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From recreational to functional drug use: the evolution of drugs in American higher education, 1960–2014

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Abstract

The increasing prevalence of so-called cognitive-enhancing drugs is well documented in American higher education. There has been little historical analysis, however, specifically exploring the role of postsecondary institutions in this evolving drug narrative. This paper traces substance use and research trends in American higher education over the past half-century, divided into three eras defined by their disparate approaches to drug policy and public health. Contextualised by historic events, shifting policies and epidemiological data, this multidisciplinary analysis contends that functional, academically oriented drug use is likely to continue rising on US campuses, while recreational drug use will evolve and persist. As history provides a useful lens for understanding the involvement of academe in the first era of drug concern in America, ongoing innovations in medical and social science may be instructive to help ensure that institutions respond judiciously in the present era of new drug synthesis and drug policy recession.

Keywords

policy; culture; health; higher education; history

Introduction

From substances of enlightenment to substances of abuse, alcohol and other drugs (AOD) have been an enduring, controversial and evolving presence in American higher education over the past half-century. That evolution continues, as college campuses have recently emerged as hotbeds for so-called ‘cognitive-enhancement drug’ use, including for example, prescription stimulants and attention deficit/hyperactivity disorder (ADHD) medications, among other substances with alleged cognitive benefits.

This paper explores the relationship between drugs and higher education across three main categories of the literature: US higher education history (collegiate drug use data trends, institutionally supported drug research); US drug history (drug research and synthesis, popularisation, policy); and a cultural, historical context (key actors, events, etc. as they relate to drug use and/or postsecondary institutions). Specifically, this historical paper posits that the rising prevalence of drugs used for functional purposes is a salient substance-use

trend in American higher education that may pose problems for postsecondary student affairs and student health practitioners, for drug-prevention efforts, and perhaps ultimately for drug policy in the United States. This examination of historical patterns also provides examples of changing drug trends and reasons for shifting use motives, revealing that the ‘promise’ of enhancement technologies belies significant health dangers and presents serious ethical and legal dilemmas that are especially likely to transpire on American colleges campuses in the future.

Three periods of drugs in American higher education

The past half-century offers a compelling window through which to chronicle the central transitional phenomena of this paper: from escapist or recreational drug use towards the functional, productive or academically oriented use of drugs in American higher education. Sponsored by the US National Institute of Health (NIH), the Monitoring the Future Study (MTF) is the longest running longitudinal dataset of collegiate substance use prevalence rates.¹ In addition to observing shifting drug use trends throughout the years, MTF authors noted a shift ‘away from social/recreational reasons toward ... “functional” reasons’, and described various motivational models of substance use.² For the purposes of this paper, drug use motivations are described as either ‘recreational’ or ‘functional’ (i.e. to augment productivity, improve grades and academic outcomes, or to enhance other elements of academic performance). This theoretical distinction is crucial to the present narrative, though in practice drug-use motivations can seldom be reduced to a simple, uncontroversial or even mutually exclusive dichotomy.

This 50-year time frame is split into three inexact key periods, an overview of which is given in Appendix 1. The 1960s and 1970s (‘*The age of exploration: 1960–1975*’) marked the first modern period of bold institutional research on the benefits and risks of drugs among college populations. Then from the mid-1970s to the 1990s (‘*Higher education “just says no”’: 1975–1990*’), shifting politics and public opinions led to the introduction of more regulations and prohibitive policies in the US that constituted a virtual moratorium on human subject research using banned substances.³ Since the early 1990s, however (‘*Better than coffee? The new wave of drugs in academia: 1990–present*’), former ‘drugs’ have reinvented themselves as ‘medicine’, and science and technology have converged to allow for sounder empirical and clinical examination of their effects, making higher education once again ground zero both for drug research and for licit and illicit self-medicating practitioners of so-called ‘enhancement drug’ use.⁴

The age of exploration: 1960–1975

Performance or ‘enlightenment’ based drug use began much earlier than 1960 with beat poets, bebop jazz virtuosos, and countless literary figures who imbibed or intoxicated to expand creative avenues for their respective crafts.⁵ Multinational groups of scientists and academics also began to explore the therapeutic potential of LSD and other ‘psychomimetic’ drugs in treatment settings,⁶ and some self-experimented to purposively stimulate creativity and work on intellectual problems.⁷ In addition to the benevolent mental health research occurring in university laboratories across the country (including Harvard, Stanford and

UCLA among many others) the CIA also co-opted American research institutions to explore whether psychomimetics could be weaponisable or used as a truth serum, ostensibly for espionage or purposes related to national defence during the cold war.⁸

Outside of laboratory settings, however, drugs really proliferated on American campuses during the ‘generational revolution’ of the 1960s,⁹ when ‘baby boomers’ (those born between 1946 and 1964) became adolescents and surged into higher education.¹⁰ Both students and researchers began exploring the effects of new or newly popularised psychoactive substances, especially marijuana and LSD, which were the emergent drugs of most concern to the media and to the public.¹¹ A 1968 survey noted that with regard to ‘alarming’ drug-use trends, ‘there is little empirical data about what is taking place in the colleges today’.¹² From the few reports that did that provide prevalence estimates, however, most agreed that marijuana use among college students increased rapidly between 1967 and 1969.¹³ Even though alcohol and tobacco were more heavily consumed, marijuana became – according to one report – the ‘recreational drug of choice among this college population’.¹⁴

Prior to the establishment of the MTF survey, research conducted by *Time* and *Gallup* in 1967 reported that 33% of UCLA students had tried marijuana, and within Ivy League universities, 25%, 20% and 15% of students at Harvard, Yale and Princeton had used marijuana, respectively.¹⁵ Some noted correlates of student drug use were surprising. For example, among a sample of marijuana-consuming students at Princeton University, the majority of users were found to be academically superior (among the top quintile of students) and a third were varsity athletes.¹⁶ Other collegiate marijuana use prevalence estimates generally ranged from 20% to 25%,¹⁷ and were consistently higher than estimates of LSD use, which ranged from 2% to 11%.¹⁸

Interestingly with regard to functional drug use, ‘pep pills’ were the most commonly used illicit substance among a sample of students at San Francisco State College in 1965;¹⁹ and a 1966 study of medical students in Oregon reported that over half of the sample used amphetamines for occupationally beneficial effects.²⁰ Other than these few early examples of performance-oriented amphetamine use, the vast majority of alcohol, marijuana and other drug consumption occurring on campuses was recreational. A systematised approach to study collegiate substance-use motivations in the US would not begin until 1976, with the MTF.²¹

Regarding the broader role of drugs in American society, institutions of higher education were more than just loci of conflict. Research on creative or ‘spiritual’ enhancement began infamously in 1960 with the Harvard Psilocybin and Harvard Psychedelic Research projects, both led by the influential and controversial Professor Timothy Leary and colleagues.²² Ethically dubious practices, criticisms of sloppy science and personal scandals involving Leary and his research team’s administration of drugs to undergraduate subjects (and uncouth relationships with some) ultimately led to the projects’ ends.²³ Leary was however credited (and blamed) for introducing great swathes of the US to psychedelic drugs, and legitimising their use to college students as his oft-quoted adage ‘turn on, tune in, drop out’ became a countercultural slogan.²⁴ Following charges of marijuana possession in 1968, President Nixon allegedly called Leary ‘the most dangerous man in America’.²⁵

Other prominent examples of institutional research further wedded academe to the burgeoning psychedelic movement. Government-sponsored research conducted by Dr Leo Hollister in the Stanford University department of psychology began in 1958, recruiting students to take experimental 'psychotomimetic' drugs,²⁶ which were later rebranded as 'psychedelics'.²⁷ One such participant was Ken Kesey, then a graduate student at Stanford University, who became a custodial employee at the Veteran's Hospital in Menlo Park in order to infiltrate and steal the large stocks of psychedelic drugs that he enjoyed as a research test subject,²⁸ later becoming a famous drug propagandist and author of *One Flew Over the Cuckoo's Nest*.²⁹

In terms of formally researching the use of drugs for purposes of 'enhancement', in 1962 Dr Oscar Janiger (then jointly appointed at the California College of Medicine and The University of California, Irvine) concluded the first phase of a large, naturalistic study on the phenomenological effects of LSD using a diverse sample of 930 men and women, focusing on academics, artists, musicians, and writers.³⁰ Janiger found that users reported greater accessibility into the subconscious, and that attention and concentration were heightened, as was their capacity for visual imagery and fantasy, with accelerated rates of thought.³¹ This was a novel study of its kind during this era, but it was terminated abruptly in 1965 when the Drug Abuse Control Amendments made LSD research in the US virtually impossible, with tighter restrictions introduced in 1966, redoubling again in 1968.³²

Collegiate and youth drug use prevalence data from this period are limited, but there is no shortage of vivid literary and scholarly accounts of the 1960s youth 'countercultural' movement, nor is there any debate about the centrality of higher education in its development.³³ The climate of 'innocent' exploration of newly synthesised and then-unregulated substances coincided with the escalating military conflict in Vietnam, and an emergent civil rights movement. A burgeoning progressive music and art scene further propelled a culturally bifurcated society's simultaneous attraction and disdain for psychedelia and drug use as a whole.³⁴

This period also saw unprecedented numbers of students entering US higher education and the erosion of parent-type regulations on student life, creating conditions ideal for protests from Berkeley to Columbia, including tragic incidents at Kent State and Jackson State.³⁵ Drugs were a countercultural staple, perceived by government officials as a conflict catalyst and destabilising factor, exacerbating student unrest and posing a threat to public safety. Compounding this was a shift in public opinion,³⁶ catalysed in part by the alcohol and drug-related deaths of several high-profile celebrities and public figures (e.g. musicians Jimi Hendrix, Janis Joplin, Jim Morrison and, later, the University of Maryland basketball phenomenon Len Bias and actor John Belushi), and tragic events such as the Manson murders and Altamont music festival, among other symbolically important events in American culture.³⁷

By the mid 1960s and early 1970s, the US was also in the grips of an amphetamine crisis, with 3.8% of all Americans misusing amphetamines and 1.9% meeting the criteria for amphetamine dependence.³⁸ Amphetamine use and dependence ascended even among prominent celebrities, politicians and public figures such as Elvis Presley, Mickey Mantle,

Marilyn Monroe and President John F. Kennedy.³⁹ A particularly historic example of enhancement drug use occurred prior to the pivotal first 1960 Presidential debate with Richard Nixon where Kennedy received an amphetamine injection from Dr Max Jacobson (a.k.a. ‘Dr Feelgood’) to overcome laryngitis.⁴⁰ The upside of medical amphetamine use belied the vast public harms of its indiscriminate administration, which brought about crime, addiction and other public concerns.⁴¹ ‘Speed kills’ subsequently became a common sentiment in the Haight-Ashbury district of San Francisco, alluding to the influx of amphetamines that were antithetical to the countercultural youth movement that championed peace and love.⁴² As the first US amphetamine epidemic peaked around 1969, the legislation that became the Drug Abuse Control Amendments was originally intended to restrict the manufacture of amphetamines.⁴³ In coming years, the US would increasingly rely on policy to attempt to define the public’s relationship with drugs.

Higher education ‘just says “no”’: 1975–1990

President Richard Nixon declared the ‘war on drugs’ in 1972 by persuading Congress to enact the Controlled Substances Act and establishing the Drug Enforcement Agency (DEA) in 1973, both of which responded to growing political pressure and public concerns.⁴⁴ It was President Reagan, however, who truly ‘raised the battle flag’ upon his election in 1980,⁴⁵ establishing mandatory sentencing minimums that many charged were racially inequitable⁴⁶ and led to ballooning incarceration rates in the US.⁴⁷

Much of the shifting attitudes and policies both nationally and within higher education was attributable to the notable death of a single college student: 22-year-old University of Maryland basketball star Len Bias. Athletically, Bias was heralded as the talent successor to Michael Jordan⁴⁸ but he overdosed suddenly in his University of Maryland dormitory from cocaine intoxication less than 48 hours after being drafted by the Boston Celtics in 1986. Though it may seem unlikely for sweeping social policies to stem from a singular event, the confluence of Bias, the epidemiological emergence of crack cocaine and it being an election year led directly to the passage of the Anti Drug Abuse Act of 1986, which was called, in some circles, the Len Bias law.⁴⁹ Since its passage, however, it was discovered that the expert witness responsible for helping establishing controversial drug quantity triggers falsified his credentials and lied under oath to the House of Representatives’ narcotics committee.⁵⁰ In a 2011 interview, Eric Sterling, the former US Counsel of the House Judiciary Committee, said that ‘hundreds of thousands of people would never have gone to jail if Len Bias had not died’.⁵¹

Both the tragedy of Len Bias and the severity of the ensuing policy response exemplify what scholars and critics refer to – in hindsight – as the estrangement of science and policy.⁵² As one author described, ‘policy can be a closed, self-validating system, almost impervious to scientific facts: While science considers new facts and alternative explanations and rejects them on logical or empirical grounds, policy can be dismissive of facts and alternatives simply on the grounds that they are distasteful.’⁵³ The ineffectiveness of the prominent and expensive publicly funded youth drug prevention campaign Drug Abuse Resistance Education (DARE)⁵⁴ serves as a periodic example of how the ‘distastefulness’ of drugs steered policy and trumped science. The estrangement of science and drug policy was

arguably most salient in the 1980s, but the policy realm did not have the benefit of important scientific tools yet to be developed. This would soon change with critical advancements in medical diagnostics, and foundational efforts in social science drug research.

This era also saw the beginning of important substance use research initiatives aimed specifically at youth and college students. The National Institute of Health's MTF study began longitudinally surveying AOD use patterns within collegiate populations in 1975 as a direct result of the 'epidemic of illicit drug use' among youths and college students during the mid- to late 1960s.⁵⁵ According to MTF data, college students were still drinking heavily in 1980 (90.5% annual use prevalence) and over half were experimenting with marijuana, the popularity of which eclipsed cigarettes (36.2% annual use prevalence, compared with 51.2% for marijuana).⁵⁶ Hallucinogen and narcotic use was declining overall, but illicit stimulants such as cocaine and amphetamine were still present on college campuses (16.8% and 22.4% annual use prevalence, respectively).⁵⁷

The short-lived therapeutic use of MDMA (i.e. 'ecstasy') was periodically indicative of how a misunderstood youth subculture exacerbated tensions between medical drug development and prevailing neo-prohibitionist attitudes in Washington. In the late 1970s and early 1980s, MDMA demonstrated promise in pharmacotherapeutic settings for the treatment of depression, schizophrenia and post-traumatic stress disorder (PTSD).⁵⁸ In the mid-1980s, however, illicit ecstasy began circulating in nightclubs in Dallas, Texas, and its burgeoning recreational use prompted the DEA, in 1985, to swiftly declare it a 'schedule-I' controlled substance with no accepted medical use.⁵⁹ This research moratorium in the US receded only recently, and MDMA has shown some efficacy in the treatment of PTSD.⁶⁰

In terms of the transitioning motivations toward functional drug use in American higher education today, the revision of the 'controlled substances act' in 1985 was arguably nowhere near as impactful as the 1987 revision of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R), which allowed stimulant medications to be prescribed to a broader swathe of American schoolchildren. ADHD first appeared as 'hyperkinetic reaction of childhood' in the DSM-II (1968), but hyperactivity was added in 1987. The expanding criteria for the disorder led to a rise in ADHD prevalence in the US, which was then estimated to affect 4–8% of all school-aged children,⁶¹ and has since ballooned to 11%.⁶²

While the debate over the efficacy of drugs to treat childhood behavioural disorders played out in the court of public opinion during this period, advancements in genetic diagnostics and magnetic resonance imaging (MRI) technology provided medical researchers with new sets of tools with which to resolve previously unanswerable questions about epidemiology, brain functioning and drug pharmacokinetics. For these reasons, 1986–1988 marked the 'birth of cognitive neuroscience', and the then-nascent field of brain tomography virtually exploded after the advent of functional MRI (fMRI) scanning in 1992.⁶³ These advancements brought empiricism to previous areas of debate, and allowed for more accurate appraisals of health risks. Genetic research also revealed that ADHD had a valid biological basis, and that the brain characteristics associated with the condition classified as ADHD are about 70% heritable, which is almost as heritable as height, weight or blood

pressure.⁶⁴ These discoveries quietened controversy over the ‘realness’ of ADHD, but both the licit and illicit use of ADHD medications began to proliferate on college campuses.

Better than coffee? The new wave of drugs in academe: 1990– present

Illicit drug use in American higher education tapered off steadily until around 1990, when a curious new drug trend began to emerge: illicitly diverted prescription drugs. Non-medical prescription drug use (NMPDU) is currently a growing problem on US college campuses, increasing fivefold between 1999 and 2005.⁶⁵ In 2006, NMPDU among college students was at its highest level in 15 years,⁶⁶ leading many to refer to millennials (those born approximately between 1982 and 2000) as ‘generation Rx’.⁶⁷

Among the main categories of prescription drugs abused by college students today (stimulants, opiates and sedatives), stimulants are unique because of how and why they are commonly used in academic settings. Counter to typical AOD prevalence patterns, prescription stimulant use is actually higher at institutions with more selective admissions standards.⁶⁸ And out of the rotating catalogue of 25–30 substances surveyed in the MTF study over an approximately 30-year period, only stimulant medications and alcohol were consistently more prevalent among college students than non-college-attending individuals one to four years beyond high school, which researchers attribute to the culture of academe and enhancement motives associated with stimulants.⁶⁹ College students are more likely to divert stimulants than any other medication, with past-year illicit use as high as 35% on some campuses.⁷⁰ In a 2006 student sample, 28% of prescribed users and 58% of non-prescribed users said obtaining stimulant medications was ‘easy to somewhat easy’.⁷¹

In addition to being both prevalent and easy to obtain, prescription stimulants are coveted by college students for both academic and recreational purposes. Students seem well aware of their perceived cognitive benefits, with academic motives for use including improving concentration, study habits, organisation, grades, as well as reducing hyperactivity and treating undiagnosed ADHD.⁷² The potential to abuse stimulant medications is also, unfortunately, no secret, with non-academic motives including partying, ‘getting high’, curiosity, experimentation, augmenting exercise, countering the effects of alcohol and other drugs, and weight loss.⁷³ Recreational or non-medical users of prescription drugs also have increased odds of using other drugs.⁷⁴

The emergence of NMPDU in higher education reflects national US trends, and the cultural concern over marijuana and psychotropics from a generation ago has resurfaced in an increasingly ‘medicated’ America.⁷⁵ With prescription drug abuse on the rise nationally,⁷⁶ irregular patient and drug-seeking behaviours (commonly referred to as ‘doctor shopping’) has surfaced as a major policy problem with several reports of corrupt prescribing physicians operating ‘pill mills’ in recent years.⁷⁷ Globally, prescription drug abuse is especially endemic to the United States, as Americans constitute approximately 4.6% of the world’s population yet consume 97% of the global stock of prescription opiates.⁷⁸ Prescriptions for anti-anxiety medications in the US (benzodiazepines, e.g. Xanax™, Valium™) have risen 17% per year since 2006.⁷⁹ Opinions diverge regarding the causes and significance of rising national prescription drug use rates, but the availability of stimulant medications on college campuses has been attributed chiefly to the ADHD epidemic of the 1990s.⁸⁰

Currently, ADHD is the most commonly diagnosed and fastest growing neurobehavioural childhood disorder in the United States,⁸¹ diagnosed among 9.5% of all American children aged 4–17,⁸² with newer estimates reaching as high as 11%.⁸³ As pharmacotherapy is the most prevalent treatment for ADHD in the US, production of Ritalin rose 900% between 1990 and 2000, and production of Adderall increased 5767% between 1993 and 2001.⁸⁴ In 2010, American consumer spending on ADHD medications grew 14.5% to approximately \$7.5 billion, which was a greater annual increase than any other therapy class of pharmaceuticals.⁸⁵ The increasing popularity of ADHD medications led to a nationwide shortage in April 2011, reported by multiple news sources.⁸⁶

Stimulant medications are classified in the US as ‘schedule-II’ controlled substances with a high potential for abuse.⁸⁷ Risks associated with non-medical prescription stimulant abuse include headaches, sleep disturbances, paranoia, stroke, cardiac arrest, violent behaviour, suicidal ideation, and developing psychological dependence.⁸⁸ Non-medical prescription stimulant users are also significantly more likely to engage in polydrug use, abuse medications intranasally and participate in other high-risk drug use behaviours such as driving under the influence and having multiple concurrent sexual partners.⁸⁹ On the other hand, stimulant medications are safe and effective for treating ADHD, and the chances of developing severe health consequences are minimal when used moderately or as prescribed.⁹⁰ Given these serious risks of drug-related health consequences, research has shown that college students today are increasingly making the determination that any risks are arguably outweighed by the potential benefits of use, which can include improvements in intelligence, concentration, learning and memory.⁹¹ This perspective is highly controversial because it rationalises non-medical drug use and problematises current US drug policies.

Evidence is mounting that stimulant medications may actually be viable cognitive enhancers both for cognitively deficient (e.g. ADHD) and healthy individuals, depending on the individuals and conditions of use. In the most thorough monograph of applicable empirical research to date on the epidemiology and cognitive neuroscience of prescription stimulants, results were compiled from approximately 80 tests conducted in 45 clinical research studies that tested various overlapping cognitive effect parameters, including executive functioning, verbal and associative learning, and memory performance and retention.⁹² Approximately half (40) of the included studies and tests reported no cognitive effects, while slightly fewer (37) demonstrated mild enhancement. Only three tests from two different studies reported cognitive impairment, which occurred mostly among higher-functioning participants and individuals with adverse genetic predispositions.⁹³ The authors concluded that stimulant medications ‘do enhance learning in ways that may be useful in the real world’.⁹⁴

Of greater significance to the larger debate over enhancement drug use in society, a contemporary opinion is emerging from the medical and bioethical establishment that perhaps there is nothing essentially wrong with enhancement.⁹⁵ A prominent 2008 editorial in the journal *Nature* titled ‘Toward Responsible Use of Cognitive-Enhancing Drugs by the Healthy’ argued that, ‘society must respond to the growing demand for cognitive enhancement. That response must start by rejecting the idea that “enhancement” is a dirty word.’⁹⁶ The authors made several provocative statements, or ‘calls’ to action, including that ‘mentally competent adults should be able to engage in cognitive enhancement using

drugs'.⁹⁷ In addition to widespread student use, enhancement motivations and the non-medical use of stimulant medications have been reported among college faculty, who may be similarly driven to enhancement by the pressures of academe.⁹⁸

The viability of neurocognitive enhancement has raised the concern that access to enhancement technologies may be an issue of social equality and academic integrity. Some scholars have called for 'enforceable policies concerning the use of cognitive-enhancing drugs to support fairness, protect individuals from coercion and minimise enhancement-related socioeconomic disparities'.⁹⁹ Higher education has been slow to respond, but Duke University and Britain's Academy of Medical Science made history by including the 'misuse of prescription drugs' as a violation of their prohibition against receiving 'improper assistance' in completing academic work.¹⁰⁰ In defence of higher education, this is relatively new science. But considering the possibility of future drugs or enhancement technologies with true cognitive and productive utility, institutional and governmental policies will likely need to consider both their use and equity of distribution as ethical issues.

Compared with stimulants and other alleged enhancement drugs, research to date is less conclusive about the advantages of psychotropics in creative fields.¹⁰¹ Nonetheless, functional drug use motivations have carried over to other substances, and old drugs are finding new utility. Exploratory research on drug-use motives revealed that many college students are following the habits of beat poets, authors and musicians, with the purposive use of marijuana, the hallucinogenic herb *salvia divinorum* and other psychotropics as 'creativity enhancers' in certain academic fields.¹⁰² Thespians, musicians and performance majors also commonly use beta-blockers and anti-anxiety medications to quell performance anxiety and 'enhance' their respective crafts.¹⁰³ These examples of purposive drug use in specified disciplines within academe have been compared to other examples of functional or career-motivated drug use in society, including the military use of stimulants and antidepressants,¹⁰⁴ and the highly visible and oft-debated issues of athletic performance enhancement drug use and doping in sport.¹⁰⁵

Formerly taboo institutionally supported research on controlled substances has returned, with current psilocybin, MDMA, or *salvia* research projects at Johns Hopkins University, New York University and the University of Arizona.¹⁰⁶ The NIH only recently re-allowed funded research involving cannabis, with studies at Temple University, for example, finding promise in the treatment of multiple sclerosis¹⁰⁷ and HIV.¹⁰⁸ Exemplified by such advancements, science can redefine the boundaries between what is perceived as 'drugs' versus 'medicine', but it can also blur them, as we are often talking about the same substances. The resulting grey area may confuse or colour the rationalisations of the college students who are disproportionately misusing AOD.

Just as science continues to catch up to understand the substances we create, social science must evolve in tandem to understand what college students know about them. Has new knowledge been translated effectively into prevention and education efforts? And have these efforts resulted in a more informed, safer collegiate population of AOD users? If so, then the 'modern' age of drugs in America that peaked nearly a half-century ago may be transitioning into a period of 'drug postmodernism'.¹⁰⁹ Contributing to this shift is vast new

breadth of information accessible online, as youths are increasingly turning to the internet for information (and often misinformation) about AOD.¹¹⁰ Whether or not an American public of postmodern drug consumers is better understanding the ‘true’ benefit and risk potentials of their respective substances, higher education should be seen as an allowable place for responsible drug research.

Confounding matters somewhat, national drug policies are currently at odds with many state drug policies, both of which are suddenly re-emerging as matters of public debate and often consequently as ballot initiatives. Even alcohol policy is being reconsidered, with higher education leading the charge. Middlebury College President Emeritus John McCardell launched the ‘Amethyst Initiative’ in 2008 to revisit the debate to lower the 21-year-old legal drinking age, and has since gathered 136 signatories from American college and university presidents.¹¹¹

The concurrent marijuana policy landscape is also very much in flux. In 2010, the US Attorney General asserted that cannabis dispensaries in states with provisions in place will be federally prosecuted, which was a reversal of a policy statement issued by the Obama administration in 2008.¹¹² Then, during the November 2012 elections, Colorado and Washington State legalised the recreational use of marijuana, and, as of this writing, the medical use of cannabis has some degree of protected status in 21 other US states.

Meanwhile, *salvia divinorum* is unregulated only in some states, and harmful synthetic psychotropics such as ‘spice’ (i.e. synthetic cannabinoids), mephedrone (and other synthetic cathinones more commonly known infamously as ‘bath salts’), and other newly concocted substances have either become banned on an emergency basis, or are simply too new to be regulated, let alone monitored comprehensively by the MTF or other collegiate substance abuse datasets.¹¹³ A recent scandal involving the pervasive use of synthetic marijuana among members of the 2011 NCAA Championship Auburn University football team serves as a contemporary example of the need for clear institutional policy in this current era of new drug creation and policy ambiguity at federal and state levels.¹¹⁴ Though there is no link between many of these newer substances and any functional use, college students are generationally exposed to drugs and prone to experimentation.¹¹⁵ Thus both the introduction of new drugs and the fluctuating drug landscape again point to the continual need for AOD research on college populations.

Conclusions and implications for future research

The historical pattern of policy and research chasing new drugs and youth drug trends will continue just as it did previously with LSD and MDMA among others, but hopefully without the estrangement from science that resulted in policy overreactions of the past. As we continue to reappraise the benefit/risk calculus of AOD use on a substance-by-substance level (as opposed to the folly of ‘just saying no’ to all drugs with equal discretion), the distinction between ‘recreational’ and ‘functional’ use motives becomes important.

Higher education is a prime locus for the discovery and transference of new knowledge, for student development, and ultimately for the development of human capital.¹¹⁶ Through a

traditional ‘drug abuse paradigm’,¹¹⁷ recreational drug use is a public health problem that threatens to erode the human capital generation potentiality of institutions (i.e. AOD abuse may lead to academic, social or behavioural problems, attrition, etc.).¹¹⁸ The notion of ‘functional’ use, however, runs counter to this logic, suggesting the alternative consideration of an ‘enhancement drug paradigm’ that problematises the use of enhancement drugs from ethical – rather than health – perspectives.¹¹⁹ Enhancement is a profoundly ethical issue: what health risks should individuals be allowed to decide for themselves if doing so may lead to personal, economic or spiritual fulfilment?

Contrast, for example, the dilemma of a student entering finals or a professor seeking tenure with a surgeon who takes anxiolytics to quell tremors or a soldier in combat who relies on stimulants to stay alert. Not all enhancement applications are matters of life and death, but some literally may be. Does context justify use more or less? And what if a concert musician or elite athlete’s enhancement-aided success operates at the expense of others’ failure? In other words, does it matter if the outcome is zero-sum (e.g. an enforced grading curve) or not? Some bioethicists argue that, indeed, the context and mode of enhancement are important distinctions that affect the tenability of use.¹²⁰ And lastly then, considering the altruistic mission and purposes of higher education, could society as a whole not benefit if, for example, cognitive enhancement allowed university researchers to more expediently develop a cure for cancer? Clearly, moral grey areas abound.

Today’s stimulant medications are relatively crude productivity aids but future neuroenhancements could be tailored to individuals with certain genetic or metabolic predispositions, or customised to serve specific occupational or academic demands.¹²¹ Stimulant medications seem to be the current neuroenhancers of choice for college students, but memory enhancers (e.g. ampakines) are currently moving swiftly through clinical trials, with some promising results.¹²² Stress is another factor tied to many important health outcomes, including immune system response and cognitive functioning, and stress accumulation can lead to cognitive declines and the slowing of neurogenesis (i.e. the birth of neurons in the brain) in a fashion similar to what is seen with Alzheimer’s patients.¹²³ But stress also produces tangible chemical signals (glucocorticoids) that cause this damage, for which researchers are developing a vaccine-like cure.¹²⁴ In terms of academic utility, what struggling college student would not opt to take a cure for stress? Thus in the near or distant future it is likely that enhancement-inclined college students will have more to choose from before entering finals.

This historical analysis reveals that academically oriented drug use is in fact nothing new, but our drug laws, drug habits and knowledge about drugs have changed. Drugs and their presence in higher education will surely continue to evolve and persist. Accordingly, enhancement-related coercion will increasingly need to be addressed as an ethical issue with legal implications. Thus, for researchers and student affairs practitioners, ensuring responsible use among ‘generation Rx’ becomes paramount, as this discussion serves as the academic strand of a broader conversation about functional drug use in society that also includes athletic performance enhancement, creativity enhancement in art and music,¹²⁵ and military use of stimulants and antidepressants¹²⁶ in an era of increasing pharmacological reliance.

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Biography

Ross D. Aikins is on the faculty of the Higher Education Division at the University of Pennsylvania Graduate School of Education, Philadelphia, USA. He specializes in college student health topics, including performance enhancement drug use in academic and athletic contexts. He recently co-authored a chapter on collegiate PED use in the forthcoming “*Scandals in College Sports: Legal, Political, and Ethical Case Studies*” edited by Shaun R. Harper and Jamel K. Donnor (2015), and is currently co-authoring a paper on student service member/veteran populations with colleagues at the National Development and Research Institutes, Inc. in New York City, where he previously served as a postdoctoral fellow with the U.S. National Institute of Health (NIH).

Appendix 1

Overview of historic trends in drugs and American higher education.

		Period	
	The age of exploration: 1960–1975’	Higher education “just says ‘no’”: 1975–1990	Better than coffee? The new wave of drugs in academe: 1990–present’
Collegiate drug use prevalence in the US	Limited reporting:	National longitudinal study (MTF, all %s below report past-year use prevalence in 1980): ¹²⁹	(MTF past-year use prevalence % in 2011): ¹³⁰ • 33.2% marijuana

	Period			
	The age of exploration: 1960–1975'	Higher education “just says ‘no’”: 1975–1990	Better than coffee? The new wave of drugs in academe: 1990–present'	
	• 20–25% marijuana prevalence ¹²⁷	• 51.2% marijuana	• 3.4% any hallucinogen	
	• 2–11% LSD prevalence; ¹²⁸ collegiate amphetamine (amph) prevalence unknown	• 6% LSD • 22.4% amph (6.2% in 1988) • 90.5% alcohol	• 12.3% stimulant medications (up to 35% according to independent estimates ¹³¹) • 77.4% alcohol	
Collegiate use motives of most concern in literature ¹³²	Primarily recreational	Primarily recreational	Recreational, but increasingly functional	
Emergent, newly synthesised, or newly popularised drugs in collegiate populations	Marijuana, LSD, psilocybin	MDMA, cocaine, crack	Prescription stimulants, opioids, sedatives; salvia divinorum; synthetic cannabinoids and cathinones	
Environment for human subject research involving recreational or controlled substances ¹³³	Open, exploratory	Prohibitive	Controlled	
Examples of institutions supporting drug research on human subjects	Harvard Psychedelic & Psilocybin Insts. (psilocybin, LSD); ¹³⁴ UC Irvine (Dr Oscar Janiger's LSD study) ¹³⁵	Very few involving controlled substances, (especially hallucinogens and drugs used recreationally by youths)	Many involving psilocybin, MDMA, salvia divinorum, etc. at institutions including Johns Hopkins University; University of Arizona; NYU, etc. ¹³⁶	
Notable changes in US drug policy	1965–1972: Drug Abuse Control Amendments; 1973: Drug Enforcement Agency	1986: Anti Drug Abuse Act (mandatory minimums)	1995–present: state-by-state cannabis use exemptions	