

Barry University School of Law

Digital Commons @ Barry Law

Faculty Scholarship

Winter 2010

Regression by Progression Unleveling the Classroom Playing Field through Cosmetic Neurology

Helia Garrido Hull

Follow this and additional works at: <https://lawpublications.barry.edu/facultyscholarship>



Part of the [Disability Law Commons](#), [Food and Drug Law Commons](#), and the [Health Law and Policy Commons](#)

Regression by Progression: Unleveling the Classroom Playing Field Through Cosmetic Neurology

Helia Garrido Hull*

*"[H]ow much happier that man is who believes his native town to be the world, than he who aspires to become greater than his nature will allow."*¹

I. INTRODUCTION

In the novel *Frankenstein*, Victor Frankenstein exceeds the natural order of reality by creating life and learns to regret his desire to become something greater than his own nature allowed. Although the story is fiction, for many, the desire to exceed their own physical, emotional, or intellectual limitations is very real. Today, medical advances intended to improve the quality of life for those suffering from disease, disorders, or disabilities are routinely employed by healthy individuals to enhance their natural abilities. The illicit use of prescription drugs for non-therapeutic purposes has sparked an ethical debate within the academic and medical communities regarding the propriety of enhancing performance through cosmetic neurology.² For some, using prescription drugs for non-therapeutic use is both morally wrong and socially unjustified. As one author opined, "the original purpose of medicine is to heal the sick, not turn healthy people into gods."³ For others, using prescription drugs to increase attention span, improve learning, or to augment productivity is both morally acceptable and culturally desirable.⁴ Nowhere is this more

* Associate Dean for Academic Affairs and Associate Professor of Law, Barry University Dwayne O. Andreas School of Law; B.A. Providence College, J.D. Stetson University College of Law. I would like to thank my research assistant, Cameron Parks, for her diligence and enthusiasm. I would also like to thank my husband, Eric V. Hull, for his constant support and patience. Without his love and encouragement I would not be where I am today.

¹ MARY SHELLY, *FRANKENSTEIN; OR, THE MODERN PROMETHEUS* 47 (Barnes and Noble Books 2003) (rev. ed. 1831).

² See generally Anjan Chatterjee, *Cosmetic Neurology: The Controversy Over Enhancing Movement, Mentation, and Mood*, 63 *NEUROLOGY* 968, 968 (2004) (defining cosmetic neurology as the use of medicine to artificially improve brain function by modulating motor, cognitive, and affective systems to enhance performance and improve quality of life).

³ Chatterjee, *supra* note 2, at 969 (citing FRANCIS FUKUYAMA, *OUR POSTHUMAN FUTURE: CONSEQUENCES OF THE BIOTECHNOLOGY REVOLUTION* 208 (2002)).

⁴ Henry Greely et al., *Towards Responsible Use of Cognitive-Enhancing Drugs by the Healthy*, 456 *NATURE* 702 (2008), available at <http://www.nature.com/nature/journal/>

evident than on high school and college campuses throughout the United States, where healthy, intelligent students are increasingly using controlled drugs without prescriptions to enhance academic performance. Lost in this debate, however, is the significant negative impact that illicit use of certain prescription drugs by healthy individuals has on those individuals for whom the drugs were originally intended.

High school and college students across the country are increasingly using methylphenidate and amphetamines to increase cognition, improve grades, and gain a competitive edge over their classmates; they also use these substances recreationally. Both stimulant drugs are prescribed to treat individuals suffering from Attention Deficit Hyperactivity Disorder (ADHD), a psychological disorder that places millions of students at a competitive disadvantage within the learning environment.⁵ Due to their high potential for abuse, methylphenidate and amphetamines are listed as controlled substances under U.S. law; therefore, they can only be used legally with a prescription.⁶ The non-medical use of either stimulant is a crime punishable by imprisonment and the imposition of substantial monetary fines, but the lack of enforcement coupled with moral acceptance of such use among students has led to an increase in illicit use of each stimulant.⁷

The use of methylphenidate and amphetamines by students without ADHD is both dangerous to the user and unfair to those individuals who require the stimulants to compete with other students in the classroom. When healthy individuals utilize stimulants to enhance their natural cognitive abilities, the gap that use of the medicine was intended to close between students with and without ADHD reemerges. As a result, the classroom playing field once again becomes unlevel, placing certain individuals at a competitive disadvantage while destroying decades of legal precedent intended to protect those individuals from such an imbalance.

This article addresses the increasing use of methylphenidate and amphetamines by high school and college students and argues that states have a responsibility to prevent the uncontrolled, non-therapeutic, and injury-causing use of stimulants by students under their supervision and to protect the rights of

v456/n7223/full/456702a.html.

⁵ *Attention Deficit Hyperactivity Disorder (ADHD)*, NAT'L INST. OF MENTAL HEALTH, <http://www.nimh.nih.gov/health/publications/attention-deficit-hyperactivity-disorder/complete-index.shtml> (last visited Sept. 5, 2010) [hereinafter NIMH].

⁶ 21 C.F.R. §1308.12 (2010).

⁷ See 21 U.S.C. § 841(a)(1) (2006) (imposing penalties for the unauthorized distribution of a controlled substance); see also Sean Esteban et al., *Non-medical Use of Prescription Stimulants Among US College Students: Prevalence and Correlates from a National Survey*, 99 ADDICTION 96 (2005), available at <http://www.wellcorps.com/files/NonMedicalUseOfPrescriptionStimulants.pdf>.

individuals with ADHD. Part II provides a brief overview of ADHD, the dangers associated with the use of methylphenidate and amphetamines to treat the disorder, and the Food and Drug Administration's response to risks posed by the use of each drug. Part III explores the increasing non-medical use of methylphenidate and amphetamines by students across the United States and considers the short-term and long-term implications of such use. Part IV argues that the current regulatory structure is inadequate and negatively impacts students with legitimate medical needs by un-leveling the playing field created by existing laws. Part V presents recommendations to level the academic playing field.

II. ADHD: DIAGNOSIS, REGULATION, AND RISK

Student misconduct in the classroom severely constrains the ability of schools to effectively educate students and has become a common reason for referring students to mental health services.⁸ Often, student misconduct is linked to inattention, hyperactivity, or impulsivity that are the hallmarks of ADHD.⁹ Once a student is diagnosed with ADHD, teaching strategies, unique learning environments, and adaptive or assistive technologies can be employed to prevent classroom disruptions and assist students with ADHD to compete on a level playing field with their fellow students.¹⁰

A. ADHD

ADHD is the current diagnostic label for a developmental disorder that has been known over the last century as "brain-damaged syndrome," "minimal brain dysfunction (MBD)," "hyperkinetic impulsive disorder," or "attention deficit disorder (ADD)."¹¹ ADHD affects between five to eight percent of school-age children and is the most common reason for referral of children to mental health services.¹² Individuals with ADHD often experience substantial impairment in family, social, and educational functioning.¹³ In a classroom environment, individuals with ADHD may have difficulty controlling their

⁸ *Strategies for Teaching Students With Attention Deficit Disorder*, W. VA. UNIV., <http://www.as.wvu.edu/~scidis/add.html> (last updated Apr. 10, 2007).

⁹ See NIMH, *supra* note 5.

¹⁰ *Strategies for Teaching Students With Attention Deficit Disorder*, *supra* note 8.

¹¹ *What is ADHD or ADD?*, NAT'L RES. CTR. ON AD/HD, <http://www.help4adhd.org/en/about/what> (last visited Sept. 5, 2010).

¹² *Id.*

¹³ Am. Med. Ass'n, *Attention Deficit Hyperactivity Disorder*, <http://www.ama-assn.org/ama1/pub/upload/mm/443/csaph10a07-fulltext.pdf> (last visited Sept. 5, 2010).

behavior and staying focused and may experience periods of hyperactivity.¹⁴ As a result, otherwise simple classroom tasks can become extremely challenging.¹⁵ ADHD symptoms first appear between the ages of three and six, but no single test has proven effective at identifying the disorder.¹⁶ Typically, individuals undergo a battery of tests by physicians and mental health specialists to rule out other possibilities for the symptoms exhibited.¹⁷ Although it is normal for young children to experience periods of inattention, hyperactivity, or impulsivity, children with ADHD exhibit these behaviors more frequently and with greater severity.¹⁸ Thus, ADHD is typically determined upon proof that the child has exhibited such symptoms for at least six months at a degree greater than that expected from children of similar age.¹⁹

Although treatment may temporarily relieve many of the disorder's symptoms to help individuals lead productive lives, no cure exists.²⁰ ADHD can continue into adulthood.²¹ Approximately two to four percent of adults have ADHD.²² Although diagnostic criteria exist for children, there are currently no age-appropriate diagnostic criteria for adults.²³ Many adult patients are self-referred.²⁴ Because it is difficult for doctors to accurately diagnose ADHD even in adults, students who understand the testing protocol can easily manipulate the process to obtain a prescription.²⁵

Once diagnosed, individuals with ADHD may be treated with one of a number of psychoactive stimulants. However, only two substances are widely utilized by American physicians to treat children: methylphenidate and amphetamines.²⁶ Stimulants work by increasing dopamine levels in the brain, a

¹⁴ NIMH, *supra* note 5.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ American Acad. of Pediatrics, *ADHD and Your School-Aged Child* (Oct. 2001), <http://pediatrics.aappublications.org/cgi/data/108/4/1033/DC1/1>.

¹⁹ *Id.*

²⁰ NIMH, *supra* note 5.

²¹ *Id.*

²² NAT'L RESOURCE CTR. ON AD/HD, *supra* note 11.

²³ ADHD diagnosis in children is based on meeting the criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR). These criteria require evidence of inattention, or hyperactivity and impulsivity, or both.

²⁴ *Adult ADHD: Issues and Answers*, NYU SCHOOL OF MEDICINE ADULT ADHD NEWSLETTER (N.Y.U. Sch. of Med., New York, N.Y.), Spring 2005, available at http://webdoc.nyumc.org/nyumc/files/psych/attachments/adult_adhd_1_1.pdf.

²⁵ *Id.* (noting that ADHD can be diagnosed in adults who exhibit criteria used to diagnose children as long as the adult can recollect such symptoms in childhood).

²⁶ *Ritalin Use Among Youth: Examining the Issues and Concerns: Hearing Before the Subcomm. on Early Childhood, Youth and Families of the H. Comm. on Education and the Workforce*, 106th Cong. 12-14, 79-98 (2008) (statement of Terrance W. Woodworth, Deputy

chemical associated with pleasure, movement, and attention.²⁷ These stimulants pass through the blood-brain barrier to affect brain function that manifests in changes in perception, mood, consciousness cognition, and behavior.²⁸ For individuals with ADHD, the stimulants act to reduce hyperactivity and impulsivity and to improve the individual's ability to focus, work, and learn.²⁹ Because these medications may pose significant dangers to individuals with cardiovascular (heart and blood) or psychiatric problems, however, physicians should examine individuals diagnosed with ADHD to assess their cardiovascular and psychiatric health and warn them of the dangers associated with using the particular drug.³⁰

The use of stimulants has been shown to improve attention span, concentration, compliance, handwriting, fine motor skills, and interactions with other students.³¹ Although methylphenidate and amphetamines are effective at treating the symptoms of ADHD, their ability to bring about short-term beneficial changes in consciousness and mood creates a high potential for abuse that can lead to addiction.³² Congress has addressed this problem by placing strict controls on these and other psychoactive drugs.³³

B. Regulation of Psychoactive Drugs

The United Nations Convention on Psychotropic Substances (UNCPS) was signed by the United States on February 21, 1971 and ratified on April 16, 1980. The goal of the Convention is to encourage stricter regulation over the illegal importation, manufacture, distribution, possession, and improper use of controlled substances.³⁴ The U.S. Drug Enforcement Agency (DEA) was

Dir., Office of Diversion Control, Drug Enforcement Admin., U.S. Dep't of Justice), available at <http://www.justice.gov/dea/pubs/cngrtest/ct051600.htm> [hereinafter Woodworth Statement].

²⁷ Nat'l Inst. on Drug Abuse, Nat'l Insts. of Health, U.S. Dep't of Health & Human Servs., *NIDA InfoFacts: Stimulant ADHD Medications: Methylphenidate and Amphetamines* (June 2009), available at <http://drugabuse.gov/pdf/Infofacts/ADHD09.pdf>.

²⁸ *Id.*

²⁹ NIMH, *supra* note 5.

³⁰ Victoria L. Vetter et al., *Cardiovascular Monitoring of Children and Adolescents with Heart Disease Receiving Medications for Attention Deficit/Hyperactivity Disorder*, 117 CIRCULATION 2407, 2418 (2008), <http://circ.ahajournals.org/cgi/content/full/117/18/2407> ("The consensus of the committee is that it is reasonable to obtain ECGs as part of the evaluation of children being considered for stimulant drug therapy.").

³¹ Jay D. Tarnow, *Pharmacological Treatment of Attention Deficit Disorders*, ADHD SELF-MGMT. CTR. ONLINE, http://www.adhdselfmanagement.com/pharmacological_treatment_add.html (last visited May 24, 2010).

³² *Id.*

³³ See *infra* Part II.B.

³⁴ Convention on Psychotropic Substances, E.S.C. Res. 1474 (XLVIII), U.N.Doc. A/RES/1474 (XLVIII) (Mar. 24, 1970).

designated as the authority responsible for meeting the United States' obligations under the treaty.³⁵ However, because the Convention is not self-executing, implementation of its terms required additional action by Congress. Recognizing the "substantial and detrimental effect on the health and general welfare of the American people" caused by such activities, Congress enacted the Controlled Substances Act (CSA) to implement the UNCPS.³⁶ The Act created five Schedules (classifications) that categorize drugs based on multiple factors including the drug's medical utility and its risk of harm. Schedule I drugs include drugs that have the highest potential for abuse, offer no recognized medical utility, and cannot be used safely.³⁷ Examples include LSD, PCP, heroin, marijuana, and crack cocaine. Schedule II includes drugs that have a high potential for abuse, the use of which may lead to severe psychological or physical dependence.³⁸ However, Schedule II drugs do have currently accepted medical use as part of treatment plans.³⁹ Examples include morphine, cocaine, oxycodone, methylphenidate, and amphetamine mixtures.⁴⁰ Drugs listed on Schedules III, IV, and V have decreasing potential for abuse, medical utility, and risk of physical dependence or psychological dependence relative to the drugs and other substances in higher Schedules.⁴¹ The DEA is charged with enforcing the CSA, but the Food and Drug Administration (FDA) also plays a critical role as the primary authority for regulating controlled drugs that are prescribed for therapeutic use.⁴²

The CSA created penalties for the unlawful manufacturing, distribution, and dispensing of controlled substances, with penalties that vary based on several factors, including the Schedule of the substance. In 1988, Congress passed the Anti-Drug Abuse Act (ADAA), which imposes penalties on both the seller and the purchaser of the drug.⁴³ Unless otherwise authorized by law, it is unlawful to knowingly or intentionally distribute a controlled substance.⁴⁴ The penalty for such action is imprisonment for up to one year, a minimum fine of \$1000,

³⁵ *Continuing Concerns Over Imported Pharmaceuticals: Hearing Before the Subcomm. on Oversight and Investigations of the H. Comm. on Energy and Commerce*, 107th Cong. 37-40 (2001) (statement of Laura M. Nagel, Deputy Assistant Adm'r, Office of Diversion Control, Drug Enforcement Admin.), available at <http://ftp.resource.org/gpo.gov/hearings/107h/73737.pdf>.

³⁶ Controlled Substances Act, Pub. L. No. 91-513, 84 Stat. 1236, 1242 (1970) (codified at 21 U.S.C. §§ 801-904 (2006)).

³⁷ 21 U.S.C. § 812(b)(1) (2006).

³⁸ *Id.* § 812(b)(2).

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.* § 812(b)(3)-(5).

⁴² 21 C.F.R. § 290.1 (2010).

⁴³ Anti-Drug Abuse Act of 1988, Pub. L. No. 100-690, 102 Stat. 4181.

⁴⁴ 21 U.S.C. § 841(a)(1) (2006).

or both.⁴⁵ If the distribution is to someone under twenty-one years of age, or occurs within 1000 feet of a private or public school, college, or university, the penalty is twice the maximum punishment normally authorized.⁴⁶ It is also unlawful for any person to knowingly or intentionally possess a controlled substance without a valid prescription for the substance.⁴⁷ Any individual found to illegally possess such drugs may be imprisoned for up to one year and shall be fined a minimum of \$1000.⁴⁸ The penalty for such distribution or possession is particularly harsh for students. In addition to the criminal penalties that may be imposed, distributors of controlled substances are ineligible to receive federal benefits for up to five years and possessors are ineligible to receive these benefits for up to one year.⁴⁹ This includes student loans and grants.⁵⁰ Despite these substantial penalties, students across the country continue to illegally use or distribute methylphenidate and amphetamines. In many cases, individuals who use the drugs illegally are unaware of the risks posed by such use.

1. Methylphenidate

Methylphenidate shares many of the pharmacological effects of amphetamine, methamphetamine, and cocaine.⁵¹ It is commonly known by a variety of names, including "Diet Coke," "Kiddie Cocaine," "Vitamin R," "Poor Man's Cocaine," "Skittles," and "Smarties"⁵² The names reflect the effects that users experience. Both animal and human studies comparing the effects of cocaine with that of methylphenidate showed that subjects could not tell the difference because each produced the same physiologic effects.⁵³ Methylphenidate acts on the central nervous system (CNS) to reduce symptoms of ADHD by "blocking the neuronal dopamine transporter, and to a lesser extent, norepinephrine."⁵⁴ Use of methylphenidate produces "dose-related increases in blood pressure, heart rate, respiration and body temperature, appetite suppression and increased alertness."⁵⁵ Chronic use can inhibit growth

⁴⁵ *Id.* § 844(a).

⁴⁶ *Id.* §§ 859(a), 860(a).

⁴⁷ *Id.* § 844(a).

⁴⁸ *Id.*

⁴⁹ *Id.* § 862(a)(1)(A), (b)(1)(A).

⁵⁰ *Id.* § 862(d)(1)(A).

⁵¹ Drug Enforcement Agency, U.S. Dep't of Justice, Methylphenidate (A Background Paper) (Oct. 1995), available at <http://www.methylphenidate.net/>.

⁵² DRUG FREE WORLD, THE TRUTH ABOUT RITALIN ABUSE (2009), http://www.drugsalvage.com.au/downloads/kiddie_cocaine.pdf.

⁵³ *Id.*

⁵⁴ Am. Med. Ass'n, *supra* note 13, at 8.

⁵⁵ Drug Enforcement Agency, *supra* note 51.

and result in weight loss.⁵⁶ If abused, methylphenidate may cause "excessive CNS stimulation, euphoria, nervousness, irritability," agitation, psychotic episodes, violent behavior, and severe psychological dependence.⁵⁷

Methylphenidate is most commonly marketed under the brand name Ritalin, and its beneficial effects on individuals with ADHD are well documented.⁵⁸ The drug's success led to its widespread administration beginning in the 1990s. Between 1990 and 2000, the production of Ritalin increased nearly 500 percent.⁵⁹ Today, Ritalin is the most widely prescribed Schedule II stimulant to treat ADHD.⁶⁰ According to the United Nations, the United States produces and consumes approximately 75 percent of the world's Ritalin.⁶¹ Although these drugs have helped many individuals with ADHD, their use has become so widespread that questions exist as to whether the drug has been over-prescribed and over-used.⁶²

2. Amphetamines

Amphetamines are potent stimulants that affect the CNS by increasing levels of dopamine and norepinephrine in the brain to produce increased alertness and focus, while decreasing fatigue and hunger.⁶³ Its actions resemble those of adrenaline, the body's fight or flight hormone.⁶⁴ The drug was widely used by soldiers in World War II to combat fatigue and increase alertness on the battlefield. After the war, easy access for the general public led to increased use that culminated in widespread abuse of the drug in the 1960s.⁶⁵ In 1971, Congress listed the drug as a Schedule II drug based on its potential for abuse,

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ See, e.g., *id.*; see also Howard Abikoff et al., *Symptomatic Improvement in Children With ADHD Treated With Long-Term Methylphenidate and Multimodal Psychosocial Treatment*, 43 J. AM. ACAD. CHILD & ADOLESCENT PSYCHIATRY 802 (2004) (reporting significant benefits from methylphenidate use in children with ADHD).

⁵⁹ Woodworth Statement, *supra* note 26, at fig.1.

⁶⁰ U.N. INT'L NARCOTICS CONTROL BD., REPORT OF THE INTERNATIONAL NARCOTICS CONTROL BOARD FOR 2009, at 13 (Feb. 24, 2010), available at http://www.incb.org/pdf/annual-report/2009/en/AR_09_English.pdf.

⁶¹ *Id.* at 26.

⁶² Gene R. Haislip, Deputy Assistant Adm'r, Drug Enforcement Admin., ADD/ADHD Statement of Drug Enforcement Administration, Address at the Conference on Stimulant Use in the Treatment of ADHD (Dec. 10-12, 1996), available at <http://www.add-adhd.org/ritalin.html>.

⁶³ Susan Jones et al., *Amphetamine Blocks Long-Term Synaptic Depression in the Ventral Tegmental Area*, 20 J. NEUROSCI. 5575, 5575-80 (2000).

⁶⁴ Alcoholism & Drug Addiction Research Found., *Amphetamines* (1991), <http://www.xs4all.nl/~4david/amphetam.html>.

⁶⁵ Everett H. Ellinwood et al., *Chronic Amphetamine Use and Abuse* (2000), <http://www.acnp.org/g4/GN401000166/CH162.htm>.

but it has reemerged as the drug of choice for many students.⁶⁶ One of the most common amphetamines used to treat ADHD is marketed under the trade name of Adderall.⁶⁷

Amphetamines act on the brain to “increase alertness, reduce fatigue, heighten concentration, decrease appetite, and enhance physical performance.”⁶⁸ They may produce a feeling of well-being, euphoria, and loss of inhibitions.⁶⁹ Misuse may result in “seizures, hypertension, tachycardia, hyperthermia, psychosis, hallucinosis, stroke, and fatality.”⁷⁰

For individuals with cardiovascular risk factors, amphetamine use is particularly dangerous.⁷¹ Blood pressure may elevate to a point where blood vessels in the brain rupture and cause a stroke.⁷² Some individuals, even young athletes, have suffered heart attacks as a result of amphetamine use.⁷³ In other cases, users may become “extremely paranoid, violent, and out of control.”⁷⁴ In the United States, Adderall use continues to climb. Between 1990 and 2000, the production for Adderall increased by 2000 percent.⁷⁵

C. FDA Response to Risk of Methylphenidate and Amphetamine Misuse

In 2005, Canada pulled Adderall off the market, citing reports linking it to twenty deaths between 1999 and 2003.⁷⁶ In that same period, twenty-five people died suddenly in the United States and fifty-four others suffered serious, unexplained heart problems while taking ADHD stimulants.⁷⁷ The FDA responded by announcing that it found no need to make immediate changes to the marketing or labeling of drugs used to treat ADHD.⁷⁸ The FDA noted that most of the victims had existing heart defects that increased the risk for sudden

⁶⁶ Woodworth Statement, *supra* note 26, at fig.1.

⁶⁷ Nat'l Inst. on Drug Abuse, *supra* note 27.

⁶⁸ Patrick G. O'Connor, *Amphetamines*, in THE MERCK MANUAL HOME EDITION (ONLINE VERSION) (last updated Jan. 2009), available at <http://www.merckmanuals.com/home/sec25/ch312/ch312c.html>.

⁶⁹ *Id.*

⁷⁰ Neal Handly, *Toxicity, Amphetamine* (last updated Oct. 21, 2009), available at <http://emedicine.medscape.com/article/812518-overview>.

⁷¹ O'Connor, *supra* note 68.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ Woodworth Statement, *supra* note 26, at fig.1.

⁷⁶ Matt McMillen, *Adderall: A Stroke of Bad News*, WASH. POST, Feb. 15, 2005, at HE02.

⁷⁷ Gardiner Harris, *Deaths Cited in Reports on Stimulant Drugs, But Their Cause is Uncertain*, N.Y. TIMES, Feb. 9, 2006, at A19.

⁷⁸ U.S. Food & Drug Admin., *Statement on Adderall* (Feb. 9, 2005), <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2005/ucm108411.htm>.

death.⁷⁹ It also noted that the overall risk associated with Adderall was only slightly higher than that associated with methylphenidate products used to treat ADHD.⁸⁰

The FDA did acknowledge, however, that use of stimulants presents the potential for rare fatal and nonfatal cardiovascular events.⁸¹ In 2006, the FDA's Drug Safety and Risk Management Advisory Committee voted unanimously to recommend the distribution of Medical Guides to warn of potential cardiovascular risks associated with using ADHD stimulants.⁸² The Committee also recommended requiring black box warnings—the strongest warning required by the FDA—to alert users of the significant cardiovascular risks associated with such use.⁸³ The Committee's decision was based on the proven relationship between elevated blood pressure and cardiovascular risk in adults, and the fact that the number of prescriptions for ADHD increased significantly over the previous fifteen years, including in the adult population.⁸⁴ Even those who disagreed with the recommendation noted the need for a broader, more effective means of communicating these risks to patients.⁸⁵

Later that year, the FDA's Pediatric Advisory Committee recommended the implementation of stronger warnings regarding the use of the stimulants in patients with underlying structural cardiovascular defects or cardiomyopathies;⁸⁶ however, the Pediatric Advisory Committee opposed requiring a black box warning to the labeling of stimulants.⁸⁷ They recommended that the FDA modify information in other sections of the product labeling to address the potential harms.⁸⁸ The FDA adopted that recommendation.⁸⁹ Product labeling on ADHD stimulants now caution on:

⁷⁹ U.S. Food & Drug Admin., *Public Health Advisory for Adderall and Adderall XR* (Feb. 9, 2005), available at <http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHeathcareProfessionals/PublicHealthAdvisories/ucm051672.htm>.

⁸⁰ *Id.*

⁸¹ U.S. Food & Drug Admin., *Drug Safety and Risk Management Advisory Committee Minutes* (Feb. 9, 2006), www.fda.gov/ohrms/dockets/ac/06/minutes/2006-4202M1_FINAL-Minutes.pdf.

⁸² *Id.* at 4.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ U.S. Food & Drug Admin., *Minutes of the Pediatric Advisory Committee* 6 (Mar. 22, 2006), http://www.fda.gov/ohrms/dockets/ac/06/minutes/2006-4210m_Minutes%20PAC%20March%2022%202006.pdf.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ U.S. Food & Drug Admin., *FDA Directs ADHD Drug Manufacturers to Notify Patients about Cardiovascular Adverse Events and Psychiatric Adverse Events* (Feb. 21, 2007), <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2007/ucm108849.htm>.

(1) use in patients with structural cardiac abnormalities or other serious heart problems; (2) the potential for increasing blood pressure and exacerbating pre-existing conditions such as hypertension, heart failure, recent myocardial infarction, or ventricular arrhythmia; (3) the need to conduct a careful history (including assessment for a family history of sudden death or ventricular arrhythmia); (4) a physical examination to assess for the presence of cardiac disease, and further cardiac evaluation if warranted; (5) the potential for causing or exacerbating psychotic, manic, or “aggressive” symptoms or seizures; (6) the potential for growth suppression in continuously medicated youth; and (7) the potential for visual disturbances.⁹⁰

The FDA also directed manufacturers of all drug products approved for the treatment of ADHD to develop Patient Medication Guides to alert patients to potential cardiovascular risks and risks of adverse psychiatric symptoms associated with the use of stimulants.⁹¹ The FDA, however, refused to require pharmaceutical companies to place black box warnings on these drugs as it had done for other dangerous drugs used to treat children and adolescents for depression.⁹² Patients, families, and caregivers receive the guides when a medicine is dispensed.⁹³ The problem with this approach is that its efficacy is based on the assumption that information about the drug’s risks is effectively conveyed to the user.

A black box warning is the strongest warning required by the FDA, and it is typically required when (1) “[t]here is an adverse reaction so serious in proportion to the potential benefit from the drug that it is essential that it be considered in assessing the risks and benefits of using a drug,” (2) “[t]here is a serious adverse reaction that can be prevented or reduced in frequency or severity by appropriate use of the drug,” or (3) where the FDA has approved the drug with restrictions to assure safe use.⁹⁴ Although black box warnings are typically mandated based on observed adverse reactions, the FDA has acknowledged that “there are instances when a boxed warning based on an expected adverse reaction would be appropriate.”⁹⁵

⁹⁰ American Med. Ass’n, *supra* note 13, at 12.

⁹¹ U.S. Food & Drug Admin., *supra* note 89.

⁹² *Antidepressant Medications for Children and Adolescents: Information for Parents and Caregivers*, NAT’L INST. ON MENTAL HEALTH (Dec. 3, 2010), <http://www.nimh.nih.gov/health/topics/child-and-adolescent-mental-health/antidepressant-medications-for-children-and-adolescents-information-for-parents-and-caregivers.shtml>.

⁹³ U.S. Food & Drug Admin., *supra* note 81.

⁹⁴ See U.S. Food & Drug Admin., *Guidance for Industry: Warnings and Precautions, Contraindications, and Boxed Warning Sections of Labeling for Human Prescription Drug and Biological Products—Content and Format* 9 (Jan. 2006), <http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm075096.pdf>; see also 21 C.F.R. § 314.520 (2010).

⁹⁵ U.S. Food & Drug Admin., *supra* note 94, at 9.

The FDA's failure to require black box warnings on ADHD stimulants is problematic for several reasons. First, stimulant misuse has increased among school-aged children, and studies show that an increasing number of students obtain the drugs illegally from a friend or acquaintance with a legal prescription.⁹⁶ Many students who use the drugs illegally are unaware of the risks associated with taking the drugs.⁹⁷ This strongly suggests that the dangers associated with sharing these drugs with others is not being effectively conveyed to those who have a prescription for the drug. Having a black box warning posted on the prescription vial could increase the likelihood that legal users will warn the illegal user of potential serious side effects of non-therapeutic use.

Second, statistically significant increases in heart rate and blood pressure occur in adults treated with stimulant use, and blood pressure is strongly and directly correlated with vascular and overall mortality in adults.⁹⁸ Placing a black box warning on the prescription vial could increase awareness of the risks associated with use by individuals with heart conditions and increase the chance that those at serious risk are informed of the dangers. Given the increased distribution of stimulants and the resultant excess supply of the drugs that can be diverted to illegal use, it would be prudent to place additional warnings on stimulants. As the United States becomes more interested in the potential for cognitive enhancement, there is a growing urgency to increase awareness of the harms of illicit stimulant use.

III. THE DECADE OF THE BRAIN: BETTER LEARNING THROUGH CHEMISTRY

Congress declared the 1990s as the "Decade of the Brain" in an effort to increase the scientific study of debilitating neural diseases and conditions that plagued society.⁹⁹ The declaration stimulated research that led to breakthroughs in fundamental knowledge on how to treat debilitating

⁹⁶ *Id.*

⁹⁷ Margaret Marrer, *Adderall Use and Abuse: Is Georgetown Part of a Growing Trend?*, GEORGETOWN INDEP. (Jan. 2, 2010), <http://www.thegeorgetownindependent.com/2.14589/adderall-use-and-abuse-1.2081595>.

⁹⁸ Joseph Biederman et al., *A Randomized, Placebo-Controlled Trial of OROS Methylphenidate in Adults With Attention-Deficit/Hyperactivity Disorder*, 59 BIOLOGICAL PSYCHIATRY 829 (2006). See also Richard H. Weisler et al., *Long-Term Cardiovascular Effects of Mixed Amphetamine Salts Extended Release in Adults With ADHD*, 10 CNS SPECTRUMS 35 (2005), available at <http://www.cnsspectrums.com/asp/articleDetail.aspx?articleid=492> (finding statistically significant increases in blood pressure and heart rate after use of stimulants).

⁹⁹ See Edward G. Jones & Lorne M. Mendell, *Assessing the Decade of the Brain*, 284 SCIENCE 739 (1999).

neurological disorders and neuropsychiatric diseases.¹⁰⁰ For some, such breakthroughs encouraged the increased acceptance of science as a means to improve the human condition and the expectation that treatments for currently incurable diseases would become available.¹⁰¹ Moreover, once those cures become available, some individuals with those disorders will seek to do what they wish with their body free from government interference.¹⁰² For others, however, artificial enhancement of humanity through application of human invention is both morally wrong and spiritually corrupt.¹⁰³ The argument cuts across science, religion and law with no clear answers, and the classroom has emerged as the epicenter of the debate. As the next section reveals, an increasing number of students are turning to stimulants to gain a competitive edge on peers in the classroom.

A. Illicit Stimulant Use By Students

The United States continues to be the world's largest market for illicit drugs and a major destination of illicit drug consignments.¹⁰⁴ In 2008, an estimated 35.5 million persons in the United States, or 14.2 percent of the population aged twelve or older, reported the use of illicit drugs at one point in their lives.¹⁰⁵ Of these, an estimated 22.2 million persons were classified with substance dependence or abuse.¹⁰⁶ That number is likely to increase, as more than 20 million Americans acknowledged being drug users in 2008.¹⁰⁷ Perhaps more troubling is the increase in abuse of prescription drugs.

In 2008, the number of individuals who abused prescription drugs in the United States exceeded the total number of individuals who abused cocaine, heroin, hallucinogens, and inhalants.¹⁰⁸ Prescription drug abuse now ranks second only to cannabis abuse.¹⁰⁹ Young adults aged eighteen to twenty-five

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² Personal autonomy and the right to privacy is viewed by some as a liberty, protected by the Due Process Clause of the Fourteenth Amendment, that allows the individual to choose what to do with his or her own body free from government restrictions that prevent such action.

¹⁰³ See, e.g., Benedict Carey, *Smartening Up: Brain Enhancement Is Wrong, Right?*, N.Y. TIMES, Mar. 9, 2008, at WK1.

¹⁰⁴ U.N. INT'L NARCOTICS CONTROL BD., *supra* note 60, at 66.

¹⁰⁵ *Id.* at 72.

¹⁰⁶ OFFICE OF APPLIED STUDIES, SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN., U.S. DEP'T OF HEALTH & HUMAN SERVS., RESULTS FROM THE 2008 NATIONAL SURVEY ON DRUG USE AND HEALTH: NATIONAL FINDINGS (2009), available at <http://www.oas.samhsa.gov/nsduh/2k8nsduh/2k8Results.pdf>.

¹⁰⁷ *Id.*

¹⁰⁸ U.N. INT'L NARCOTICS CONTROL BD., *supra* note 60, at 72.

¹⁰⁹ *Id.* at 72-73.

years exhibited twice the level of prescription drug abuse than youth aged twelve to seventeen years, and more than triple the level of abuse among adults aged twenty-six years and older.¹¹⁰ This trend is likely to continue in the United States because individuals are increasingly turning to prescription drugs to fulfill a need. In 2008, 2.5 million individuals abused prescription drugs for the first time.¹¹¹ This is 300,000 more than the number of first-time cannabis users.¹¹² Of those individuals who used illicit drugs for the first time in 2008, nearly one third (29.6 percent) initiated their use with psychotherapeutics, including pain relievers, tranquilizers, stimulants, and sedatives.¹¹³ Of these, approximately 600,000 individuals initiated their illicit drug use through use of prescription stimulants.¹¹⁴ More than half of these individuals acknowledged that they received the prescription drugs from friends or relatives for free.¹¹⁵ Illicit stimulant use begins as early as middle school, extends through high school and college, and continues into the workforce.

1. Illicit stimulant use in middle school and high school

The misuse and abuse of stimulants used to treat ADHD is common among youth. For example, one study reported that 23.3 percent of middle and high school students taking prescribed stimulants had been solicited to give, sell, or trade their medication to friends.¹¹⁶ The rate increased as the student moved from middle school to high school.¹¹⁷ A Wisconsin study reported that of 161 elementary and high school students prescribed the stimulant methylphenidate, 16 percent had been asked to give or sell their medications to others.¹¹⁸ Another study from Canada reported that of a random sample of middle and high school students who were using legally prescribed stimulants, 14.7 percent gave their medications to others, 7.3 percent sold their medication to others, and 4.3 percent had their medications stolen by others.¹¹⁹ This early use continues in college.

¹¹⁰ *Id.* at 73.

¹¹¹ *Id.*

¹¹² *Id.* at 73, 74.

¹¹³ OFFICE OF APPLIED STUDIES, *supra* note 106, at 52.

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 30.

¹¹⁶ Sean Esteban McCabe et al., *The Use, Misuse and Diversion of Prescription Stimulants Among Middle and High School Students*, 39 SUBSTANCE USE & MISUSE 1095, 1103 (2004).

¹¹⁷ *Id.*

¹¹⁸ C.J. Musser et al., *Stimulant Use and the Potential for Abuse in Wisconsin as Reported by School Administrators and Longitudinally Followed Children*, J. DEVELOPMENTAL & BEHAVIORAL PEDIATRICS 187, 192 (1998).

¹¹⁹ Christine Poulin, *Medical and Nonmedical Stimulant Use Among Adolescents: From Sanctioned to Unsanctioned Use*, 165 CAN. MED. ASS'N J. 1039, 1039 (2001).

2. Illicit stimulant use in post-secondary education

In 2008, college-aged students (eighteen to twenty-five years old) had the highest rate (19.6 percent) of illicit drug use among all age groups.¹²⁰ In this age group, the use of psychotherapeutics (5.9 percent) was almost four times greater than the use of cocaine (1.5 percent).¹²¹ This data shows that illicit use of prescription stimulants has become a major problem in post-secondary education.¹²² In a recent study of 1811 undergraduate students at a large public university, thirty-four of the students questioned admitted to the illegal use of ADHD stimulants.¹²³ Most of the students questioned acknowledged that they used the drugs during periods of high academic stress because the stimulants increased reading comprehension, interest, cognition, and memory.¹²⁴ Furthermore, most students acknowledged that they possessed little knowledge of the drug or its potential to cause harm.¹²⁵ In another study of 1550 college students, of those responding who were not diagnosed with ADHD, almost half (43 percent) reported illegally using prescription stimulants.¹²⁶ Approximately 16 percent to 29 percent of students with ADHD stimulant prescriptions were asked to give, sell, or trade their medications.¹²⁷ Perhaps more troubling, students have acknowledged they find it easy to obtain prescription drugs on campus and that they do not perceive any stigma attached to their use.¹²⁸ Rather, many students believe such use is physically harmless, morally acceptable, and even a necessary predicate to success.¹²⁹ This perspective has led to an increased illicit use of stimulants in the workforce.

¹²⁰ OFFICE OF APPLIED STUDIES, *supra* note 106, at 2.

¹²¹ *Id.*

¹²² Sean E. McCabe, *Medical Use, Illicit Use and Diversion of Prescription Stimulant Medication*, 38 J. PSYCHOACTIVE DRUGS 45, 45-46 (2006).

¹²³ Alan D. DeSantis et al., *Illicit Use of Prescription ADHD Medications on a College Campus: A Multimethodological Approach*, 57 J. AM. COLL. HEALTH 315, 316 (2008).

¹²⁴ *Id.*

¹²⁵ *Id.* at 317.

¹²⁶ Claire D. Advokat et al., *Licit and Illicit Use of Medications for Attention-Deficit Hyperactivity Disorder in Undergraduate College Students*, 56 J. AM. COLL. HEALTH 601, 602 (2008).

¹²⁷ Timothy E. Wilens et al., *Misuse and Diversion of Stimulants Prescribed for ADHD: A Systematic Review of the Literature*, 47 J. AM. ACAD. CHILD ADOLESCENT PSYCHIATRY 21 (2008).

¹²⁸ DeSantis, *supra* note 123, at 322.

¹²⁹ *Id.*

3. *Illicit stimulant use in the workplace*

The abuse of drugs has also filtered over into the workforce. In 2008, of the 17.8 million illicit drug users aged eighteen or older, 12.9 million (72.7 percent) were employed either full- or part-time.¹³⁰ Today, doctors, lawyers, and other professionals use stimulants such as Ritalin and Adderall to compete in increasingly stressful, competitive work environments.¹³¹ Recent reports suggest the declining economy may be a key factor behind the increasing number of individuals using these inexpensive stimulants.¹³²

While stimulants like Ritalin and Adderall increase the user's attention and productivity, they may have the unwelcome effect of sapping the person's creativity. Memory, attention, and creativity represent three different cognitive domains that are interconnected and contribute to the "mental performance" of an individual.¹³³ As one psychologist noted, individuals taking Ritalin act "like a horse with blinders, plodding along . . . moving forward, getting things done, but . . . less open to inspiration."¹³⁴ Many entrepreneurs, performers, politicians, and communicators alike attribute their success to untreated ADHD.¹³⁵ Some argue that living with untreated ADHD allows them to think unconventionally and believe that ADHD medications dampen inspiration, leaving them to think like everyone else.¹³⁶ This view may have some merit, given that some of the greatest figures in history—including Albert Einstein, Thomas Edison, Salvador Dali, and Winston Churchill—exhibited classic ADHD traits, but were never treated for the disorder.¹³⁷

Although no long-term career studies exist to determine whether stimulants actually dampen creativity and imagination, at least one study has found anecdotal evidence that taking Ritalin renders some children less interested in pursuing creative opportunities.¹³⁸ Psychologists have acknowledged that there may be a trade-off between the ability to focus and creativity for individuals

¹³⁰ OFFICE OF APPLIED STUDIES, *supra* note 106, at 2.

¹³¹ *Popping Pills a Popular Way to Boost Brain Power*, CBS NEWS (Apr. 25, 2010), <http://www.cbsnews.com/stories/2010/04/22/60minutes/main6422159.shtml>.

¹³² Matt Manning, *Sandusky County Officials: No Decline Seen in Drug Use*, NEWS-MESSENGER (Fremont, Ohio), Aug. 6, 2009 (on file with author) (noting that many new cases of illicit drug use involve the use of less expensive prescription medicines like Adderall and Ritalin).

¹³³ Christina Lanni et al., *Cognition Enhancers Between Treating and Doping the Mind*, 57 PHARMACOLOGICAL RESEARCH 196 (2008).

¹³⁴ Jeffrey Zaslow, *What if Einstein had Taken Ritalin? ADHD's Impact on Creativity*, WALL ST. J., Feb. 3, 2005, at D1.

¹³⁵ *Id.*

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

using ADHD drugs, where individuals capable of focusing on a single thing while filtering out distractions may be less creative.¹³⁹ As Martha Farah, a psychologist and director of the University of Pennsylvania's Center for Cognitive Neuroscience opined, "I'm a little concerned that we could be raising a generation of very focused accountants."¹⁴⁰ Farah, however, also believes cosmetic neurology will be as commonplace as cosmetic surgery, as it may lead to improvements in the world.¹⁴¹ As another author indicates, despite increased use of stimulants by academics, "so far no one is demanding that asterisks be attached to Nobels, Pulitzers or Lasker awards" like those associated with the possible enhanced performances of professional athletes.¹⁴² The apparent acceptance of cognitive enhancement by professionals in the workplace has raised a number of ethical dilemmas, the answers to which have the potential to change what it means to be successful in or out of the classroom.

B. The Ethics of Brain Enhancement

The use of ADHD stimulants is just the beginning. Today, scientists are actively investigating memory enhancement drugs to help millions of baby boomers suffering from age-related memory loss. If such a "Viagra for the brain" is discovered, how should it be used?¹⁴³ Should it be administered, for example, to the elderly population if it improves their quality of life? No consensus likely exists on this question, given the divergent views on the use of brain enhancers. An affirmative answer would generate important questions and challenge notions about human meaning and its limitations. A negative answer would generate equally important questions about the role of medicine to humanity and challenge notions about the purpose of human intellect. From a purely scientific viewpoint, it makes little sense to wait patiently for evolution to improve brain function. Human intellect has evolved to the point at which it is now capable of creating technology that increases brain capacity.¹⁴⁴ Arguably, using brain enhancement technology to improve the quality of life of modern-day man is no different than the use of rudimentary stone tools by early

¹³⁹ Margaret Talbot, *Brain Gain: The Underground World of "Neuroenhancing" Drugs*, NEW YORKER, Apr. 27, 2009, available at http://www.newyorker.com/reporting/2009/04/27/090427fa_fact_talbot?currentPage=all.

¹⁴⁰ *Id.*

¹⁴¹ *Popping Pills a Popular Way to Boost Brain Power*, *supra* note 131.

¹⁴² Carey, *supra* note 103.

¹⁴³ See Pew Forum on Religion & Pub. Life, *The Pursuit of Perfection: A Conversation on the Ethics of Genetic Engineering* (Mar. 31, 2004), available at <http://pewforum.org/Science-and-Bioethics/The-Pursuit-of-Perfection-A-Conversation-on-the-Ethics-of-Genetic-Engineering.aspx> [hereinafter Pew Forum].

¹⁴⁴ Michael S. Gazzaniga, *Smarter on Drugs*, SCI. AM. MIND, Oct. 2005.

humans 2.6 million years ago.¹⁴⁵ Such tools were the product of human intellect and dramatically improved early man's quality of life, allowing individuals to perform activities the human body was not equipped to perform.¹⁴⁶ For some, the development of simple tools parallels the development of brain enhancing drugs and represents another step in the evolutionary process that should be embraced. For others, however, the use of technology to enhance natural abilities raises profound questions about the moral status of nature and the proper stance of human beings toward the natural world.¹⁴⁷ Thus, the fundamental question is not whether improvement is possible, but whether humans should aspire to improve their natural state at all.¹⁴⁸

Much of the debate has focused on the equality of access to enhancers. In 2007, for example, the British Medical Association argued for the equal access to brain enhancement drugs.¹⁴⁹ The authors of that paper acknowledged that equality of opportunity is an explicit goal of the educational system, and requires that individuals are given "the best chance of achieving their full potential and of competing on equal terms with their peers."¹⁵⁰ The best way to achieve this goal, according to the authors, is through selective use of neuroenhancers among individuals with lower intellectual capacity or those who have deprived backgrounds.¹⁵¹ However, this argument misses the larger problem. From a legal and societal perspective, the question should be whether the use of such brain enhancement drugs by healthy individuals to increase normal abilities is consistent with the goal of leveling the playing field so that *all* students, including those suffering from ADHD, have an equal opportunity to receive an appropriate education.

IV. UNLEVELING THE PLAYING FIELD THROUGH COGNITIVE ENHANCEMENT

In 1970, U.S. public schools educated only one in five children with disabilities.¹⁵² In many states, it was illegal for any deaf, blind, emotionally

¹⁴⁵ Sileshi Semaw et al., *2.6-Million-year-old Stone Tools and Associated Bones from OGS-6 and OGS-7, Gona, Afar, Ethiopia*, 45 J. HUM. EVOLUTION 169 (2003).

¹⁴⁶ *Id.*

¹⁴⁷ Michael J. Sandel, *The Case Against Perfection*, ATL. MONTHLY, Apr. 2004, at 50.

¹⁴⁸ *Id.*

¹⁴⁹ Med. Ethics Dep't, British Med. Ass'n, *Boosting Your Brainpower: Ethical Aspects of Cognitive Enhancements* 19 (2007), available at http://www.bma.org.uk/images/Boosting_brainpower_tcm41-147266.pdf.

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² OFFICE OF SPECIAL EDUC. PROGRAMS, OFFICE OF SPECIAL EDUC. & REHAB. SERVS., U.S. DEP'T OF EDUC., HISTORY: TWENTY-FIVE YEARS OF PROGRESS IN EDUCATING CHILDREN WITH

disturbed, or mentally retarded individual to attend public school.¹⁵³ That changed after two landmark decisions. In *Pennsylvania Association for Retarded Children v. Commonwealth of Pennsylvania (PARC)*,¹⁵⁴ plaintiffs challenged the constitutionality of state laws that denied mentally retarded children access to a free public education because of their disabilities. PARC ended in a consent decree that enjoined the state from denying disabled individuals “access to a free public program of public education and training.”¹⁵⁵ In *Mills v. Board of Education of the District of Columbia*,¹⁵⁶ seven children labeled by school personnel as having behavioral problems or mental retardation, or as emotionally disturbed or hyperactive, were denied admission to public school or excluded after admission with no provision for an alternative educational placement or review.¹⁵⁷ The court, relying on a Supreme Court mandate that states provide public education on equal terms, held that the state must provide a free public education to the students.¹⁵⁸

PARC and *Mills* established that the Equal Protection Clause of the Fourteenth Amendment to the United States Constitution guarantees every child with a disability the right to appropriate public education. In 1975, Congress enacted the Education for All Handicapped Children Act (EHA), to help states protect the educational rights and meet the needs of students with disabilities.¹⁵⁹ The EHA is now codified as the Individuals with Disabilities Education Act (IDEA).¹⁶⁰

In promulgating the EHA, Congress found that state and local agencies have a responsibility to provide education for all disabled students.¹⁶¹ Congress also found it in the country’s interest for the federal government to assist state and local efforts to provide education for all disabled individuals.¹⁶² The EHA codified existing law by requiring states to provide access for every disabled individual to a Free Appropriate Public Education (FAPE).¹⁶³ To be eligible for federal financial assistance under the EHA, states must develop and implement policies assuring access to a FAPE for all children with

DISABILITIES THROUGH IDEA (2005), available at <http://www2.ed.gov/policy/speced/leg/idea/history.pdf>.

¹⁵³ *Id.*

¹⁵⁴ 334 F. Supp. 1257 (E.D. Pa. 1971).

¹⁵⁵ *Id.* at 1258.

¹⁵⁶ 348 F. Supp. 866 (D.D.C. 1972).

¹⁵⁷ *Id.* at 868.

¹⁵⁸ *Id.* at 874 (citing *Brown v. Bd. of Educ.*, 347 U.S. 483, 493 (1954)).

¹⁵⁹ Education for All Handicapped Children Act of 1975, Pub. L. No. 94-142, 89 Stat. 773.

¹⁶⁰ 20 U.S.C. §§ 1400-1482 (2006).

¹⁶¹ *Id.* § 1400(3).

¹⁶² *Id.* § 1400(6).

¹⁶³ *Id.* § 1400(3).

disabilities.¹⁶⁴ Congress expressly intended that states provide a *full* educational opportunity to ensure that disabled individuals between the ages of three and twenty-one have equal opportunities in the learning environment.¹⁶⁵ Today, challenges to these mandates are brought under the IDEA.

Under the IDEA, a child is considered disabled if that child suffers from "other health impairments . . . [and] by reason thereof, needs special education and related services."¹⁶⁶ Implementing regulations promulgated by the U.S. Department of Education provide:

Other health impairment means having limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that—

(i) [i]s due to chronic or acute health problems such as . . . attention deficit disorder or attention deficit hyperactivity disorder . . . and

(ii) [a]dversely affects a child's educational performance.¹⁶⁷

Once a child is evaluated and determined to be learning disabled under the IDEA, states are required to ensure that an individualized education program (IEP) is developed for the student.¹⁶⁸ Academic success is an important factor in determining whether an IEP is reasonably calculated to provide educational benefits.¹⁶⁹ The IEP considers, for example, accommodations provided to the student to help him attain identified academic goals in a regular classroom.¹⁷⁰ Those goals are measured through classroom performance and by state administered standardized test results.¹⁷¹ Congress added procedural safeguards that permit re-evaluation of state plans to measure their effectiveness in providing a free and appropriate education to all disabled individuals.¹⁷² The Act requires the state or Secretary of Interior to conduct studies, investigations, and evaluations that are necessary to ensure the effective implementation of the Act.¹⁷³ Collectively, these provisions were intended to ensure that disabled individuals have a fair chance to compete academically with individuals who do not suffer from a disability.

Studies have demonstrated that the Intelligent Quotients (IQ) of individuals with ADHD are normally distributed and that the academic deficits of ADHD

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* § 1412(a)(1)(A).

¹⁶⁶ *Id.* § 1401(3)(A)(i)-(ii).

¹⁶⁷ 34 C.F.R. § 300.8(c)(9) (2010).

¹⁶⁸ 20 U.S.C. §§ 1412(a)(4), 1414(d)(1)(a) (2006); 34 C.F.R. § 300.347 (2010).

¹⁶⁹ 20 U.S.C. §§ 1401(14), 1412(a)(4), 1414(d) (2006).

¹⁷⁰ *Id.* § 1414(c)(1)(A)(ii), (d)(1)(A)(i)(II)-(IV).

¹⁷¹ *Id.* § 1412(a)(16)(A).

¹⁷² *Id.* § 1418(a).

¹⁷³ *Id.* § 1418(b).

may be a consequence of it rather than a core feature.¹⁷⁴ This suggests that students with ADHD are just as smart and capable as their peers but are hindered by their disorder. Prescription stimulants, therefore, play a critical role in maintaining equality of opportunity. Advances in cognitive neurology, however, threaten to turn back the hands of time and once again place disabled students at a competitive disadvantage in the classroom. The non-therapeutic use of stimulant drugs designed to help disabled individuals compete in the classroom is inconsistent with United States disability policy and must be prevented. Efforts to prevent illicit use in post-secondary education have largely failed; the legal and financial obligations imposed on states related to primary and secondary education, however, offer an effective means to address the problem.

V. ANALYSIS AND RECOMMENDATIONS

The misuse of stimulant drugs is frequently a prelude to chronic abuse or drug dependence.¹⁷⁵ The diversion of prescription drugs for non-therapeutic use begins as early as middle school and continues into high school, college, and the workplace.¹⁷⁶ States have diminishing levels of responsibility and control over students as they progress from primary and secondary education to post-secondary education and into the workforce.¹⁷⁷ As such, states should act early to prevent the illicit drug abuse.

A. Re-evaluate Success in the Classroom Under IDEA

Congress exercised its authority under the Spending Clause of the Constitution to enact the IDEA with the express goal of providing a free and appropriate public education to students who are disadvantaged because of a disability.¹⁷⁸ In 2010, the federal government authorized almost \$24 billion in

¹⁷⁴ Bonnie J. Kaplan et al., *The IQs of Children with ADHD are Normally Distributed*, 33 J. LEARNING DISABILITIES 410, 425-32 (2000); see also T.P. Ho et al., *Situational Versus Pervasive Hyperactivity in a Community Sample*, 26 PSYCHOL. MED. 309 (1996).

¹⁷⁵ Donald E. Greydanus, *Stimulant Misuse: Strategies to Manage a Growing Problem* (June 2007), http://www.acha.org/prof_dev/ADHD_docs/ADHD_PDprogram_Article2.pdf.

¹⁷⁶ See generally NAT'L CTR. ON ADDICTION & SUBSTANCE ABUSE, COLUM. UNIV., NATIONAL SURVEY OF AMERICAN ATTITUDES ON SUBSTANCE ABUSE XV: TEENS AND PARENTS (Aug. 2010), <http://www.casacolumbia.org/upload/2010/20100819teensurvey.pdf> (discussing the use of prescription drugs for non-therapeutic use by middle and high school students).

¹⁷⁷ See, e.g., *Guckenberger v. Boston Univ.*, 974 F. Supp. 106 (D. Mass. 1997) (citing *Se. Cmty. Coll. v. Davis*, 442 U.S. 397, 401 (1979)) (noting that federal disability laws do not compel educational institutions to make substantial modifications in their program to allow disabled persons to participate).

¹⁷⁸ See 20 U.S.C. § 1400(d)(1)(A) (2006); see also *Arlington Cent. Sch. Dist. Bd. of Educ.*

funding for the IDEA.¹⁷⁹ To receive federal funds under the IDEA, a state must comply with the extensive goals and procedures set forth in the Act as they apply to state and local educational agencies that accept funds for K-12 programs.¹⁸⁰ Because the IDEA is an entitlement statute, school districts must identify children with disabilities and provide a free and appropriate public education.¹⁸¹ Unlike other federal disability laws that are designed to ensure equality of access for disabled individuals at all levels, the IDEA was intended to ensure that students are successful in the K-12 system.¹⁸² That success is evaluated in large part on student performance in the classroom and on state-administered standardized tests, where a student's achievement is reflected in relation to how well that student performs relative to other students taking the same test.¹⁸³ When healthy individuals use performance enhancing stimulant drugs to perform well on tests, the value of the testing protocol is significantly diminished and test scores may not accurately reflect student achievement.

For many students with debilitating mental or physical disabilities, the IDEA provides help through the provision of educational plans that help modify personal behavior and other aspects of the classroom environment. For students with ADHD, however, the IDEA can do more. Individuals with ADHD are as intelligent as individuals without ADHD, but they require assistance to be successful in the classroom. Like many of their non-disabled peers, students with ADHD are fully capable of performing well in post-secondary education. In fact, individuals with ADHD often move well beyond the basic goals of the IDEA to lead very productive lives. In many ways, the success of students with ADHD reflects the underlying goal of United States disability policy—equality of opportunity through accommodation. Yet, absent change, existing law will act to set back decades of progress in the field of disability law. States must be required to take action to prevent healthy students from using performance enhancing drugs that provide a competitive advantage over individuals with ADHD on standardized tests.

While the IDEA currently does not require states to provide services that maximize each child's potential, it does require states to level the playing field by providing services that are appropriate to ensure the success of the student.

v. Murphy, 548 U.S. 291 (2006).

¹⁷⁹ Office of Special Educ. Programs, U.S. Dep't of Educ., IDEA Regulations: State Funding (2006), http://idea.ed.gov/object/fileDownload/model/TopicalBrief/field/PdfFile/primary_key/18.

¹⁸⁰ See 20 U.S.C. §§ 1412-1414 (2006).

¹⁸¹ *Id.*

¹⁸² *Id.* §1400(d)(1)(A).

¹⁸³ For example, Arizona mandates use of a "statewide nationally standardized norm-referenced achievement test in reading, language arts and mathematics[.]" ARIZ. REV. STAT. § 15-741 (West, Westlaw through 2010 legislation).

For standardized tests, the appropriate environment is one that provides an otherwise capable student with ADHD to compete fairly with students who do not have ADHD. Absent this procedural safeguard, the test scores are rendered meaningless and cannot accurately reflect student progress as required under the IDEA.

In enacting the IDEA, Congress expressly provided for the re-evaluation of state plans to measure their effectiveness in providing appropriate education to all disabled individuals.¹⁸⁴ Given the increasing illicit use of performance enhancing drugs by healthy middle and high school-aged students, the effective implementation of the Act is at risk. As part of any state education plan approved for funding under the IDEA, the state should be required to take appropriate measures to ensure that illicit drug use by healthy students does not detrimentally impact the ability of disabled students to compete in the classroom or on state-administered standardized tests.

B. Implement Social Norm Educational Programs

Many students who misuse drugs do so because they are unaware of the medical, psychological, and legal consequences of illicit drug use and abuse.¹⁸⁵ One of the most effective ways to address the problem of illicit drug use by students is through targeted educational campaigns that address misconceptions of such use.¹⁸⁶ Through early state-wide intervention, states can counter the potential adverse effects of illicit drug use while promoting student health and protecting the rights of disabled individuals. To be effective, any educational campaign must recognize that illicit stimulant use has become an accepted part of the academic experience for many students.¹⁸⁷ Unlike other forms of drug use, there is little stigma attached to the non-therapeutic use of stimulants. The culture of some schools may actually encourage students to use stimulants.¹⁸⁸ As one student at Columbia University acknowledged, “[a]s a kid, I was made to feel different for taking these drugs . . . [n]ow it’s almost cool to take

¹⁸⁴ See 20 U.S.C. §1418(d)(2)(A)-(C) (2006).

¹⁸⁵ See DeSantis, *supra* note 123, at 317.

¹⁸⁶ See, e.g., Cal. Dep’t of Alcohol & Drug Programs, Preventing Prescription Drug Abuse: Colleges (2011), <http://www.prescriptiondrugmisuse.org/index.php?page=colleges>.

¹⁸⁷ See, e.g., Higher Educ. Ctr. for Alcohol & Other Drug Abuse & Violence Prevention, Fraternity and Sorority Members and Alcohol and Other Drug Use (Aug. 2008), http://www.higheredcenter.org/files/product/fact_sheet5.pdf (recommending social norm marketing to combat the widespread drug and alcohol culture on college campuses).

¹⁸⁸ Andrew Jacobs, *The Adderall Advantage*, N.Y. TIMES, July 31, 2005, available at <http://www.nytimes.com/2005/07/31/education/edlife/jacobs31.html>.

them.”¹⁸⁹ Today, students with legal stimulant prescriptions routinely sell or give pills to others, without regard for the consequences of their actions.¹⁹⁰

The most effective means to prevent illicit stimulant use is to dispel misconceptions students have regarding the drugs. For example, one college used a social norms marketing campaign to target prescription drug misuse in college.¹⁹¹ Of the students surveyed at the completion of the campaign, 36.6 percent acknowledged that they would be more cautious in using prescription drugs.¹⁹² Other targeted social norms campaigns have documented significant reductions in risky behaviors among students within a few years of the campaign.¹⁹³ To effectively address illicit stimulant use, states should implement educational campaigns aimed at addressing both the physiological harm that may occur to individuals who use drugs without a prescription, and the impact illicit drug use has on disabled individuals who require assistance to succeed in the classroom.

Social norm campaigns should elicit student input and use appropriate visual media that bring credibility to the presentation to improve the likelihood that the message will be received. States must be proactive in addressing student perceptions of stimulant use. Early intervention through education is an essential first step, but states that receive federal funds under the IDEA must also take steps to ensure that student assessment is fair and accurately reflects the performance of disabled students. The state's power to take appropriate steps to protect the health of students and to protect the rights of the disabled is strongest when school authorities act in loco parentis.¹⁹⁴

C. Protecting the Rights and Safety of Students

Unemancipated minors are subject to the control of their parents or guardians.¹⁹⁵ Minors placed in private or public schools for their education are subject to the care and control of the teachers and administrators of those schools who stand in loco parentis.¹⁹⁶ The nature of that power is both

¹⁸⁹ *Id.*

¹⁹⁰ *See id.*

¹⁹¹ *See* Cal. Dep't of Alcohol & Drug Programs, *supra* note 186 (referencing a social norm study conducted by Western Washington University).

¹⁹² *Id.*

¹⁹³ *See generally* Nat'l Social Norms Inst., Univ. of Va., *Articles on the Social Norms Approach-Measuring Misperceptions and Behavior*, <http://www.socialnorm.org/> (last visited Sept. 5, 2010) (cataloging studies on social marketing campaigns to students).

¹⁹⁴ *Vernonia Sch. Dist. 47J v. Acton*, 515 U.S. 646, 654 (1995). In *Vernonia*, the Supreme Court noted that during the school day the teacher or school serves “in loco parentis” or “in the place of the parent.” *See id.* at 654-55.

¹⁹⁵ *Id.* at 654 (citing 59 Am. Jur. 2d *Parent and Child* § 10 (1987)).

¹⁹⁶ *Id.*

custodial and tutelary, and it permits school officials a degree of supervision and control that cannot be exercised over adults.¹⁹⁷ Indeed, “a proper educational environment requires close supervision of schoolchildren, as well as the enforcement of rules against conduct that would be perfectly permissible if undertaken by an adult.”¹⁹⁸ While schools do not have an absolute duty to protect students from harm in all circumstances, schools do have a responsibility to protect students entrusted to their care from health risks.¹⁹⁹ As the United States Supreme Court has noted, states have a compelling interest in deterring illicit drug use by students in primary and secondary education because “[s]chool years are the time when the physical, psychological and addictive effects of drugs are most severe.”²⁰⁰

The misuse of stimulants such as Ritalin and Adderall pose significant risk to school-aged students who may not be aware of the strong contraindications to their use. Indeed, the Court itself has noted that amphetamines produce an “artificially induced heart rate increase, [p]eripheral vasoconstriction, [b]lood pressure increase, and [m]asking of the normal fatigue response,’ making them a ‘very dangerous drug when used during exercise of any type.’”²⁰¹ For students with undiagnosed heart defects, the risk is even greater. Dangerous complications, including death, may result from use of stimulants. Many students overdose as result of misuse and must seek medical intervention.²⁰²

The Supreme Court has acknowledged that “[t]he effects of drug-infested schools are visited not just upon the users, but upon the entire student body and faculty, as the educational process is disrupted.”²⁰³ The illicit use of prescription stimulants by healthy students harms disabled individuals who must use the stimulants to compete in the classroom. Such use interferes with the school’s ability to provide an appropriate education to individuals with ADHD and should not be tolerated. When a state accepts funding under the IDEA, it effectively agrees to take all reasonable steps to provide each disabled student with an education that is appropriate for the individual.²⁰⁴ Illicit stimulant use interferes with that requirement and places students with ADHD

¹⁹⁷ *New Jersey v. T.L.O.*, 469 U.S. 325, 336-337 (1985).

¹⁹⁸ *Id.* at 339.

¹⁹⁹ *Vernonia*, 515 U.S. at 656 (noting that “[f]or their own good and that of their classmates, public school children are routinely required to submit to various physical examinations, and to be vaccinated against various diseases”).

²⁰⁰ *Id.* at 662.

²⁰¹ *Id.* (quoting Jerald Hawkins, *Drugs and Other Ingesta: Effects on Athletic Performance*, in HERB APPENZELLER, *MANAGING SPORTS AND RISK MANAGEMENT STRATEGIES* 90, 90-91 (1993)).

²⁰² Beth Beavers, *Campus ADHD Prescription Abuse Increases*, UNIV. DAILY KANSAN, Sept. 2, 2009, available at <http://www.kansan.com/news/2009/Sep/02/ADHD>.

²⁰³ *Vernonia*, 515 U.S. at 662.

²⁰⁴ 20 U.S.C. § 1412(a) (2006).

at a competitive disadvantage in the classroom, in direct contravention of United States disability policy.

In view of the increased misuse of stimulants among students and the harm it causes to the user and to disabled individuals, state action to protect students from harm is warranted. States must ensure that student assessment accurately and fairly reflects student progress. Since student achievement is largely determined based on the results of standardized tests, states should implement random drug testing procedures prior to administering standardized tests.

Suspicionless drug testing in the middle school and high school environment is constitutional. In *Board of Education of Independent School District No. 92 of Pottawatomie County v. Earls*,²⁰⁵ high school students challenged the constitutionality of the schools' suspicionless urinalysis drug testing policy. The school district's policy required all middle and high school students to consent to drug testing in order to participate in any competitive extracurricular activity, such as the Academic Team, Future Farmers of America, Future Homemakers of America, band, or choir.²⁰⁶ The test was designed to detect use of illegal drugs, including amphetamines.²⁰⁷ After considering the reasonableness of the policy,²⁰⁸ the privacy interest affected,²⁰⁹ the character of the intrusion imposed by the policy,²¹⁰ and the ability of the policy to meet its stated goals,²¹¹ the Court held that the policy was constitutional.²¹²

The Court began its analysis by noting that in the context of safety, a search unsupported by probable cause may be reasonable "when special needs, beyond the normal need for law enforcement, make the warrant and probable-cause requirement impracticable."²¹³ Special needs inhere in the public school context.²¹⁴ The Court placed great emphasis on the fact that the school district's policy was undertaken in furtherance of the district's responsibilities as guardian and tutor of the children entrusted to its care. Thus, the relevant question became whether the policy allowing for suspicionless searches was one that a reasonable guardian and tutor might undertake.²¹⁵ The Court found that the policy was reasonable because it was implemented to address the

²⁰⁵ 536 U.S. 822 (2002).

²⁰⁶ *Id.* at 826.

²⁰⁷ *Id.*

²⁰⁸ *Id.* at 828-30.

²⁰⁹ *Id.* at 830-31.

²¹⁰ *Id.* at 832-34.

²¹¹ *Id.* at 834-38.

²¹² *Id.* at 838.

²¹³ *Id.* at 829 (quoting *Griffin v. Wisconsin*, 483 U.S. 868, 873 (1987)) (internal quotation marks omitted).

²¹⁴ *Vernonia Sch. Dist. 47J v. Acton*, 515 U.S. 646, 653 (1995).

²¹⁵ *Earls*, 536 U.S. at 830.

general nationwide epidemic of drug use, and because of the specific evidence of increased drug use in the school district.²¹⁶

In assessing the students' privacy interest, the Court noted that students have a diminished expectation of privacy in public schools where the state is responsible for maintaining discipline, health, and safety.²¹⁷ It noted that students are routinely required to submit to physical examinations and vaccinations against disease.²¹⁸ Respondents attempted to draw a distinction between individuals engaged in extracurricular athletic activities who had a diminished expectation of privacy under existing law, and individuals engaged in non-athletic extracurricular activities who are not subject to regular physicals and communal undress.²¹⁹ The Court disagreed, noting that its prior decision allowing for suspicionless drug testing of high school athletes depended primarily upon the school's custodial responsibility and authority.²²⁰

Next, the Court considered the character of the intrusion.²²¹ The Court noted that the degree of the intrusion on privacy associated with sample collection largely depends on the way in which production of the urine sample is monitored.²²² Students were required to fill a sample cup behind closed doors and deliver the sample to an official stationed outside the bathroom.²²³ The sample was not released to law enforcement officials, and it was only used to determine eligibility to continue participating in the activity.²²⁴ In view of the non-intrusive mode of collection used by the district, the Court found that the intrusion was negligible.²²⁵

Finally, the Court considered the nature and immediacy of the government's concerns and the efficacy of the policy in meeting them.²²⁶ The Court noted that "the nationwide drug epidemic makes the war against drugs a pressing concern in every school."²²⁷ The need for state action is magnified, according to the Court, when the threat affects children "for whom [the state] has undertaken a special responsibility of care and direction."²²⁸ The school district's evidence of increased drug use among students, coupled with rising

²¹⁶ *Id.* at 825.

²¹⁷ *Id.* at 830.

²¹⁸ *Id.* at 830-31.

²¹⁹ *Id.* at 831.

²²⁰ *Id.*

²²¹ *Id.* at 832.

²²² *Id.*

²²³ *Id.*

²²⁴ *Id.* at 833.

²²⁵ *Id.*

²²⁶ *Id.* at 834.

²²⁷ *Id.*

²²⁸ *Vernonia Sch. Dist. 47J v. Acton*, 515 U.S. 646, 662 (1995).

drug use nationwide, convinced the Court that the school district's drug testing policy was a necessary and appropriate means to address the drug problems.

In view of the rising misuse of prescription stimulants by middle and high school students across the country, the substantial risk of harm associated with misuse of stimulants, and the negative impact such use has on the opportunities of disabled individuals to compete in the classroom, it is likely that the United States Supreme Court would uphold any carefully tailored, state-sponsored drug testing of students taking standardized tests. Although standardized tests are not technically extracurricular activities, they are competitive by design and the test results have significant consequences for students intending to continue their education in college. Randomly testing students for illicit use of stimulants to protect students from harm and to preserve the rights of disabled individuals is no less reasonable than testing students involved in Academic Team, Future Farmers of America, Future Homemakers of America, band, choir, or other activities.

VI. CONCLUSION

Over the last 35 years, the IDEA and other laws have increased educational opportunities for individuals with disabilities and their families.²²⁹ Despite this, a significant threat has emerged that threatens to undo decades of progress. On school campuses across the nation, an increasing number of students illegally use prescription drugs to enhance their natural ability in the classroom. The non-therapeutic use of powerful prescription stimulants poses significant risks for students and places disabled individuals at a competitive disadvantage in the classroom in direct contravention of United States disability policy. Breakthroughs in neuroscience present humanity with a promise and a predicament. Brain enhancement therapeutics has the potential to improve the quality of life for those living with neurological disorders or impairment, and forces humans to address the propriety of artificially elevating human capabilities. The use of stimulants to elevate abilities in the classroom raises difficult questions about nature, science, and fundamental fairness. Given the United States' express goal of providing equal opportunities for disabled individuals, policies and activities directed to the use of enhancement

²²⁹ See, e.g., Elementary and Secondary Education Act of 1965, Pub. L. No. 89-10, 79 Stat. 27 (providing grant assistance to help educate children with disabilities); Elementary and Secondary Education Act Amendments of 1965, Pub. L. No. 89-313, 79 Stat. 1158; see also Handicapped Children's Early Education Assistance Act of 1968, Pub. L. No. 90-538, 82 Stat. 901 (authorizing support for exemplary early childhood programs); Economic Opportunities Amendments of 1972, Pub. L. No. 92-424, 86 Stat. 688 (authorizing support for increased Head Start enrollment for young children with disabilities).

technology must be based on a sound consideration of the impact such use will have on the rights of disabled individuals.