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EXPLANATORY MODELS OF OFF-LABEL PRESCRIPTION STIMULANT USE AT THE UNIVERSITY OF PENNSYLVANIA

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Abstract

Prescription stimulants, for example Ritalin and Adderall, are most commonly used to treat attention deficit disorder (ADD) in both children and adults. Over the past two decades, there has been an astonishing increase in the number of stimulant prescriptions recorded to treat ADD, and this increase in legitimate use has been accompanied by increasing reports of nonmedical use of these same stimulants. Anecdotally, it has been reported that individuals not diagnosed with ADD may experience beneficial side effects from the consumption of prescription stimulants, effects ranging from alertness to cognitive enhancement.

This study attempts to garner information about non prescribed stimulant use at the University of Pennsylvania, a highly competitive educational institution in the North East of the United States, and to examine factors correlating with use in order to encapsulate a profile of prescription stimulant use among the student cohort as well as interrogate the construction of identity through the consumption of publically traded goods. Specifically, this study focuses on stimulant use for the purposes of cognitive enhancement among the student population.

A short, ten-question, survey was administered to a small cross-section of students at the University of Pennsylvania. The study showed an overall prescription stimulant abuse rate of 13.9% among the sample student population (n=115). Interviews with prescription stimulant users and dealers, as well as round-table discussions with small groups of students provides insight into the explanatory model of stimulant use at the University of Pennsylvania, and suggests multiple perspectives on the utility of mind-altering drugs and the psychology of enhancement.
What qualifies as a drug deserving of cultural and/or legislative control? In the case of neurocognitive enhancement via psychopharmaceutical use, the overlap of disciplines such as pharmacology, clinical neurology, medical and social ethics, as well as cultural and medical anthropology, is significant. The question of the legitimacy of the use of prescription stimulants, such as amphetamines, Adderall, and methylphenidate, Ritalin, to enhance the processing speed and focus of normal individuals is underpinned by a discourse of fairness and morality within a changing social and technological environment, a discourse that must be ongoing as we obtain further information regarding the long term effects of use. At the crux of the matter is a concern for the social repercussions of artificial enhancement. With the advent of deeper understanding of the malleability of the brain’s function, we are forced to re-examine the meaning of optimal neural capacity and the individual potential of each functioning member of society in order to consider if and when society should intervene to limit or regulate the use of such pharmacotechnology. According to Toby Miller, author of Makeover Nation, “The distinction is cultural: when medicalized, these drugs are legitimate; when claimed as pathways to transcendence, they are not.” (Miller, 77) This clear-cut dichotomy is broken down, however, in the case of pharmaceuticalized compounds such as amphetamines and methylphenidates which can exhibit dual functionality. In this study, I employ quantitative and ethnographic approaches to examine the issue of prescription stimulant abuse within a college-age cohort, most particularly interrogating use patterns linked to cognitive enhancement. In order to effectively address the subject, an examination of the genesis and history of stimulant use as well as a basic understanding of the underlying physiological effects of the drug is essential.
Attention Deficit Disorder & the Rise of Prescription Stimulant Use

In a general sense, interrogating the use of any form of bodily or mental enhancement requires not only a baseline definition of normal functionality, but also definitions of sub-optimal and superior performance, definitions which are most often based in opposition to the generally understood normal behavior/functionality/ability. The concept of average intellectual capacity is one that is examined throughout many disciplines, through both quantitative and qualitative means, but little overall consensus has been achieved either across disciplines or cross-culturally. This study addresses the off-label use of prescription stimulants, such as Adderall and Ritalin, which are employed primarily to treat attention deficit disorder (ADD) a condition whose diagnosis is hinged upon evaluations of hyperactivity, impulsivity, and inattentiveness, behaviors which have no objective quantitative correlate. Instead, inattention is measured by distractibility and forgetfulness, hyperactivity by excessive non-essential movement and ceaseless motion, impulsivity by intrusive behavior and frequent accidents (DSM-IV). These traits are almost always anecdotal relayed to physicians who then evaluate these qualitative symptoms with relation to “age appropriate behavior” in order to arrive at a diagnosis of the syndrome. Scientific studies more recently report that ADD is most likely a disorder of self-regulation within the larger realm of social behavior rather than inattention (Barkley, 1995), suggesting that ADD is perhaps a culturally bound illness rather than a translatable disease. In order to effectively comprehend the utility of prescription stimulant treatment regimes, examining the disorder which they are prescribed to address is therefore informative. The very word “disorder”, the preferred DSM nomenclature, is defined as a “code for a vision of the world that ought to be orderly”, highlighting the very unstable ground upon which the diagnostic criteria for ADD is based, for whose vision of the world is most valid or most significant? (Hacking 1995) The DSM similarly
demonstrates this inability to concretely define the disorder, with successive DSM revisions showing three different structures of diagnostic cadres. The most recent revision, the DSM-IV, clusters the three cores of ADD diagnosis (hyperactivity, impulsiveness, and inattention) into one multifaceted complication, while indicating criteria for inclusion and requiring that a minimum of six forms of hyperactivity be evident in order for a diagnosis to be confirmed. (DSM-IV). This most recent revision devotes slightly more than eight pages to the disorder as opposed to the eight lines employed to describe the condition in the DSM-II, demonstrating an increased medical interest in the disorder over the past several decades. Regardless of this shifting diagnostic criteria, it is estimated that the prevalence of ADD within the United States ranges between 1.7 and 17.8%, with some estimates suggesting that over 8 million American adults have the disorder (Markowitz, 2003) and resulting in approximately “$77 billion national income lost annually due to educational “under attainment” as caused by ADD. (AMA, 2004)

Despite its reported prevalence, questions regarding the legitimacy of the diagnosis of ADD have been publicly raised as the underlying neuropathology of the disorder remains unclear. Neuro-imaging studies such as MRI, magnetic resonance imaging and PET, positron emission tomography, indicate that there may be various functional and/or structural differences between ‘normal’ individuals and those identified as experiencing ADD symptoms. For example, one of the seminal papers suggesting a structural basis for ADD behavior was published in 1990 by the NIMH containing several images of brain scans indicating decreased brain metabolism in ADD sufferers, an anomaly which the authors suggested was due to an underlying pathology of brain lesions affecting dopamine receptors. (Breggin, 1998). Another, highly controversial study published in 2003 by the NIH concluded that people diagnosed with ADD have statistically smaller brains than the average individual, prompting immediate debate over whether the
findings, if supposed accurate, demonstrated a correlation that existed prior to or following stimulant treatment (Miller, p77). Recent studies suggest that further differences between normal and ADD brains may exist in the disruption of frontostriatal circuitry, which connects the frontal lobe regions with basal ganglia, a disjunction which may inhibit ability to regulate behavior. Beyond structural studies, the search for a biological basis for the disorder has led to genetic studies and the identification of some genetic candidates that may be causative loci for the pathology, including those expressing dopamine receptors such as the dopamine transporter gene, DAT1 and dopamine β-hydroxylase. (Miller, p77) Interestingly, the theory behind these postulations often hinges upon the perceived efficacy of the drugs employed to treat the disorder. The basic postulation is that the efficacy of symptom alleviation using a neurotransmitter-like drug suggests that the root of the disorder lies in neurotransmitter disregulation. For example, it is widely supposed that the dopamine pathway in the nucleus accumbens and the ventral tegmental area of the midbrain is associated with ADD because dopaminergic drugs such as amphetamines and methylphenidate are effective in its treatment. The efficiency of other psychotropic drugs, such as Stratera, which promote noradrenergic and serotonergic activity within the brain, however, suggests that the dopamine pathway may not be the sole neurotransmitter involved with the disorder.

This disconnect in the theory of a biologically based etiology of disease—as well as an overall lack of compelling quantitative data—has prompted a focus on sociological environmental factors correlating with ADD diagnosis including maternal diet and lead exposure. Perhaps most significantly, it has been shown that families with children experiencing ADD or ADHD are more likely to come from environments in which they experience family dysfunction, marital discord and divorce. (Goldman, 1998). Still others believe that the diagnosis
of ADD is artificially constructed in order to marginalize and label less productive, or less conforming members of society. As Ian Hacking argues, “The power of the Protestant work ethic to require productivity and erase failure is clearly evident in the NIMH’s concern that ADHD sufferers “impulsively choose to do things that have an immediate but small payoff rather than engage in activities that may take more effort yet provide much greater but delayed rewards” (Hacking, 1995). Hacking’s criticism suggests that ADD is, rather than a medical disease, a culturally bound illness with unique symptomology linked to the social environment in which it manifests.

Although the physiological basis for the disorder is unclear, within the last 15-20 years, a dramatic increase in both the diagnosis of ADD and treatment of the disorder using prescription stimulants has resulted in an associated increase in the availability of methylphenidate and amphetamine salt-based prescription medication among the general population. In fact, according to estimates by Safer and Zito, methylphenidate prescriptions alone rose 250% between 1990 and 1995 (Safer and Zito, 1996). In a more recent study, from 2003, Zito reports that in 1990s, methylphenidate prescription had a 2.5-7.5 fold increase while amphetamine prescription underwent a 7-14 fold increase among youths younger than 20 years old (Zito, 2003). Along with this dramatic rise in production and prescription sales, reports of prescription stimulant abuse, particularly among younger individuals who are most often prescribed the medication, similarly rose to the surface, alarming parents and physicians alike. Not surprisingly, studies show possible addictogenic characteristics of these dopaminergic stimulants; notably, data suggest that like cocaine, methylphenidate and amphetamine will maintain self-administration among laboratory animals (Babcock, 2000). This is not particularly surprising as the actual mechanism of these prescription stimulants is known to be similar to that
of cocaine—as previously mentioned, they increase the activity of dopamine within the chemical circuitry of the brain. While cocaine blocks the reuptake of the neurotransmitter, the d-enantiomer of amphetamine promotes the release of dopamine from the presynaptic cells. Methylphenidate similarly acts upon this dopamine-driven pathway by inhibiting dopamine reuptake, as its levorotary enantiomer displays an affinity for the dopamine transporter, preventing its functionality (Markowitz, 2006). Several sources postulate that by manipulating the activity of this cycle, with the ultimate result of unusually high dopamine levels within the neural synapse, these three drugs similarly stimulate and reinforce the reward system of the brain. Compounding these concerns of abuse, oral methylphenidate and amphetamine salts are both available in quick-release and ounce-a-day osmotically controlled-release formulations which, while both orally consumed, have differing overall compounds, containing adjuvants that drastically alter the sensation of use and potential for abuse, as evidenced by PET scans (Spencer, 2006).

A Brief History of Prescription Stimulants

Amphetamines as a class of chemicals were first synthesized in 1887 by chemist Lazar Edeleanu, who was at the time seeking to develop a synthetic form of ephedrine. The compound was, itself, not explored for use as a drug until 1929 when a young chemist, Gordon Alles, synthesized the chemical and tested it on human subjects. Only four years later, the first amphetamine medication was produced and distributed by Smith, Kline, and French under the trade name Benzedrine as a medication for asthma and nasal decongestion in inhaler form. The symptoms for which amphetamines were initially prescribed varied widely from hyperactivity to weight loss, and various amphetamine products were rapidly developed and marketed, ranging
from patches to pills. By 1943, over half of Smith Kline and French’s sales of Benzedrine were prescribed for individuals who wanted to stay awake, experience a “lift” in emotions or benefit from the drug’s anorectic properties. (Grinspoon, p45) By 1958, annual legal amphetamine production rose to 3.5 billion tablets, a volume which increased over the decade following to an annual production rate of 8 billion pills—nearly 25-50 pills per person in the United States. Around that time, in 1960, Ritalin, a methylphenidate combination which was first patented and produced in 1954 by the CIBA pharmaceutical company, was introduced into the drug market as an alternative stimulant for the treatment of hyperactivity, replacing other amphetamine psychostimulants prescribed such as Benzedrine. Its introduction was wildly successful in both the legal and illegal drug markets, and with rising prescription sales, a correlating rise in abuse was reported, culminating in the ban of Ritalin in Sweden due to an epidemic of street abuse. (DeGrandpre, p153) The Drug Abuse Control Amendments of 1965 attempted to cut down on the availability and production of prescription stimulants through increased record-keeping without the system of distribution, prescription and sale; however, the bill was generally unenforceable and the FDA’s power to inhibit the abuse of the drugs proved ineffective. (Grinspoon, 1975) As a follow up to the 1965 restriction of amphetamine use, the FDA placed prescription amphetamines on the list of schedule II drugs, or drugs that are both addictogenic and extremely potent, along with morphine and cocaine, subjecting the compound to greater legal regulation and restrictions on its import/export (DeGrandpre, p153). These measures proved ineffective, and in 1971, during a special congressional committee meeting that same year, the conclusion was met that Gordon Alles had unintentionally “unleashed a Frankensteinian-type monster over which we [the government] seemingly have no control”. (Amphetamines, Fourth Report by the Special Committee on Crime). Despite these
pronouncements and increasing controls over the prescription and use of amphetamine and methylphenidate stimulant compounds, abuse of prescription stimulants remained popular throughout the 1970s and 80s particularly as an increase in diagnosis of the attention disorder, ADD, resulted in a resurgence of stimulate medications. Adderall, a mixed combination of dextroamphetamine and racemic amphetamine salts, was introduced in 1996 by Shire Pharmaceuticals, and has grown steadily in popularity for ADD/ADHD treatment due to its reported reduction in negative side effects when compared to Ritalin and Ritalin-like generic methylphenidate compounds.

Reports of methylphenidate and amphetamine abuse have persisted throughout the history of the drugs’ respective availabilities on the pharmaceutical market. Initially, abuse was limited to the chewing of amphetamine strips found in Benzedrine inhalers, however as the stimulants became available in pill form, abuse by oral intake became the most pervasive mechanism of use for addicts (Grinspoon, p.14). The first published observation of stimulant abuse in a college setting occurred in 1936 at the University of Minnesota during a clinical trial during which the effect of stimulant compounds on volunteers in the student population was being studied. Students taking the drug reported an increased ability to stay awake to study or party, results which led to abuse among the student test group and the observation of an increase in hospital admissions of collapsed and insomniac patients in the university hospital presumably linked to an overdose of the amphetamine pills. (JAMA, 1937) Stimulant abuse among young people was not specifically noted as being anomalous to general societal use, however, until the 1960s. The 1960’s saw a general alteration in drug use demographics as the average recreational drug user profile shifted drastically from individuals in their late-twenties to mid-forties with criminal backgrounds and lower socioeconomic backgrounds seeking a means of escapism to a
population of young individuals under twenty-five with no criminal history and a middleclass, educated background. Unsurprisingly, around this time there was a similar marked shift in amphetamine and other psychoactive drug use among young people with a significant increase in the college student user population. The pervasive dialogue underlying this shift in user profile is one that highlights the utility of the cognitive enhancement effects of stimulants, and it is this effect that is of particular interest to this study.

**Prescription Stimulants as Cognitive Enhancers**

While anecdotal reports of cognitive enhancement due to prescription stimulant use are common, physiological evidence of such enhancement has been controversial and indeterminate. Beginning as early as 1938 with J. E. Barmack’s initial examination of the effects of amphetamines on fatigued truck drivers, neurologists and medical doctors have examined the possibility of the enhancement of perception, precision and/or intellectual capacity through the use of psychopharmaceuticals; however, initial qualitative tests appear to have been inconclusive. For example, an early Air Force comparison between amphetamine, caffeine, placebo and no drug samples of fighter pilots in the mid-1950s indicated superior performance and “task disposition” among pilots taking amphetamines over a four-hour test period. (Grinspoon p72). However, Payne and Hauty, neuro-researchers, executed several important studies in the late 1960s, demonstrated that while amphetamine compounds strongly counteract the usual decline in performance over a duration of time, similar effects could be achieved and boredom substantially diminished among subjects if “(1) the individual is supplied with feedback on how well he is doing; (2) the task involves some novelty, challenge, excitement or intrinsic meaning; (3) he is allowed to shift to new tasks at regular intervals.” (Hauty, 1955) These results
mirror the conclusions of a 1966 Hurst and Widner study that indicated that “Drug enhancement of cognitive performance is achieved through mitigation of disturbing influence rather than through direct facilitation of cognitive processes”. Hurst and Widner also proffered evidence suggesting that amphetamines lower the time between stimulus and response, however they noted that the effect was not perceptible in subjects who were well rested, leading the researchers to suggest that amphetamines somehow blocked the “emotional component of task-induced stress” rather than actually enhancing response times or accuracy (Hurst, 1966).

Contemporary studies similarly indicate that although the consumption of methylphenidate and amphetamine compounds anecdotally illicit enhancement effects on individuals with non-ADD identified brains, little quantitative evidence can be found to support these results. A particularly interesting study performed by Roehrs suggests that methylphenidate is selectively chosen over placebo by subjects allowed to choose their preferred capsule following a period of sampling that has a duration of several days. This selection is correlated to the severity of sleep deprivation sustained by the subjects—individuals will consistently choose methylphenidate over placebo when allowed only 4 hours of sleep, while they will less predictably choose between the two drugs if allowed approximately 8 hours of sleep. This result in and of itself is not particularly surprising, however the study also suggests that methylphenidate use following a period of sleep deprivation significantly improves the subject’s ability to successfully perform assigned tasks (Roehrs, 1999).

Despite a general lack of physiological evidence for enhancement due to amphetamine ingestion, anecdotal evidence of enhancement effects while taking prescription stimulants has led to a pervasive dialogue in recent years which suggests that stimulants such as Adderall and methylphenidate may be forerunners of a new, directed, exploration into the potential
pharmaceutical technologies of enhancement. In effect, these proponents of stimulant use for non-ADD individuals suggest that the benefit of such use is sufficiently evidenced by (oftentimes personal) experimental experience with the drugs, and that a complete understanding of how the compounds affect brain chemistry is less crucial to the question of beneficial use. In fact, several pre-eminent neuroscientists such as University of Pennsylvania professor Martha Farah have recently penned strongly worded articles of support for this use of such pharmaceutical technology, pointing out that “the enhancement of normal neurocognitive function by pharmacological means is already a fact of life for many in our society” (Farah, 2004), and that because of this, the question of controlling policies for the use of neurocognitive enhancement is moot. Instead, as Farah suggests in her article in Nature, this use of pharmaceutical technology should be viewed as a new frontier of medicine, pushing the boundaries of cognitive ability.

**Collegiate Abuse of Prescription Stimulants**

Studies of cognitive enhancement vis-a-vis off-label prescription stimulant use have by and large focused on the collegiate population cohort because, as mentioned, rates of abuse among such groups have historically been noted, and designed to enhance mental capacities have been previously observed. Additionally, such cohorts are easily accessible by researchers and a significant amount of information about the student population from which a user population focus-group is drawn can be garnered from statistical information collected by the home institution. Particularly useful with respect to the overall question of off label prescription stimulant use within society is the interrogation of the moral debate over stimulant use within this young population. College is widely regarded as a liminal period within the course of an
individual's life trajectory—a period of time in which individuals are no longer subject to parental control and are confronted with concerns of social responsibility, and the establishment of themselves as contributors to the society within which they live. By consequence, college represents a period in which individuals may be more liberal with the experimentation and use of drugs, providing a population which has access to prescription stimulant medication and who will be, perhaps, more willing to explore and discuss its use. As intimated by previous discussion of ADD and the observed increase in both diagnosis and treatment of the disorder over the past several decades, the current collegiate population has a history of exposure to the concept of attention disorders and also to the use of stimulants such as amphetamine and methylphenidate to counteract such symptoms. As a result, collegiate prescription stimulant users and non-users alike have prior common knowledge of medications such as Adderall and Ritalin, and most individuals have at least peripheral experience with the use of stimulants in both prescription and non-prescription modalities. This population, therefore, provides the optimal cohort for the interrogation of off-label stimulant use for the purposes of enhancement, and because of their position as younger members of society on the cusp of entering the workforce, deliberations of the morality of cognitive enhancement is particularly salient.

Initial studies of prescription stimulant use among the collegiate cohort occurred during the 1960s as drug use became the focus of scientific and sociological inquiry. A confluence of studies at that time attempted to encapsulate a shift in drug user profile, focusing on the college student user population as the nascent at-risk population for substance abuse. In his 1969 article, *Heads and Seekers: Drugs on Campus, Counter-Cultures, and American Society*, for example, Kenneth Keniston puts forth evidence arguing that level of drug use in a college population is dependent on the intellectual climate of the school. In schools where academic excellence and
personal freedom are stressed, he claims that an increase in drug use is expected, whereas he postulates that little drug use is common in schools where social activities and sports absorb most student energies. He also correlates the size of the college or university to drug use, linking larger student populations to increased abuse. Interestingly, he argues as well that drug use is more common among students majoring in humanistic, or introspective fields, while students of more practical and technical subjects and the applied sciences are less likely to use. (Keniston, 1969) These initial observations of the collegiate cohort of abusers are particularly informative when viewed in light of contemporary studies of stimulant use at college campuses.

Several recent studies of illicit prescription stimulant use among the collegiate population highlight further contemporary correlatory factors linking stimulant use to the characteristics of the institutions in which the abuse occurs, some of which mirror those found in Keniston’s 1969 study and the profile described in The Speed Culture by Grinspoon. For example, in his 2002 article, Illicit use of Psychostimulants Among College Students, Low demonstrates a statistically significant correlation between students with high sensation seeking behaviors and drug use, and suggests that amphetamine and/or methylphenidate use by individuals high in perfectionism is linked to pro-social motivations such as achievement and success (Low, 2002). The student group at risk for stimulant abuse according to this hypothesis, therefore, is the student who is both sensation seeking and perfectionist—such an individual would seek not only the mind altering experience of the drug but also seek to utilize the drug’s effects in order to achieve greater productivity. Similarly, McCabe (2005) shows a correlation between a student’s grade point average, indicating that students who earned a B or lower are more than twice likely to report use of prescription stimulants than students who earned B+ or higher. A similar correlation was postulated by Keniston in 1969 but never demonstrated conclusively (McCabe,
2005). Interestingly, studies also suggest that there is a statistically significant gender difference in user profile—Men are much more likely to report prescription amphetamine use (Low, 2002 & McCabe, 2005)—however, no study to date has directly interrogated the underlying cause of this disparity. Interestingly, a racial component also surfaces across stimulant studies, with self-reported use among college students more than three times more likely among Caucasians and Hispanics than among African-Americans (Teeter, 2006 and McCabe, 2005). These studies together indicate that the most common prescription stimulant abuser among the college student population is a Caucasian male with middling grades and both a sensation and success seeking personality.

Unsurprisingly, self-reported motivations for prescription stimulant abuse can be similarly correlated across contemporary studies. These motivations, although differing in specific wording between studies, can be broadly categorized into performance enhancing-seeking behavior and sensation-seeking behavior, as previously discussed in Keniston and Grinspoon. These behaviors have additionally been correlated with differing user demographics. For example, among those users seeking sensation-altering experiences, significantly higher levels of alcohol and other drug use are reported. For example, Low’s study showed that 19.3% of self-reported prescription stimulant users admitted to mixing stimulant and alcohol use for recreational purposes. That same study also showed that 34% of students abusing prescription stimulants also reported using cocaine in the previous year. (Low, 2005) Most significantly, a study by Christian Teeter in 2003 demonstrated that 100% of students reporting prescription stimulant use among the cohort studied also reported marijuana use, and 98% of the students reported a binge drinking episode two weeks prior to the stimulant survey.
Interestingly, despite a convergence of similar findings across stimulant studies, numerical estimates of the current illicit prescription stimulant use on college campuses are widely variable and impossible to generalize conclusively although several researchers have attempted to determine overarching national use statistics. In his 2005 study, for example, McCabe suggested an average overall collegiate past year prescription stimulant use rate of 4.1%. This 4.1% is derived from the average of individual college-use rates across 119 nationally representative 4-year colleges, with 10,904 students responding to the self-administered survey. As expected, however, individual use rates varied drastically between institutions, ranging from 0% to 25% past year prevalence. McCabe contributes this broad dynamic range to variation in the characteristics of the four year colleges investigated, suggesting that the geographic and intellectual environment of the institution is correlated with drug use among the student population. For example, his study shows that the use of amphetamines and/or methylphenidate is linked to not only the size but also the geographic location of the college attended, noting increased use in the North East Atlantic states, particularly among schools with higher admission standards. (McCabe, 2005). Estimations of use within the same institution may also vary, depending on the year of the survey and amount of individuals self-reporting as demonstrated by CJ Teeter at the University of Michigan. In those studies, two consecutive surveys only two years apart demonstrated a difference in percentage of reported past year use among the undergraduate student population from 5.4% to 3% (Teeter, 2003; Teeter, 2005). In this study, a focus group of collegiate prescription stimulant users was identified and interrogated at the University of Pennsylvania. Statistical data is presented, however, I found the personal explanatory models of individual users to be far more instructive than bare numerical models. By consequence, the majority of data presented and examined consists of personal interviews with
both stimulant users and non-users, in an attempt to examine motivations of use, preconceptions of enhancement possibility via stimulant use, considerations of the morality of use, and the identification of environmental factors that may contribute to moderately high levels of use among the population identified.

Methodology

This small study consisted of three main branches of inquiry: an online survey, personal interviews and roundtable discussions with student groups. At every point during this study great care was taken to maintain the anonymity of sources and respondents—accordingly, no identifying information about any individuals was collected. The value of this study is that the University of Pennsylvania is representative of a higher education community and the various factors related to stimulant use that are revealed provide correlations that are not only important for administrators and students alike but may prove to be valuable points of future investigation.

A surveymonkey (www.surveymonkey.com) 10 question survey, attached in appendix 1, was distributed electronically via various student group listservs on campus, such as athletic team listservs and other scholastic, college house and sorority/fraternity listservs. Every effort was made to vary the types of student group listservs targeted for the survey, however, the data shows some asymmetry in respondent demographics, as discussed later in the results section. The survey emphasized the need for non-user respondents as well as user data in an effort to counteract self-selection skewing of the data. It is impossible, however, to discern the impact of the survey’s self selection bias on the collected information. Data collected from this portion of the study does not contain any identifying information and cannot be linked, directly or indirectly, to any single individual, although each individual response sequence can be
interrogated as a whole in order to identify correlating factors to use. Approximately 200-300 individuals were solicited to participate in the study by email, however only 115 individuals elected to fill out the survey.

Questions in the survey were designed to link previously identified correlating factors of use—extracurricular activities and additional drug use—with other use factors such as age at first use, motivations for use and frequency of use in order to better identify the characteristics of the using population of students at the university. The questionnaire collected responses from students who use prescription stimulants both in a prescribed manner and illegally, and allowed for responses of individuals utilizing a variety of prescription stimulants, both amphetamine salts and methylphenidate combinations identified by both name brands such as Ritalin and Adderall, and generic brands such as Focalin. For the purpose of this study, students responding to the survey who were prescribed stimulants were regarded as non-abusers, regardless of reported use patterns.

Personal interviews were conducted with five individuals who are admitted prescription stimulant users of various scholastic and personal backgrounds, one of whom was additionally a stimulant dealer while on campus. Two additional interviews were conducted with individuals of the student population who do not employ prescription stimulants to study or party but who employ other stimulants, in each case, caffeine, in order to achieve similar bodily effects. These interviews were approximately 30 to 40 min in duration, and several subjects were asked to participate in follow up interviews that, again, had duration of approximately 30 min. Selection for follow-up interview was determined by my need for clarification and the subject's willingness to further discuss use patterns. These interviews were recorded with the consent of the subject, and permission to use content of the interviews obtained by signed consent form as
per IRB requirement. Interviews were conducted on campus in public spaces—coffee houses and dorm common areas—and at no point were interviewees compensated or coerced to participate. Interviews were informally conducted with no formalized progression of questions; rather, interviewees were encouraged to speak freely of their own experience with stimulants with a minimum of interruption. Anecdotes from these individuals regarding friends, acquaintances and clients are included in the following sections while recognizing the limited utility of anecdotal evidence; however emphasis is placed on accounts of personal experience. Additionally, although full transcriptions of the interviews are unavailable for publication as per IRB restriction, excerpts follow in the discussion/results section and the substance of each individual’s experience provided the framework for subsequent analysis.

Using a “snowballing” technique, I was able to locate those individuals who were willing to discuss their prescription stimulant use through friends of friends, advertising my desire to speak to users on the previously discussed survey that was sent out electronically and by discussing my topic openly within various groups of friends and acquaintances at coffee houses, college house events, etc. Many individuals were willing to discuss their stimulant use with me superficially but were unwilling to sit down for a formal, recorded interview. Most difficult to locate were the sources of prescription stimulants within the student population, the dealers or distributors. Again, several individuals were willing to discuss their “trade” of prescribed stimulants for cash or just because they “had extra for friends”, but only one admitted dealer was willing to discuss their sale of pills openly. Although as a student my access to students employing prescription stimulants was enhanced, skepticism and an unwillingness to discuss drug use remained and provided a general hindrance for this study.
A third branch of the study involved focus group round-table discussions with small samples (3, and 4) of the University of Pennsylvania student population. Discussions occurred informally and participants were not solicited for their involvement, rather, their participation was self-directed once at an on-campus coffee house and once at a dorm-sponsored study break event. Notes were taken by the author and following conversation permission was orally granted by participants to include their comments in this study. Apart from general introductory questions such as “How do you feel about cognitive enhancement and prescription stimulant use on campus?”, the discussion groups were free-form and allowed participants to express their opinions, doubts and concerns regarding prescription stimulant use among their fellow student population without prompting.

**Statistical Prescription Stimulant User Profile**

A short, ten question, survey distributed to approximately 200 to 300 students of the University of Pennsylvania elicited 115 online, anonymous respondents, of whom 13.9% (n=16) reported illicit prescription stimulant use. Respondents comprised a small cross-section of university life—slightly greater than one percent of the total undergraduate student population of 10,275—and were asymmetrically distributed across the classes, with 89% of the students representing sophomore, junior and senior students. Although this asymmetrical class-standing distribution is not ideal, the student respondent pool does portray an approximately accurate distribution across the four undergraduate schools, with the largest number of respondents, 73% (n=71) representing students of the School of Arts and Sciences, a proportion which is slightly higher than their actual presence on campus (SAS students represent 63% of the population). Nursing students are similarly slightly over-represented in the survey, with 7.8% of the survey
group identifying as nursing students, while in reality, nursing students comprise only 4.7%, of the undergraduate population. In contrast, two student groups were less substantially represented in this study than in their actual presence on campus, with Engineering students comprising only 5.2% of total respondents, while constituting 15.7% of the total undergraduate student population, and Wharton students representing 10.43% of the survey population as compared to 18.1% of the actual student population. Although the respondents portray slightly skewed demographics when compared with the actual undergraduate student population, a variety of student profiles is represented in the respondent pool, allowing for correlations between characteristics such as school and extracurricular activities to be drawn.

Of the 115 student respondents, 13.9% (n=16) of the total survey population reported off-prescription use of stimulants. This cohort of students was comprised of 8 seniors, 4 juniors, and 4 sophomores. Interestingly, an overwhelming majority, 93.75% (n=15), of these stimulant users were students of the School of Arts and Sciences. Of the 16 students admitting illicit use of prescription stimulants, 50% (n=8) of these students identified themselves as sorority or fraternity members. A two-proportion z-test assuming equal variation demonstrates that this correlation has a z-score of -0.3265, or a p-value of 0.37, demonstrating that the two student populations, users and non-users, have a statistically similar analogous proportion of fraternity and sorority members, indicating that among this cohort, fraternity or sorority membership is not necessarily a correlating factor to stimulant abuse at the University of Pennsylvania. Additionally, a striking characteristic of the self-reported user population is the overwhelming 68.7% (n=11) of whom admit to additional recreational drug use. This correlation, although unsurprising when one considers previously reported studies is nonetheless significant as it indicates a propensity for drug use among the population that is significantly greater than the
31% reported among the total respondent population of 115 (Lowe, 2002). A two-proportion z-test, assuming equal variance among the total student population, shows that this difference between user and nonuser populations is, in fact, highly statistically significant with a z-score of 2.99, or a p-value of 0.01. All the more interesting is the relatively few, 12.5% (n=2), users who report prescription stimulant use to get high or to party, although it is notable that both of these individuals were members of a fraternity or sorority. In contrast, 75% (n=12) of prescription stimulant users reported use with the intent to study and/or focus on academics (the remaining 2 individuals did not indicate a motivation for use). These numbers indicate a user profile at the University of Pennsylvania that is striking in its acceptance of drug use for the purposes of sensory stimulation and partying but that predominantly employs prescription stimulants for studying purposes rather than for recreational use.

**Anecdotal Prescription Stimulant User Profile**

This University of Pennsylvania user profile is outlined anecdotally by both stimulant users and non-stimulant users alike who suggest to me that a clear prescription stimulant-user stereotype exists on campus. This stereotypical prescription stimulant abuser follows many of the statistical correlations shown from my brief survey—and, interestingly also conform to some of the hypothesized correlations indicated in previous sections, segregating logically into two general user groups. For example, Megan, who is both a former Ritalin abuser and Adderall dealer, indicates that her customer pool was sharply divided between individuals buying with the intent to use for partying or getting high, and those who purchased with the intent to enhance their studying or academic focus. Megan particularly highlights up the previously mentioned correlation between prescription stimulant use and Greek life, attributing that subpopulation with
the majority of her stimulant sales for the purposes of getting high: “People that I sold to study, I don’t think many of them were in any kind of Greek life, but the people that I sold it to to party were most definitely [in the Greek system].” Mary, an Adderall user and a member of a sorority herself, similarly notes a preponderance of prescription stimulant use for the purposes of getting high within the Greek population; however, interestingly, she indicates that there is a difference between sorority (female) and fraternity (male) use. In response to a question concerning use patterns among her sorority sisters, for example, she said “No, well, I’m sure people in my sorority used it to study, but it [use for partying] was more my boyfriend’s social circle who were all fratty and drunk all the time, and I mean I feel the frat scene just promotes that kind of behavior.” Further personal accounts hint at similar correlations and confirm the perception of a prescription stimulant abuser who is open to other drug use, or at least a “party-er”, meaning an individual who “drinks pretty heavily on a semi-regular basis. In an effort to maintain anonymity, however, the sex of subjects was not identified in my survey, so I was unable to statistically substantiate claims of predominantly male use for partying and predominantly female use for studying purposes.

In focus group conversations, a reportedly analogous relationship between cocaine and prescription stimulants was discussed, particularly the use of Adderall, Ritalin or other generic stimulants as a substitute for cocaine. Although present on campus, this form of use is seemingly more rare than the use of prescription stimulants as study-aids, for, as one respondent notes, “I’ve seen a lot of coke use but not really Adderall for that purpose, but I’m sure kids do it, but most people would never give up their Adderall for that reason. I mean they’d much rather go buy coke and would never waste their precious Adderall.” Jay, a habitual user emphasizes this point: “I have a few friends who do it [snort Adderall] and they are like ‘oh well its sort of like
that cocaine only it just lasts like five seconds and then you have to do it again and I’m just like ‘you could be using that to get your homework done.’ Other students, however, point to the “sex appeal” associated with crushing and snorting of a stimulant pill, indicating that this sort of use is like “baby coke”, and that “it makes people feel naughty and ready to party. I mean if it didn’t, they would just swallow it like every other time.” Megan brings up this allure when describing the boys to whom she sold Adderall in bars: “I would charge them so much for such a small amount, I really don’t feel like they were even getting high off of it, like they just wanted to be cool and show that they could like snort something, and I think the fact that you could snort it made it more attractive.” However, despite the connections drawn between cocaine and prescription stimulants, Megan indicates a marked difference in sensation between the two drugs: “It makes you more jittery […] I mean obviously they are both stimulants, but I don’t know, Adderall is more like meth. If I had to pick a high it’s like meth. Like a really fast, intense feeling.” Megan goes on to describe how she typically targets “frat guys” at bars, flirting a little to “get their attention” then casually asking if they want to try a “really fun high” before showing them how to crush and snort the pills. This sort of posturing behavior is clearly linked in many individual’s minds to the active playing-out of the fraternity or general Greek persona at the university. Among focus groups, a repeated emphasis on the concept of snorting any sort of drug, be it prescription stimulant or cocaine, indicates that it is the mechanism of intake that is most important to the carrying out of this stereotype rather than the chemical makeup of the drug itself—in fact, as Megan notes, the high derived from snorting prescription stimulants is fleeting and, although more intense than other stimulants, “It is a much harder come down not very pleasant.” It seems, therefore, this user population is employing the drug as a status symbol, mimicking the use of cocaine, and as a prop utilized to demonstrate participation in a certain
lifestyle, a lifestyle that I would argue is not unique to the members of Greek life on campus, although it is more prevalent among those self-selected populations.

Although there appear to be two clear user populations at the University of Pennsylvania, there exist some correlations that both users and non-users attribute to the whole prescription stimulant user cohort regardless of intent of use. Most obvious is the repeated emphasis on the background of individuals employing Adderall or other prescription stimulants as a study aid or to party. For example, Jay describes a user population that is in general relatively if not extremely well-off with previous exposure to prescription medication use. "I went to a pretty intense private catholic school and it was common there too[...] And I mean, depending on their backgrounds, most people are just jaded by it and not offended or phased at all, and those that aren't sort of ok with it are kids from like really rural areas, and maybe their schools didn't send a lot of kids to Penn and they are ... they were definitely big fish in the little pond and I feel like if their high schools were bigger ponds in the academic competition sort of area, they would be a little more appreciative of it." This dialogue correlating use with privileged background is echoed throughout the focus group conversations, particularly with respect to previous exposure to psychotropic medication use. Mary, for example, echoes Jay's emphasis on the competitive nature of academics at the University of Pennsylvania, saying "I think it's because it's a competitive school but it's also just the people and the notions that they already have about psychotropic medications. I mean I didn't know anybody who had any antidepressants or who had any sort of medication to treat any sort of psychological problem, but then I came here [...] I just think it's a common thread throughout Penn, kids where it's like ok to define yourself by these illnesses and drug yourself accordingly." Anna, an adamant opponent to prescription stimulant use also identifies this profile of user: "I was gonna say earlier, they're the sort of
people that necessarily have things handed to them and might not want to work for it. Kids who are from the expectation that they have to succeed, that they are from a part of society that says that they have to do well, that there is no other option and this is just a means to get it.” In this transition, Anna points to the second group of prescription stimulant users on campus—a group which out-numbers those using the drugs for recreational purposes 3 to 1 according to previously-cited survey results—those members of the student population employing prescription stimulants to achieve academic success.

The profile of an individual using prescription stimulants to study is far more varied than that of the party user as gleaned from student accounts; however, there are several trends that are apparent across individual interviews and focus group conversations. The first and most emphasized characteristic of this type of user population is that there is an evident purpose for consumption that is completely separate from concerns about mechanism of intake or posturing, but that is instead predominantly outcome-driven and centered about a dialogue of time management and balance. The majority of non-user students, when asked what sort of student uses prescription stimulants for academic motivations, identified a group of individuals who employ the drug as a last-minute study-aid to bolster “last minute cramming sessions”. As Anna explains, “When I think of Adderall use I think of people who can’t control their time and who take it and cram.” Another non-user student, Tom, describes his perception of individuals using stimulants to study: “It’s usually people that just screw around for weeks and then all of a sudden look up and are like ‘Shit! I’m screwed for this class or that class’ and then they spend days in the library coked out to get stuff done.” Mary echoes this sentiment when describing her own use and the use of others seeking academic improvement: “I mean it’s not really the straight up overachievers, because they already have everything done. Its more people who put off their
work and who don’t really prioritize work so they are the ones that are more, you know, pressed for time and you know because they prioritize social stuff anyway they might be more alright with substances and then yeah, like people that still really care about doing well all the way down to people who don’t do anything all semester and then procrastinate and need help.”

**Explanatory Models of off-label Stimulant Use at the University of Pennsylvania**

Apart from simply identifying the prescription stimulant user profile within the University of Pennsylvania student community, one of the most valuable components of this investigation is the insight that it provides into the motivations of stimulant use, insight which only personal interviews can afford. A participant-observation, ethnographic approach has allowed me to interrogate use patterns of individuals in order to distill each personal experience with stimulants into an overarching explanatory model of stimulant use at the university. The concept of an explanatory model of a disease or treatment regime is fundamental to the theoretical approach of a medical anthropologist, and is comprised of all thought processes relating to the etiology of an illness or disease, the diagnostic criteria employed, treatment options available, and all factors contributing to the conceptualization of a relationship between person and illness. The construction of such models occurs via a process of negotiation between an individual’s personal experience or social history and the cultural matrix within which he or she exists. Therefore the explanatory models of a particular illness or treatment regime provides insight into both the past history of individuals considered and the sociocultural factors contributing to the health or disease state of a population. The mapping of these explanatory models is, therefore, a particularly informative method to interrogate motivations underlying treatment decisions and to identify the personal and environmental factors linked to the
negotiation of a redefinition of personhood through the recognition of an illness state. This investigation of prescription stimulants focuses upon explanatory models of drug efficacy as communicated by individual users, touching on factors leading to the initiation of their use, mechanisms of dose-determination and the establishment of personal use patterns, as well as specifically highlighting the explanatory models of key informants.

All prescription stimulant abusers that I spoke with, apart from those using stimulants as a cocaine substitute to party or get high, spoke of employing the drug with specific outcomes in mind. Says Emma, “I mostly used it to wake up and sort of get my mind on my work... and at that point, coffee really wasn’t working to keep me up anymore.” Jay, on the other hand, employs the drug in order to achieve a level of focus that he says is more difficult without the stimulants because of the “classes where it’s just like...regurgitation. [...] I know that if I take it, it will make me interested [in boring material] and then I can push myself to do the work. It kind of gets you over that mental block and you can kind of sit down and get to work” Mary similarly echoes Jay’s emphasis on prescription stimulant’s ability to make school work interesting and easy to complete: “Like I can’t stress how much it really enhances your ability. To focus and to work well and to feel like everything you are doing is interesting and that you are retaining absolutely everything. Like you know when you sit in class and you absorb like 50%, 60%? Because your mind wanders? Well you can take that and you can sit down and just like ferociously scribble notes for like two hours... and everything just syncs.” The pervasive dialogue, therefore, suggests that the pill serves one of two functions, that of stimulation and that enhancement—most users employed the pill for both motivations and reported both sensations while using. However, interestingly, several users also expressed skepticism that the pill actually enhances their abilities in a real sense. Says Jay, “Sometimes I wonder if it’s the placebo effect
now because I’m probably... I mean I’ve been doing it for awhile now and been taking it for so long at these doses, I mean you sort of get adjusted to them.” However, despite this passing concern, Jay maintains that the drug is highly effective and helps him to just “sit down in front of a computer for like four hours and just get my semester paper out of the way”, emphasizing the utilitarian nature of his use “just like any other tool.” Rob echoes this sentiment: “I mean, it’s like, you could just drink coffee... but this helps you focus too, and then you get through your work so quickly you find that you can get through your work in like three hours instead of an all-nighter.”

How did these users initially determine that the use of prescription stimulants was a viable course of action when seeking tools for academic success? There has been substantial evidence that the initiation of drug use is highly correlated with use patterns among individual’s immediate social circles, and anecdotal evidence volunteered by prescription stimulant users confirms this correlation among the University of Pennsylvania student population as well, with 56.23% (n=9) of student respondents contributing their first introduction to prescription stimulants to a friend’s influence (Kirke, 2004). Says Jay, “When I first came to Penn, freshman year. I mean, it wasn’t really necessary, it’s just that the volume of work had increased. It’s like, alright well if you want me to read these next ten chapters for lecture tomorrow, that’s fine...[but I’ll use Adderall] And I mean, I lived in the quad and it was everywhere. And then kids who came to college with a prescription and found out that they didn’t really need it because they only had like two hours of class were just all about sharing. It was kind of a communal thing.” Sharing medication is a theme that is emphasized across users, with Emma reporting that her stimulant use is limited to “whatever my friend has and wants to share with me. I don’t really seek it out besides from her.” Several users, however, report obtaining prescription stimulants
from medical personnel via legitimate prescriptions that they then subsequently abuse as study
aids rather than maintaining their prescribed regime. Mary explains her acquisition of Adderall:
“I had taken it a couple of times, gotten it for free from my friend freshman year who was taking
it for his ADD so I had just like been familiar with it—like two or three times—and then I was
actually prescribed it after coming back from abroad because I came back and I was just so so
depressed and then while we were talking about that he [my psychiatrist] asked me other
questions like ‘do you procrastinate?’ ‘are you late for things?’ and of course, ‘yes’, ‘yes’, so he
um just prescribed them for me and I stretched that one bottle for so long, because it was just so
much and so strong.” Essentially, she continues, “I don’t really have ADD. And yeah, I do feel a
weird conflict about it because do I need it? No. I can go and study for like five hours without it
if I want. But I got it, a medical doctor gave it to me. So sure I’m totally gonna use it under those
circumstances.” Megan similarly reports that she receives the Adderall that she sells as the
University from a prescription given to her for ADD. In her case, she was diagnosed as a
freshman and prescribed Adderall, which she abused daily for stimulant-seeking purposes before
entering rehabilitation for stimulant abuse and ceasing to abuse the medication in that way,
beginning to sell her medications instead. Megan states that she was always skeptical of her
diagnosis of ADD and that “I don’t know I mean I think that it’s really hard to diagnose to begin
with and I don’t really think that I had it, I mean I think I just had organizational problems to
begin with and like I said I was having drug and alcohol problems at the time…” Regardless of
the path of acquisition, it is apparent that all users with whom I spoke did not encounter much
difficulty in obtaining prescription stimulants, whether they acquired the medication from friends
or doctors.
The manipulation or exploitation of a legitimate means of stimulant medication acquisition introduces a question of personhood and identity to be considered. With respect to the acceptance or rejection of an ADD diagnosis, at least two people with whom I spoke rejected what they considered to be false diagnoses of ADD while manipulating the medical system in order to receive medication which they then employed for enhancement purposes. Both refused to identify as an ADD sufferer but were ready to accept the role of stimulant abuser. This dimension of prescription stimulant use, the concept of identity and personhood in relation to prescription stimulant use was explored by several informants with regards to the question of what, in fact, the pills alter if the user is themselves not diagnosed with ADD. For example, says Louis “It depends on how you view yourself. Body as a tool or... I mean it’s different than a new tool or invention in a lot of ways. Its manipulating you versus a machine.” Most users dissociated their expression of personhood, their identity, from their body, conceptualizing their use as alterations of their brain chemistry, of their brain potential, but not altering their intrinsic selves. Jay goes so far as to describe two “selves” that become apparent while taking prescription stimulants: “You kind of see that there are different strata to your cognition. I mean the worker-bee me is sort of typing and going through the motions and then whatever else can just sort of float above.” To Jay and other users, therefore, it is not the intrinsic self that is altered, for even while taking the drug they are able to meta-cognate and monitor their levels of stimulation and catalogue their experiences as they take the drug. Several non-users, however, disagreed with this view. Says Anna, “I would say that people taking Adderall are different people while under the influence because they can’t unfocus themselves. I think that they don’t really have control over themselves while they are on the drug.” Anecdotally, my own experiences observing Adderall users has led me to a similar conclusion, as the one prescription stimulant user who
allowed me to observe her use of stimulants while studying visibly reduced extraneous
movement, procrastination activities such as checking email, etc., and focused on the task which
she had planned to finish while under the influence. This apparent productivity, however, was
not impenetrable and her response to external stimuli, such as a question from a study partner or
a phone call, did not appear to be forced, although she quickly returned to work once the
interruption was addressed. My observations suggest that she was compelled to be productive,
however, it is impossible to determine whether this compulsion was medically or internally
motivated, and I am unsure as to whether she was experiencing a division of self such as Jay
suggests occurs when taking stimulants, or whether she was unable to disengage, as Anna
postulates. These observations aside, however, it is evident that to Anna, and others that the
intrinsic self is linked to control of one’s actions and the ability to react and or disengage as one
wills rather than simply self-reflect—one must be able to not only metacognate but also control
and temper personal action, a substantial extension of Descartes’ *Cogito ergo sum* that may be
impossible or at least reduced while under the influence of stimulants.

Another component of the construction of an explanatory model of a treatment regime is
the quantification of side effects, and using prescription medication off label does involve a risk-
benefit analysis before consumption, and several students suggest that negative physical or
psychological side effects can occur with prescription stimulant use. The experience of these side
effects reportedly aids in the determination of functional use patterns for many of the users
interviewed, and this process of calibration, although not directly addressed by most of the
informants, was characterized throughout the interviews. For example, Mary recounts an
experience in which she did not time her Adderall use accurately: “There was one time when I
took it too late and I was like laying in bed trying to fall asleep before a final and I was gonna
wake up at six and study a bit before the final but then at six I was still awake so I just took another one and then... it like half an hour later you start feeling like a new person. Like wow. But then half an hour after the final I started to feel just eh... a little cracked out.” Jay recounts a similar experience when he first began using Adderall: “The first time I tried it I took like a whole one or a half of one and it was just horrible and then I did experience anxiety and I just realized you know, too much. And I mean I just toned it down.” Emma and Megan both reported a suppression of appetite while taking the drug, a result which both girls noted might be desirable for some people. In describing her feelings while on Adderall, Megan employs a particularly illustrative analogy: “It just makes your whole body feel like a fist and then when you go off it, it’s just like an intense release. Like you’re just so tired so hungry...” The possible negative side effects of prescription stimulant use are not unknown to the general student population either. The generation of “just say no”, most students cited concerns of previous heart conditions and high blood pressure as possible complications that could arise with the consumption of stimulants without a doctor’s advisement, and several recounted anecdotes students who have been hospitalized because of stimulant use. One story in particular arose in two separate conversations and involved an individual who “took it for days and didn’t sleep for days and then had a seizure in one of his finals.”

Despite these reported negative experiences, prescription stimulant use prevails within the university and in many ways, the use of prescription stimulants at the University of Pennsylvania can be linked to a pragmatically-focused behavioral pattern that seeks to maintain a balance between social and academic success, employing these drugs as tools to achieve equilibrium by enhancing the body’s ability to focus/stay awake/retain information. Interestingly, the use-models of prescription stimulants vary in the mechanism by which they attempt to
achieve balance. For example, some users report the use of Adderall and other prescription stimulants to maximize their efficiency for work time, allowing them to, by consequence, achieve more free time for other activities. Jay emphasizes this concept of balance throughout our conversation, pointing out that at Penn there is very little division between “life” and “work”, and that “It [Adderall] sort of like, I mean, it helps you compartmentalize your life. I mean, like being in school…it allows you to treat it more like a job. Kind of like ‘this is work time’ rather than sort of just living your work. And then you can really devote yourself to your real life.” Jay, in a sense, uses the drug to demarcate his time through consumption, marking “work time” as time when he consumes prescription stimulants to study, allowing for later “free time” which is free of drug use. As with all of the students interviewed who used the drugs to study, Jay does not use prescription stimulants for party purposes: “I can’t really imagine it as a recreational drug. I mean, if I’m going out, the last thing I want to do is feel like I do when I’m studying bio or something.” By employing stimulants as a physical marker of work time, Jay’s use is highly ritualized and routine. “I divide them into sections of about 5mg and then I’ll take one before like 3 hours of studying and then I’ll have a cup of tea halfway through. It’s more like rationing. And what it does is kind of gets you over that mental block and you can just kind of sit down and get to work.” […] In effect, although Jay employs a rationale of use that emphasizes the functional aspects of the medication, his use of the medication is predominantly linked to a ritual of studying, as a sort of conduit through which he passes between the binary experience—“work” and “life”—of his time at Penn. Jay himself questions the enhancement effects he feels while taking the drug, pointing out that his use patterns have not changed over time despite continual use and a presumed development of tolerance. It is not, therefore, simply the enhancement or stimulant effects of the drug upon which Jay relies; instead, he employs the medication as a
mechanism by which he can compartmentalize his use of time outside of class. Everything about his use pattern—the almost daily consumption, the extraordinarily low dose, the structured timeline of each use—suggests that Jay’s is an explanatory model which is less about the result and more about the ritual of use.

Of course, not all users interviewed employed prescription stimulants in the same forward-planning, ritualized manner as Jay, many instead justify use as a means to re-gain an equilibrium lost because of an over-emphasis on other activities, be they social, academic or sport. For example, Emma describes her motivations for use: “I would take it whenever I was really really behind in a class and needed to catch up really fast. I mean it’s like I’m taking so many classes that require so much just time to do well in…you kind of have to always act in crisis mode no matter how far you plan ahead. It’s like, I had two exams yesterday and I have one tomorrow. The pill just helps you get back on your feet and get a hold of the material by keeping you up without having to drink gallons of coffee.” Emma describes an environment that requires constant “catching up” and that, by consequence, it is difficult to “stay sane” when “there are so many things you are supposed to do—that you want to do.” Emma’s explanatory model employs the drug as a practical means to balance a heavy workload. According to Emma, it is necessary to prioritize one’s classes at Penn, that with limited work time, one must neglect some courses in order to focus on others. Unwilling to sacrifice success in any of her courses, Emma describes several methods by which she manages her workload, including all-nighters, and an excessive consumption of coffee. She characterizes the type of work for which she uses the drug as “regurgitation”, suggesting that she carefully chooses the sort of work that can be affected successfully while medicated. “Cause I mean, it’s already so mechanical. I mean reading, I enjoy reading so I set aside time to do it but some sorts of reports, of papers, it’s
nothing but a literature review or a repetition of something and you don’t really need to be
creative or think critically. It’s just work. Lots of work and it keeps me up to get stuff done.”
Emma’s use pattern is clearly outcome-motivated, focusing more on the stimulatory effects of
the drug than presumed enhancement, but again her use is mediated by careful deliberation and
necessitated, in her mind, by prioritization of courses with an overriding desire to succeed.

The explanatory use model of Mary is constructed similarly to that of Emma, with its
primary objective propelled by a decidedly pragmatic focus; however, Mary describes a use
pattern that is necessitated, in part, by procrastination, an element which implies use of the
stimulant as a reaction to a misuse of time, rather than a pre-determined pattern of use. Says
Mary, “I never really took it to be competitive, I just wanted to get my stuff done,” a statement
which implies the use of prescription stimulants in a reactionary manner with low overall
frequency. When asked if she uses in a planned manner, she says “Well, in a habitual sense, no.
Because I never took it for like weeks at a time, but I mean I felt like just my level of
comprehension and understanding... like my level was higher. I wish I had procrastinated less
and maintained my time better, but...” Mary’s use pattern centers about the productive
enhancement that she experiences while under the influence of prescription stimulants.
Interestingly, Mary does not evoke Adderall’s enhancement effects as an absolute, rather, she
indicates the experience of prescription stimulant use as a functionally useful experience that
does not improve her quality of work, but simply aids her in remaining focused and staying alert
while affording an illusion of mastering the material. Despite this skepticism of actual
enhancement, Mary does indicate that she seeks the illusion of enhancement, and that this
illusion aids her in mastering her coursework effectively in a shorter amount of time. The
practicality of prescription stimulant use is therefore again emphasized in Mary’s explanatory
model of consumption as the pill is conceptualized as a fail-safe fall back mechanism to counteract procrastination and a mismanagement of time.

Whether employed to regain balance lost or used as a marker to create balance, the model of prescription stimulant use at the University of Pennsylvania is centered upon concepts of the drugs as tools that can be employed when necessary to achieve predictable and desirable results. Students employing prescription stimulants as study aides identify a pragmatically focused etiology of use, with an intense focus placed upon a delicate calculus of side effects, potential benefits of consumption. The pill is seen by these users as a legitimate means by which a healthier balance of time management, may be achieved, a use pattern that is validated by the desirable results obtained. In this model, the ends always justify the means, particularly when the means consist of the intake of a widely available and normalized (at least among these user’s social networks) consumer good. To these individual, prescription stimulants represent a course of action which is similar, even preferable, to alternative means of enhancing focus such as caffeine intake or sleep-deprivation. An Adderall or Ritalin pill is nothing more than a tool in their pursuit of academic success.

Environmental Factors Contributing to Explanatory Models of Stimulant Abuse

The construction of an explanatory model of prescription stimulant use is highly dependent upon the social and cognitive matrix of not only individual users but also upon environmental factors that contribute to the creation of illness and treatment paradigms. With regards to illicit use of prescription stimulants, these environmental factors are particularly salient, as use is not instigated by identification with a particular clinical diagnostic category, but is instead self-determined and correlated with the recognition of a socially-mediated, rather than
biological, need. In many ways, the models outlined previously reveal a student population that seeks to balance a successful social life and academic career through the exploitation of the effects of prescription stimulants—this theme of balance is, in fact, an overarching theme that is maintained throughout much student dialogue on the University of Pennsylvania campus. An identification of these factors is, therefore, crucial to the acquisition of a complete understanding of stimulant use among this student population.

The desired outcome in this specific population is, of course, inexorably linked to academic performance, whether the individual seeks to experience wakefulness while taking the drug or to exploit a perceived increase in cognitive ability. Survey responses similarly show that these academic motivations are among the most prevalent in the user population at Penn. As previously mentioned, 75% of self-reported users attribute their use to motivations related to academics and it is this population that was most discussed in small groups and individual interviews. Of these individuals, all reported an improvement of focus as their primary motivation for use. Other motivations reported for stimulant abuse include use to stay awake while studying (n=8), and a desire to improve academic performance (n=5). It is this last motivation that is most salient to the majority of the group discussions conducted—concerns over the veracity of anecdotal reports of increased mental capacity while taking prescription stimulants were prevalent not only among users who affirm this effect and non-users who respond to the question of enhancement with reactions varying from denial to anger. According to both users and non-users, the most important consideration is the ability to succeed academically in relation to your fellow students—the ability to out-compete classmate for a fixed number of As or Bs in a course. As Anna explains, "The acquisition of an A at Penn is a 100% will power thing. I fully believe that. In most classes I take, its literally are you willing to do the
work. And yes, intelligence matters to a certain degree—I mean, it means that yes, you can
maybe fuck around a little more, it makes it easier for you, but for the most part it’s just training
yourself to put in the effort. Forcing yourself to go above and beyond the person next to you to
take that A.” Emma goes a step further, linking GPA to stimulant use: “It’s probably, you know,
more like B students who want to step up to get an A. You know, people that can’t handle
anything other than an A. People who always did well and then get here and are like crap I need
to step it up.” A dialogue of competition was pervasive in all of the small group discussions,
where the concept of grading “on a curve” was repeatedly raised. Said one student: “I mean, I’m
an Anthro major and so it’s not like everything is graded on a curve, but I mean I took an econ
class once and it was [graded on a curve] and it was like ridiculous, because I mean people
would average like 95s on the tests and so I mean I think that breeds more competition.” Emma
similarly brought up the concept of competition in her interview: “I mean everything is about
how many points above average you are on a test, and what your deviation is as compared to
everyone else. It’s all a numbers game. In some ways, it doesn’t even matter if you learn
anything. Just if you are above or below the curve. So people will do a lot to get ahead, whether
that is abusing their body with caffeine and all that or not sleeping or just… anything.”

In discussions centered about question of the morality of the use of prescription
stimulants as cognitive enhancers, the general theme of environment was raised on multiple
occasions in reference to a local culture whose characteristics might lead to actions seeking
enhancement or achievement by means beyond the natural. Following that course of
conversation, the concept of the University of Pennsylvania environment and the quintessential
Penn student was raised. “Penn is definitely a different sort of environment,” Anna says when
asked about the university. “I think we are all a certain sort of personality that all wants to
achieve and Penn is set up in certain ways where you are competing against each other and not everyone can get the A they want, so it's very cutthroat. And I think also with the size of Penn, unless you know how to work it, it's very intimidating and people aren't necessarily willing to look at you as an individual versus just another body going through this or that class.” While the concept of competition and curved grading has been raised previously, it is important to note also that Anna highlights the selection process leading to the specific group of students at Penn. Although all college or university institutions are self selective via the application system, Penn is a highly competitive institution, accepting approximately 10.3% of applicants seeking to enroll there. By consequence, as Emma notes, “We all were the top 10% at least of our high school class. Valedictorians and salutatorians all fighting for recognition and for success here.” Mary emphasizes this competition but also notes that most students have a common history of being high achievers seeking positive reinforcement and recognition. “There’s this weird and spoiled and totally helpless mentality people have here because they’ve had it so easy for so long and then they come here and everyone is smart and it’s just this really competitive place.”

Anonymity was another theme pervasive throughout small group discussions—mirroring Anna’s comment about feeling like a faceless body moving through classes at times, Megan described her history of struggles with drug abuse on campus and the lack of administration support that she experienced as she struggled with her use: “I feel like even teachers were like you can party hard as much as you want and we’ll look the other way as long as you do well. Like the only time that I ever had teachers go to the administration before about me was when my performance suffered, but as long as I was getting good grades, I could come in late, you know miss classes.” Although none of the other informants reported abuse issues correlated with their use, several other students commented on their skepticism that teachers or professors would
“even care” if they wrote papers while under the influence, because “all that matters is that you turn your work in and do ok.” Despite these criticisms, the majority of students interviewed considered the competitive, anonymous environment of Penn to be similar to the life that they anticipate upon graduation. Says one student, “I think Penn is very much like real life where you have your job, you have your classes, you have your friend and you’re trying to balance them and mature as a person and you’re just trying not to fail miserably.” Interestingly, though, despite this acceptance of the general competitive mentality, the artificiality of the university environment in general is not passed by unnoticed. Penn might have some of the qualities of “real life”, but as Jay notes, “Once you get out it’s a different kind of work. It’s like because it’s what I’ll really be doing. It’s not like here where... I mean I really like my major and I’m really into it but I also know that I won’t ever be doing this again, that’s definitely a different mindset.” Emma notes that “A lot of the classes you take here just seem like steppingstones. Especially if you want to go to med school or law school or something beyond... it’s not really practical knowledge just one more thing you have to take and excel in even if you don’t care about the actual material.”

**Legitimizing Prescription Stimulant Use**

The pervasive dialogue of competition throughout both individual interviews and focus group discussions begs the question of the morality of prescription stimulant use to enhance performance in an environment ostensibly constructed to gauge relative, not absolute success. On this topic, both users and non-users appear to be strongly divided with varying rationale for their differing stances. For example, a common analogy between caffeine and prescription stimulant use in discussion sessions seemingly attempts to rationalize its use as a strict stimulant whose
only difference is intake mechanism. In emphasizing the end product of consumption, these students incorporate a risk-benefit ratio analysis of sorts to the drug use. As one student states, “I mean, I know some people get all mad because there are unfair advantages, but I think that there are you know costs that kind of even it out. Like I don’t really think it’s an unfair advantage, because, like you could drink coffee... I mean I know it’s not really the same thing, but it kind of has the same effects.” While explaining his use, in fact, Jay evokes an analogy to caffeine, pointing to the difference between consumption of caffeine as a component of coffee and then as a component of gum or in pill form, both of which are readily available at local convenience stores. “I mean in coffee, yes there is a difference because it’s sort of a socialized beverage, but we put caffeine in a lot of products now, like the gum you can get at WAWA. And coffee drinking in the United States is very different here than anywhere else [in the world] like here we basically soak in it.” In his portrayal of caffeine use, Jay contrasts his carefully metered stimulant use as a more judicious mechanism to achieve a similar outcome to the excessive use of caffeine in the general community, excusing his consumption through an implicit criticism of the over-caffeination he portrays in the student population, offering stimulant use as a logical, if not safe, substitute. Safety is a theme that is continuously raised in support of prescription stimulant use. As Megan explains, “I think part of its [Adderall’s] appeal is that it’s a pill. It’s not an illicit drug. I mean people don’t think it’s that bad because other people are prescribed it and some people take it every day and that’s fine.” The assumption underlying this defense of stimulant use is that if the use achieves an outcome that is desired, and if there are legal means to achieve the same, or similar, outcome, then the means by which you obtain that outcome is less important than the overall result.
Other students rationalize their illicit prescription stimulant use by referencing the pre-existing disparities among the student population, be they natural (i.e., intelligence) or economic. For example, Mary says that she doesn’t feel like prescription stimulant use is cheating “because I mean if other people felt slighted, they could just go get it themselves. I mean even if a few people choose to abstain [from using stimulants to study], enough people don’t that the playing field isn’t even anyway.” This sort of “everyone is doing it” mentality is frequently referenced by users who allude to friends who also use prescription stimulants who study, justifying the legitimacy of their own drug use through the availability of stimulants on campus and the use patterns of others. “I mean I feel like the availability of it [prescription stimulants] on campus hints to at least a minimum threshold of use among the student population. And if there are people doing it, then no matter whether you decide to use it or not, the chances are someone in your class is and so no matter what it’s not fair,” said one student member of a round-table discussion. Similarly, a user reported that, “I guess you could say it sort of exacerbates the achievement gap because I mean kids from a certain economic background can afford a certain insurance program and medical care. And their parent’s acquaintance psychiatrist friends can prescribe it for them, but a lot of kids here have that, so it’s kind of naturalized unfairness.” Similarly, students pointed to other forms of unfairness linked to economic disparities already present within the student population at Penn, such as the ability to pay for a private tutor or to take an expensive preparatory test for a graduate school exam. For example, Jay references his LSAT studies: “I used it when I studied for the LSATs is what I did—and I mean, that’s also probably unfair, but at the same time if you want to take a three thousand dollar prep course, then this is what I am going to do and it will cost less.” And although both users and non-users exhibit uncertainty over the ability of prescription stimulants to actually improve the quality of work
conducted while under the influence, both groups express a belief that the drugs do not, when used “judiciously”, negatively affect the user’s ability to produce a minimum level of quality output. As one student stated, “I don’t know that it really hurts you so much, and I’m pretty sure that professors can’t tell the difference between a paper written on Adderall or just coffee, so if you want to take the risk, go for it.” This pervasive theme—“it can’t hurt, it can only improve your work”—introduces a cost-benefit ratio in which the downside to prescription stimulant use is difficult to pinpoint exactly, although many students who participated in discussions of the general fairness of use were very opposed to the concept of prescription stimulants as justifiable in their academically utilitarian use pattern.

Students who disagree with the use of prescription stimulants for academic enhancement repeatedly highlight the illegality of such use and the dubious medical grounds of such use. Anna, for example, focuses her objection to prescription stimulant use on the concept of a misuse of medical technology: “I think Adderall is safe because it is regulated by the FDA, which is a huge statement to accept by the way, but only for people who need it based on the fact that ADD is a chemical imbalance. But if your brain is healthy, then it’s not meant for you. It’s like I don’t want that in me. These are my brain chemicals, they’re fine, they’re chilling. Let them be.” Safety is a concern that many students raised, questioning the effects of prescription medications on the brains of individuals who do not have the traditional symptoms of an ADD affected individual. Objections to use were also vocalized with regards to an asymmetrical distribution of access to the medications—an imbalance which, some students suggested, simply codifies the socioeconomic strata among society as a whole. For example, one student asserts that “Adderall can just be used off label to maintain your position within a certain social strata, but it doesn’t really promote upward mobility because it’s expensive.” Upward mobility is perhaps not chief
among the concerns of student users at the university, however heterogeneous access to the drugs was intimated in several dialogues, and as a consumer good, the cost of the medication is a factor to use, although not one that was raised as an inhibitory force by any of the users with whom I spoke.

The concept of “fairness” within the classroom was also raised consistently among both individual and group conversations, who again raised concerns of disproportionate success within a curved curriculum. Said one non-prescription stimulant user, “I don’t care if you fuck up your life; I care if you fuck up my curve.” General dialogue additionally focused on the theoretical increase in expectation of work assuming a baseline number of students increasing their productivity via prescription stimulant enhancement. Says Louis, “I mean I think it’s like when you do stuff more efficiently, it’s not that you do the same amount of work… it’s like you’re more efficient so do more work! It just artificially increases the pace of life and then the expectation is raised and people expect you to do more.” Interestingly, although many students raised moral objections or personal objections to prescription stimulant use for enhancement purposes, all student participants in round table discussions expressed a basic understanding of the suggested motivations behind prescription stimulant use, demonstrating an empathetic comprehension of the environmental factors leading to use: “I mean, regardless of whether they [stimulant users] are lazy or not, Penn’s tough sometimes to get a handle on successfully.”

Discussion

The explanatory model of prescription stimulant use at the University of Pennsylvania presented here is drawn from a three pronged approach, utilizing not only a numerical analysis of the overall stimulant user profile at the university but also interviews with individual users as well as round-table discussions with examples of the general student population. I believe that
this approach is able to encompass the utilization of prescription stimulants three-dimensionally, unearthing factors correlating to use that a purely statistical approach would be unable to accurately portray. The clearly bounded prescription stimulant user population examined in this study represents a cohort that is both informed and willing to discuss use patterns, environmental factors leading to use, and the risks and benefits associated with off-prescription use of stimulants. As such, the user population at the University of Pennsylvania provides an informative cohort whose experiences with prescription stimulants and the continuing debate over their consumption are of particular interest to policy makers, researchers and ethicists. The majority of information presented here is therefore derived from personal interviews, a medium of examination that is particularly pertinent for understanding personal patterns of drug use. The survey data briefly presented is informative in its confirmation that prescription stimulant use does, in fact, exist at the University of Pennsylvania, and suggests that the percentage of students consuming stimulants off-label is within the 0 to 25% suggested by McCabe (McCabe, 2005). The statistical model shown is, however, limited in its ability to address prescription stimulant use for the means of cognitive enhancement. The various use factors described by individual users within this study provides greater insight into the overarching dialogue of off-label prescription stimulant abuse, suggesting the legitimacy of such enhancement-seeking behavior.

To better understand the shifting dialogue surrounding the future of cognitive enhancement by pharmaceutical technology, therefore, it is particularly instructive to examine individual explanatory models of use in order address the thought process underlying such use and to interrogate the calculus of risk/benefit leading to consumption. Through the lens of this individual experience, environmental factors promoting the employment of stimulants off-label are highlighted, and characteristics of the University of Pennsylvania that are incorporated into
explanatory models of use can be disentangled and examined in order to better comprehend the overarching motivations for use among this population and, by extension, among society as a whole. For example, the overriding explanatory model of stimulant use at the University of Pennsylvania with the voiced goal of enhancement is predominantly constructed by self-motivated by individuals to whom academic success is vitally important. Although this concern is not strictly translatable to the general public, analogous motivation for stimulant use may result from pressure for improved performance in the professional sphere. Similarly, risk factors involved in the off-label stimulant use at the university are informative when considering the negative side effects of such use in the in a broader sense. In this way, ethnography and personal interviews can provide a vital contribution to dialogue regarding the utility of enhancement technology and it is from this methodological focus that this study was conducted.

The results and individual perspectives offered here are particularly salient as the discussion of stimulant use for the purposes of cognitive enhancement in particular has become more public in recent years as several high profile articles in Nature (Farrah, 2004; Greely, 2008), an opinion editorial in USA Today, a national newspaper (Role of Drugs, Pharmaceutica. Industry Examed by Susan J. Matchinger 4/17/09) and an article in the popular science magazine, Discover (Are Smart Drugs the Answer to Bad Moods—And A Bad Economy, by Sherry Baker April, 2009) have received national attention for their permissive stance on psychopharmaceutical enhancement of non-ADD individuals. It is evident that popular dialogue has transitioned from previous condemnation of stimulant abuse towards a measured endorsement of the exploration of controlled stimulant use for the purposes of enhancement of intellectual capacity and improvement in general productivity. What seems to be the turning point in this dialogue is, as previously stated, the intent of use. When used for predominantly
hedonistic or self-serving motives, the abuse of stimulants is vilified; however, when framed in a discourse of productivity and enhanced contribution to society, stimulant use has become accepted and even supported by the popular media.

Interestingly, this pattern of acceptance/rejection of stimulant use was also perpetuated within the University of Pennsylvania cohort with the notable exception of use in circumstances in which competition between students is the driving force behind grade acquisition and an individual's success in a course depended on the success/failure of fellow students. By and large, student discussions of prescription stimulant use outside of the collegiate environment were ambivalent, if not positive, toward stimulant use with the overall purpose of the amelioration of performance and execution of professional responsibilities, particularly with regards to societal actors such as doctors and air traffic controllers on whom lives depend. Anna particularly illustrates this permissive attitude to societal use as her reaction to stimulant use among those in the medical professions is markedly different to her reaction towards those exploiting the drug's effects among the college environment: “I mean if you have certain professions, who are you hurting? Nobody—you’re protecting people from mistakes and, I don’t know… sleepiness is dangerous.” In effect, Anna and others demonstrate a practical outlook with regards to prescription stimulant use among the general public, an outlook which is interestingly similar to that of the explanatory models of use of those employing stimulants as study-aids, however which differs significantly in the calculus of the benefits arising from use. Collegiate explanatory models are designed to bolster performance within a classroom environment with decidedly individual outlook while general use is accepted by the individuals with whom I spoke in the event of altruistic outcomes benefiting society as a whole. In both cases, one might view the
cost-benefit analysis of stimulant use in light of the common aphorism, “the ends justify the means”—the underlying question is, of course, whose ends?

Despite a general acceptance of the pragmatics of prescription stimulant use, concerns remained within the student population, concerns which were directed towards the question of what is being altered while consuming stimulant medications. The concept of an individual’s identity, of their authentic self, when under the influence of psychotropic drugs was a theme brought up by both users and non users, and it is this central concern which I believe lies at the crux of the debate over the use of psychotropic compounds for the purposes of enhancement. Many of the individuals with whom I spoke were willing to assume the identity of an ADD-afflicted individual in order to obtain prescription stimulants, molding their identities for the purposes of drug acquisition, however none conceived of themselves as drug users or deviants. This conceptualization is, I believe in part, due to the pharmaceuticalized culture in which we live and the prevalence of such medication, however it also points to a gray area of abuse that can be termed functional abuse and that is self-motivated and controlled. In this way, prescription stimulants are viewed by users as a consumer good and not as a component of their social identity. In fact, all of the users with whom I spoke separated their “true” identity from the medication, never once incorporating Adderall or Ritalin into their descriptions of themselves, and always holding the pill apart as a tool for success but not a part of their identity. A dialogue of true self versus altered self was however employed by opponents to the use of prescription stimulants for the purposes of cognitive enhancement. These students invariably suggested that users lost a portion of themselves and experienced an attenuation of personal agency while under the influence of the psychotropic substances. In many ways, as Singh postulates in her 2005 paper, “Much of the bioethical argument [against the use of prescription stimulants] appears to
assume an actual, authentic self. [...] Concerns that psychotropic drugs may diminish a ‘real’ self, or transform the self, are founded upon the assumption of a self that is identifiable, coherent, and stable.” (Singh, 2005) But is there, in fact, a true self that is at risk of being adulterated by prescription stimulant use?

In many ways, it is this very question which lies at the heart of medical anthropology research—can one separate the self from one’s bodily response to medication, illness or affliction, or are these factors incorporated into the mechanisms by which an individual self-identifies or is identified by others? Artificial enhancement through chemical or pharmaceutical means particularly highlights this concern. In effect, one’s conception of the location of personhood is critical in this consideration. For example, Louis’ vivid image of the body-as-a-tool is based upon an explanatory system which separates the body from the mind, focusing upon the corporeal reactions of the body as being wholly directed, willed and exploitable by the mind. Louis’ model breaks down in the case of cognitive enhancement via pharmaceutical use, however, because this metaphor, as with most medical metaphors within western medical theory, suggests that the self/the will resides in the brain, which is itself altered by stimulant use. Jay’s explanation of metacognition while consuming prescription stimulants extends Louis’ model and presents an interesting interpretation of the brain and thought processes as a malleable and manipulateable machine with individual will separate from this manipulation. Jay and other users maintain a distance from the drugs they use and the ways in which the stimulants alter their synapses for a desired behavioral output in a very similar way to an individual with a cold might separate their identity from the viral disease which they combat. In both cases, the individual is engaged in a relationship with the foreign chemical or pathogen within their physical selves while maintaining a figurative distance between these corporeal concerns and their true self.
With psychotropic drugs, however, the pervasive dialogue of brain as the locus of the true self is complicated by the manipulation of the functionality of the brain by prescription stimulants, and there is no longer, in this case, any way to conceptually separate the authentic self from bodily processes within the convenient metaphor of the body as a machine.

When viewed in light of an altered conceptual paradigm of the self in relation to the body, with the inclusion of the brain as a component capable of alteration separate from the will, it is evident that, at least within the cohort studied, a practical outlook on prescription stimulant use provides the impetus for off-label prescription stimulant consumption and underlies the student explanatory model of use at the University of Pennsylvania. This outlook, in which end results including increased productivity and enhanced focus justify the use of stimulants, is pervasive among the user group studied and persists despite differing individual conceptions of risk, reward and agency linked to the consumption of such medication. The students interviewed highlight the utility of stimulant use, and their explanatory models suggest that a functional use pattern of prescription stimulants is both possible to achieve and defensible within a system that holds output and end results at a higher standards than the process by which the results are achieved. Considerations of unequal access to such enhancing medications, questions about the effects of long term stimulant use and the ramifications of use within the public sphere are concerns which extend beyond this study but which must be addressed before a functional model of prescription stimulant use may be effectively adopted for pervasive use in the general public, however information garnered from these university students is insightful and provides a case-study for use that extends far beyond simple statistical models. Despite the permissive attitude garnered from these students, it is evident that above all, general use of prescription stimulants within society would necessitate a shift in popular explanatory models of identity and
personhood, with a reconceptualization of the body as machine model to include the brain as a manipulateable part of the body that is separate from the intrinsic self of an individual.
Appendix 1: SurveyMonkey Survey

What year are you in school?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student

Are you a (circle all that apply)
- Member of a sorority or fraternity
- Member of a sports team (NCAA)
- Member of an athletic team (intramural/club)
- Member of a secret society
- Member of an academic group
- Member of a social service organization

What school do you attend?
- Wharton
- School of Arts and Sciences
- Nursing
- Engineering

Do you or have you ever taken prescription stimulants (such as Adderall, Ritalin or Focalin) for any reason?

- Yes
- No

Are you/have you been diagnosed with ADD or ADHD?
- Yes
- No

When did you begin taking prescription stimulants?
- High School
- Freshman year
- Sophomore year
- Junior year
- Senior year

Who suggested you try prescription stimulants and/or facilitated the experience?
- Friend
• Roommate
• Sorority/fraternity sister/brother
• Family member
• Doctor
• Self

How often do you take prescription stimulants?
• Once or twice a semester
• Once Monthly
• Two to three times a month
• More than two or three times a month but not weekly
• Once a week
• Two to three times a week
• More than two or three times a week, but not daily
• Daily

For what purpose do you use the drug?
• Improve your focus/attention
• To help you stay awake while working on academics
• To perform better on a test or assignment
• To help study or focus on academics
• To relieve anxiety or stress
• To lose weight
• To get buzzed or high
• To help stay awake while not working on academics
• To party

Do you take other drugs, illegal or prescription, for recreational purposes?
• Yes
• No
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