL'Y REV., Winter 2007, at 12, 15-16 (discussing the difficulties that poor women have obtaining abortions when they are not covered by government health programs); Stephanie Simon, *Abortions Down 25% from Peak*, L.A. TIMES, Jan. 17, 2008, at A12 (discussing shortage of physicians who perform medical or surgical abortions in rural areas).

¹⁷³ MURPHY & ROSENBAUM, *supra* note 38, at 8-9, 49-50.

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at 17-19.

¹⁷⁶ See generally *id.* at 17-24.

¹⁷⁷ *Id.* at 18-19, 50; see also Blume, *supra* note 18, at 647.

¹⁷⁸ Many other researchers have found that childhood sexual abuse is a significant predictor of both depression and post traumatic stress disorder, which in turn make substance abuse much more likely. See, e.g., Weiss et al., *supra* note 133, at 247; Zickler, *supra* note 133, at 1.

¹⁷⁹ See, e.g., MURPHY & ROSENBAUM, *supra* note 38, at 41-45.

¹⁸⁰ See Covington, *supra* note 121, at 15; see Kissin et al., *Characterizing Pregnant Drug-Dependent Women in Treatment and Their Children*, 21 J. Substance Abuse Treatment 27, 29, 30, 32 (2001).

¹⁸¹ See MURPHY & ROSENBAUM, *supra* note 38, at 33, 41-45. See also Margaret L. Holland et al., *The Effects of Stress on Birth Weight in Low-Income Unmarried Black Women*, 19 WOMEN'S HEALTH ISSUES 390, 391, 394-95

users lack an education, and are thus unable to be economically self-sufficient.¹⁸² They are often socially and physically isolated, lack close friends and family members,¹⁸³ and are frequently homeless.¹⁸⁴

As adults, pregnant drug users are often in dependent and physically abusive relationships that mirror those of their childhood.¹⁸⁵ Frequently their boyfriends or partners are involved in the drug world, as users or a sellers.¹⁸⁶ Once they become pregnant, their partners may become even more abusive or controlling, replicating childhood patterns of coercive drug use and prompting women to try to escape the abuse through even greater drug use.¹⁸⁷ Other partners may use violence to attempt to force the pregnant woman either to continue the pregnancy or have an abortion at the partner's whim.¹⁸⁸

Yet despite their difficult lives, many pregnant drug users try to minimize the harm that their drug use may have on their fetuses.¹⁸⁹ Depending on the drugs they are using, it may be too dangerous for the women to stop taking drugs completely because of the effects of drug withdrawal on the fetuses.¹⁹⁰ However, reducing drug usage can minimize the drugs' potential harmful effects, particularly if this occurs early in the pregnancy. Many addicts are successful in limiting their drug use, particularly if they are able to obtain treatment that provides creative therapeutic interventions, including incentives and other supports to make a reduction in use possible.¹⁹¹ Alternatively, some women switch to drugs that they perceive to be less dangerous or attempt to provide a healthier environment for fetal development by taking prenatal vitamins,

(2009) (describing how "neighborhood disorganization," a sociological construct encompassing multiple aspects of neighborhood poverty, crime, social isolation, and marginalization, is associated with higher rates of premature births and babies born with lower birth weight, at least some of which may be attributed to the physiological effects of stress). See also Debra Niehoff, *Invisible Scars: The Neurobiological Consequences of Child Abuse*, 56 DEPAUL L. REV. 847, 854-57 (2007) (describing the debilitating mental and physical health effects of chronic stress).

¹⁸² MURPHY & ROSENBAUM, *supra* note 38, at 35-41.

¹⁸³ *Id.* at 26-33; see also Susan F. James et al., "I Couldn't Go Anywhere." *Contextualizing Violence and Drug Abuse: A Social Network Study*, 10 VIOLENCE AGAINST WOMEN 991, 993-96 (2004).

¹⁸⁴ Kissin, *supra* note 180, at 30 (noting that over one-third of pregnant drug users studied had been homeless at some point during the last three years).

¹⁸⁵ See, e.g., MURPHY & ROSENBAUM, *supra* note 38, at 50-52; Copeland, *supra* note 90, at 331-32; James, *supra* note 183, at 992, 1004-07.

¹⁸⁶ See Diane M. Morrison et al., *Beliefs about Substance Abuse Among Pregnant and Parenting Adolescents*, 8 J. OF RESEARCH ON ADOLESCENCE 69, 92 (1998) (discussing how boyfriends influence the behavior of teenage pregnant drug users); see also Frank et al., *supra* note 17, at 345 (explaining that substance-using women frequently report a substance-using partner).

¹⁸⁷ See Covington, *supra* note 121, at 15-16; see also Wendy Chavkin, *Enemy of the Fetus?: The Pregnant Drug User and the Pregnancy Police*, HEALTH/PAC BULLETIN, Winter 1992, at 5, 9; Martin, *supra* note 147, at 991-92, 997 (discussing studies that suggest that domestic violence during pregnancy exacerbates a woman's substance abuse).

¹⁸⁸ See MURPHY & ROSENBAUM, *supra* note 38, at 60-61.

¹⁸⁹ See Suzanne Pursley-Crotteau, *Perinatal Crack Users Becoming Temperant: The Social Psychological Process*, 22 HEALTH CARE FOR WOMEN INT'L 49, 62 (2001).

¹⁹⁰ However, methadone and a newer drug, buprenorphine, may be useful in helping heroin-dependent pregnant women reduce their drug use. Marvin Wang, *Perinatal Drug Abuse and Neonatal Drug Withdrawal*, EMEDICINE (Apr. 12, 2010), <http://emedicine.medscape.com/article/978492-overview>.

¹⁹¹ See Bjørg Hjerkin et al., *Substance Abuse in Pregnant Women, Experiences from a Special Child Welfare Clinic in Norway*, 7 BMC PUB. HEALTH, no. 322, 2007 (describing successful intervention); Weiss et al., *supra* note 133, at 249-50; see also *supra* text accompanying notes 98-114 (describing incentives).

eating better, and getting more rest.¹⁹² Some women seek prenatal care, and others try to find drug treatment. However, many have found health care professionals to be unsympathetic and judgmental,¹⁹³ which may lead them to withhold information about their drug use in the future.¹⁹⁴ Many pregnant women delay seeking prenatal care or skip appointments in order to avoid being screened for drugs, which they fear could result in being reported to child protective services.¹⁹⁵ Indeed, this fear is well-founded.¹⁹⁶

1. Treatment for Pregnant Drug Users

As is the case with other women who use drugs, pregnant drug users face many barriers to obtaining competent, integrated health care that addresses their mental and physical health needs, as well as their substance abuse.¹⁹⁷ Pregnant women face additional hurdles due to pregnancy—their need for treatment is immediate, yet historically, many women have had difficulty in obtaining a “slot” in any treatment program, let alone one designed to meet the special needs of pregnant and parenting women.¹⁹⁸ Many pregnant drug users find that health

¹⁹² MURPHY & ROSENBAUM, *supra* note 38, at 73-74; see also Kissin et al., *supra* note 180, at 32 (suggesting that women reduce their use of drugs on which they are not dependent despite their inability to reduce their use of other drugs).

¹⁹³ See, e.g., Lambert, *supra* note 163, at 171; Howell, *supra* note 152, at 209.

¹⁹⁴ See MURPHY & ROSENBAUM, *supra* note 38, at 88-89, 93 (discussing a wide range of responses by health care providers to their patients' disclosure of drug use); Sarah C. M. Roberts & Amani Nuru-Jeter, *Women's Perspectives on Screening for Alcohol and Drug Use in Prenatal Care*, 20 WOMEN'S HEALTH ISSUES 193, 194-98 (2010).

¹⁹⁵ Roberts & Nuru-Jeter, *supra* note 194, at 196-98. Pregnant women's fear of losing custody of the babies they carry and desire to regain custody of older children motivate many of them to seek substance abuse treatment, even they may be less than candid with health care professionals out of fear that those professionals will disclose their confidences to governmental authorities. *Id.*; see also Diane Phillips et al., *Factors that Influence Women's Disclosures of Substance Use During Pregnancy: A Qualitative Study of Ten Midwives and Ten Pregnant Women*, 37 J. DRUG ISSUES 357, 359, 367-68 (2007).

¹⁹⁶ In most states, physicians and other health care professionals are mandated to report suspected child abuse or neglect to child protective services. In fourteen states and the District of Columbia, prenatal drug exposure is explicitly defined as evidence of child abuse. CHILD WELFARE INFO. GATEWAY, U.S. DEP'T OF HEALTH & HUMAN SERV., DEFINITIONS OF CHILD ABUSE AND NEGLECT: SUMMARY OF STATE LAWS 1 2009, available at www.childwelfare.gov; see, e.g., ARIZ. REV. STAT. § 8-201 (22). A referral to child protective services triggers an investigation, which in turn will start the clock ticking on mandatory decision-making about termination of parental rights under the Adoption and Safe Families Act of 1997 (AFSA), which authorizes the termination of parental rights if children have been in foster care for fifteen of the previous twenty-two months. See Annette R. Appell, *Protecting Children or Punishing Mothers: Gender, Race, and Class in the Child Protection System*, 48 S.C. L. REV. 577, 581-589 (1997); Catherine J. Ross, *The Tyranny of Time: Vulnerable Children "Bad" Mothers and Statutory Deadlines in Parental Termination Proceedings*, 11 VA. J. SOC. POL'Y & L. 176, 196-217 (2004).

¹⁹⁷ See Weiss et al., *supra* note 133, at 250-51; Whiteford & Vitucci, *supra* note 150, at 1373-74. In addition, as noted, many women are likely to avoid the public health care system, which is the only system they can access, if it means that their drug use will be detected and reported to authorities. *Id.* at 1374.

¹⁹⁸ See Jane E. Corrarino et al., *Linking Substance-Abusing Pregnant Women to Drug Treatment Services: A Pilot Program*, 29 J. OF OBSTETRIC, GYNECOLOGIC, & NEONATAL NURSING 369, 370 (2000) (explaining that less than ten percent of pregnant women who are substance abusers receive treatment for their addictions); see also Walter B. Connolly, Jr. & Alison B. Marshall, *Drug Addiction, Pregnancy, and Childbirth: Legal Issues for the Medical and Social Services Communities*, 18 CLINICS IN PERINATOLOGY 147, 180-81 (1991) (suggesting that many drug programs declined to provide care either out of a fear of legal liability if the woman or fetus should be injured or because many women lacked public or

care providers fail to understand their difficulties in reducing or abstaining from drug use, while substance abuse treatment programs often ignore the physical and psychological realities of pregnancy.¹⁹⁹ Other barriers to treatment include lack of public funding for substance abuse treatment, lack of coordinated substance abuse and mental health treatment, and transportation difficulties.²⁰⁰ Women who already have children face an uphill battle when searching for inpatient treatment that allows them to keep their children with them.²⁰¹ Many experts believe that inpatient treatment or intensive outpatient treatment, particularly in programs that accommodate women with children, are most likely to achieve long-term abstinence or reduction in drug use; however, there are so few programs that the studies are inconclusive.²⁰² In addition, while many programs support women while they are pregnant, fewer offer services to new mothers.²⁰³ Because the reality is that caring for a newborn is a daunting prospect under the best of circumstances, many mothers relapse and increase their drug use under the stress of parenting.²⁰⁴

III. DETERRENCE

Deterrence has been a pillar of Anglo-American jurisprudence for centuries, serving, along with retribution, as an essential justification for the imposition of punishment.²⁰⁵ In its narrowest form, deterrence refers simply to the idea that fear of punishment motivates potential offenders to abide by the law.²⁰⁶ Jeremy Bentham was an earlier proponent of this view of deterrence. He postulated that a rational actor—“economic man”—would calculate the risks of being apprehended, convicted, and punished and compare them with the potential benefits of a

private health insurance). In the 1980s, many substance abuse treatment programs would not accept pregnant women, although by the early 1990s more programs were open to pregnant women. Wendy Chavkin, *supra* note 172, at 9; Vicki Breitbart et al., *supra* note 150, at 1660. While the situation has improved somewhat, it is still frequently difficult to find a treatment slot. Bernstein et al., interview, *supra* note 148.

¹⁹⁹ Pursley-Crotteau, *supra* note 189, at 57-59, 61.

²⁰⁰ See Whiteford & Vitucci, *supra* note 150, at 1373-74; WOMEN’S LAW PROJECT, RESPONDING TO THE NEEDS OF PREGNANT AND PARENTING WOMEN WITH SUBSTANCE ABUSE DISORDERS IN PHILADELPHIA 4-5, 8-10, 35 (2002) (on file with the author).

²⁰¹ See Pursley-Crotteau, *supra* note 189, at 62.

²⁰² Nishimoto & Roberts, *supra* note 162, at 176-77; Jan Copeland, *A Qualitative Study of Self-Managed Change in Substance Dependence Among Women*, 25 CONTEMP. DRUG PROBS. 321, 359, 370-71 (1998) (describing a study of recovered addicts in Australia).

²⁰³ See Brigham et al., *supra* note 104; Heil et al., *supra* note 105; Donatelle et al., *supra* note 107.

²⁰⁴ See generally Donatelle et al., *supra* note 107, at S173 (discussing new mothers’ frequent relapse and difficulties abstaining from smoking); Brindis et al., *supra* note 150, at 116 (describing the need for varied post-partum services); see also Diane M. Morrison et al., *Beliefs About Substance Use Among Pregnant and Parenting Adolescents*, 8 J. RES. ON ADOLESCENCE 69, 80, 87-88 (1998).

²⁰⁵ See, e.g., Johannes Andenaes, *Deterrence*, in ENCYCLOPEDIA OF CRIME AND PUNISHMENT 507, 508 (2002); see also Paul H. Robinson & John M. Darley, *The Role of Deterrence in the Formulation of Criminal Law Rules: At Its Worst When Doing Its Best*, 91 GEO. L.J. 949, 950 (2003).

²⁰⁶ Robinson & Darley, *supra* note 205, at 950. Scholars also refer to the moral educational effect of the criminal sanction on society over a period of years: the idea that punishment sends a message that certain conduct is morally wrong. Andenaes, *supra* note 205; see also ANDREW VON HIRSCH ET AL., CRIMINAL DETERRENCE AND SENTENCE SEVERITY: AN ANALYSIS OF RECENT RESEARCH 3 (1999).

crime when deciding whether or not to commit it.²⁰⁷ Bentham hypothesized that three factors are central to a criminal sanction's deterrent effect: the certainty, severity, and celerity (swiftness) of punishment.²⁰⁸ In the twentieth century, economists like Gary Becker and George Stigler of the University of Chicago developed detailed formulae to describe the predicted calculations, both by the state, in considering the proper penalties to deter criminal acts, and by potential offenders, in evaluating the benefits and drawbacks of committing particular crimes.²⁰⁹ More recently, psychological research has challenged these "rational choice" models, showing that a person's values (including views about the legitimacy of the law-making body and the morality of specific behavior) can significantly affect the deterrent capability of a particular criminal law and that governmental efforts to enhance the perceived legitimacy of the law-making body can lead to a more law-abiding society.²¹⁰

Scholars tend to agree that deterrence works in the most general sense. The existence of a system of investigation, prosecution, conviction, and punishment for crimes serves to decrease the overall amount of crime committed.²¹¹ Yet most criminal justice policy decisions involve questions of marginal, rather than absolute, deterrence; that is, an evaluation of the difference that a particular change in sentence severity or law enforcement policy will have on crime rates. Thus, what is hotly debated in political circles, although less so in academic ones, is the relative importance of deterrence's underlying pillars: certainty, severity, and celerity of punishment.

Most politicians emphasize sentence severity as the key to cutting crime, as the wave of get tough legislation enacted in the 1970s, '80s and '90s, such as the "three strikes and you're out" laws and the greatly enhanced drug penalties enacted by the federal and state governments as

²⁰⁷ Robert J. MacCoun, *Drugs and the Law: A Psychological Analysis of Drug Prohibition*, 113 PSYCHOL. BULL. 497, 498 (1993) (citing JEREMY BENTHAM, AN INTRODUCTION TO THE PRINCIPLES OF MORALS LEGISLATION (1948)). Cesare Beccaria articulated a similar position in ON CRIMES AND PUNISHMENTS. Greg Pogarsky, *Identifying "Deterrable" Offenders, Implications for Research on Deterrence*, 19 JUST. Q. 431, 431 (2002) (citing CESARE BECCARIA, ON CRIMES AND PUNISHMENTS (1964) (H. Paolucci trans., 1963)).

²⁰⁸ MacCoun, *supra* note 207, at 498; *see also* Tom R. Tyler & John M. Darley, *Building a Law-Abiding Society: Taking Public Views about Morality and the Legitimacy of Legal Authorities into Account When Formulating Substantive Law*, 28 HOFSTRA L. REV. 707, 711-13 (2000) (describing the social control model of deterrence), *see also* KADISH ET AL., *supra* note 34, at 90-91 (citing EMILE DURKHEIM, THE DIVISION OF LABOR IN SOCIETY 62-63 (W.D. Halls trans., 1984)).

²⁰⁹ Stigler, *supra* note 32, at 526-31.

²¹⁰ MacCoun, *supra* note 207, at 503 (indicating that the perceived morality of an act affects the deterrent powers of particular punishments); *see also* Tyler & Darley, *supra* note 208, at 714 (describing the impact of morality on deterrence); Yifat Kivetz & Tom R. Tyler, *Tomorrow I'll Be Me: The Effect of Time Perspective on the Activation of Idealistic Versus Pragmatic Selves*, 102 ORG. BEHAV. & HUM. DECISION PROCESSES 193, 196, 208-09 (2007) (suggesting that social context influences the ways that people perceive justice). The psychological literature may also be seen as complementing the views of classical deterrence scholars, such as Andanaes and Von Hirsch, as well as sociologists like Durkheim who assert that a criminal prosecutions serves a critical function as a boundary marker—an explicit, public notice that certain conduct is and is not tolerated in a particular society. As Marty Hoffman explains, Durkheim agrees with Freud that "most people do not go through life viewing society's moral norms as external, coercively imposed pressures to which they must submit;" rather, these norms gradually become internalized as part of the person's motivation system which can then lead them to be more law-abiding. TOM R. TYLER & YUEN J. HUO, TRUST IN THE LAW: ENCOURAGING PUBLIC COOPERATION WITH THE POLICE AND COURTS 102 (2002) [hereinafter TRUST IN THE LAW] (citing Marty Hoffman, *Moral Internalization: Current Theory and Research*, in 10 ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 85 (Leonard Berkowitz ed., 1977)).

²¹¹ *See* VON HIRSCH, *supra* note 206, at 29.

part of the “War on Drugs,” illustrate.²¹² This focus on sanction severity is consistent with a retributive approach to crime control—the belief that people should be punished in accordance with their [moral] “deserts” and that behavior that is seen as blameworthy should be punished harshly, regardless of such punishment’s impact on crime rates.²¹³

In contrast, scholars have overwhelmingly concluded that the certainty of punishment is a much more effective deterrent than severity²¹⁴ and urge policy makers to increase the certainty that offenders will be apprehended and convicted (i.e., by spending more on police road blocks for drunk driving or increasing border patrols to prevent immigration violations).²¹⁵

Deterrence research emphasizes that deterrence is perceptual. Potential offenders *cannot* be deterred unless they perceive that their violations carry a significant risk of apprehension and conviction.²¹⁶ Unless potential offenders learn that the sanction for a particular crime has been increased or that law enforcement efforts have been expanded, such changes in criminal justice policy will do little to affect citizens’ behavior.²¹⁷ Deterrence scholars have identified the following five key factors that influence the likelihood that offenders will pay attention to a change in the risk of sanction:

- 1) A potential offender must realize that the probability of conviction or the severity of punishment has changed. . . .

²¹² MICHAEL TONRY, *MALIGN NEGLECT – RACE, CRIME, AND PUNISHMENT IN AMERICA* 19 (1995); *see also* Robinson & Darley, *supra* note 205, at 964-65 (discussing “three strikes” and other habitual offender laws); MEDA CHESNEY-LIND & LISA PASKO, *THE FEMALE OFFENDER: GIRLS, WOMEN, AND CRIME* 7 (2d ed. 2004) (discussing the simplistic and punitive approach of many politicians to the problem of drug use).

²¹³ *See, e.g.,* KADISH ET AL., *supra* note 34, at 80-81 (citing IMMANUEL KANT, *THE PHILOSOPHY OF LAW* (W. Hastie trans., 1887)).

²¹⁴ *See* Kirk R. Williams & Jack P. Gibbs, *Deterrence and Knowledge of Statutory Penalties*, 22 *SOC. Q.* 591, 593 (1981); VON HIRSCH, *supra* note 206, at 5-6, 14 (defining certainty as “the likelihood of being arrested and convicted” and “severity” as referring both to whether the defendant will be imprisoned if convicted and if so, for how long); Anthony N. Doob & Cheryl Marie Webster, *Sentence Severity and Crime: Accepting the Null Hypothesis*, 30 *CRIME & JUST.* 143, 187-89 (2003); *see also* H. LAURENCE ROSS, *CONFRONTING DRUNK DRIVING: SOCIAL POLICY FOR SAVING LIVES* (1992) (summarizing research on “driving under the influence” in the United States and in Europe, which finds that severe sentences may sometimes result in lower rates of conviction and imprisonment). That certainty is more important to potential criminals than severity might be predicted from the nature of the American criminal justice system, which involves many steps, from the initial criminal behavior to the eventual imposition of sanction, including arrest, formal charging, trial, and conviction, all of which can occasion the use and abuse of discretion by key actors. *Cf.* Daniel Nagin, *Criminal Deterrence Research at the Outset of the Twenty-First Century*, 23 *CRIME & JUST.* 1, 34 (1998).

²¹⁵ VON HIRSCH, *supra* note 206, at 5-77; ROSS, *supra* note 214, at 2-14.

²¹⁶ VON HIRSCH, *supra* note 206, at 6-9. In part, this may be due to individual variations in the extent to which people consider events in the future to be relevant to them. Studies have found that those “who discount the future more heavily are less likely to be deterred by a given punishment.” Shawn Bushway & Peter Reuter, *Economists’ Contribution to the Study of Crime and the Criminal Justice System*, 37 *CRIME & JUST.* 389, 405 (2008). Some research has shown that when people make decisions whose consequences will take place in the future, they are more likely to use an “idealized” self-concept in their decision-making, while when they make near-term decisions, they rely more on an instrumental, “pragmatic” self-concept. Kivetz & Tyler, *supra* note 95, at 196, 208-09.

²¹⁷ Williams & Gibbs, *supra* note 214, at 591; *see also* Daniel S. Nagin et al., *Imprisonment and Reoffending*, 38 *CRIME & JUST.* 115, 166 (2009) (describing the need for visibility as a requirement that sanctions be “in your face”); *see also* ROSS, *supra* note 214, at 46-47 (emphasizing the need for changes in penal policy—either enforcement or severity of sanctions—to be communicated to the public, usually through mass media publicity).

- 2) A potential offender must take these altered risks into account when deciding whether to offend. If offenders act impulsively, or under the influence of drugs or alcohol, their beliefs about punishment risks may have less impact on their behavior.
- 3) A potential offender must believe that there is a non-negligible risk of being caught. . . . This means that sanctions for prohibitions thought to be poorly enforced are likely to have only a small deterrent impact.
- 4) A potential offender must believe that the altered penalty will be applied to him if he is caught. . . . [This means that if there are multiple contingencies intervening between apprehension and conviction, an “optimistic” offender may believe that he will escape the heightened penalty, and thus not be deterred by it].
- 5) A potential offender must be willing to alter his or her choices regarding offending in the light of the perceived change in certainty or severity of punishment. . . . [If the crime is sufficiently important to the offender] because of the resources or life-style it provides or the needs it fulfills, then enhanced certainty or severity of punishment may not make him desist. This has been the problem, for example, in applying drug prohibitions to active drug users.²¹⁸

In addition, potential offenders are less likely to respond to changes in the severity or certainty of sanctions if they do not share the community’s value system—i.e., they don’t believe the conduct is morally wrong or do not have “high [] stakes in conventionality.”²¹⁹ The threat of a criminal sanction is most likely to be effective for those who wish to be seen by others as law-abiding, as well as those who have the most to lose from being convicted and sentenced to prison.²²⁰ For example, a study of Minneapolis police efforts to reduce domestic violence found that the most effective strategy was arresting the offender, rather than separating the parties or giving them advice. However, this intervention worked best where offenders had strong social relationships within the community and worked “least well where they had little or nothing to lose.”²²¹

A study of thefts committed by active burglars in St. Louis highlighted a different limitation on deterrence as a crime control tool, by showing that the criminals behaved “irrationally.” The study found that the burglars ignored the threat of criminal prosecution whenever they felt themselves “to be in [situations] of immediate need,”²²² which encompassed both financial exigency and threats to their psychological and social status. Nonetheless, the

²¹⁸ VON HIRSCH, *supra* note 206, at 38 (substituting Arabic for roman numerals and using American spelling of certain words).

²¹⁹ *Id.* (citing Nagin, *supra* note 217, at 70).

²²⁰ *Id.* For example, studies of income tax evasion show that although many people say they are willing to fudge the numbers somewhat on their tax returns when the penalties are only civil and cannot be made public by the Internal Revenue Service, they are much less likely to cheat when the result would be a criminal conviction. *Id.* (citing Nagin, *supra* note 217); see also STUART P. GREEN, LYING, CHEATING, AND STEALING: A MORAL THEORY OF WHITE-COLLAR CRIME 246-248 (2006). Of course, income tax evasion is a criminal act that has only monetary goals, as opposed to other crimes—like rape and murder—which frequently have more complex emotional goals as well.

²²¹ *Id.* (citing L.W. SHERMAN ET AL., POLICING DOMESTIC VIOLENCE: EXPERIMENTS AND DILEMMAS (1992)).

²²² VON HIRSCH, *supra* note 206, at 38.

reality that the burglars might be caught did influence their behavior *after* they had broken into dwellings, causing them to act quickly while there and to ignore potentially more lucrative items if stealing them would require them to remain inside longer.²²³ Similar results have been found in hypothetical studies of criminality that show that potential offenders are motivated more by potential gain (carrots) than by the threat of penalties (sticks).²²⁴

Studies of government interventions aimed at reducing the incidence of drunk driving²²⁵ provide the clearest evidence of the limits of a criminal sanction in reducing crime, particularly crime that implicates drug use. Empirical studies show that increasing the severity of sanctions, such as by enacting mandatory minimum sentences for first-time offenders, fails to achieve either specific or general deterrence.²²⁶ Although nationwide alcohol-related fatalities have declined by about fifty percent since 1982, no deterrence model adequately explains the connection between state drunk driving laws and decreased alcohol-related fatalities.²²⁷ At best, the studies suggest that the threat of arrest and conviction works only with those offenders who are not so opposed to drinking and driving that they would never consider doing it, but not so “impulsive and pathologically present oriented” that they would fail to take future costs into account in their decision-making.²²⁸ It is not surprising that “problem drinkers” with significant alcohol dependence are likely to reoffend despite the risk of incarceration, either because of their diminished ability to rationally assess the risks of punishment²²⁹ or because their alcohol dependency causes them to seek immediate gratification—getting drunk.²³⁰ Some social scientists now postulate a U-shaped curve of deterrence, with only those drinkers in the middle—“occasional sinners”—being susceptible to deterrence at the margins through a change in

²²³ *Id.*

²²⁴ MacCoun, *supra* note 207, at 501 (citing J.S. Carroll, *A Psychological Approach to Deterrence: The Evaluation of Crime Opportunities*, 36 J. PERSONALITY & SOC. PSYCHOL. (1978)).

²²⁵ I use this common term to describe all prosecutions for “impaired” or “under the influence” driving. Current state and federal laws do not require an individual to be drunk or heavily intoxicated by alcohol or other drugs in order to be convicted. Instead, all states have followed the federal government in setting a .08 blood alcohol level as the minimum required for conviction of “driving under the influence” or “driving while impaired.” *DUI/DWI Laws*, INSURANCE INST. FOR HIGHWAY SAFETY, www.iihs.org/laws/dui.aspx (last visited Mar. 7, 2011) [hereinafter *DUI/DWI Laws*]; see also 23 U.S.C. § 163 (2007) (establishing federal blood alcohol limit of .08, which states must follow if they are to receive federal highway safety funds). These laws recognize that consumption of very small drug amounts can impair perception and motor control, raising the risk of motor vehicle accidents. ROSS, *supra* note 214, at 6, 19-21.

²²⁶ ROSS, *supra* note 214, at 48, 59-60 (reviewing many studies and noting that only one study found a specific deterrent effect on offenders in response to a judicially initiated policy of mandating a two day jail sentence for all first-time offenders, and that one study had many methodological problems); see also Rodney F. Kingsnorth et al., *Specific Deterrence and the DUI Offender: The Impact of a Decade of Reform*, 10 JUST. Q. 265, 279 (1993) (finding that increasingly severe sentences imposed by California law for repeat drunk driving offenses did not deter individual offenders).

²²⁷ Anthony M. Bertelli & Lilliard E. Richardson, Jr., *The Behavioral Impact of Drinking and Driving Laws*, 36 POL’Y STUDIES J. 545, 545-50, 560-62 (2008).

²²⁸ *Id.* at 546.

²²⁹ Jiang Yu, *Punishment and Alcohol Problems: Recidivism Among Drinking-Driving Offenders*, 28 J. CRIM. JUST. 261, 262-67 (2000) (evaluating problem drinking by drivers’ score on a standard assessment of alcoholic impairment, the Michigan Alcoholism Screening Test).

²³⁰ This second hypothesis is suggested by Gene Heyman, *supra* note 3, who has propounded a theory of “local” v. “global” choicemaking processes as a way to explain addiction. See *supra* notes 93-99 and accompanying text.

sanctioning or enforcement policy.²³¹

At the same time, empirical research on drunk driving illustrates popular confusion about retributive and deterrent goals. Severe sanctions are attractive precisely because they overlap with popular assumptions about drunk driving: that most offenders are grossly intoxicated individuals with many prior convictions, whose actions can only be prevented if they are treated severely at the outset.²³² The data do not support these assumptions: most drunk drivers are not repeat offenders, and many are not grossly intoxicated individuals.²³³ Nonetheless, convicting such individuals satisfies the public's thirst for revenge. By holding drunk drivers criminally liable, and declaring them responsible human actors, the moral fabric of society is restored.²³⁴ However, these sanctions neither decrease drunk driving nor reduce its harms.²³⁵

In contrast, law enforcement actions that increase the certainty of apprehension, such as well-publicized road blocks and routine breathalyzer testing, do appear to have a general deterrent impact.²³⁶ Yet even here, some are less likely to be deterred by the threat of the criminal sanction; as is the case with deterrence generally, this tends to be people on the lower end of the socio-economic spectrum²³⁷ or who are less likely to believe that governmental authority is legitimate, two groups of people which often overlap.²³⁸

Generally, the reason that using criminal penalties to reduce drunk driving and motor vehicle fatalities is so difficult is that the odds of receiving sanctions are very low. Most drivers assume, correctly, that they are unlikely even to be arrested for drunk driving, let alone convicted.²³⁹ The most successful interventions appear to be administrative sanctions, such as mandatory license suspensions or revocations,²⁴⁰ or the imposition of heavy fines.²⁴¹ These

²³¹ Greg Pogarsky suggests that deterrence research may overemphasize the role of certainty because it fails to separate out those offenders who are in fact "detractable" by changes in criminal sanction and errs when it includes those who are either "acutely conformist" or "incorrigible." Pogarsky, *supra* note 207, at 435, 440-41, 444-46.

²³² ROSS, *supra* note 214, at 2, 18.

²³³ *Id.*

²³⁴ Here one can see the overlap between retributive and deterrent philosophers. *See, e.g.,* KADISH ET AL., *supra* note 34, at 82-86, 89-97; *see also* Bertelli & Richardson, *supra* note 227, at 545-550.

²³⁵ ROSS, *supra* note 214, at 52-62.

²³⁶ ROSS, *supra* note 214, at 67-73. The Supreme Court has upheld the constitutionality of road blocks and "sobriety checkpoints" to permit police to check drivers for symptoms of intoxication, despite a lack of probable cause to believe that the driver was driving while impaired. *Mich. Dep't. of State Police v. Sitz*, 496 U.S. 444, 447 (1990). However, many state courts have found that such interventions violate their state constitutions. *See, e.g.,* R. Marc Kantrowitz et al., *Validity of Police Roadblocks or Checkpoints for Purpose of Discovery of Alcoholic Intoxication—Post-Sitz Cases*, 74 A.L.R. 319, 319 (2004).

²³⁷ ROSS, *supra* note 214, at 48 ("The conditions of lower-class life in industrial societies seem to lead to preferences for risk over safety and for immediate as against deferred gratification. . . . [that] may diminish the subjective severity [of punishment] and neutralize the perceived swiftness and certainty of punishment.").

²³⁸ TYLER & HUO, *TRUST IN THE LAW*, *supra* note 210, at xiv- xv, 101-07.

²³⁹ ROSS, *supra* note 214, at 61-62, 68.

²⁴⁰ *Id.* at 49. These programs are much more effective than efforts to rehabilitate offenders, such as those that require convicted drunk drivers to attend educational or group therapy programs, as well as Alcoholics Anonymous. *Id.* at 50; *see also DUI/DWI Laws*, *supra* note 225. In addition, reliance on a criminal justice solution to the problem of drunk driving inevitably means that celerity, the third prong of deterrence, is less likely to be achieved, as the practical and due process requirements of a criminal prosecution mean that it will take longer for impaired offenders to feel the consequences of their actions. *Id.* at 63-65.

²⁴¹ In Norway, in contrast, a person apprehended with a blood alcohol level of .05, compared to .08, is

sanctions lack the dramatic impact and satisfying righteous condemnation of a criminal conviction, but they have proved effective in reducing the total number of miles driven by impaired drivers and thus the accidents and injuries that they cause.²⁴² These strategies exemplify a public health approach to undesirable behavior, stressing harm reduction rather than total elimination of the undesired behavior through public condemnation, which is the stated goal of the criminal justice approach.

Thus, when one considers deterrence in the context of a broader discussion about how government policy could reduce fatal car accidents involving alcohol use, it is not surprising that the criminal law is only one of the government's many tools to reduce alcohol-related vehicle fatalities.²⁴³ Other effective strategies include efforts to encourage people not to drink and drive, such as by promoting available and affordable public transportation, to engineer safer highways and automobiles, to require seat belt use, to improve emergency medical services, and to decrease alcohol consumption by raising its price and decreasing its availability, particularly when the drinker is likely to drive.²⁴⁴ One highly effective strategy is to require alcohol-impaired drivers to install breath alcohol ignition interlocks in their cars as a condition of driving while their licenses are suspended or as a condition of license restoration,²⁴⁵ yet only ten states require this under all circumstances.²⁴⁶

The lessons of deterrence research in general, and drunk driving research in particular, are relevant to whether pregnant women who abuse drugs can be deterred from their drug use through the threat of the criminal sanction.

IV. IMPLICATIONS OF ADDICTION AND DETERRENCE RESEARCH FOR CHANGING THE BEHAVIOR OF PREGNANT DRUG USERS

A. *The Lessons of Deterrence Research*

When one considers the reality of pregnant drug users' lives in light of the empirical literature on deterrence, it appears extremely unlikely that draconian criminal justice policies, such as prosecuting women for homicide if their child is stillborn or sentencing them to prison for fetal child abuse, will deter pregnant women with substance abuse problems from using drugs. Classical deterrence principles postulate that potential offenders will respond either to a legislative decision to increase the punishment for particular behavior (increased severity) or to changes in local prosecutorial policy (increased certainty of punishment) by adjusting their

punished by a fine of 1.5½ % of his monthly salary. ROSS, *supra* note 214, at 56.

²⁴² ROSS, *supra* note 214, at 3-4, 8-12, 52; Joseph Gusfeld, Foreword to ROSS, *supra* note 214, at xi-xii.

²⁴³ *Id.*

²⁴⁴ William N. Evans et al., *General Deterrence of Drunk Driving: Evaluation of Recent American Policies*, 11 RISK ANALYSIS 279, 285 (1991). In addition, tort liability for those who fail to "cut off" obviously inebriated drivers could discourage bartenders and others from serving intoxicated patrons. ROSS, *supra* note 214, at 3-4, 8-11.

²⁴⁵ MOTHERS AGAINST DRUNK DRIVING (MADD), STOPPING DRUNK DRIVING BEFORE IT STARTS: A TECHNOLOGICAL SOLUTION, <http://pdfcast.org/pdf/stopping-drunk-driving-before-it-starts-a-technological-solution> (last visited Mar. 7, 2011).

²⁴⁶ *Id.*; see also Daniel Wise, *Drunken Drivers Must Install Devices to Monitor Alcohol Use*, N.Y.L.J., July 23, 2010, www.law.com/jsp/nylj/PubArticleNY.jsp?id=1202463814947&slreturn=1&hblogin=1; State Ignition, NATIONAL CONF. OF STATE LEGIS., <http://ncsl.org/default.aspx?tabid=13558> (last updated Jan. 2011); see also *DUI/DWI Laws*, *supra* note 225.

behavior to minimize the risk of apprehension and conviction. However, due to the nature of drug use, addicts and drug dependent persons are, in general, much less likely than the archetypal “rational man” to respond as classical deterrence theory anticipates. Both neuroscience researchers and behaviorists agree that over time, drug use causes a change in the reward circuitry of the brain that makes continued drug use highly reinforcing.²⁴⁷ Long-term addicts can have cognitive impairments that impair rationality, decreasing the likelihood that the threat of a criminal sanction will be salient in making decisions about stopping drug use.²⁴⁸ Whether one views addiction as a “chronic, relapsing brain disease”²⁴⁹ or a mental illness or behavioral problem that can be ameliorated by treatment coupled with economic and social supports that help addicts choose to reduce or discontinue their drug use,²⁵⁰ drug addiction is certainly a condition for which appeals to logic face an uphill battle.

For pregnant drug users, the data suggest that they are even less likely than other addicts to respond to the “sticks” of classical deterrence. Pregnant drug users are overwhelmingly poor, socially isolated, and uneducated. They frequently suffer from co-occurring mental illnesses, which, without treatment, make rational responses to changed circumstances more difficult.²⁵¹ Pregnant drug users often have minimal stakes in conventionality; thus, they are precisely the type of offenders who are least likely to respond to traditional threats of punishment.²⁵² Indeed, the limited data indicate that for pregnant drug users, the threat of criminal prosecution or other legal sanction is likely to have an opposite, unintended effect: driving pregnant drug-using women away from any governmental authorities (legal, medical, or social service), even those offering help.²⁵³ This problem is compounded by the lack of trust that many members of minority groups have in physicians and other health care professionals.²⁵⁴

In addition, the basic predicate for deterrence appears to be missing for many pregnant women. The *sine qua non* of deterrence is that “[a] potential offender must realise [sic] that the probability of conviction or the severity of punishment has changed.”²⁵⁵ Because deterrence depends on a potential offender’s *perception* that she risks the imposition of a legal sanction if she is caught engaging in prohibited behavior, she must be aware of the specific law or policy change being pursued before it can affect her behavior. As noted earlier, five factors shape the likelihood that a change in the risk of sanction will influence an offender.²⁵⁶ First, legal and policy changes

²⁴⁷ See *supra* notes 79-90 and accompanying text.

²⁴⁸ See *supra* note 125 and accompanying text.

²⁴⁹ See *supra* note 3.

²⁵⁰ See discussion *supra* Section II. C.

²⁵¹ See *supra* notes 135-45 and accompanying text.

²⁵² See *supra* notes 219-221 and accompanying text.

²⁵³ Roberts & Nuru-Jeter, *supra* note 194, at 193-98; MURPHY & ROSENBAUM, *supra* note 38, at 88-93; Phillips, *supra* note 195, at 359, 367-68.

²⁵⁴ See, e.g., L. Ebony Boulware et al., *Race and Trust in the Health Care System*, 118 PUB. HEALTH REP. 358, 362-64 (2003) (finding that African-American patients are significantly less likely to trust their health care providers, which is probably a consequence of a history of racial discrimination in the health care system); Janice Blanchard & Nicole Lurie, *R-E-S-P-E-C-T: Patient Reports of Disrespect in the Health Care Setting and Its Impact on Care*, 53 J. OF FAM. PRAC. 721, 727-29 (2004) (“Persons who believed they had been treated unfairly due to their race and who thought they would have received better care had they been of a different race were more likely to ignore the doctor’s advice and put off care when medically needed.”)

²⁵⁵ VON HIRSCH, *supra* note 206, at 7.

²⁵⁶ *Id.*

must be clearly communicated to a potential offender if they are going to affect her behavior.²⁵⁷ While a pregnant drug user is undoubtedly aware that drug use is against the law,²⁵⁸ she is unlikely to know that if she uses drugs and something happens to her fetus or newborn child, she will be prosecuted for homicide or another serious felony.²⁵⁹ Studies of legal awareness show that “average” citizens living in the community usually lack specific knowledge about what conduct the law prohibits and are ill-informed about the particular sanction (e.g., sentence length) attached to specific laws.²⁶⁰ Pregnant women using drugs, who usually live at the margins of society, are highly unlikely to be aware of specific changes in the criminal code or in enforcement policy.

Second, even assuming that a potential offender accurately perceives the likelihood that she will receive a criminal sanction for her conduct, deterrence will not occur unless the offender “takes these altered risks into account when deciding whether to offend. If the offender acts impulsively, or under the influence of drugs or alcohol, her belief about punishment risks may have less impact on her behavior.”²⁶¹ Research on drunk driving makes clear that the best predictor of recidivism (in which deterrence has implicitly failed) is the severity of the driver’s addiction: more severely addicted individuals are less likely to be responsive to the risk of future apprehension and sentence.²⁶² Only those situated at the middle of the U-shaped deterrence curve are likely to alter their behavior because of a change in drunk driving sanctions.²⁶³ Research on drug prohibitions and deterrence generally suggests the same conclusion: increasing the certainty and severity of conviction, the lynchpins of American drug policy, has very little impact on drug using behavior.²⁶⁴

When this second deterrence criterion is applied to drug-using pregnant women, the threat of criminal prosecution seems even less likely to change the women’s behavior, both

²⁵⁷ See *supra* note 217 and accompanying text (indicating that changes in law enforcement policy must be both “in your face” and widely disseminated). Indeed, some research shows that perception is more important than reality in shaping the public’s behavior. MacCoun, *supra* note 207, at 500.

²⁵⁸ Indeed, the limited data available suggests that when women fear that they will be criminally prosecuted if they are candid with health care professionals, they are less likely either to seek care or be candid when they do. See *supra* note 210 and sources cited therein.

²⁵⁹ Of course, some prosecutors argue that this is precisely what must change. They assert that they need to initiate prosecutions for more serious crimes in order to “educate” drug-using pregnant women, as well as the larger community, in order to bring home to everyone that drug use during pregnancy is a serious criminal matter. In this sense, they are relying on the moral educational aspects of deterrence, as well as the Durkheimian notion that criminal prosecutions serve a boundary maintenance function. See *supra* note 210. This latter argument is problematic, however, because many people, including those who want to promote the birth of healthy children, disagree that the conduct of pregnant women should be regulated by the legal system, let alone the criminal justice system. See, e.g., Dorothy Roberts et al., *Drugs, Pregnancy, and the Law: Rethinking the Problems of Pregnant Women Who Use Drugs*, 43 HASTINGS L.J. 505 (1992); Lynn M. Paltrow, *Pregnant Drug Users, Fetal Persons, and the Threat to Roe v. Wade*, 62 ALB. L. REV. 999 (1999).

²⁶⁰ Williams & Gibbs, *supra* note 214, at 592-94; see also MICHAEL HOUGH & JULIAN ROBERTS, ATTITUDES TO PUNISHMENT: FINDING FROM THE BRITISH CRIME SURVEY vii-x (1998) (finding that most British citizens overestimated the extent of crime in England and Wales and underestimated the severity of sentences that judges were imposing).

²⁶¹ VON HIRSCH, *supra* note 206, at 7 (italics in original).

²⁶² Yu, *supra* note 229, at 267.

²⁶³ See *supra* text accompanying notes 228-33.

²⁶⁴ MacCoun, *supra* note 207, at 501 (asserting that the certainty and severity of punishment for drug crimes explains less than five percent of the behavioral change predicted in perceptual deterrence studies).

because of the severity of their impairment and the lack of options that would enable them to act differently. These women are typically long-term drug users, suggesting that their behavior is both impulsive and compulsive.²⁶⁵ They often view themselves as essentially choiceless, making the kind of rational calculation encompassed in the notion of “deciding whether to offend” virtually impossible. Instead, it would appear to be more fruitful to try to move potential sanctionees to the middle of the deterrence curve, where they would be able to respond to a change in sanctions or other incentives.²⁶⁶ Removing some of the barriers pregnant women now face in accessing treatment would permit them to decrease their drug use, taking advantage of women’s frequently expressed desire to reduce their drug usage to protect the health of their fetus.²⁶⁷

The third, fourth, and fifth factors relevant to deterrence also suggest that pregnant drug users are unlikely to respond to marginal increases in the threat that a criminal sanction will be imposed if they do not change their behavior. These are that “[a] potential offender must believe that there is a non-negligible risk of being caught,” “believe that the altered penalty will be applied to him if he is caught²⁶⁸ and be willing to alter his or her choices regarding offending in the light of the perceived change in certainty or severity of punishment.”²⁶⁹

Pregnant drug users can hardly be described as “optimistic,” but the passive and choiceless worldview of many who fall in this category suggests they are unlikely to undertake the kind of calculus required for deterrence principles to work. The case of the St. Louis burglars is instructive.²⁷⁰ While recognizing they might be caught, these burglars nonetheless chose to commit burglaries. Their fear of detection motivated them to act quickly to minimize the chances of apprehension, but this also led them to act “irrationally,” by leaving behind valuable items that could not easily be stolen.²⁷¹ Here, too, even if one assumes that a pregnant drug user is aware of the risk that her drug use may be detected (“a non-negligible risk of being caught”), as indeed it might if she was open with a doctor, nurse, or social worker,²⁷² the impulsive nature of her drug use renders rational calculation and “alter[ing of] choices” unlikely. The desire to get high is such that it is likely to trump any distant concern about long-term criminal consequences.

B. Lessons of Addiction Research

Pregnant women and other addicts may respond to “carrots”—the incentives of positive

²⁶⁵ Kissin, *supra* note 180, at 30-31; Whiteford & Vitucci, *supra* note 150, at 1373.

²⁶⁶ See also Tyler & Darley, *supra* note 208, at 721-29 (finding that enhancing citizens’ perception of governmental legitimacy can increase their compliance with the law).

²⁶⁷ See *supra* notes 181, 189, 222, 226.

²⁶⁸ The corollary to this principle is that if there are multiple contingencies intervening between apprehension and conviction, an “optimistic” offender may believe that he will escape the heightened penalty, and thus will not be deterred by it. VON HIRSCH, *supra* note 206, at 7.

²⁶⁹ The gloss on this principle is that “[if the crime is sufficiently important to the offender] because of the resources or life-style it provides or the needs it fulfills, then enhanced certainty or severity of punishment may not make him desist. This has been the problem, for example, in applying drug prohibitions to active drug users.” VON HIRSCH, *supra* note 206, at 7.

²⁷⁰ *Id.* at 36.

²⁷¹ *Id.*

²⁷² Whiteford & Vitucci, *supra* note 150, at 1374 (describing a study suggesting that pregnant drug users would choose to deliver their babies at home if hospital-delivery required drug-testing).

rewards—which can be powerful tools in helping them reduce or eliminate their drug use. Heyman and many other researchers have shown how incentives can shape behavior, setting the stage for more permanent recovery from addiction. Higgins, Prendergast, Heil, and Donatelle all found that addicts could be motivated to become abstinent or substantially reduce their drug use through contingent financial incentives, offered in conjunction with other supportive services.²⁷³ These contingencies are especially important in the early stages of addiction treatment and recovery, when relapse is common.²⁷⁴ Although most contingent management programs for pregnant women focus on reducing nicotine use,²⁷⁵ there is no reason that they could not be expanded to reduce alcohol and drug abuse by pregnant women.

Both anecdotal evidence and controlled studies suggest that incentives are most effective with drug users who have the most to gain by stopping their drug use or the most to lose if they continue it. This includes professionals, like airline pilots and physicians, who are offered one chance to succeed in treatment or face losing their jobs or licenses,²⁷⁶ or those who risk losing their middle-class lifestyles if they do not quit.²⁷⁷ In addition, epidemiological data suggests that most drug users “age out” of heavy drug use by their early thirties, when the demands of work and family obligations prove incompatible with a drug-infused lifestyle.²⁷⁸ The pregnant drug users who come to the attention of the criminal justice system are “outliers” from this general trend precisely because they do not have the kinds of alternatives—close friends and family, a job, and a middle-class lifestyle—that would provide attractive incentives to desist from drug use.

V. RECOMMENDATIONS AND CONCLUSIONS: MORE CARROTS, FEWER STICKS

If pregnant drug users are to successfully end or reduce their drug use, prosecutors must give up the punitive, counterproductive strategy they have pursued in recent decades, which tries to threaten pregnant women into giving up drugs. While such a strategy has short-term political benefits for prosecutors,²⁷⁹ everything we know about deterrence, in theory and in practice,

²⁷³ See *supra* text accompanying notes 99, 101, 105, 107.

²⁷⁴ See *supra* notes 135-37, 140-42 and accompanying text. Indeed, many programs acknowledge the likelihood of relapse by designing their incentives to “reset” to initial levels if relapse occurs, rather than terminating the relapsing addict. See, e.g., Higgins, *supra* note 101, at 65.

²⁷⁵ Higgins, *supra* note 101, at 70; Heil, *supra* note 105, at 1011; Donatelle, *supra* note 107. One study examined the impact of adding case management services to behavioral interventions (including incentive payments for “clean” urine samples) to try to reduce the use of illegal drugs among pregnant women, but did not have a control group of drug-using women who were not provided with behavioral interventions or case management. Jones, *supra* note 102, at 343-45.

²⁷⁶ HEYMAN, *supra* note 3, at 86; see also Richard T. Paris & David I. Canavan, *Physician Substance Abuse Impairment: Anesthesiologists vs. Other Specialties*, 18 J. ADDICTIVE DISEASES 1 (1999) (finding that eighty-one percent of anesthesiologists had sustained recovery from addiction for more than two years).

²⁷⁷ HEYMAN, *supra* note 3, at 56-61; see also Copeland, *supra* note 90, at 339 (describing a study of recovered addicts in Australia).

²⁷⁸ HEYMAN, *supra* note 3, at 73, 77.

²⁷⁹ Unlike their counterparts in other democratic nations, most American prosecutors are elected, rather than appointed, and they are accountable to the local citizenry, rather than a centralized government bureaucracy. As a result, they are always running for reelection, and they have every incentive to bring prosecutions based on a theory of fetal abuse. While they are almost certainly going to be reversed on appeal, they will have taken a stand that will attract conservative, law-and-order voters, who are frequently “pro-life” as well. See Fentiman, *In the Name of Fetal Protection*, *supra* note 19, at 660-67; Fentiman, *Pursuing the Perfect Mother*, *supra* note 19, at 459-61.

indicates that it will not stop the drug use of women living at the margins of society. What pregnant drug users and addicts need, and what all the data suggests that they will respond to, is comprehensive, integrated health care that addresses their physical and mental health needs, provides substance abuse treatment, and offers individualized support in accessing necessary services, such as housing, transportation, and child care.²⁸⁰ Contingent management programs that provide concrete financial incentives to initiate and sustain drug abstinence should be an important part of the overall treatment offered.²⁸¹ Treatment and social service interventions must acknowledge both reality and the underlying causes of female addiction, including its frequent co-occurrence with depression and PTSD, its connection with both childhood physical and sexual abuse, and adult domestic violence.²⁸² Without helping addicted women live safely, away from drug-using and physically abusive partners, all efforts at treatment will be futile. Women should be given the opportunity to have their children live with them in residential treatment or access quality day care whenever it is safe and feasible for the children, since having custody of one's children is associated with longer time in treatment and positive treatment outcomes.²⁸³

The need for, and potential of, integrated health care for pregnant drug-using women has been recognized since the 1970s.²⁸⁴ However, implementation has been slow and uneven due to insufficient and constantly changing funding sources and the prevailing punitive approach to drug use.²⁸⁵ In times of financial belt-tightening, funding for substance abuse may seem like an unaffordable luxury, but providing comprehensive, integrated substance abuse and health care services is cost-effective. Studies have shown that residential treatment and intensive outpatient care for pregnant and parenting women decreases substance abuse, leading to improved outcomes in the children of these women and financial savings for neonatal intensive care.²⁸⁶ In addition, intensive drug treatment has also been shown to save tax-payers money by reducing crime and the costs of addressing it.²⁸⁷

Ultimately, the only solution to the problem of substance use by pregnant women is a strategy that joins prevention with effective treatment that draws from what researchers know about the physiological and neurological elements of addiction. Since a large number of pregnant substance users were the victims of childhood physical and sexual abuse, medical and social services must ensure that these girls receive appropriate treatment, and the criminal justice system must remove perpetrators from the places in which they inflict these harms. The criminal justice and family court systems should also aggressively address domestic violence against adult women. In both cases, health care workers need to learn to conduct appropriate screening

²⁸⁰ See Covington, *supra* note 121, at 34; Brown & Melchior, *supra* note 139, at 371-74.

²⁸¹ See, e.g., Prendergast, *supra* note 99; Higgins, *supra* note 101; Heil, *supra* note 105 (discussing vouchers and other incentives to comply with treatment).

²⁸² See, e.g., Covington, *supra* note 121; Marcenko & Spence, *supra* note 150, at 107.

²⁸³ Weiss et al., *supra* note 133, at 250.

²⁸⁴ See, e.g., Brindis et al., *supra* note 150, at 113-21; Jansson, *supra* note 151, at 321-29; Covington, *supra* note 121, at 377-78.

²⁸⁵ Janet W. Stevenson & Traci Rieckmann, *Legislating for the Provision of Comprehensive Substance Abuse Treatment Programs for Pregnant and Mothering Women*, 16 DUKE J. GENDER L. & POL'Y 315, 326-31 (2009). Many states have used their own funds as well as federal block grants to establish innovative pilot programs, but could not use Medicaid funding because it may not be used for residential substance abuse treatment in institutional settings. *Id.*

²⁸⁶ Jansson, *supra* note 151, at 322, 328-329; Brigham, *supra* note 104, at 91, 94.

²⁸⁷ Marilyn Daley et al., *The Costs of Crime and the Benefits of Substance Abuse Treatment for Pregnant Women*, 19 J. SUBSTANCE ABUSE TREATMENT 445, 452-55 (2000); Lambert, *supra* note 163, at 173.

evaluations of young girls and women to ensure that PTSD and other mental illnesses and substance abuse problems are identified early. Health care workers must be trained to be less judgmental and more empathic so that women and girls will be forthcoming about their experiences. Finally, instead of abandoning and stigmatizing young women who get into trouble in school or with the law,²⁸⁸ we must work to provide them with the education, training, and social support networks necessary for them to have attractive alternatives to drug use.

²⁸⁸ Cf. CHESNEY-LIND & PASKO, *supra* note 212, at 3-9, 25, 27, 68, 176.