

“Prescribing the Problem”: *A Multi-Theoretical Approach to Predicting Illicit Stimulant Use at the University of Minnesota-Duluth*

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Dedication

This thesis is dedicated to...

My mom and dad for the giving me the skills and opportunities which have allowed me to achieve what I have throughout my life, my sister for being my academic inspiration growing up and the definition of a role model, my fiancé Christa who has never let me give up on anything I begin and finally, all those passionate about the continued pursuit of knowledge in the discipline of criminal justice.

Abstract

Illicit prescription stimulant use by college students has been a rapidly growing problem across college campuses throughout the United States in the past decade. Students are abusing drugs such as Adderall and Ritalin at an alarming rate for academic improvement, recreational use and in some cases as a dieting agent. Past research has focused largely on the amount of students abusing these drugs and has neglected using criminological theory to determine what type of student uses these prescription stimulants and why they began using. To address this gap in literature, this research examined survey data from a Midwestern university in Minnesota. It was found that variables from both social learning theory and social control theory predicted the illicit use of stimulants. School importance was not found to be a key predictor in stimulant use. These results are valuable in understanding illicit prescription stimulant use and demonstrate the need for further research using criminological theory.

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Introduction

In the past few years, the nonmedical use of prescription drugs has become a rapidly growing problem on college campuses across the country. This problem has become so widespread that many studies, news media and researchers have labeled current college students as "Generation Rx" (Critser, 2005; Associated Press, 2005). In 2005, a study done by the National Center on Addiction and Substance Abuse found that the number of teenagers using prescription drugs tripled from 1992 to 2003 (Jacobs, 2005). In fact, the National Institute on Drug Abuse has been investigating reports suggesting that more than 7 million people in the United States have abused methylphenidate (Adderall) to get high or to improve academic performance (Elsner, 2009). Prescription stimulants such as Ritalin and Adderall have become some of the most commonly illicitly used prescription drugs on college campuses within the past five years.

Prescription stimulant use is often portrayed by the media as a student response to academic pressure. Students use these stimulants as a study aid in hopes to increase academic performance (Jacobs, 2005; Defective Drugs, 2005; Marrer, 2004). Adderall has become so popular it is now known as the "study drug." Many students seem to believe they are necessary for academic success. A junior at Columbia University stated that, "I don't think I could keep a 3.9 average without this stuff" (Jacobs, 2005:1). These drugs have even drawn comparison to the use of steroids in athletics, by allowing students to increase their GPAs with less effort (Jacobs, 2005:2).

However, a student at Harvard University stated that often times illicit prescription stimulant use is not used with the intention of allowing them to become the top student in class and is more commonly used simply to pass the course:

At Harvard, at least, most people are to some degree realistic about it. . . . I don't think people who take Adderall are aiming to be the top person in the class. I think they're aiming to be among the best. Or maybe not even among the best. At the most basic level, they aim to do better than they would (Talbot, 2009:1).

Given the medical, psychological and legal dangers involved with the illicit use and sales of prescription stimulants, as well as the rapid increase in their use, news media and academia have begun to focus much more closely on the use of these drugs in college populations. However, this research comes primarily from the medical and/or psychology fields and fails to make a connection to criminological literature. The fact that these drugs are being used and sold illegally is underemphasized in much of the past research, with medical dangers/ethical matters being the focus instead of criminological theory.

The potential relation of the illicit use of prescription stimulants and other substances (illicit drugs/alcohol) as well as unacceptable social behavior (stealing, cheating) has also been ignored in terms of criminology. Thus, the connection between the illicit use of stimulants and criminological theory has been almost completely ignored. Given the nature of the problem and its potential link to other forms of deviance, the failure to incorporate theories of crime is an important void in the Adderall/Ritalin literature.

The purpose of this study then, is to add to the research regarding the connection between the non-medical use of prescription stimulants (i.e. Adderall/Ritalin) and

criminological theory. Specifically, this study, assess the connection between college students' non-medical use of prescription stimulants and variables from social control and social learning theory.

Literature Review

Scope of The Problem

Adderall (produced by the company Shire), as well as Ritalin (produced by Novartis) are composed of mixed amphetamine salts and are intended to assist those diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). A person suffering from ADHD has a lower level of the neurotransmitter dopamine than someone without ADHD, which is why these stimulants are prescribed. Ritalin and Adderall both increase dopamine levels in the brain in order to increase attention/motivation (WebMD). The illicit use of these prescription stimulants is considered "off label," meaning using these drugs without a prescription not been approved by neither the drug's manufacturer or the Food and Drug Administration (Talbot, 2009).

Prescription stimulants are a multi billion dollar a year industry. In fact, according to the health care consulting firm IMS, sales of these drugs were responsible for \$4.8 billion dollars in profits last year for both Shire and Novartis (Perrone, 2009). Specifically, Adderall XR, the most popular product produced by Shire accounts for \$1 billion dollars a year of their profits (Gibson, 2008). Ritalin was the most commonly prescribed psychostimulant in the past twenty years. Recently however, Adderall rapidly took over this honor, making it the current highest prescribed medication for ADHD

(DeSantis et. al, 2009). Both drugs stimulate nerve and brain activity (central nervous system) in order to control impulses and lower hyperactivity (White et. al, 2006: 261). According to the Drug Enforcement Administration, in 2003, Ritalin was the fourth highest prescribed drug in the U.S. (White et. al, 2006:261). Ritalin has an immediate effect on the user but does not last for an extended period of time. Adderall on the other hand, comes in two forms, immediate release and extended release (XR). The latter of the two allows the user to stay focused for many hours at a time, and is the type most commonly found on college campuses.

Ritalin and Adderall are defined by the Drug Enforcement Administration as schedule II drugs under the Controlled Substance Act, yet are not considered narcotics. A schedule II drug means (Cornell Law School, 2007):

- 1.) The drug has a high potential for abuse
- 2.) The drug has a currently accepted medical use in treatment in the United States or a currently accepted medical use with severe restrictions
- 3.) Abuse of the drug or other substances may lead to severe psychological or physical dependence.

Accordingly, the Food and Drug Administration (FDA), has posted a warning on Adderall prescriptions stating that “amphetamines have a high potential for abuse and can lead to dependence” (Talbot, 2009:2). Previous research found that college students prefer Adderall over other stimulants such as Ritalin, coffee and caffeine because it is easier to obtain, lasts longer, causes fewer emotional “ups and downs”, and is believed to be more effective for academic improvement (Wish, 2006:2). These drugs have been

abused by both students seeking an extra edge at elite institutions, and by students trying to “get by” at smaller, less challenging universities.

Dr. Eric Heiligenstein, the clinical director of psychiatry at the University of Wisconsin-Madison stated that students who are not quite as bright believe these drugs can be a cure, even at universities where courses are not as challenging. “For students who have put off work or are not very strong academically, we find some are using it to kind of counteract or remedy their problems.”

Students are able to obtain these drugs in various ways, some involving more manipulation than others. For example, many students lie on the tests given to diagnose ADHD in order to be (mis)diagnosed with the disorder, so that they may obtain Adderall “legally” and more continuously through the use of a prescription. Dr. Robert Winfield, the director of health services at the University of Michigan found that many students were falsely claiming to have ADHD in hopes of getting a prescription (Jacobs, 2005). A description of this technique was provided in *The New Yorker*. A recent Harvard graduate described how during his freshmen year of college, he was able to “cheat” the ADHD test by repeating typical symptoms of ADHD that his brother displayed when diagnosed as a child in order to obtain his own prescription (Talbot, 2009). Furthermore, Dr. Robert Herman, a staff psychiatrist at the University of Maryland, College Park made the point that, "in psychiatry, there is no blood test so, it's impossible to sort out those with legitimate diagnoses from the deceivers" (Jacobs, 2005:2).

Even when a student cannot fake ADHD, there is an abundance of students with prescriptions and excess pills who are willing to share. Some students have even begun

profiting off of their ADHD diagnosis by selling stimulant pills for as low as \$5 a pill to students they have never met before (Jacobs, 2005:1). The most common route of obtaining pills is through close friends with legal stimulant prescriptions (McCabe, 2005). A student at the University of Pennsylvania stated that to get stimulants, "I would just get it from one of my friends who have it. I definitely would never pay for it, we have lots of ADD buddies running around here" (Daley, 2004:1). One concern about the growing number of students who are abusing stimulants through illicit means (or being misdiagnosed with ADHD), is the potential dangers incorporated with their non-medical use.

When prescribed out of necessity to assist with a legitimate medical condition, stimulants are relatively safe. However, when taken for non-medical use, these drugs can have wide range of side effects (Gibson, 2008). These problems can range from insomnia, headaches, and high blood pressure, to aggressive behavior, suicidal thoughts, heart complications and even death (White et. al, 2008). The specific dangers may increase, depending upon how the drug is introduced to one's body. The DEA found that injecting or snorting Ritalin or Adderall into the body can actually cause further problems than when taking them orally as prescribed. When injected in the blood stream or snorted, these drugs become more dangerous due to "fillers in the pills blocking small blood vessels which may cause lung and eye problems" (White et. al, 2008:262). A study conducted by Babcock and Byrne found that 12.7% of students at a small New England college who had used Ritalin or Adderall do so intranasally (White et. al, 2008).

Another danger is the element of polydrug use associated with Adderall. Studies

have shown that students who illicitly use prescription stimulants commonly use other substances for recreation or enjoyment as well (McCabe, 2005). However, in recent years, with the exception of marijuana, the prevalence of prescription drug use has become greater than other illicit “street drug” use on college campuses (Ford & Schroeder, 2009).

Students’ perceptions of the safety and acceptability of stimulants, are often learned from their peers who have taken them, and are far different than the actual dangers involved with continued use of the drugs. Students tend to consider these stimulants “soft drugs,” with a very low risk of addiction and medical risk. This perception is often due to the fact that students feel stimulants are safer because prescription drugs are tested in a lab and then prescribed from a doctor. A study done at the University of Maryland found that freshmen perceive the illicit use of prescription stimulants as, “less risky than cocaine, but more risky than marijuana or consuming five or more alcoholic beverages every weekend” (Arria et. al, 2008: 193).

Those selling prescription drugs in general also appear unaware of the potential legal dangers involved with prescription drug sales. According to a 21 year old female student selling OxyContin from her prescription to close friends:

"Selling them was good for a little bit of extra cash and it was not anything that I felt was really bad until I had gotten a script for OxyContin and then I read the bottle and it said it as illegal to sell them. I was like "Oh my God!" It kind of freaked me out." (Quintero et. al, 2006:926).

College students have often been the key focus group for researchers who study patterns in substance abuse, since drug abuse patterns in college students often mirror

substance abuse changes in the general public (Johnston et al. 2006b). This is attributed to the fact that “college life has traditionally been associated with experimentation and following trends” (Ford & Schroeder, 2009:29). Although there is a vast amount of studies regarding substance abuse on college campuses, there has been a limited amount of studies done concerning prescription drug use. Illicit prescription drug use is a relatively new trend and had not been studied until the past ten years. It wasn’t until events such as the death of a college student from a mixture of prescription drugs and alcohol in 2000, that the true dangers of these drugs began to effect how researchers across the country studied this problem (Zeilbauer, 2000).

The recent addition of studies on the topic of illicit prescription stimulant drug use demonstrates the concern the academic world has for this rapidly growing problem. This concern is well founded. In one of the largest studies done, McCabe et. al (2005) found that 8.1% of American undergraduate studies had used prescription stimulants illicitly in their lifetimes. Other studies have been conducted which demonstrate similar numbers (Murray, 1998; Zielbauer, 2000; Teter et. al, 2005). However, there have been studies done in which the number of students illicitly using prescription stimulants is much higher. A study done in 2002 at a small competitive college revealed that one-third (35.5%) of the students surveyed (n=150) had taken prescription stimulants illicitly (Low and Gendaszek, 2002). Even more recently, a 2008 study of 1,550 respondents at Louisiana State University found that as many as 43% of the students had used prescription stimulants (of this 43%, 89% used short-acting Adderall, and 30% used Adderall XR) without a prescription (Advokat et al. 2008).

Overall, the national average for illicit stimulant use in the past year is much lower than many of the reported individual school studies. The National Survey on Drug Use and Health (NSDUH) reported a more conservative number. They found that 6.4% of full-time college students ages 18 to 22 had taken stimulants illicitly in the past year. However, full-time college students were found to be more than twice as likely as non full-time college students (3%) to illicitly use stimulants (NASDUH, 2009).

In the past few years, illicit prescription stimulant use has infiltrated the lives of college professors and proven academic scholars as well. Barbara Sahakian, a neuropsychologist at Cambridge University stated that many of her colleagues have begun to take prescription stimulants illicitly for the sake of cognitive enhancement, knowing their potential side effects. She states that trying to stop the spreading of these drugs' popularity would be very difficult due to their widespread availability. She also stated that, "We are a society that so wants a quick fix that many people are happy to take drugs. Therefore, the drive for self-enhancement of cognition is likely to be as strong if not stronger than in the realms of 'enhancement' of beauty and sexual function" (Sahakian and Morein-Zamir, 2007:1158). Dr. Anjan Chatterjee has coined the term "cosmetic neurology" which suggests that the evolution of cosmetic surgery may be similar to the popular non-prescription use of prescription stimulants (Gibson, 2008). He argues that the original idea of these drugs was to help those who really needed them and now have begun to turn into a popular way to improve oneself, without thinking of the consequences.

Students who are no longer in college but who used Adderall while going to school have been found to continue its use in their new careers. The Harvard University student quoted earlier started using Adderall again for assistance with his new career. However, since he had taken Adderall throughout college and knew how it affected his body, he felt that he was “learning to use the drug in a more ‘disciplined manner’” (Talbot, 2009:10). Unlike in college, his Adderall use was now less about staying up late in order to complete work that should have been already completed and now was used to “stay more focused at work in order to work more hours” (Talbot, 2009:10).

The illicit use of stimulants is not confined to college students. In fact, in 2002, according to findings of the University of Michigan’s annual “Monitoring the Future” study, nearly 4% of students in the 8th, 10th, and 12th grades were found to use Ritalin without a prescription (White et. al, 2008: 262). Even those who are not a part of “generation Rx” are starting to learn that these cognitive enhancers can be useful in their daily lives. According to Martha J. Farah, the director of the Center for Cognitive Neuroscience at the University of Pennsylvania, “From assembly-line workers to surgeons, many different kinds of employee may benefit from enhancement and want access to it” (Gibson, 2008:1).

The Demographics of Illicit Stimulant Use

The extant literature reveals a number of demographic variables that relate to the illicit use of prescription stimulants, including race, gender, and type of school. The most common prescription stimulant users in the U.S. college setting are white, more likely to be male and attend universities in the Northeastern part of the United States (McCabe et

al. 2005). However, contrary to the (McCabe et. al, 2005) study, in which men were found to be twice as likely to illicitly use prescription stimulants, gender did not play a significant role in illicit stimulant use by full-time college students age 18 to 22 in a study done in 2009 by the National Study of Drugs and Health. In this study, 6.9% of male college students reported using stimulants illicitly in the past year, compared to a relatively close 6.0% of female students (NSDUH, 2009). There was found to be a significant difference in the illicit use of prescription drugs among White and Asian students and their high level of illicit Adderall compared to the significantly lower use by and African-American students (NSDUH, 2009).

Criminological Theory and Prescription Stimulant Use

For the most part, research on the illicit use of prescription stimulants has focused largely on determining the extent of use in different populations. These studies have used basic demographic variables and have almost completely ignored theory in their measures. Where theory has been incorporated, it has been appropriated from disciplines (e.g., mental health, psychology) outside of criminology. One consequence of this situation is that Ritalin and Adderall are commonly depicted as a unique types of “study drugs” that are different than “street drugs.” There is evidence, however, that students are using the drugs for purposes other than cognitive enhancement. For example, students in some social circles report using these stimulants as “party drugs.” They believe that these pills will make them more social and make parties more fun by giving them more energy (Edmiston, 2009). Additionally, Adderall’s ability to suppress appetite

has led to the drug being used as a diet pill for many females across college campuses as well, leading to further abuse of the drug (Daley, 2004).

Within the realm of criminology, and consistent with these diverse reasons for their use, illicit stimulant would be considered simply as another form of criminal behavior. Indeed, a great deal of research has found links between variables from mainstream criminological theory and illicit drug use (Akers et al., 1979; Akers and Cochran, 1985; Currie, 1994; Jang, 2002; Hwang and Akers, 2006). This paper focuses on the potential of two popular theories of crime, social control theory and social learning theory, to explain illicit stimulant use.

Social Learning Theory

Within criminology, social learning theory originated with Edwin Sutherland's differential association theory (1947). He argued that crime was a behavior learned through verbal communication and (face-to-face) interaction between an individual and their intimate social groups. This learning is contingent upon the priority one puts on interaction with their most intimate peer groups, the intensity of these interactions and the duration of which these social groups exist. According to Sutherland, individuals learn "definitions" (attitudes) either in favor or against the law through interaction with intimate groups. These definitions when in favor of criminal behavior thus give the individual motives and make them more likely to commit deviant acts. Sutherland also highlighted that learning criminal behavior involves all of the mechanisms that are involved with any other types of learning (Sutherland, 1992).

Akers (1985) social learning theory built on Sutherland's idea of differential association by adding the principals of psychology, including operant conditioning (reinforcement and punishment) as well as role modeling (c.f., Bandura, 1977). Akers most recent version of social learning theory has four central concepts—imitation, differential association, definitions (attitudes) and reinforcement. Akers uses the idea of differential association just as Sutherland—people differentially associate with a wide range of people. The idea imitation (observational learning) stems from the work of Bandura (1977) and others on role modeling. Akers argues that those who are deviant generally imitate the behavior of role models or those in their intimate peer groups. Emerging behaviors continue (or not) based largely on the application of reinforcements and punishments. Sequentially, individuals tend to imitate a behavior, receive reinforcement, and then repeat behavior. Ultimately, the individuals learn to define behaviors that are rewarded as positive (Akers, 1985). Commonly, positive reinforcement is social, with the behaviors being reinforced by peer groups and the acceptance that accompanies its use. However, this positive reinforcement can often be nonsocial; for example, the direct physical effects of drugs and alcohol (Akers & Jensen, 2005).

To test social learning theories, researchers typically focus on only a limited number of variables. The most common measure of social learning theory is the strength of association to delinquent intimate groups (i.e. parents or peers). Additionally, researchers connect individuals' pro-criminal attitudes (definitions) to their criminal behavior. Akers and his colleagues' (1979) first test of social learning theory included illicit drug use as a dependent variable. In this test, Akers and colleagues tested their

social learning theory principals using survey data to determine its effect on adolescent drinking and drug use. They found that their theory was strongly supported by the data analysis. They found that social learning variables (differential association, imitation, definitions and differential reinforcements) combined to explain 68% of the variance in marijuana use and 55% of the variance in alcohol use (Akers et. al, 1979).

Given that prescription stimulants are sometimes coupled with the use of alcohol and/or other illicit drugs for recreational purposes, it seems likely that Akers' social learning theory would explain their use. In particular, it is likely that imitation, reinforcement, and attitudes help to explain Ritalin/Adderall use. In fact, "peers are the major means of support and guidance for most college students, exerting greater impact on behavioral decisions than biological, familial, or cultural influences" (Bosari & Carey, cited in LaBrie et al, 2008:957). Consistent with this, prescription stimulant users are more commonly are a part of a fraternity or sorority and come from public high schools yet attend more selective colleges (McCabe et al. 2005). This suggests that the ease of access and intimate peer groups play a role in predicting illicit stimulant abuse.

Peer groups can offer easy access to stimulants or can even introduce them into a student's life along with attitudes and definitions attached to their use. A study done at the University of Wisconsin surveyed 179 men and 202 women and found 44% of the students surveyed stated that they knew of other students who used stimulant medication illicitly for both academic and recreational reasons. The study also showed that males tended to be more active in their acquisition of prescription stimulants and the study found that "regression analysis revealed that the factor that predicted men's use was

knowing where to get easily acquired stimulant medication, whereas the main predictor for women was whether another student had offered the prescribed stimulants” (Hall et al, 2005:168).

Consistent with their idea of low self-control, Gottfredson and Hirschi also argue criminals tend to be generalists. Specifically, those with low self-control are expected to engage in a wide variety of deviance. This expectation was derived from studies of criminals that indicate they tend to engage in variety offenses (e.g., burglary, drug use, violence) rather than specialize in one type of crime. There is reason to believe that this logic extends to Adderall/Ritalin use. For example, a recent study found that students who used prescription stimulants illicitly were also more likely to report using alcohol, cigarettes, marijuana, ecstasy, cocaine, and to engage in drunk driving (McCabe et al. 2005).

Given theoretical expectations and research findings on crime (including drug use), it seems likely that students with lower moral standards (or high deviant attitudes), and those with a large proportion of peers who are deviant should be more likely to use Ritalin or Adderall illicitly.

Informal Social Control Theory

Control theories utilize one or more of three types of informal control—direct, indirect, and internal—to explain crime. Hirschi’s (1969) social bond theory proposed that criminal behavior would be inversely related to the strength an individual’s bond to society. He outlined four specific elements (attachment, commitment, involvement, belief) of the social bond that ties a person to society. The concepts of “attachment” and

“commitment” both suggest that crime is more common when person has something (e.g., an emotional bond, reputation, social capital) that a person will not risk losing by engaging in crime. The more attached, involved, and/or committed an individual is to following and participating in socially approved norms and activities, the less likely they will be to engage in criminal behavior growing up. As with learning theory, measures from Hirschi’s (1969) social bond theory have successfully predicted the use of illicit substances (c.f., Akers & Cochran, 1985), and is therefore appropriate that it be extended to prescription stimulants.

Indeed, one of Hirschi’s (1969) original measures of commitment was school performance. Specifically, he argued that since grade point average reflected a student’s commitment to education, lower GPA should be associated with higher levels of delinquency. In general, those students illicitly using prescription stimulants have lower grade point averages (McCabe et al. 2005). There are, however, other explanations for a GPA-stimulant use relationship. Students fearful of being shamed by parents or others for getting low grades may use these prescription stimulants to try and eliminate embarrassment and criticism and to succeed academically.

More recently, Gottfredson and Hirschi (1990) have suggested that the concept of low self-control is crucial in the cause of both crime and delinquent behaviors that share characteristics of criminal behavior but not illegal (e.g., cheating, smoking cigarettes). Low self-control incorporates a multitude of personality traits, including impulsivity, insensitivity, low verbal ability, and a risk-taking orientation. Gottfredson and Hirschi

believe that people are generally born without self-control, but that proper parenting (e.g., supervision, punishing deviance) produces self-control.

A meta-analysis confirms that Gottfredson and Hirschi's central concepts have consistently explained a variety of crimes and deviant acts among many different populations (Pratt & Cullen, 2000). In 2006, LaGrange & Silverman conducted a theory of 2,000 Canadian secondary school children. This study tested Gottfredson and Hirschi's theory. They measured self-control using separate psychological factors, including a preference for risk seeking, impulsivity, temper, present oriented, and carelessness. They also measured frequency of self-reported smoking and drinking. They also determined opportunity for delinquency by measuring parental/teacher supervision. These measures and opportunities were then used to predict various delinquent behaviors including drug usage (LaGrange & Silverman, 2006). Results provide "partial support for the general theory, revealing relationships between measures of self-control and delinquency that vary by magnitude across genders and for different offense types" (LaGrange & Silverman, 2006:69).

Studies from other disciplines that also suggest that factors related to self-control are important. For example, college students who are "sensation-seekers" are more common illicit users of prescription stimulants, even if they perceived them to be dangerous to ones health. According to a study done in the September 2008 *Prevention Science* journal, "sensation-seekers are students who like novel experiences, who want to try something new and a little dangerous, like jumping off the highest diving board or placing themselves in high-risk situations. They are much more likely to use stimulants

nonmedically even if they perceive the drugs to be quite harmful" (Arria et. al, 2008: 194). This sensation seeking behavior follows along with Gottfredson and Hirschi's theory of self-control (1990). They hypothesized that persons with low self-control and risk taking traits were more likely to be deviant. Thus, the concepts of low self-control and propensity for criminal behavior are the same.

Given the success of past studies correlation between low self-control and deviant behavior, low self-control would be expected to also predict the illicit use of Ritalin or Adderall.

Methods

Sample

In order to test the hypotheses regarding illicit substance use among college students, data was collected from a convenience sample of undergraduate students at the University of Minnesota-Duluth. The University of Minnesota-Duluth, which is part of the University of Minnesota system of schools is a relatively small campus located in northern Minnesota. The student body consisted of 9,516 undergraduate students as of 2008. The gender breakdown at this university is very equal. In 2008, there were 5,822 men enrolled at the University of Minnesota-Duluth compared to 5,490 women. The racial makeup of the school is quite disproportionate, with only 708 (13.4%) of students reporting themselves as a minority. The study surveyed 512 undergraduate students and

484 usable surveys were returned.¹ The final sample of 484 students resulted in a 94.5% response rate.

There are many common objections to using a convenience sample of college students. Some question the use of college students to study crime, as they are not an especially “high risk” population for serious forms of criminal behavior. Further, as “people,” college students certainly do not accurately reflect the population of adults, or even young adults (Payne & Chappell, 2008). Given the intent of this project to examine a so-called “study drug,” using a college sample is a strength, rather than a limitation. Still, the main limitation to using a convenience sample is that an unknown portion of the population was excluded. Because some members of the population have no chance of being sampled, the extent to which a convenience sample actually represents the entire population cannot be known. Thus, the sample may not accurately reflect students at UMD.

Two factors suggest that this is not a serious limitation in the current study. First, the sample was drawn disproportionately from sections of large, introductory level criminology and sociology courses. Both courses meet liberal education criteria and therefore draw from a wide swath of students. Further, upper division courses in criminology were also sampled in this study so that upperclassmen would also be represented. Second, basic demographic information from the sample roughly mirrors that of the UMD population. For example, the sample was 46 percent male and 93

¹ 28 of the surveys were handed back to the primary investigator blank (due to the student not wanting to volunteer for the study) so they were discarded.

percent white, whereas the UMD population figures for the year of the survey are 51 percent male and 93 percent white).

The data was collected over a two-month period from January to March of 2009. Students were recruited for this study by obtaining permission to distribute the survey from the professors of large introductory criminology/sociology courses as well as upper division courses. If permission was granted for distribution of the survey, the survey was handed out to students during the first fifteen minutes of a class period mutually agreed upon by the primary investigator and the professor.

Participation in this study was completely voluntary and students could choose not to take the survey without penalty of any kind if they so wished. There were no financial or academic benefit offered to those students taking this survey, but they were informed that by taking the survey they would be helping to advance research in the field of criminal justice. By taking the survey, students thereby gave their informed consent for their responses to be used in the study. However, before taking the survey, student expectations and instructions were explained in detail by the primary investigator. There was also a paper copy of these instructions, as well as information regarding consent attached to the survey, which was to be kept by each student in case of future questions about the study (see **Appendix A**). Students' responses to the survey were completely anonymous and did not require the student to include any personal and/or identifiable information.

Students were to place their completed survey in a box marked "surveys" in the front of the classroom face down, therefore ensuring that there was no way to connect a

specific survey to a respondent. The 484 completed surveys collected were then stored in a locked room until they could be coded and analyzed by SPSS 17 statistical software (SPSS Inc, Chicago, IL).

Data

Data was collected for the study by distributing a 56-question, self-administered (pencil and paper) survey. A convenience sample at the University of Minnesota-Duluth was used.² This survey was used to collect demographic information (gender, age, residence type), school information (undergraduate grade level, credits taken) and information on variables related to social control and social learning theory. Additionally, students were asked a number of questions related to the use of prescription stimulants, as well as various forms of deviance/crime. Specific measures are illustrated on **Table 1**.

Measures

Demographic Information.

Basic measures of demographic information included the variables *age* (in years), *race* (dummied as White = 1) and *sex* (Male = 1). Additionally, the primary investigator collected information on *residency type* (dormitory, on-campus apartment, off-campus housing), and *college year* (freshman, sophomore, junior, senior).

² The University of Minnesota Institutional Review Board prior to its distribution approved this survey for distribution.

Table 1. Descriptive Statistics for overall sample, past-year nonmedical prescription stimulant using students and students not using prescription stimulants illicitly (N=484).

Variable	N	x	sd	range
Age (2009)	484	19.78	2.0	17-44
Gender (1=male) Male (46%) Female (54%)	484	1.54	.49	1-2
Race African American (1%) Asian (3%) Hispanic (.4%) Native American (.6%) White (93%) Other (2%)	484	3.02	.53	1-5
Average credits Taken a semester (2009)	484	15.19	1.3	6-20
Class Year PSEO (2%) Freshmen (45%) Sophomore (23%) Junior (17%) Senior (13%)	484	2.93	1.0	1-5
Residence Type Dorm (35%) On-Campus Apartment (17%) House (rented/owned) (33%) Off-Campus Apartment (15%)	484	2.29	1.0	1-4

Illicit Use of Prescription Stimulants.

Students were asked whether they had been diagnosed with ADHD. Four percent of students reported a diagnosis of ADHD, which is consistent with national estimates (DuPaul, & Weyandt, 2004). Individuals who reported a diagnosis of ADHD were excluded from analyses predicting the illicit use of prescription stimulants. Respondents were asked the extent to which they used prescription stimulants in the past year (never, 2-3 times per year, once per month, once per week or more). Additionally, a dummy variable was created that measured whether (yes = 1) or not an individual used prescription stimulants in the past year.

Differential Association/Social Learning

The two most commonly utilized measures of social learning theory are exposure to delinquent peers and the presence of antisocial attitudes. Antisocial attitudes (or strong moral beliefs) represent an important aspect of social learning theory. Both Sutherland and Akers identify attitudes as crucial content that is learned. Accordingly, the 7 item scale measuring the variable *moral beliefs* was created which address the respondent's moral values and focus on how wrong respondent's perceived various delinquent acts. Responses ranged from "not wrong" to "very wrong." Items in this scale include questions regarding how wrong the respondent perceived different behaviors. These questions pertained to the use of alcohol, marijuana, hard drugs, stealing, destruction of property and cheating. Higher scores on this scale would indicate that the respondent has stronger moral beliefs (e.g., they believe deviant acts are more wrong) and would be less likely to engage in delinquent acts (Cronbach's alpha = .73).

Delinquent peers are one of the primary “intimate groups” from which a person learns delinquent values and/or behaviors. Thus, the four-item scale *delinquent peers* measures the extent to which the respondent’s peers have engaged in delinquency. The questions included are the same as were used to determine morals (marijuana/hard drug/alcohol use and cheating) but are now focused on the respondent’s peers. Response categories for each item ranged from “none of my friends” to “all of them.” Therefore, the higher the score on this scale suggests the greater number of the respondent’s peers have acted delinquently (Cronbach’s alpha = .68).

Informal Social Control.

Control theories utilize some combination of direct, indirect, or internal control to explain delinquency/deviance. Hirschi’s (1969) social bond theory stressed the importance of indirect controls, including one’s commitment to social institutions. *School importance* is a 7-item scale, which measures the commitment of the respondent to college. This scale includes questions such as, “How important are school/grades to you?,” “How important do you believe school/grades are to your parents or guardian(s)?,” and “How important is it to you to complete college?” Higher numbers on this scale indicates a greater commitment to college (Cronbach’s alpha = .49). Hirschi (1969) also considered grade point average as a measure of commitment to education, and subsequent researchers have tended to also see GPA as a control variable. Here, *GPA* is the self-reported grade point average of the respondent.

Gottfredson and Hirschi (1990) identify a form of internal control (low self-control) as a central cause of crime and deviance. A cluster of traits including risk-taking

orientation, impulsiveness, and insensitivity defines people with low self-control. The measure *low self-control* used here is a 4-item scale (Cronbach's alpha = .48), which asks respondents to assess different statements (from strongly agree to strongly disagree) related to this concept. Specific statements include, "I do not devote much thought and effort to preparing for the future" and "I sometimes find it exciting to do things for which I might get into trouble," and "I often times neglect my homework or studying to attend a spur of the moment social event." Higher scores on this index reflect lower levels of self-control.

Deviant/Delinquent Behavior.

Gottfredson and Hirsch (1990) suggest that criminals tend to be generalists rather than specialists. The logic of their theory (and this specific argument) suggests that the use of prescription stimulants should be related to other forms of offending and/or deviance. The variable *deviance* was created to test this assertion. The variable is a six-item scale which respondents were given a point for each of the six different delinquent/deviant acts they reported engaging in over the previous year. Specific acts included using marijuana, hard drugs (cocaine, methamphetamine), abusing alcohol, cheating, stealing, and vandalism. Higher scores therefore reflect greater involvement in a variety of deviant/delinquent acts (Cronbach's alpha = .55).

Analysis Plans

To test the hypothesis of the primary investigator in determining which criminological theory best describes the prevalence of illicit prescription stimulant use on college campuses, a three-stage analysis was used. First, the prevalence of illicit use of

prescription stimulants was examined, as well as students' reasons for using stimulants. Second, independent bi-variate (mean) comparison t-tests were used to investigate predictors of Adderall/Ritalin use. In the third stage, illicit use of prescription stimulants was examined using multivariate logistic regression models in order to determine what criminological theory best predicted illicit prescription stimulant use.

Results

Information pertaining to the illicit use of prescription stimulants by the respondents can be found in **Table 2**. Excluding those students who were taking Adderall/Ritalin with a prescription the sample becomes 463. Among these students, 28% reported using Adderall/Ritalin illicitly. Among those who reported illicit use, 77 percent reported using 2-3 times per year, while 20 percent reported using 2-3 times per month, and about 3 percent reported using once per week or more. Respondents who had illicitly used prescription stimulants were instructed to choose (among several options) the main reason(s) behind their initial use. The most common response (44%) was school pressure. However, "other reasons" or "multiple reasons" also had a high prevalence, which may imply that more categories should have been offered. Additionally, a relatively high percentage (27%) of students responded that they had illicitly used stimulants for social/recreational use (e.g. parties, bars, other social gatherings).

Bi-Variate Predictors of Illicit Stimulant Use (Independent T-Tests)

Table 3 illustrates the results of a series of independent t-tests measuring the mean-level comparisons, which were based on whether or not a student reported using

Table 2. Profile of illicit prescription stimulant use

Variable	N	Category Percent
Illicit prescription stimulant use among full sample	463	
Never		72%
2-3 times per year		21%
Once a month		3%
2-3 times per month		3%
Once per week or more		1%
Reason for illicit prescription stimulant use	149	
School pressure		44%
Social events		3%
Peer pressure		1%
To get high		5%
Multiple reasons		15%
Other reasons		30%
Use prescription stimulants for recreation	149	
Yes		27%
No		73%

Table 3. Mean comparisons predicting the illicit use of prescription stimulants

(N = 463).

Variable	Illicit use of prescription stimulants in past year?		t	sig
	Yes (mean)	No (mean)		
Demographic				
Age	19.52	19.88	1.69	.333
Race (White = 1)	0.94	0.91	-1.00	.292
Sex (Male =1)	0.57	0.42	-2.86	.003
Social Control Variables				
GPA	2.97	3.13	2.86	.001
School Importance	21.42	21.05	-0.78	.855
Low self-control	9.57	8.42	-5.69	<.001
Social Learning Variables				
Moral Beliefs	18.24	20.76	7.73	<.001
Delinquent peers	12.67	10.46	-8.32	<.001
Deviance (past year)	13.22	17.85	-10.7	<.001

prescription stimulants illicitly. Sex was found to be the only significant predictor of illicit Adderall/Ritalin use amid all of the demographic variables. 32% of males and 26% of females reported using prescription stimulants illicitly than ($p < .01$). Although information regarding Greek affiliation was obtained, the University of Minnesota-Duluth does not have acknowledged fraternities or sororities. Therefore, it was not possible to determine whether or not Greek affiliation played a role.

Among all of the social control variables, grade point average ($t = -2.86, p < .01$) and low self-control ($t = -5.69, p < .001$) were revealed to be significant predictors of illicit stimulant use. Thus, those students with lower GPAs and lower self-control were more likely to acknowledge they use Adderall/Ritalin illicitly. Both variables in the social learning domain predicted illicit prescription use consistent with expectations. Students who scored higher on the delinquent peers index ($t = 8.32, p < .001$) and lower on moral beliefs ($t = 7.73, p < .001$) were more likely to use prescription stimulants illicitly. Finally, past year deviance level was related to prescription stimulant use. The higher a student scored on the past year deviance scale, the more likely they used Adderall/Ritalin illicitly ($t = -10.7, p < .001$).

Multivariate Predictors of Illicit Stimulant Use

Logistic regression was employed to assess whether the predictors of illicit prescription stimulant use remained significant in multivariate models. Logistic regression was used instead of OLS regression because the dependent variable, stimulant use, is dichotomous. All of the results from the logistic regression models are shown in **Table 4**. These five models will be described as if one were reading them from left to

right. The first regression, (Model 1) is used as a base for the rest of the models and includes only demographic variables. In this model, sex was found to be the only significant predictor ($B = .67, p < .01$) of illicit prescription stimulant use, which is consistent with what was found in the bivariate results. Males were found to be more likely than females to illicitly use Adderall/Ritalin.

In Model 2, variables from control theory were added to the base used in Model 1. Among the control theory variables, only low self-control ($B = .335, p < .01$) was found to be a significant predictor of illicit Adderall/Ritalin use. Thus, those students that scored higher on low self-control were more likely to use prescription stimulants illicitly. In Model 3, elements of social learning theory are added to the base model, while control measures were removed. After introducing social learning measures into the model, it was found that both variables were associated with illicit prescription stimulant use. Delinquent peers ($B = .216, p < .01$) and moral beliefs ($B = -.128, p < .05$) had a significant effect on the use of Adderall/Ritalin without a prescription. Specifically, the data revealed that those students with a greater number of delinquent peers and lower moral beliefs were more likely to use prescription stimulants illicitly.

In Model 4, social control measures were actually set up to compete with the social learning/differential association measures by placing them in the same model. As found earlier, both delinquent peers and moral beliefs remained significant. In regards to control theory, low self-control still maintained its significant as well. However, in this model, the variable of school importance also emerges as a significant predictor ($B = .149, p < .05$) of illicit stimulant use. However, the direction of school importance is in the

Table 4. Logistic regression predicting the illicit use of prescription stimulants in past year ^a

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
N	463	447	456	441	441
Demographic					
Age	-.141	-.081	-.154*	-.072	-.096
Race (White = 1)	.425	.230	-.063	-.044	-.122
Sex (Male =1)	.670**	.617**	.475*	.413	.429
Social Control					
GPA	---	-.229	---	-.314	-.155
School Importance	---	.079	---	.149*	.136*
Low self-control	---	.335**	---	.165*	.124
Social Learning					
Moral Beliefs	---	---	-.128**	-.153**	-.105*
Delinquent peers	---	---	.261**	.216**	.161*
Deviance (past year)	---	---	---	---	.381**
Model chi square	14.41**	38.77**	84.75**	91.01**	99.17**

^a unstandardized coefficients reported

- p < .05, ** p < .01

opposite direction as expected by control theory. Those students with higher expectations for their education were found to be more likely to acknowledge their illicit use of stimulants.

The final model (Model 5), introduces the variable of deviance into the previous regression model. Deviance actually becomes the strongest predictor for illicit stimulants in the model ($B=.381, p < .01$). With the emergence of deviance in the model, the measures of social learning remain significant, staying consistent to what was found in Model 4. However, the strength of the relationships between the variables is weakened. School importance remained a significant predictor of prescription stimulant use. Low self-control was actually found to no longer be statistically significant with the addition of the deviance variable. Therefore, it was found by both bivariate and multivariate tests that illicit Adderall/Ritalin abuse is related to an index of deviance.

Discussion

The central hypothesis of this study was that criminological theory could be applied to illicit stimulant use. Additionally, the study was designed to supply more descriptive data regarding prescription stimulant use among college students. To address these research areas, the principal investigator of this study developed a survey instrument, which included variables from social learning (moral attitudes, peer groups) and social control theory (GPA, importance of school). This survey also included questions regarding risk-taking behaviors and if applicable, reasons for use of illicit prescription stimulants. This survey was distributed to introductory level criminology classes at the University of Minnesota-Duluth using a convenience sample. The responses

to this survey were then organized and analyzed using SPSS statistical software. This analysis used bivariate predictors of illicit stimulant use using independent t-tests as well as multivariate predictors using logistic regression. It was found that social learning and low self control theories both were shown to predict illicit stimulant use.

The results from the present study provide clear evidence that the illicit use of prescription stimulants (Ritalin/Adderall) is common among undergraduate students at the University of Minnesota-Duluth. In terms of prevalence, it was found that 28 percent of students surveyed used prescription stimulants illicitly. These findings are consistent with past research among other college campuses (Advokat et al. 2008; Low & Gendaszek, 2002). These findings were high compared to the national average of 6.4% of college students using prescription stimulants illicitly by the NASDUH study. However, they were very similar to what was found by individual campus studies across the nation. The majority of the individual studies found that about slightly less than one third of the students had taken prescription stimulants with some studies reaching as high as 43% of students illicitly using these drugs at schools such as Louisiana State University.

Most students who used prescription stimulants did so sporadically. For example, when using the full sample, 72% of students had never taken Adderall/Ritalin illicitly. The majority of those who had taken stimulants illicitly were only found to have used them 2-3 times per year (21% of total sample). Only 3% had taken them once a month along with 3% taking them 2-3 times per month. Only 1% of the total sample had illicitly taken Adderall/Ritalin once or more per week. It is hard to say if this is consistent with

past findings because they commonly only asked their respondents to choose if they had taken them or not and did not include amount of times used in the past year.

The results also reveal evidence that variables selected from mainstream criminological theories may play a significant factor in the use of these drugs. In terms of the predictors of use of stimulants, the results were generally consistent with the established theory and criminological knowledge. For example, it was found that sex was a strong predictor of illicit stimulant use across both bivariate and multivariate models. Males have been found to be more deviant behavior in nearly all of past criminological theory and research.

The measure of general deviance was the strongest predictor of illicit Adderall or Ritalin use in the logistic regression models. It was found that those students who used Ritalin/Adderall without a prescription were very commonly found to use alcohol and/or other drugs, and to engage in other forms of crime and deviance. Therefore, it seems safe to state that the illicit use of prescription stimulants follow the same behavioral patterns as other forms of crimes and deviant behaviors. This is consistent with Gottfredson and Hirschi's (1990) contention that offenders tend to be generalists rather than specialize in any sort of crime. Thus, it appears that criminological theory may be a good way to further analyze the use of these prescription drugs.

Measures from social control theory (low self-control, GPA) and social learning theory (moral beliefs, delinquent peer associations) were also significant predictors of Ritalin/Adderall use at the bivariate level. Thus, individuals with lower levels of self-control, lower GPAs, weaker moral beliefs, and greater exposure to delinquent peers

were more likely to illicitly use and/or abuse prescription stimulants. The multivariate models remain the same in terms of variables being predictors of illicit use, except that GPA drops out of being significant predictor when social learning variables are added to the model. Measures of social learning were the most robust predictors. Specifically, delinquent peer associations and antisocial attitudes were always significant, regardless of the controls added.

The only results that did not conform to past criminology theory was the measure of school importance. In two of the regression models, it was positively related to illicit prescription stimulant use. This means that students who placed a high value on their college education were actually more likely to illicitly use Ritalin/Adderall. This is not consistent with social bond theory, but does fit in with strain theory (Agnew, 1992; Merton, 1938). Briefly, strain theory suggests that the pressure to succeed creates pressure to succeed by any (including criminal) means. Thus, some students may resort to illegal means (Ritalin/Adderall use) to achieve academic success. Post-hoc conclusions should always be provisional. Indeed, school importance was not significant at the bivariate level, and only in some multivariate models. Still, the findings suggest that strain theory may be an important part of the explanation of why students use Adderall/Ritalin illicitly. Although it was found that school importance did not play a significant role in predicting stimulant use, the most common response to the question about why they used these drugs initially was “school pressure.”

This leads the primary investigator to believe that in future research, other questions regarding school importance could be used or substituted that may in fact make

this a predictor of illicit stimulant use. This finding also gives the argument of prescription stimulants being used as a “cognitive steroid” some credit. If school pressure was the most common reason for initial stimulant use, it may imply that they are being used as academic performance enhancers. However, after looking at the finding of GPA in terms of what type of student uses stimulants illicitly, the findings suggest that its not the good students (high GPAs) looking for an edge as past research has suggested. Therefore, perhaps more research should be conducted surrounding the use of illicit prescription stimulants by struggling students in order to raise their declining GPAs.

This study had a number of limitations and there are many suggestions by the principal investigator that would improve future research. First, the study done on the theories was rather simple and did not use very many complex measures of the theories. Given the findings regarding school importance, future tests may include measures regarding strain. Future studies might also include more elaborate measures of social learning/social control theories, as well as measures from other theories of crime. Second, the results from this study should not be generalized to schools across the country, to other countries, or other levels of education. Therefore, future research to place some focus on other levels of education (e.g., high school), different parts of the country, types of school (e.g., large public, small private), and/or even education systems in other countries.

Third, future research might employ random sampling techniques. This sample had some representativeness issues based on the convenience sample used. This sample was nonrandom and included only courses in a specific field and therefore may not truly

represent the University of Minnesota-Duluth (UMD). Therefore, if the use of these prescription stimulants is truly related to school pressure/difficulty, their use could be found to be even more common in disciplines such as engineering, pre-med and or other more difficult fields. The coursework in these fields generally tend to be more time consuming, thus may require a greater use of Adderall/Ritalin as “study aids” when compared to criminology. However, steps were taking to increase the level of representativeness in this sample. Large introductory level classes were used for the majority of respondents. These courses are part of the liberal education program at UMD and are often required for students to enroll in them regardless of their future major as a “general” learning requirement. Upper level courses were also sampled in order to gain a more representative sample in regards to age of the college students as well.

Fourth, in terms of the sample, students who had been diagnosed with ADHD were excluded from the sample due to the fact that the principal investigator wanted to study only those students without prescriptions taking these stimulants *illicitly*. However, future research that includes those diagnosed with ADHD could prove valuable. Those students that have been diagnosed could very well still be abusing these prescription drugs; perhaps even more so than those without prescriptions because of their access.

Fifth, future research might better differentiate among the reasons for illicit stimulant use. It was found here that many students used stimulants for social reasons as well as academic reasons. It would be valuable to learn more about the extent to which students use these drugs socially. It may also be that the causes of use depend upon the

reasons for use (e.g., predictors of social use may be different than predictors of academic use).

Finally, this study did not investigate to enough extent the social factors behind illicit stimulant use. As stated earlier, a relatively high percentage (27%) of students responded that they had illicitly used stimulants for recreational use (e.g. parties, bars, other social gatherings). Therefore, this finding could mean that more studies could be done outside of academic enhancement in terms of the use of these prescription stimulants. Further consideration should be given to the social elements and subculture of illicit prescription stimulant use in future studies.

Despite these limitations, the present study provides strong evidence that illicit prescription stimulant use is consistent with other forms of crime and deviance. Stimulant use was strongly correlated with other forms of deviance. Further, predictors of crime drawn from criminological theory proved useful in the prediction of prescription stimulant use. Thus, it appears that the field of criminology does have something to offer to this emerging social issue.

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Appendix A

UMD: Substance Use Self-Report Survey

This survey seeks to determine undergraduate substance use at the University of Minnesota-Duluth. This survey will not ask any questions regarding your identity. Please be honest in answering the following questions. Once again, by filling out this survey you hereby give your consent for your responses to be analyzed with statistical software by the investigator (Ryan Smith). Your participation in this survey is greatly appreciated and I thank you for your time.

****NOTE: Pages are double sided, please be aware of this while filling out survey****
In this section, please circle or fill in the answer that best describes you as a respondent.

Q1.) Sex

- 1.) Male
- 2.) Female

Q3.) Age

_____ **(Please Fill In)**

Q4.) GPA

_____ **(Please Fill In)**

Q6.) On average, how many credits do you take each semester?

_____ **(Please Fill In)**

Q8.) Residence Type

- 1.) Dorm
- 2.) On-Campus Apartment
- 3.) House (rented or owned)
- 4.) Off-Campus Apartment

Q2.) Race (Circle All That Apply)

- 1.) African American
- 2.) Asian
- 3.) Caucasian (White)
- 4.) Latino/Hispanic
- 5.) Native American
- 6.) Other _____

Q5.) School Year

- 1.) PSEO
- 2.) Freshmen
- 3.) Sophomore
- 4.) Junior
- 5.) Senior

Q7.) Do you live with your parents during the school year?

- 1.) Yes
- 2.) No

Q9.) Are you a part of an athletic team?

- 1.) Yes
- 2.) No, proceed to Q12

Q10.) Type of athletic team?

- 1.) Varsity
- 2.) Club sports
- 3.) Intramural
- 4.) Off-Campus sports team
- 5.) More than one of the above

Q11.) Are you in a fraternity or a sorority?

- 1.) Yes
- 2.) No

In the section, please circle the response that best describes how wrong you feel it is to do the following. For each question, select only 1 response.

<i>IS IT WRONG TO? (Circle One)</i>	<i><u>Not Wrong at All</u></i>	<i><u>A Little Wrong</u></i>	<i><u>Wrong</u></i>	<i><u>Very Wrong</u></i>
Q12.) Be drunk in a public?	1	2	3	4
Q13.) Use marijuana?	1	2	3	4
Q14.) Use alcohol?	1	2	3	4
Q15.) Cheat on an exam and/or homework?	1	2	3	4
Q16.) Destroy or damage public property?	1	2	3	4
Q17.) Use hard drugs? (cocaine, meth, etc...)	1	2	3	4

In this section, please circle the response inside the chart regarding how many times in the past year you've done each of the following. If you don't know the exact number, choose response that best describes usage in past year. For each question, select only 1 response.

<i>IN THE PAST YEAR, HOW OFTEN HAVE YOU?</i> (Circle One)	<u>Never</u>	<u>2-3 Times a Year</u>	<u>Once a Month</u>	<u>2-3 Times a Month</u>	<u>Once a Week</u>	<u>2-3 Times a Week</u>	<u>Once a Day</u>
Q18.) Used marijuana?	1	2	3	4	5	6	7
Q19.) Used hard drugs? (cocaine, meth, etc...)	1	2	3	4	5	6	7
Q20.) Used caffeine to help you study?	1	2	3	4	5	6	7
Q21.) Drank Alcohol?	1	2	3	4	5	6	7
Q22.) Cheated on an exam and/or homework?	1	2	3	4	5	6	7

In this section, please circle the response that best describes the relationship between you and your friends, as well as the number and amount of times in the past year your friends (Q29-32: closest friend) have done the following to your knowledge. For each question, select only 1 response.

Q23.) How important is it to you to have a strong group of friends and be included in their activities?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q24.) How important are your friends' opinions of what you've thought and done?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q25.) How many of your friends have smoked Marijuana?

- 1.) None of them
- 2.) Just a few of them
- 3.) Some of them
- 4.) Most of them
- 5.) All of them

Q26.) How many of your friends have have used hard drugs (cocaine/meth)

- 1.) None of them
- 2.) Just a few of them
- 3.) Some of them
- 4.) Most of them
- 5.) All of them

Q27.) How many of your friends have been drunk?

- 1.) None of them
- 2.) Just a few of them
- 3.) Some of them
- 4.) Most of them
- 5.) All of them

Q28.) How many of your friends cheated on an exam/homework?

- 1.) None of them
- 2.) Just a few of them
- 3.) Some of them
- 4.) Most of them
- 5.) All of them

<i>IN THE PAST YEAR, HOW MANY TIMES HAS YOUR CLOSEST FRIEND?</i>	<u>Never</u>	<u>2-3 Times a Year</u>	<u>Once a Month</u>	<u>2-3 Times a Month</u>	<u>Once a Week</u>	<u>2-3 Times a Week</u>	<u>Once a Day</u>
Q29.) Smoked marijuana?	1	2	3	4	5	6	7
Q30.) Drank alcohol?	1	2	3	4	5	6	7
Q31.) Done hard drugs? (cocaine, meth, etc...)	1	2	3	4	5	6	7
Q32.) Cheated on an exam/hw?	1	2	3	4	5	6	7

In this section, please circle the response that best describes the importance of your academic performance and future goals. For each question, select only 1 response.

Q33.) How important are school/grades?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q34.) How important do you believe your grades are to your parents/guardian?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q35.) How important is it to you to complete college?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q36.) How difficult do you believe your classes are?

- 1.) Not difficult at all
- 2.) Not too difficult
- 3.) Somewhat difficult
- 4.) Pretty difficult
- 5.) Very important

Q37.) While studying for an exam or doing homework, do you have problems concentrating?

- 1.) Never
- 2.) Almost never
- 3.) Sometimes
- 4.) Almost always
- 5.) Always

Q38.) How often does stress about Grades motivate you to stay up late to study or finish h/w?

- 1.) Never
- 2.) Almost never
- 3.) Sometimes
- 4.) Almost always
- 5.) Always

Q39.) How important to you is getting a good (high paying) job after college?

- 1.) Not important at all
- 2.) Not too important
- 3.) Somewhat important
- 4.) Pretty important
- 5.) Very important

Q40.) If you had to choose between having a low paying job you loved or having a high paying but stressful job, which would you choose?

- 1.) Love paying job I love
- 2.) High paying/stressful job

In this section, please circle the response that you feel best describes you and/or your personality. For each question, select only 1 response.

Q41.) I do not devote much thought and effort to preparing for the future.

- (1) Strongly disagree- -(2) Disagree- -(3) Agree- -(4) Strongly Agree-**

Q42.) I sometimes find it exciting to do things for which I might get into trouble.

-(1) Strongly Disagree- -(2) Disagree- -(3) Agree- -(4) Strongly Agree-

Q43.) I often times neglect my homework or studying to attend a spur of the moment social event.

-(1) Strongly Disagree- -(2) Disagree- -(3) Agree- -(4) Strongly Agree-

Q44.) I often use illicit substances (alcohol illegally, illegal drugs/prescription drugs) because it's exciting to do something illegal?

-(1) Strongly Disagree- -(2) Disagree- -(3) Agree- -(4) Strongly Agree-

In this section, please circle the response that best describes how dangerous (physically and/or mentally) you believe doing the following regularly (2+ times a week) are to your body. For each question, select only 1 response.

<i>How Dangerous is...?</i>	<u>Not Dangerous at All</u>	<u>Not Very Dangerous</u>	<u>Somewhat Dangerous</u>	<u>Pretty Dangerous</u>	<u>Very Dangerous</u>
Q45.) Using marijuana?	1	2	3	4	5
Q46.) Using hard drugs? (cocaine, meth, etc...)	1	2	3	4	5
Q47.) Drinking alcohol?	1	2	3	4	5
Q48.) Using painkillers? (2-3 times a week or more)	1	2	3	4	5

In this section, please circle the response that best describes you and your friend's usage and perceptions of the use and consequences of prescription stimulants

(Ritalin/Adderall). If you have never taken any prescription stimulants the survey is finished (skip Q49-56). For each question, select only 1 response.

Q49.) In the past year, how many times have you used Ritalin and/or Adderall?

- 1.) 2-3 times a year
- 2.) Once a month
- 3.) 2-3 times a month
- 4.) Once a week
- 5.) 2-3 times a week
- 6.) Once a day

Q51.) How wrong do you think it is to take Ritalin/Adderall to help you study?

- 1.) Not wrong at all
- 2.) A little wrong
- 3.) Wrong
- 4.) Very wrong

Q53.) How likely do you believe you are to be caught using Ritalin/Adderall without a prescription?

- 1.) Very unlikely
- 2.) Pretty unlikely
- 3.) Somewhat unlikely
- 4.) Pretty likely
- 5.) Very likely

Q55.) What reasons made you start taking Ritalin and/or Adderall in the first place?

- 1.) School Pressure
- 2.) Social events (to be more outgoing)
- 3.) Friends take it (peer pressure)
- 4.) To get high
- 5.) More than one of the above
- 6.) None of the above

Q50.) Have you ever you been diagnosed with ADHD?

- 1.) Yes
- 2.) No

Q52.) How often do you use Ritalin or Adderall at social events? (parties/sporting events/bar/etc...)

- 1.) Never
- 2.) 2-3 times a year
- 3.) Once a month
- 4.) 2-3 times a month
- 5.) Once a week
- 6.) 2-3 times a week
- 7.) Once a day

Q54.) How dangerous do you believe taking Ritalin/Adderall regularly (2-3 times a week) is to you physically and/or mentally?

- 1.) Not dangerous at all
- 2.) Not very dangerous
- 3.) Somewhat dangerous
- 4.) Pretty dangerous
- 5.) Very dangerous

Q56.) What source best describes where you obtain your Ritalin and/or Adderall from?

- 1.) Close friends with prescriptions
- 2.) Acquaintances
- 3.) Internet websites
- 4.) On vacation (brought it back)
- 5.) Prescription from a doctor

- 6.) More than one of the above
- 7.) None of the above