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Prescription Stimulant Use by Graduate Students

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To the Graduate Council:

I am submitting herewith a dissertation written by Matthew Donald Varga entitled "Prescription Stimulant Use by Graduate Students." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Higher Education Administration.

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Prescription Stimulant Use by Graduate Students

A Doctoral Dissertation
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Matthew Donald Varga
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DEDICATION

This dissertation is dedicated to my beautiful and wonderful wife, Mary Alice, my parents, Dave Varga and Meg Varga, my faculty advisor and inspiration, Dr. Norma T. Mertz, and my friend Dr. James Gleaves.

Mary Alice, there is nothing I want you to know more than without your support and encouragement, this accomplishment would never have happened. Your patience has been that of an angel; your understanding has been that of a saint; and your support has been unfathomable. You have been, and always will be, the absolute best thing that has ever happened to me and I know, together, we can accomplish and overcome anything. I hope I am as good to you as you have been to me in life and throughout this process. I love you!

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Words will never adequately express what you all mean to me and how you all have contributed to this accomplishment. I am truly blessed for having each one of you in my life. Thank you all very much!

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ABSTRACT

The purpose of this study was to measure graduate student prescription stimulant use by assessing the extent of use, reasons for use, and poly-substance use. Graduate students (n = 1,015) enrolled at a large Southeastern university completed the Student Life Survey. The data were analyzed using a variety of analytical techniques including descriptive statistics, frequencies, and a stepwise logistic regression in order to answer the research questions guiding this study:

1. What is the extent of prescription stimulant abuse among graduate students on college campuses?
2. What are the reasons for graduate students' illicit use of prescription stimulants?
3. Are graduate students who abuse prescription stimulants more likely to abuse other substances?

The findings reveal that 15% of graduate students surveyed had illicitly used prescription stimulants in their lifetime, and 5.1% had used in the last 12 months. The primary reason they gave for illicitly using prescription stimulants included academics (67.5%), with recreational use occurring at a smaller rate (30.5%). Graduate students, who illicitly used prescription stimulants in their lifetime, were found to be more likely to use other illegal drugs than those who had not done so. Specifically, graduate students who illicitly used prescription stimulants in their lifetime were 1.5 times more likely to use marijuana, 6.3 times more likely to use cocaine, and 2.4 times more likely to use ecstasy.

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CHAPTER I

Introduction and Purpose

Prescription drug abuse is quickly becoming an epidemic effecting millions of Americans (Johnston, O'Malley, Bachman, & Schulenberg, 2010; Substance Abuse and Mental Health Services Administration, 2010). The National Center on Addiction and Substance Abuse (2005), which conducted the first national comprehensive analysis of prescription drug abuse in the United States, reported that 15.1 million people admitted abusing prescription drugs in 2003, a 94% increase from 7.8 million in 1992. That increase in prescription drug abuse was twice the growth rate of marijuana use, five times that of cocaine abuse, and sixty times that of heroin abuse (National Center on Addiction and Substance Abuse, 2005). Furthermore, the 15.1 million prescription abusers accounted for more than the combined number of admitted abusers of cocaine (5.9 million), hallucinogens (4.0 million), inhalants (2.1 million), and heroin abusers (.3 million) (National Center on Addiction and Substance Abuse, 2005). One year later, 48 million people admitted abusing prescription drugs suggesting a rapid increase in the number of prescription drug abusers (Substance Abuse and Mental Health Services Administration, 2010).

Prescription drug abusers compared to poly-substance abusers, are more likely to be married (59.3 percent vs. 25.8 percent), better educated (24.7 percent vs. 15.8 percent; have a bachelors degree or higher), and have higher incomes (81.7 percent vs. 72.8 percent) according to the Substance Abuse and Mental Health Services Administration, a branch of the United States Department of Health and Human Services (Substance Abuse and Mental Health Services Administration, 2010). These statistics represent the adult population abusing prescription drugs; however, young adults between the ages of 18 and 25 are the primary abusers of prescription

drugs (Johnston et al., 2010; National Center on Addiction and Substance Abuse, 2005; Substance Abuse and Mental Health Services Administration, 2010). Second only to marijuana, prescription drugs (i.e., opiates and stimulants) are the most widely abused drugs for individuals between 18 and 25 (Johnston et al., 2010).

The Drug Enforcement Agency (2011) reported methylphenidate (e.g., Ritalin®) and dextro-amphetamine (e.g., Adderall®) to be the most widely abused prescription stimulants. Methylphenidate is a Schedule II substance and includes generic and brand names drugs such as Ritalin®, Concerta®, and Methylin®. Also a schedule II drug with slight chemical differences are dextro-amphetamines, which include the brand names Dexdrine®, Meirdia®, and Adderall® (Drug Enforcement Agency, 2011). The Controlled Substances Act classifies the aforementioned drugs as Schedule II drugs due to their high potential for addiction, medical/non-medical abuse, patient and non-patient self-medication, recreational use, and for selling to non-patients (Drug Enforcement Agency, 2011). Medically, these drugs are used for treating attention deficit disorder (ADD), attention deficit hyperactivity disorder (ADHD), narcolepsy, and weight loss (National Center on Addiction and Substance Abuse, 2005).

In an ABC Nightline News broadcast ominously titled *Teen Prescription Drug Abuse on the Rise* (2006), they told a story about Jay, a seventeen year old abuser of prescription drugs. "Jay was a nationally ranked tennis player, a good student, well-groomed. His parents had no idea he was going to school and to practice – walking right past their faces – stoned on prescription drugs" (American Broadcasting Company, 2006). Beginning at the age of 13, Jay named Percocet®, OxyContin®, Xanax®, Vicodin®, Ritalin®, and Adderall® as just a few of the prescription drugs he abused. Four years later and pounds lighter, with black eyes, Jay resides

in a small drug and alcohol treatment clinic in Houston, Texas. One of the more alarming pieces of information provided by Jay was how he gained access to these drugs. Jay said it was as simple as roaming the halls or locating the “candy man”.

A similar story reported by ABC News involved an “A” student at a top university named Maggie, who was highly motivated and determined to do well (American Broadcasting Company, 2005), who used prescription drugs “as a way to boost grades”, something the report indicated was “sweeping colleges”. *Primetime Live* followed “Maggie” during exams, since she was part of “a fast-growing college subculture of study drugs – hardcore prescription medications that give students hours and hours of almost superhuman focus and concentration.” Maggie explained that prescription stimulant drugs such as Ritalin® and Adderall® “just really makes [her] feel confident and peaceful with [her] studies and helps [her] retain the information that [she is] learning.”

The New York Times printed an article about a student at Columbia University, Angela, who needed a miracle during finals week (Jacobs, 2005).

> Like many of her classmates, Angela, a bleary-eyed junior, had already pulled a pair of all-nighters to get through a paper on "Finnegans Wake," a French test and an exam for her music humanities class. All that remained was a Latin American literature final, but as midnight approached, her stamina was beginning to fade. "This week is killing me," she said, taking a cigarette break in front of the school library. "At this point, I could use a little help." Thanks to a friend, the tiny orange pill in her purse would provide the needed miracle. Angela, who asked that her last name not be published for fear of alarming her family and angering university officials, popped a 30-milligram tablet of

> Adderall into her mouth, washed it down with coffee and headed back to the library for another night of cramming. The next morning, she sailed through the exam confidently and scored an A. "I don't think I could keep a 3.9 average without this stuff," she said afterward (Jacobs, 2005, para. 1).

The Chronicle of Higher Education reported a similar story about Chris Langely, a student previously attending The University of Maryland at College Park (Nichols, 2004).

> At 8 p.m. the night before his psychology midterm, Chris Langley found himself at a familiar crossroads. Should he open his thick textbook and start studying, knowing that his mind would soon drift elsewhere? Or should he first visit a friend who, he knew, had something that could help him meet the seemingly insurmountable task? That night in October, Mr. Langley, a senior majoring in English at the University of Maryland at College Park, chose the latter option. He walked over to visit a friend who had been diagnosed with attention-deficit hyperactivity disorder, or ADHD, and who had a bottle full of Adderall, a prescription stimulant that can increase a person's ability to concentrate whether he has the disorder or not. After popping one of his friend's 10-milligram pills, a relatively low dose of the amphetamine-based drug, Mr. Langley felt "zoned in." He read 100 pages of his textbook in three hours, a task that normally would have taken him much longer, he says. And the information stuck in his head: he got a 92 on the exam. "It's almost like drinking a lot of coffee, but to a higher degree," he says. "Adderall is a ... stronger way of getting me to concentrate. It almost makes it like you don't mind studying" (Nichols, 2004, para. 1).

In the same article, *The Chronicle of Higher Education* reported that one out of five students at the University of Wisconsin at Madison admitted having taken prescription stimulants without a prescription (Nichols, 2004).

The behavior of college students illicitly taking narcotic prescription drugs for academic improvement shows few signs of slowing down, since 2.3 million middle and high school students (Substance Abuse and Mental Health Services Administration, 2010), and roughly 16 percent of college students (Babcock & Byrne, 2000; McCabe, Teter, & Boyd, 2006b) are reputed to self-medicate with the generic and brand name prescription stimulant drugs Adderall® and Ritalin®. Despite the limited mental health disorders for which stimulants are prescribed as a treatment, diagnoses of these disorders, specifically Attention Deficit Disorder (ADD) and ADHD, have increased significantly over the past ten to fifteen years, and show little signs of declining (Kessler et al., 2006); consequently, prescriptions for stimulants have also increased during the same time period (Olfson, Marcus, & Jensen, 2003). The number of written prescriptions for stimulants increased 368.5 percent from 1992 to 2002 (National Center on Addiction and Substance Abuse, 2005). An increase in Adderall® production naturally followed increased demand, resulting in production growing approximately 9,008% in ten years (numbers are in the ‘000s). In 2005, Adderall® was the most widely prescribed stimulant, second only to Ritalin®, with 12,881,000 prescriptions written from 1992 to 2002 (National Center on Addiction and Substance Abuse, 2005).

The dramatic increase in Adderall® and Ritalin® production is suggestive of widespread use of these prescription medications. There have been attempts to assess the levels of stimulant abuse on campuses (Babcock & Byrne, 2000; Hall, Irwin, Bowman, Frankenberger, & Jewett,

2005; Teter, McCabe, Cranford, Boyd, & Guthrie, 2005). Surprisingly, the studies suggest comparable percentages of undergraduate students self-reporting their illicit use. Averaging the respective percentages reported, approximately 20% of undergraduate students abuse prescription stimulants, specifically Adderall® and/or Ritalin® (Babcock & Byrne, 2000; Hall, Irwin, Bowman, Frankenberger, & Jewett, 2005; McCabe, Teter, & Boyd, 2006; White, Becker-Blease, & Grace-Bishop, 2005).

Anecdotal reports from professionals who work with undergraduate students affirm those studies indicting prescription stimulant abuse not only occurs, but also increases with greater academic pressures. For example, one student affairs professional who assists a small group of student-athletes manage and balance their academic responsibilities with their athletic responsibilities, reported a student's eagerness to take Adderall®. The professional explained that one night he was reviewing a student-athlete's upcoming academic week with the student-athlete, which included reading three books and studying for an exam, an essay, and a quiz. The professional reported that the student-athlete broke down, crying in fear of failing her classes and losing NCAA eligibility. The professional and student reviewed the assignments, breaking them down into daily tasks. The student was then asked about the upcoming week. She responded, "I feel better; besides, I will get Adderall from my friend and just pump it out." The response was incredibly carefree, and the only concern she had was completing her assignments and maintaining eligibility. Unfortunately, this mindset is reportedly common among undergraduate students striving for success, both academically and professionally (Babcock & Byrne, 2000; Ford & Schroeder, 2009). This example also affirms the presence and availability of prescription

stimulants to undergraduate students' as well as their carefree attitude toward abusing the narcotic.

While the research suggests undergraduate students are illicitly using prescription stimulants at an alarming rate, particularly for academic and recreational reasons, as well as concomitantly using these drugs with other illegal substances, we know very little about graduate students' illicit use of prescription stimulants. Clearly, graduate students are in the age category for higher rates of abuse, and operate under enormous academic pressure, both of which are risk factors for undergraduate students. However, given the absence of research, it is unclear whether graduate students have a similar rate of abuse as undergraduate students, or if their reasons for using prescription stimulants and poly-substance behavior is similar.

Statement of the Problem

As prescription drug abuse remains a problem among adults, it has become a growing problem for students between the ages of 18 and 25. Evidence suggests that college students, ages 18 to 25, are abusing prescription stimulants on college campuses and are using them for recreational and/or academic reasons. Students taking prescription stimulants, although not diagnosed with ADHD, experience a chemical effect almost identical to cocaine. Thus, the likelihood of becoming addicted to prescription stimulants is high (Compton & Volkow, 2006). Additionally, prescription stimulants increase the body temperature, cause dehydration, and are known to cause seizures (National Institute on Drug Abuse, 2009), psychosis (Surles, May, & Garry, 2002), and death (Massello & Carpenter, 1999). Illicit use of prescription stimulants also account for 8% of emergency room visits among students between 20 and 25 years of age (Substance Abuse and Mental Health Services Administration, 2008).

While what we know about stimulant abuse in this age category is based on research on undergraduates, we do not know if the same behaviors and use are characteristic of graduate students. In the absence of such knowledge, we are forced to apply what is known about a different group, or to draw conclusions without a basis in fact. The truth is we do not know if the same problem as has been found with the use of prescription stimulants is descriptive of graduate students, and if it is, whether it is for the same reasons. Thus, we are without a sound basis for addressing the problem, if it is such.

Purpose of the Study

The purpose of this study is to measure graduate student prescription stimulant use by assessing the extent of use, reasons for use, and poly-substance use.

Research Questions

The research questions which guided the study were:

1. What is the extent of prescription stimulant abuse among graduate students on college campuses?
2. What are the reasons for graduate students' illicit use of prescription stimulants?
3. Are graduate students who abuse prescription stimulants more likely to abuse other substances?

Significance of the Study

This study could provide valuable information about graduate student behavior regarding prescription drug use, information which will fill a gap in the research. Furthermore, understanding more about the abuse of stimulants among graduate students may assist administrators and healthcare professionals to determine if there is a need to develop new

programs and interventions to serve this particular population, rather than relying on existing programs directed to undergraduate students. By understanding the factors that may promote the illicit behavior among graduate students, health care workers, school administrators, and faculty may be better equipped to identify students suffering from or likely to begin abusing prescription stimulants.

Preview of Method and Procedures

This study will utilize a quantitative methodology. A survey will be used to learn about the use of prescription stimulants by graduate students on one college campus, assessing the extent of use, reasons for illicitly using, and poly-substance use.

Delimitations of the Study

This study was delimited to graduate students at one Southeastern institution. By utilizing only one campus population, the findings may not speak to experiences at other institutions or to the experiences of all graduate students.

Limitations

Since the survey involved self-reports, the accuracy of the information obtained depends heavily on the students' willingness to admit illegal activity. This open acknowledgement may prevent some students from admitting to the use of such drugs, for example, students who used it once and are fearful of getting into trouble. Thus, the findings may not provide a valid picture of prescription drug abuse among the respondents. The clandestine nature of this topic thus imposes limitations on the study.

Conceptual Framework

The theoretical framework guiding this study is the Problem Behavior Theory, originally constructed by Jessor and Jessor (1977) and augmented by Jessor, Donovan, and Costa (1991). Problem Behavior Theory holds that all behavior is the result of person-environment interaction and clusters around other problem behaviors, which means individuals are more likely to engage in problematic behavior if they have already engaged in another deviant behavior. For example, students that are binge drinkers are more likely to engage in other deviant behaviors because they already binge drink. Additionally, variables can serve as instigators or controls on behavior. Instigating variables encourage the problem behavior, whereas controlling variables serve as inhibiting factors (Jessor et al., 1991). The balance among the perceived environment, personality, and social environment and the comprising variables determines the overall likelihood an individual will engage in problematic behavior. The greater the number of variables that have an instigating and proximal relationship, the more likely the students will engage in a problematic behavior. Once an individual engages in deviant behavior, this serves as the greatest predictor for other deviant behaviors, such as poly-substance use. Therefore, as an individual engages in problematic behavior, other deviant behavior may follow, resulting in a cluster of dangerous and deviant behaviors.

The Problem Behavior Theory influenced the study by creating the foundation for the study and helped establish the need for conducting the study. Additionally, the conceptual framework assisted in framing the focus of the research questions. Determining whether graduate students are illicitly engaging in prescription drug use may be an indicator of other deviant behaviors such as poly-substance use. Furthermore, Problem Behavior Theory suggests

individuals with high controlling factors such as valuing achievement and independence, inhibit students' willingness to engage in deviant behavior. By focusing on the reasons for use, it could be determined if graduate students who use prescription stimulants recreationally may be at greater risk for engaging in other deviant behaviors than those who use for academic reasons.

Organization of Study

The study is organized into five chapters.

Chapter 1 introduces the study and includes the following sections: the statement of the problem, purpose of the study, research questions, significance of the study, preview of the method, limitations of the study, the theoretical framework for the study, and this organizational plan of study.

Chapter 2 provides a critical review of the research and literature related to the study and an explication of the theoretical framework of the study.

In Chapter 3 the methods and procedure used in the conduct of the study are detailed.

Chapter 4 details the findings of the study.

Chapter 5 concludes with a review of the study and its findings, a discussion of those findings, conclusions, and implications of the study for administrators, educators, and policy makers, as well as recommendations for future research.

Definitions

Adderall®

A prescription stimulant used to treat attention deficit disorder, attention deficit hyperactivity disorder, narcolepsy, and weight loss. It is also referred to as dextro-amphetamine (Drug Enforcement Agency, 2011).

Illicit Drug Use

Illicit drug use is described as using illegal drugs that have no widely accepted medical use including, but not limited to, marijuana, hallucinogens, cocaine, crack, ecstasy, and heroin (National Center on Addiction and Substance Abuse, 2007).

Poly-substance Abuser

A poly-substance abuser is described as an individual using multiple substances concomitantly to increase the sensation. One example includes an individual consuming alcohol with a prescription drug (National Center on Addiction and Substance Abuse, 2005).

Poly-substance Use

Poly-substance use is described as using multiple substances concomitantly to increase the sensation. One example includes consuming alcohol with a prescription drug (National Center on Addiction and Substance Abuse, 2005).

Prescription Drug Abuse

Prescription drug abuse is described as using a prescription drug not under a doctor's order; not prescribed for the person using the prescription; or solely for the sensation or experience caused by taking the prescription (National Center on Addiction and Substance Abuse, 2005, 2007).

Prescription Stimulants

Prescription stimulants are a classification of prescription drugs that enhances brain activity resulting in an increase in alertness, attention, energy, and an elevated blood pressure. Other effects include an increase in heart rate and respiration. The clinical use of stimulants

includes attention deficit hyperactivity disorder, narcolepsy, and in some cases depression (National Center on Addiction and Substance Abuse, 2005).

Ritalin®

Ritalin® is a prescription stimulant used to treat attention deficit disorder, attention deficit hyperactivity disorder, narcolepsy, and weight loss. It is also referred to as methylphenidate (Drug Enforcement Agency, 2011).

Schedule II Drugs

The Controlled Substances Act of 1970 classifies all types of drugs into five categories referred to as schedules. Drugs that are classified as Schedule II are considered to have a high potential for addiction, medical/non-medical abuse, patient and non-patient self-medication, recreational use, and for selling to non-patients (Drug Enforcement Agency, 2011).

CHAPTER II

Review of Literature

The purpose of this study is to examine graduate students' illicit use of prescription stimulants. This chapter contains a critical review of the literature related to the present study. It is organized in terms of three primary topics: national prevalence and extent of use, prevalence rates among college and university students, and student related factors such as modes of acquisition, initiation, characteristics of use, perceptions, beliefs, reasons for use, and risk and protective factors for prescription stimulant abuse.

National Prevalence

National drug surveillance assessments allow health institutions, researchers, and others to track drug abuse trends in the United States. There are two primary national surveillance studies on drug use in the United States: the Monitoring the Future survey (Johnston et al., 2010) and the National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration, 2010). The Monitoring the Future (MTF) survey is conducted by the University of Michigan's Institute for Social Research, which is funded primarily by research grants from the National Institute on Drug Abuse. The National Survey on Drug Use and Health (NSDUH) is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), which is a government agency dedicated to reducing substance abuse and mental illness in the United States.

Currently in its 35th year, the MTF survey identifies the social trends occurring within the United States. Additionally, the MTF survey helps accurately characterize the levels and trends of certain illicit behaviors, such as substance abuse, attitudes, beliefs, and environmental

conditions that may affect drug use. Finally, the MTF survey attempts to understand why and how social changes are occurring with substance use among those 12 and older. The MTF survey incorporates multiple surveys into one single survey, thus enhancing the analytical power of the data. At the end of each academic year, the survey is distributed to students across the country measuring alcohol use, drug use for prescription and illicit drugs, social attitudes, behaviors, perceptions, and general demographics (Johnston et al., 2010).

The survey is a self-report instrument, however, 35 years of consistent data suggest a solid validity and reliability rating for the survey (Johnston et al., 2010). Additionally, the trend analysis for 35 years of data provides a sensitive mechanism for detecting changes in the drug culture in the United States. Analysis of the survey consists primarily of cross-sectional analyses among subpopulations and prevalence reports. The data are provided to researchers for conducting more powerful statistical analyses.

The most recent results from the MTF study indicate a disturbing trend in the use of prescription stimulants among college students one to four years beyond high school (Johnston et al., 2010). The survey measures two specific prescription stimulants Ritalin® and Adderall®. Ritalin® has been part of the survey since 2002 and Adderall® was introduced to the survey in 2009. In 2002, 5.7% of college students reported illicitly using the prescription drug Ritalin®. However, over the next few years, the illicit use of the drug declined steadily by approximately .5% annually. The decline increased in 2009, with 1.7% being reported by college students. Adderall® debuted with a rate of 7.9%, which suggests the popularity of Adderall® may have affected the decline in the reported use of Ritalin®. In 2009, prescription stimulants were the

third most abused drug among college students behind marijuana (32.8%) and prescription opioids such as OxyContin® (7.3%) and Vicodin® (8.4%) (Johnston et al., 2010).

It is evident that college students are engaging in the illicit use of prescription stimulants, but whether Adderall® is growing, remaining stagnant, or declining, is yet unclear, since only one year of data on Adderall use is available. Furthermore, other, newer stimulants have come onto the market or are being introduced such as Concerta® and Vyvanse®, that are not a part of the MTF survey (Drug Enforcement Agency, 2011; National Center for Biotechnology Information, 2010). Therefore, the overall rate of prescription stimulant use by college students remains unclear.

The National Survey on Drug Use and Health (NSDUH) is another national drug surveillance survey that evaluates national estimates of drug use, prevalence rates, and other factors related to the illicit use of prescription and illegal drugs including alcohol. The primary purpose of the NSDUH is to compare data from previous years for evaluating and identifying national trends. The most recent report compares data from 2008 to 2009. The data were acquired from surveying all noninstitutional populations, military bases, households, residence halls, shelters, and rooming houses (Substance Abuse and Mental Health Services Administration, 2010).

The NSDUH employs a state based design throughout the nation, but focuses on the eight states with the largest populations, which also comprise half of the national population. A total of 3,600 residents are surveyed from each of the eight states. A sample of 900 is drawn from the remaining 42 states. The purpose of this design is to distribute the sample in a manner comparable to the population distribution of the United States. The surveys are conducted via

computer-assisted interviewing and audio-computer assisted interviewing. In 2010 the 143,565 surveys were completed, and 68,700 interviews conducted, which were equated to 88.8% and 75.7% response rates respectively (Substance Abuse and Mental Health Services Administration, 2010).

The NSDUH presents findings similar to those derived from the MTF, although it presents findings based on individuals between 12 and 49 in age, rather than individuals attending an educational institution between 12 and 50 years of age. The survey affirms that prescription drug abuse is on the rise among individuals between 12 and 49, but individuals between 18 and 25 are at a greater risk. The NSDUH does not specify types of prescription drugs being used, and classifies all drugs in the stimulant category. This makes trending data for specific drugs such as Adderall® and Ritalin® difficult. Regardless of the limitations of the study, the data presented indicates stimulant abuse to be a national problem for individuals 18 to 25 (Substance Abuse and Mental Health Services Administration, 2010).

The analysis of the 2009 NSDUH data revealed, 28.6% of drug users 12 and older were initiated to drug use via prescription drugs. Of that percentage, 2.0% attributed their overall illicit drug use to the use of prescription stimulants. The study also reported a rise in general prescription drug abuse from 2008 to 2009, from 5.5% to 6.3%. These statistics are comparable to the findings of the MTF study (Substance Abuse and Mental Health Services Administration, 2010).

Kroutil et al. (2006) examined the NSDUH data to determine prevalence rates and correlates of prescription stimulant abuse. In 2002, the prevalence rate among individuals 12 and older in the United States illicitly having used prescription stimulants at least once in their

lifetime was estimated to be 21 million people (Kroutil et al., 2006). Individuals who reported using prescription stimulants exclusively for ADHD symptoms accounted for 39.3% of the population reporting illicit stimulant use, whereas 70% of those self-reported had used stimulants other than methamphetamine for various reasons other than self-treatment (Kroutil et al., 2006). The age group that exhibited the highest rate of use was individuals from 18 to 25, with a rate of abuse at 5.9%. Further, they were 16.74 times more likely to abuse prescription stimulants for ADHD than any other age group. Males had a slightly higher risk of abusing prescription stimulants than females (Odds Ratio = 1.52 vs. 1.00). Individuals with household incomes of less than $10,000 had a slightly higher rate of abusing prescription stimulants than did individuals with higher incomes (Kroutil et al., 2006).

Prior to Kroutil et al. (2006), the National Center on Addiction and Substance Abuse at Columbia University (CASA) noted the growing trend of prescription drug abuse in the United States (2005), specifically among college students (2007). CASA conducted two studies on prescription drug abuse, the first on the general United States population (2005), and the second on college students (2007). The purpose of both studies was to secure information about prescription drug abuse and abuse of other illicit substances in the United States, as well as to generate suggestions for prevention strategies.

The 2005 CASA study was a comprehensive analysis of all aspects of prescription drug abuse in the United States. The study is a compilation of the literature, national drug surveillance data, publications, and studies from the National Center on Addiction and Substance Abuse. In addition, data were collected from surveys of physicians, pharmacists, and students, as well as

interviews, focus groups, and consultation with experts in the field of substance abuse (National Center on Addiction and Substance Abuse, 2005).

One key finding of the CASA (2005) study included the number of people who were believed to be abusing prescription drugs. In 1992, 7.8 million people reported abusing prescription drugs; that increased by 94% to 15.1 million people in 2003. The increase was seven times faster than the population growth of the United States. Of the 15.1 million who reported abusing prescription drugs, 25.3% reported abusing only prescription drugs. They were more likely to be women, older, married, better educated, and to have higher incomes than those who did not abuse prescription drugs.

In terms of prescription stimulants, the CASA (2005) report found that the most commonly abused prescription stimulants included methylphenidate (e.g., Ritalin® and Concerta®), amphetamine-dextroamphetamine (e.g., Adderall®), dextroamphetamine (e.g., Dexedrine®) and sibutramine hydrochloride monohydrate (e.g., Meridia®). All these drugs are used for treating attention deficit disorder (ADD), attention deficit hyperactivity disorder (ADHD), excessive appetite, and narcolepsy. CASA (2005) also suggested the increase in abuse rate of prescription stimulants was related to the increase in production, and number of prescriptions issued for these drugs. From 1992 to 2002, Adderall® experienced a 9,008% production increase, Dexedrine increased by 211%, Ritalin® increased by 187%, and the overall production of prescription stimulants increased 369%. All of these numbers are in the 000's. The production increase paralleled the increase in individuals self-reporting prescription stimulant abuse, which rose by 41.5% during the same period. Furthermore, from 1992 to 2000, the increase in new abusers of prescription stimulants was 171.2% for individuals 12 and older.

When comparing adolescents to adults, adolescents (283%) demonstrated the greatest increase compared to adults 18 and over (106.7%).

Findings from the CASA (2005) study suggested a growing epidemic of prescription stimulant use, especially among adolescents and college students. Therefore, CASA commissioned a study focusing on college students and their substance abuse that included prescription and illicit drugs (National Center on Addiction and Substance Abuse, 2007). Data collection involved 2,000 students surveyed via telephone and 400 college administrators surveyed by mail. In addition, the data included six national datasets, interviews with experts in the field of substance abuse, eight focus groups, and a review of approximately 800 articles. The report of the study, *Wasting the Best and the Brightest: Substance Abuse at America's Colleges and Universities* (National Center on Addiction and Substance Abuse, 2007), was a comprehensive analysis of all forms of illicit substance abuse occurring on college campuses. A secondary intent of the study was to compare the results with the previous report in 2002, to determine what, if any, progress had been made in curbing substance abuse on college campuses.

The CASA (2007) report revealed important information regarding the illicit use of prescription stimulants among college students. It revealed that past month abuse of prescription stimulants rose 93.2%, from 1993 to 2005. Additionally, in 2005, college men were more likely to abuse prescription stimulants than noncollege men (4.0% vs. 2.3%). In terms of race and ethnicity, white students were four times more likely to use prescription stimulants for nonmedical purposes (4.9% vs. 1.9% for African Americans and 1.3% for Asians). However, only 16.6% of college administrators felt abuse of stimulants was a problem on their campus (National Center on Addiction and Substance Abuse, 2007).

The CASA studies (2005, 2007) provided valuable information about the growing problem of prescription stimulant abuse among college students in the United States, which was also supported by Kroutil et al. (2006); however, the CASA (2007) report did not provide evidence regarding the motives for illicitly using prescription stimulants. Additionally, the report provided cursory evidence suggesting how students were obtaining the prescription stimulants. Novak, Kroutil, Williams, and Van Brunt (2007) studied the general motives, sources, and patterns of substance abuse among individuals 18 and older who abused prescription stimulants among a nationally representative sample.

Novak et al. (2007) employed a self-reporting internet survey from a nationally representative pool of participants who were enrolled in the Harris Interactive's Harris Poll Online panel (HPOL). The HPOL is a database of several million members who elect to participate in online polling. The final sample size was 4,297 of noninstitutionalized adults, ages 18 to 49. In order to control for national-level estimates, weighting procedures and propensity scoring methods were conducted by using data from three nationally representative probability samples. These included the United States Census, NSDUH data, and random-digit dialed telephone surveys. Novak et al. found the prevalence rates of prescription stimulant abuse among adults 18-49 nationally to be 7.1%. The group most likely to abuse prescription stimulants included those between the ages of 18 and 25, compared to those between 26 and 49 (4.3% vs. 2.8%). Students who were likely to abuse other substances were the most vulnerable for abusing prescription stimulants. Students who abused methamphetamine were 48.3 times more likely to abuse prescription stimulants. Students who used cocaine were 26.4 times more likely more likely to abuse prescription simulants. Those who abused marijuana were 7.3 times more likely

to abuse prescription stimulants. Those who reported binge drinking were 5.1 times more likely to engage in illicit prescription stimulant use. These findings suggested that students may be at a greater risk to abuse prescription stimulants when they use other illicit substances. This suggestion was supported by additional data that 69.2% of students who reported nonmedical use of prescription stimulants concomitantly reported binge drinking. Furthermore, 53.9% of the participants reported marijuana and prescription stimulant use in the past year. Only 16% of the participants reported using only methamphetamine and prescription stimulants (Novak et al., 2007).

Novak et al. (2007) did not find a specific prescription stimulant drug that was used more than others. However, they did report 2% of the sample indicated a willingness to acquire any prescription stimulant, suggesting that students may not have a preference for a specific drug but rather for the effect of the drugs. They also reported on students' sources for prescription stimulants. Students who received the drugs for free from friends or family accounted for 65.8% of the sample, whereas 13% bought the drugs from friends and family. Other means of acquisition included stealing the medication (34.5%), obtaining it fraudulently from a doctor (19.8%), internet pharmacy (5.2%), and other (10.3%). Individuals 18 and older reported their motivations for taking the drugs were primarily for increasing productivity (39.8%), staying awake (23.1%), feeling good or getting high (13.0%), and relaxing or relieving tension (10.4%).

These results from Novak et al. (2007) provide illuminating information regarding individuals who use prescription stimulants. Their results are comparable to the other national reports on prescription drugs, specifically prescription stimulants. More importantly, they

suggest a pattern of polysubstance use among individuals who use prescription stimulants illegally.

Extent of Use on College Campuses

The national and independent studies with national populations indicated a trend of rising prescription stimulant abuse, with students 12 to 25 at risk, and individuals between 18 and 25 at the highest risk. The traditional age college student is between 18 and 25, which places college students at the greatest risk for prescription stimulant abuse. McCabe, Knight, Teter, and Wechsler (2005) examined the extent of illicit use of prescription stimulants among college students, as well as characteristics of college students who used stimulants by analyzing data from the 2001 College Alcohol Study. The College Alcohol Study sends a survey instrument to students from 119 four year colleges across 39 states. An administrator from each college provides the names of 215 randomly selected students to the researchers who subsequently send a survey to those students. The resulting sample is a nationally representative, random sample of 10,904. Based on that sample, as reported by McCabe, Knight, et al. (2005), approximately 6.9% of the college students reported life-time nonmedical use of prescription stimulants. Students who reported past-year use accounted for 4.1%, and 2.1% reported past-month use of prescription stimulants. Traditional college aged students (18 – 25) were significantly more likely to abuse prescription stimulants than non-traditional college students (26 and greater). Additionally, fraternity and sorority members living in houses were significantly more likely than single sex, coed, other university housing, and off campus apartments to use prescription stimulants in the past year. The same is true for fraternity and sorority members versus nonmembers. Students with a “B” or lower GPA were more likely than students with a “B+” or

higher grade point average to have engaged in the illicit use of prescription stimulants. Finally, students whose parents possessed an undergraduate degree or higher were significantly more likely to abuse prescription stimulants than students whose parents did not have a college education. Males were almost twice as likely as females (Odds Ratio=1.92) to demonstrate past year use of prescription stimulants. Additionally, students who were white, members of fraternities and sororities, and had a lower grade point average were more likely to abuse prescription stimulants than African Americans, non-Greek affiliated students, and those with higher grade point averages.

McCabe, Knight, et al. (2005) reported the demographics of students abusing prescription stimulants, but they also found significant results suggesting college location and selectivity were more likely to have high rates of abuse. They found college students who attended a competitive, or highly competitive, school in the Northeast were almost four times more likely to report past year use of prescription stimulants than their peers attending less competitive institutions elsewhere in the United States. Furthermore, students attending a Southern competitive institution were almost twice as likely to report prescription stimulant abuse as other regions except for the Northeast. These factors, in addition to Greek affiliation, serve "collectively as a proxy for higher socio-economic status" (McCabe, Knight, et al., 2005, p. 103). Babcock and Byrne (2000) reported similar results regarding prevalence rates for a Northeastern college.

Babcock and Byrne (2000) assessed the prevalence rates and perceptions of prescription stimulants on a single college campus. They specifically addressed the prescription stimulant Ritalin®. They developed a ten-item questionnaire that was administered to 1,401 students at the

Massachusetts College of Liberal Arts. The surveys were placed in students' mailboxes and measured students' perception of use on campus, personal use, and methods of acquisition. The final sample size was 283 participants (193 women, 88 men, 2 unreported), and the analysis of the responses consisted primarily of central tendencies for each measure. Babcock and Byrne found that 65.4% of the sample reported knowing someone under the age of 24 illicitly using Ritalin® on campus. However, few students (17.9%) reported knowing anyone above the age of 24 that illicitly used prescription stimulants. Students' self-reported use of prescription stimulants accounted for 20.9% of the sample for students under the age of 24. A little over half of the students reported peers using the drug intranasally as opposed to orally, whereas only 16.1% self-reported taking the drug intranasally. In terms of acquiring the drug, only 1.9% said they actually had a prescription for Ritalin®, and 3.3% indicated stealing the drug from someone. Just under half (45.5%) of the students reported knowing someone from whom they could purchase Ritalin®. Finally, 36% of the students under 24 reported Ritalin® as a drug of abuse on their campus.

Prudhomme-White, Becker-Blease, and Grace-Bishop (2006) also conducted an exploratory study regarding prescription stimulant abuse on a Northeastern college campus, specifically the University of New Hampshire. The purpose of their study was to gain a better understanding of the use of prescription stimulants on a college campus. From the overall sample size of 1,025, 16.2% reported misusing prescription stimulants, with the majority of use occurring over a year (50.6%) compared to monthly (33.9%) and weekly use (15.5%). Students reported initiating illicit use of prescription stimulants in high school (49%) or in college (51%). Students also reported that the drug was "very easy" to "somewhat easy" to obtain (58%), and

the preferred method of use was swallowing the drug (55%) compared to intranasal (40.3%) administration. A small percentage of the sample (9.8%) reported having a legal prescription for the drug, but still misusing the medication. There was little difference between men and women (53% vs. 47%) illicitly using prescription stimulants without a prescription. The students who had previously attended a private high school (27%, $n = 43$) were more likely to abuse prescription stimulants than students who had attended a public school (14% $n = 120$), which further suggests students from higher socio-economic incomes are more likely to illicitly use prescription stimulants. The primary motive for illicitly using prescription stimulants included improving attention (68.9%), partying (65.2%), improving study habits (54.3%), improving grades (54.3%), and reducing hyperactivity (9.1%).

Similar to Babcock and Byrne (2000), Prudhomme-White et al. (2006) found a relatively high rate of use of prescription stimulants on college campuses. The results of Prudhomme-White et al. presented additional evidence that students are illicitly using prescription stimulants on college campuses for various reasons. Furthermore, students are coming to college with experience of illicitly using prescription stimulants.

Student Related Issues

A number of issues related to prescription stimulant abuse have been addressed. They include the acquisition and diversion of prescription drugs, reasons for use, students' beliefs and perceptions about the use, sensation seeking, and poly-substance behaviors. Prescription stimulant abuse begins with the illegal diversion and distribution of prescription stimulants among college students. It was relatively unknown how students were acquiring prescription stimulants until McCabe and Boyd (2005) addressed the gap.

McCabe and Boyd (2005) investigated the sources for prescription drugs. They identified four classes of prescription drugs (opioids, sedatives, sleeping, and stimulants) that were illicitly used by undergraduate students, and investigated the relationships between the acquisition sources and other substance use. In the spring of 2003, a random sample of 19,378 students was sent an email inviting them to participate in an online self-reporting study. The final sample was 9,161. The instrument used in the study, the Student Life Survey (SLS), included questionnaire-items from several national studies including the MTF and NSDUH that asked about episodic drinking, past year marijuana abuse, and illicit use of prescription drugs. General demographic information was gathered including Greek affiliation.

In terms of acquisition, students reported the primary source for prescription stimulants was peers (67.7%), followed by parents (3.1%), with 29.3% not specifying a source. A multiple logistic regression model revealed that students who reported receiving prescriptions from their peers were 7.68 times more likely to smoke, 7.27 times more likely to engage in heavy episodic drinking, 14.78 times more likely to have alcohol or other drug disorders, 24.61 times more likely to use marijuana in the past year, 23.55 times more likely to engage in other illicit drugs, and 12.49 times more likely to use other prescription drugs than those who did not report using prescription stimulants illicitly. Students who reported receiving prescription stimulants from family were 5.11 times more likely to smoke cigarettes, 3.76 times more likely to use marijuana in the past year, 7.43 times more likely to use other illicit drugs, and 6.49 times more likely to use other prescription drugs.

McCabe, Teter, and Boyd (2006a) also used the Student Life Survey to examine prevalence rates and factors associated with the nonmedical use of prescription stimulants among

college students. Drawing from the same sample as used by McCabe and Boyd (2005), McCabe, Teter, and Boyd analyzed the data using bivariate associations, chi-square tests, and logistic regressions to determine factors that predicted nonmedical use of prescription stimulants. They determined that students who were white, Greek affiliated and lived in a fraternity or sorority house, lived off-campus, had an annual income of $250,000 or more, were Jewish or had no religious affiliation, had a low GPA, and were previously exposed to prescription stimulants in secondary school were significantly more likely to engage in the nonmedical use of prescription stimulants. They also supported the claim that students received their prescription stimulants from peers.

A third study that utilized the Student Life Survey methodology and data from McCabe and Boyd (2005) was Teter et al. (2005). Their primary objective was to systematically evaluate the prevalence rate and motives for college students illicitly using prescription stimulants. Using the same aforementioned methodology, they used descriptive statistics for determining the average number of motives for use. Of the 8.1% that indicated illicit use, their results also indicated students' motives for using prescription stimulants were for increasing concentration, increasing alertness, and getting high. The chi-square analysis revealed that students who abused prescription stimulants also had higher rates of alcohol abuse compared to nonusers. Finally, they indicated that students who endorsed any of the aforementioned motives were also significantly more likely to have alcohol or other drug abuse.

Reasons for Use

The motivations and modes of acquisition for prescription stimulants are related to other substance use problems and represent a larger problem among college students centered on

multiple problem behaviors and drug abuse (Jessor et al., 1991). Students who received prescription stimulants from friends and endorsed motivations for illicitly using prescription stimulants were defined as a high-risk population (McCabe & Boyd, 2005). DeSantis, Webb, and Noar (2008) sought to understand how and why college students illicitly use prescription stimulants, and what motives increased their likelihood to do so. Specifically, they examined factors that led to initiating use, motives for continuing use, and how students acquired these drugs. Their data collection methodology included quantitative and qualitative approaches. The quantitative data was obtained from surveys administered to 1,340 students in an introductory communication theory class at one institution over three semesters. Their survey was a 25-item survey developed for their study. They followed the survey with 175 interviews. Of the 1,811 students that completed the survey, 63% first used prescription stimulants in college. During the interviews, DeSantis et al. (2008) found that students did not need to seek out information about using prescription stimulants. In fact, it was quite the opposite. Prescription stimulant use appeared to be a salient part of the campus culture and use was almost expected among students. Additional data from the interviews revealed that students initiated use during high levels of academic stress and anxiety. In terms of motivation, DeSantis et al. found two primary motives: academic motives and non-academic motives.

Seventy-two percent of the students that reported illicitly using prescription stimulants reported using them for staying awake to study longer, 66% indicated they illicitly used prescription stimulants for enhancing concentration, and 36% indicated it helped with memorizing information. Students reported the drugs helped them read 50 to 60 pages in one sitting. Additionally, students felt prescription stimulants assisted them during finals, particularly

with balancing multiple finals in a day. Recreational motivations were minimal, with only 7% indicating "getting high" as a reason for illicit use (DeSantis et al., 2008).

Like McCabe and Boyd (2005), DeSantis et al. (2008) found that 82% of students felt stimulants were "very easy" to "somewhat easy" to obtain. Additionally, 89% of the illicit users indicated they received the prescription stimulants from friends. Therefore, they suggest the increased access to these drugs, reasons for use, and pre-existing knowledge of these drugs may be contributing to the illicit use of stimulants by undergraduate students. Teter, McCabe, LaGrange, Cranford, and Boyd (2006) found results similar to De Santis et al. regarding motives for nonmedical use of prescription stimulants that support this theory.

Teter et al. (2006) used a multiple logistic regression to examine the differences between students who illicitly used prescription drugs and those who did not. They obtained a random sample of 4,580 students from a Midwestern institution and administered a web-based survey. The survey contained items regarding types of use, motivations for use, and basic demographics. They also provided students with an extensive list of prescription stimulants for determining which prescription was more popular among students. Chi-square analyses were calculated for comparing demographics such as sex, age, and age of initiation. The analyses revealed the lifetime use of prescription stimulants for students in this sample consisted of 8.3%, and a past-year use of 5.9%. Additionally, students preferred Adderall® (75.8%) to Ritalin® (24.5%). Students who illicitly used prescription drugs were three times more likely to be white and Hispanic compared to African American. The main reasons for illicitly using prescription stimulants were for helping with concentration (65.2%), studying more effectively (59.8%), and

increasing alertness (47.5%). Other secondary motives included getting high (31%) and experimentation (29.9%) (Teter et al., 2006).

McCabe, Boyd, and Teter (2009) specifically examined the link between the motivations for using prescription drugs and other substance abuse. They categorized the motivations for substance abuse into three categories: self-treatment, recreational, and mixed. They administered an online survey to a large university in the Midwestern region of the United States. The random sample consisted of 3,639 students. The analysis of the survey consisted of prevalence rates, bivariate associations, chi-square analyses, and one-way ANOVA to assess the associations between subtypes and frequency of nonmedical use of prescription drugs.

Among their sample, approximately 2.2% of students indicated using prescription stimulants for self-treatment, 1.6% indicated only using stimulants for recreational purposes, and 4.5% had mixed motivations for using stimulants. Men and women were equally likely to use prescription stimulants for self-medication, whereas men were more likely to use prescription stimulants for recreational purposes. Students who used prescription stimulants for recreation compared to those who self-medicated were 3.2 times more likely to use marijuana and other illicit drugs. Students that had mixed motivations, compared to students who used only for self-medication were 3.9 times more likely to use marijuana and four times more likely to have an alcohol disorder (McCabe et al., 2009).

Teter et al. (2006) and McCabe et al. (2009) contributed to the knowledge base by identifying that students were using prescription stimulants for self-medication, recreation, and mixed motivations. Additionally, students who used prescription stimulants for these reasons were also in danger of using other drugs. Ford and Schroeder (2009) expanded on this

information and evaluated academic strain and nonmedical use of prescription stimulants. They hoped to determine why students used prescription stimulants for academic purposes.

Ford and Schroeder (2009) evaluated the relationships between factors and academic strain. They found that illicit use of prescription stimulants was indirectly associated with academic purposes. They found that an increase in academic strain was significantly related to an increase in depression. The increase in depression was significantly related to the nonmedical use of prescription stimulants. Students undergoing academic strain tended to feel depressed, which resulted in their need for prescription stimulants.

Students' Beliefs and Perceptions

The research on prescription stimulant abuse suggests three motives for illicitly using these drugs. The motives are academic, recreational, and mixed use (Ford & Schroeder, 2009; McCabe et al., 2009; Prudhomme-White et al., 2006; Teter et al., 2006). Quintero, Peterson, and Young (2006) evaluated students' motivations for using prescription stimulants illicitly; however, they employed a qualitative methodology for studying the problem. They hoped to assess the acceptability of use among students, types of misuse, and any additional patterns.

Quintero et al. (2006) conducted 52 interviews in two phases. The first phase of interviews was semi-structured, focusing on types of prescription drug use, college drug use, personal experiences, social settings, and outcomes of using prescription drugs. The second stage of interviews consisted of semi-structured questions from the first interview, based on a structured ranking procedure developed from the first set of interviews. There were 19 participants in the second phase.

Three themes emerged from the interviews. The first theme related to types of misuse including self-medication of physiological conditions and states of affect, socio-recreational applications, and uses organized around academics. Adderall® (17.3%) and Ritalin® (25%) were the preferred drugs for academic work. The second theme related to students' perceptions regarding the acceptability of use. According to the participants, prescription stimulants and other prescription drugs were more acceptable than "hard drugs" such as cocaine, heroin, and speed. Prescription drugs were considered "soft drugs," socially and culturally acceptable because they are considered safe, made in a controlled lab, and prescribed by a doctor. Furthermore, students felt prescription stimulants and other drugs were acceptable because a user can still maintain a high level of functioning while using the drugs. There was also the perception that prescription drugs carry less addictive potential than hard drugs.

The perceived safety of the drugs was a major reason for students' willingness to engage in prescription drug abuse. Students indicated they had been exposed to these drugs for most of their life and familiarity with the drugs made experimentation easier. Additionally, individuals saw their friends using these drugs for various reasons and became aware of the side effects and actions of the drugs. Finally, the participants recognized college as a time for experimentation. Interestingly, they also indicated that upon graduation, this lifestyle was no longer accepted (Quintero et al., 2006).

Judson and Langdon (2009) surveyed students at two small New England colleges. Their sample size was 333, mostly female (72%), and white (89%). The survey measured ADHD symptoms, illicit use of stimulants, motives for illicitly using, and social acceptability of use.

They compared students with legal prescriptions to students without prescriptions who illicitly used prescription stimulants.

The two highest reported motives for use were improving concentration (28.8%) and staying awake (23.4%). The less common motives were recreational use including getting high (6.3%), controlling appetite (6.3%), and losing weight (3.6%). When comparing illicit users to nonusers, there was a significant difference between the social acceptability of using prescription stimulants. Illicit users felt the nonmedical use of prescription stimulants was ethical, and they were significantly less concerned regarding the health risks compared to nonusers. Furthermore, illicit users also had significantly more knowledge of the effects and side effects of the prescription stimulants than nonusers. Therefore, Judson and Langdon (2009) concluded students who perceive illicit use as ethical, self-diagnose, and have knowledge regarding the effects are more likely to illicitly use prescription stimulants. These data also suggest students who acquire information regarding prescription stimulant use are more likely to engage in the illegal behavior. Furthermore, the data suggest students who have experienced the effects do not feel remorse for illicitly using prescription stimulants.

Carroll, McLaughlin, and Blake (2006) contributed to this body of literature by exploring the perceptions among peers and the efficacy of using prescription stimulants illicitly. Of the 347 students who completed the survey at a single institution, 9.2% reported illicit use of prescription stimulants, 71.6% of students reported knowing peers that had illicitly used prescription stimulants, 44.3% knew someone who went to a doctor for a prescription knowing they did not have ADHD, and 53% knew someone selling their prescription to students. Students who indicated they had illicitly used prescription stimulants stated the main reasons for using were for

studying longer (96.8%), staying awake (96.8%), studying better (83.9%), and losing weight (51.7%). Students who indicated they had not used prescription stimulants but had friends that did, demonstrated a similar understanding of reasons of abuse. They believed students used prescription stimulants for studying longer (78.8%), staying awake (73.4%), studying better (64.7%), relaxing (27.5%), remembering more (28.5%), and losing weight (24.9%). These data suggest students are aware of the effects of the prescription stimulants even without illicitly using the drugs. Students who believed the myths that prescription stimulants helped individuals study better (Odds Ratio=3.17), stay awake (Odds Ratio=9.04), and lose weight (Odds Ratio=2.45) had a significantly greater chance of engaging in prescription stimulants use.

Rabiner et al. (2009) hoped to expand on this information and determine a motive's frequency for using prescription stimulants. Therefore, instead of asking whether a general motive was a factor, they wanted to know how often that motive was a factor in the decision for engaging in prescription stimulant use. They distributed a survey at two institutions, a public and private institution located in the Southeastern United States. The survey measured basic demographic information, use of nonmedical ADHD medication, motivations for said use, possible adverse consequences, ADHD symptoms, depressive symptoms, nonmedical use of other medications, substance use, and academic concerns.

The survey was distributed via email to 9,825 students and had a response rate of 35%. Of those that responded to the survey, 8.9% of the students reported nonmedical use of prescription stimulants (Rabiner et al., 2009). The three most frequently endorsed statements for the illicit use included concentrating better while studying, studying longer, and feeling less restless while studying. Sixty-one percent of students indicated these motives were "often" or

"always" a reason for illicitly using prescription stimulants. Students did not generally endorse using prescription stimulants for recreational purposes, which included feeling better, getting high, prolonging intoxicating effects of other substances, and losing weight. In fact, students who stated "often" or "always" for recreational motives accounted for only 2% to 6% of students (Rabiner et al., 2009).

Sensation Seeking

Low and Gendaszek (2002) studied whether students' need for perfection and sensation seeking contributed to their nonmedical use of prescription stimulants. They collected data on students' motivation for illicitly using prescription stimulants on two personality dimensions, perfectionism and sensation seeking. They used a convenience sample of 150 students from various undergraduate psychology classes at a single institution. Students were asked whether they have engaged in nonmedical use of prescription stimulants or street amphetamines including cocaine and ecstasy. Additionally, they used two scales for assessing perfectionism and sensation seeking. For evaluating perfectionism, they used the Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblatt, 1990) and the Sensation Seeking Scale (Zuckerman, Kolin, Price, & Zoob, 1964) for evaluating sensation seeking. In order to analyze whether sensation seeking and perfectionism related to illicit stimulant use, they conducted a 2x2 ANOVA with the illicit use of prescription stimulants as the dependent variable.

From the sample of 150, 24% indicated using both Ritalin® and Adderall®. Only 4% indicated using Adderall® and 7.3% indicated only using Ritalin®. Students reported the primary motivations for using prescription stimulants as improving intellectual performance (23.3%), improving efficiency with academics (22%), and using in combination with alcohol

(19.3%). The 2x2 ANOVA revealed that students that were high sensation seeking perfectionists had the greatest self-reported abuse rate of prescription stimulants. Additionally, sensation seeking was a significant main effect for predicting prescription stimulant abuse (F=8.8, (1,145), p = .004); however, perfectionism was not significantly related to self-reported use of prescription stimulants (F=0.011, (1,145), p = .92) (Low & Gendaszek, 2002).

The data from Low and Grandaszek (2002) indicated that students who had high sensation seeking attitudes were more likely to illicitly use prescription stimulants than those with low sensation seeking attitudes. However, what was unclear from Low and Grandaszek's (2002) study was students' perceptions of the harmfulness of use, and whether that affected their willingness to engage in prescription stimulants.

Arria, Caldeira, Vincent, O'Grady, and Wish (2008) filled this gap by evaluating students' level of sensation seeking as it relates to perceived harmfulness for illicitly using prescription stimulants. A screening survey was administered to 3,401 incoming students attending orientation at a large Mid-Atlantic institution considered diverse. Students who indicated never illicitly using prescription stimulants were excluded from the survey. After the initial screening, personal interviews, including questions on sensation seeking and drug use, were conducted with 1,253 first year college students. Investigators followed up with participants twice, at 6-month intervals. At the 12-month follow-up interview, drug use was again assessed. Students who never reported drug use were excused from the study. The students were assessed in two areas. The first was sensation seeking, which involved a self-administered survey based on the Zuckerman-Kuhlman Personality Questionnaire Short Form (Zuckerman et al., 1964). This survey consists of seven-item subscales measuring impulsive sensation seeking, need for

excitement, unpredictability, and need for new experiences, as well as the tendency for impulsive actions. The other independent variable was perceived harmfulness. This survey included questions based on the MTF survey. The dependent variables of the study included the nonmedical use of prescription drugs that consisted of a set of expanded questions based on the NSDUH survey. Weighted frequencies were used for assessing the perceived harmfulness of prescription stimulants. Additionally, weighted frequencies were calculated for cocaine, marijuana, and alcohol serving as a base for comparison. A series of logistic regression models were calculated to assess the relationship between the perceived harmfulness and nonmedical use of prescription stimulants. The interaction between perceived harmfulness and sensation seeking was also tested in the full logistic regression model (Arria, Caldeira, Vincent, et al., 2008).

Students who associated "great risk" with the nonmedical use of prescription stimulants accounted for 25.2% of the sample. The comparisons between cocaine (72.2%), marijuana (7.2%), alcohol (17.4%), and nonmedical prescription stimulant use (25.2%) indicated prescription stimulants were perceived as less risky than cocaine, but more risky than marijuana and drinking five or more alcoholic drinks every weekend. Students that had a low level of perceived harmfulness were 10.3 times more likely to use prescription stimulants, but only 1.1 times more likely with a high level of sensation seeking. Students with prior experience using prescription drugs were 4.6 times more likely to illicitly use prescription stimulants. Overall, students with a low level of perceived harmfulness and a high level of sensation seeking were more likely to illicitly use prescription stimulants than students with a high level of perceived harmfulness and a low level of sensation seeking (Arria, Caldeira, Vincent, et al., 2008).

Poly-substance Behavior

The findings from Rabiner et al. (2009), Carroll et al. (2006), Low and Gendaszek (2002), and Arria, Caldeira, Vincent, et al. (2008) present further evidence that at-risk students are those who do not perceive prescription drugs as dangerous. Students who perceive these drugs to be harmful are less likely to use these drugs illicitly. This information suggests that students who use prescription stimulants have a low level of perceived harmfulness and a high level of sensation seeking, thus making them vulnerable for other substance use. Teter, McCabe, Boyd, and Guthrie (2003) undertook the challenge of identifying other substance abuse behaviors among college students nonmedically using prescription stimulants.

Utilizing the Student Life Survey, Teter et al. (2003) sampled 3,500 full time students at the University of Michigan. They used a chi-square analysis for comparing student demographics, prescription drug use, and alcohol use among three specific groups. These three groups included students who used prescription stimulants not prescribed by a doctor, students who reported taking the stimulants as prescribed by a doctor, and students who reported no illicit use. One-way ANOVA statistical test was also used for comparing these three groups across multiple continuous measures. The final test conducted was a multiple logistic regression, which was used for predicting other factors that may be associated with students' illicit use of prescription stimulants.

The final sample size was 2,250, with a response rate of 64%. Of those students who reported illicitly using prescription stimulants, 2% initiated use in junior high school, 19% initiated in high school, and 79% began in college. Teter et al. (2003) found that students who illicitly used prescription stimulants were significantly more likely to use other substances in the

past month and past year. For example, students who reported taking Ritalin®, also reported taking eight times more drugs than students who had not illicitly used it. Additionally, students with three or more sexual partners in the past year were 17.04 times more likely to have used other prescription stimulants. The substance abuse patterns of students who illicitly used prescription stimulants consisted of users reporting significantly more alcoholic drinks than nonusers, and they were significantly more likely to use other substances. One such example includes marijuana and ecstasy where 100% and 58% of students reported using those drugs, respectively. The rate of use suggests that students who partied five to nine hours a week were twice as likely, and those who partied 10 or more hours a week were four times more likely, to use prescription stimulants illicitly.

College students use of other drugs with prescription stimulants was also confirmed by Arria, Caldeira, O'Grady, et al. (2008), who interviewed 1,253 students regarding their extent of use. The results confirmed previous findings regarding the characteristics of students' use, and identified risk factors for students who illicitly used prescription stimulants. They targeted the freshmen class at a large public university in the mid-Atlantic region. After their two-stage sample selection process, they selected 1,253 students for interviews. They interviewed the students in four areas: medical use of prescription stimulants for ADHD and overuse of prescription stimulants, nonmedical use of prescription stimulants, nonmedical use of other prescription drugs and illicit use, and dependence on alcohol and marijuana.

Using data from the screening surveys, they generated descriptive statistics and logistic regressions for predicting factors associated with the nonmedical use of prescription stimulants. In total, 45 students reported illicitly using prescription stimulants in their sample. Of those

students, 88.7% used marijuana in the past year. After controlling for demographic factors such as race, gender, and mother's education, they determined students who had a prescription for stimulant medication that used it against doctors' orders were significantly more likely to use hallucinogens, cocaine, ecstasy, and prescription tranquilizers. Additionally, students without a prescription who illicitly used prescription stimulants were almost twice as likely to abuse alcohol and were four times more likely to use marijuana.

Herman-Stahl, Krebs, Kroutil, and Heller (2007) explored the risk factors associated with prescription drugs and substance abuse by looking at students' psychosocial state and overall behavior, not just other substance use. Using the NSDUH data from 2002, they conducted logistic regressions analyses of the following measures: demographic, psychosocial, and behavioral correlates of nonmedical stimulant use. The logistic regression analyses revealed students with lower levels of religiosity, higher levels of psychological distress, and high levels of deviant behavior were likely to engage in prescription stimulants and other illicit drugs

Rabiner, Anastopoulos, Costello, Hoyle, and Swartzwelder (2010) conducted a study with a similar purpose to Herman-Stahl et al. (2007); however, they did not use a national dataset. They developed a survey designed for eliciting information on a variety of measures such as demographics, nonmedical use of prescription stimulants, alcohol and drug use, attention difficulties, academic concerns, depressive symptoms, and nonmedical use of other medications. They surveyed 843 students who were from a public or a private university in the Southeastern United States.

In order to determine the factors that predict the onset of nonmedical use of prescription stimulants, Rabiner et al. (2010) used a multiple logistic regression. Central tendencies were also

calculated to identify factors that might predict stimulant use. The analyses revealed students affiliated with fraternities and sororities were twice as likely to engage in the illicit use of prescription stimulants. Additionally, for each substance students abused, the likelihood for them engaging in prescription stimulants increased three-fold. Students who believed they had attention problems, but had no other substance abuse history, were five times more likely than nonusers to engage in the felonious behavior. However, for students who were high substance users, the level of self-perceived attention difficulties did not contribute to their decision for illicitly using prescription stimulants (Rabiner et al., 2010).

It is evident from Rabiner et al. (2010), Herman-Stahl et al. (2007), and Arria, Caldeira, O'Grady, et al. (2008), that nonmedical use of prescription stimulants is associated with other problematic behaviors. McCabe, Cranford, and Boyd (2006) explored this relationship as it related to alcohol and past-year drinking behaviors. They used the 2001 – 2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) on a nationally representative sample of 43,093 students aged 18 and older. The sample was primarily white (71%) and balanced between men and women (48% vs. 52%). The measures of the survey included basic demographic information, alcohol use disorders, and nonmedical use of prescription drugs. The analysis consisted of a series of logistic regressions for assessing the relationship between alcohol use and nonmedical prescription drug use. College students were more likely to be binge drinkers and prescription stimulant users. In fact, students who used prescription stimulants were 36.2 times more likely to have an alcohol dependence problem, and 7.8 times more likely to abuse alcohol. They were also five times more likely to binge drink without an alcohol disorder. This information confirms previous studies' suspicions that students

are more likely to engage in prescription stimulant use when they are engaging in other risky behaviors such as marijuana and alcohol (McCabe, Cranford, et al., 2006).

McCabe and Teter (2007) provided additional information regarding the relationship between students illicit use of prescription stimulants and other substance abuse. Their primary purpose was comparing drug use related problems between nonmedical prescription stimulants and other types of drug users in hopes of identifying characteristics discerning between the two populations. This study was part of a larger study in 2005 and included a sample of 3,639 students from a large Midwestern institution. The survey assessed four measures: nonmedical use of prescription stimulants, past year drug use, routes of administration, and drug use related problems.

The prevalence rate of illicit stimulant use for this population was 6.5% for past year and 8% for lifetime use. This was the second highest rate of drug use compared to the 35.5% reporting marijuana use. Characteristics of students that used prescription stimulants and other drugs included being white, possessing a high family income, and Greek affiliation. Of this sample, over 90% of students reported using prescription stimulants and other drugs. Students engaging in this behavior were significantly more likely to have an alcohol disorder. The logistic regression revealed that students who ingested prescription stimulants intranasally were nine times more likely to engage in other drug-related recreational activities (McCabe & Teter, 2007).

Barrett, Darredeau, Bordy, and O' Pihl (2005) examined prescription stimulant use as it relates to other substance use. However, their primary objective was evaluating the pattern of other substance use among students who used prescription stimulants for academic purposes compared to students who used it recreationally. They interviewed 100 students from McGill

University. Half of the students admitted illicitly using prescription stimulants, while the other half were considered nonusers. The students were matched for age, sex, and ethnicity to help provide further control over the study (Barrett et al., 2005).

The interviews focused on routes of administration, substances of abuse, and motivations for use. After collecting their data, they used sample t tests for identifying differences between the two groups of students. Furthermore, they compared students who used stimulants recreationally and exclusively for academics. The results confirmed students who used prescription stimulants were more likely to use other substances. Students who illicitly used prescription stimulants were seven times more likely to use other substances compared to nonusers. However, what was different about these results from other studies was the comparisons between students' academic and recreational use. Students who reported using stimulants exclusively for academics were significantly less likely to use the drug intranasally, and were less likely to use the drug with other substances. Furthermore, students who used prescription stimulants exclusively for academics reported less use of ecstasy, cocaine, and methamphetamine. This information suggests a distinct difference between students who use prescription stimulants for academics compared to those who use stimulants recreationally (Barrett et al., 2005).

It is evident from the literature that the use of prescription stimulants is occurring nationally, most especially on college campuses. Furthermore, the research suggests prescription stimulant use is not an isolated behavior. Students who use prescription stimulants are at risk for engaging in other illicit drugs and abusing alcohol at an increased rate.

Summary

Extensive research has been conducted regarding prescription stimulants in terms of the motivations for use, perceptions of, beliefs about, prevalence, and rates of abuse. College students are primarily using prescription stimulants for academic and recreational purposes. Additionally, students are self-diagnosing attention deficit disorders and are seeking the medication for prescription stimulants. This behavior comes with a serious risk, which is an increase in other substance abuse for those students who use the drugs recreationally and academically.

However, there is a distinct gap in the existing literature regarding the information known about prescription drug abuse. First, it is known students use for either recreational, academic, or mixed reasons. As is most pertinent to this study, the trend data suggests students between the ages of 21 and 25 are also at risk for abusing prescription stimulants; however, there is no information about the illicit use of prescription stimulants among this group. Yet a large student group, graduate students, belongs to this age group.

The research conducted thus far on prescription stimulant abuse has focused on undergraduate students. The exhausting literature does not mention graduate students or the prevalence rates, risk factors, or polysubstance abuse relationships among graduate students in spite of the fact that many graduate students fall within the age range of high risk users, 21 to 25 (Johnston et al., 2010; Substance Abuse and Mental Health Services Administration, 2010). Further research is needed on graduate students' illicit use of prescription stimulants and whether they are at the same risks as undergraduate students for polysubstance use.

CHAPTER III

Methods and Procedures

The purpose of this study is to measure graduate student prescription stimulant use by assessing the extent of use, reasons for use, and poly-substance use.

The three research questions guiding this study were:

1. What is the extent of prescription stimulant abuse among graduate students on college campuses?
2. What are the reasons for graduate students' illicit use of prescription stimulants?
3. Are graduate students who abuse prescription stimulants more likely to abuse other substances?

This chapter details the methods and procedures used in the conduct of the study. The chapter includes a description of the study design, site and population, instrumentation, and procedures undertaken in implementing the study as well as collecting and analyzing the data.

Design of the Study

Research Design

The study employed a cross-sectional survey research design using an online, self-administered questionnaire to assess the prevalence rates of prescription stimulant use among graduate students, reasons for use, and graduate students' likelihood for poly-substance use. Survey design allows for reaching a large number of participants and securing a breadth of responses. This method also allows for generalizations to be made about the target population's use of prescription stimulants (Creswell, 2003).

Site and Population

The target population for this study was part-time and full time graduate students enrolled at a public university in the Southeast, classified by the Carnegie Commission as a research university with very high research activity. The university has an overall student population of 27,500. The graduate student population accounts for approximately 6,000 students. The overall student population is approximately 51% male and 49% female. With respect to graduate students, males account for 47%, and females account for 53%. Of the 6,000 graduate students, the international population constitutes 844 graduate students from 114 countries.

The academic programs vary across both undergraduate and graduate levels. The university offers more than 300 undergraduate degree programs, and has more than 1,400 faculty. The university offers 60 doctoral degrees, 81 master's degrees, three specialist degrees, three professional programs, and 31 graduate certificate programs in eleven colleges.

Instrumentation

A single instrument was used to gather data from the participants about their use of prescription stimulants. The instrument is the Student Life Survey (SLS) (CJ Boyd & McCabe, 2010), which was originally developed and pilot tested for undergraduate and graduate students in 1993 and 1999 (McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002). However, graduate students have not been a part of the survey for the past ten years (C. Boyd, personal communication, June 17, 2011). The development of the survey originally included graduate students in addition to undergraduate students, which suggests it is acceptable to use the SLS on graduate students for this study.

The original survey includes items from the Monitoring the Future survey, CORE survey, and the College Alcohol Study (Bostwick et al., 2007; Johnston, O'Malley, & Bachman, 1999; Presley, Meilman, & Cashin, 1996; Wechsler, Lee, Kuo, & Lee, 2000). Boyd and McCabe (2010) created additional survey items pertaining to demographics and ADHD symptoms. This is the survey used for this study, with modifications as indicated.

The Student Life Survey (SLS) used in the study consists of a demographic section with nine questions. It includes items that appear on the original survey such as gender, age, race/ethnicity, and family income. Additional demographic items have been added to accommodate the graduate student population. These items include enrollment status, marriage status, native country, and English as first language.

The survey then consists of 65 questions from the original survey that asks about the prevalence and use of illegal drug use, including marijuana, cocaine, LSD, other psychedelics, crystal meth, heroin, inhalants, ecstasy, and the illicit use of prescription drugs, specifically opiates and stimulants. There are four questions specifically addressing illicit drugs followed by 46 questions addressing the illicit use of prescription stimulants (23 questions) and opiates (23 questions), which are dependent upon a participant's response to using prescription stimulants or opiates. The questions on prescription opiates and stimulants seeks the respondents' perceptions about prescription stimulants and opiate use, attitudes toward substance abuse, lifetime and past month use, age of initiation, and types of prescription drugs used. There are eight questions regarding symptoms for Attention Deficit Hyperactivity Disorder. A copy of the survey used in the study appears in Appendix A.

Reliability and Validity of the Student Life Survey

The survey instrument was developed using previously tested items from national studies, including the Monitoring the Future, CORE study, and the College Alcohol Study (Bostwick et al., 2007; Johnston et al., 1999; Presley et al., 1996; Wechsler et al., 2000). Additionally, the Student Life Survey was pilot tested twice during its development. The developers of the survey instrument have not conducted validity or reliability tests; however, since its development, the Student Life Survey has been used in studies published in numerous journals indicating its acceptance as a reliable and valid instrument (Bostwick et al., 2007; C Boyd, McCabe, & d'Arcy, 2003; McCabe, Boyd, Hughes, & d'Arcy, 2003; McCabe et al., 2009; McCabe, Teter, & Boyd, 2005; McCabe & Teter, 2007; Teter et al., 2005; Young, Morales, McCabe, Boyd, & d'Arcy, 2005). The principal investigator sent Sean McCabe, the co-principal investigator of the Student Life Survey, the survey for this study. He confirmed the survey was almost identical to the SLS and should properly measure prescription stimulant abuse among graduate students (S. McCabe, personal communication, September 15, 2011). Additionally, to further validate the survey for this study, the principal investigator convened a panel of professionals to review the survey to establish construct validity, which has been cited as an acceptable means of validity (Colton & Covert, 2007). The professional panel also confirmed the survey for this study should properly measure prescription stimulant abuse among graduate students.

Procedures

After securing IRB approval from The University of Tennessee, Knoxville for conducting the research study, the principal investigator distributed the online survey via email to all graduate students at the selected institution. The email addresses were obtained from the

institution's Office of the Registrar. The email sent to participants introduced the research and the researcher, described the nature and purpose of the study, the time commitment for participating (15 to 20 minutes), and explained that all data would be aggregated for reporting purposes, thereby ensuring that the identity of the institution and of individuals participating would be protected.

Additionally, the email explained that participants could enter a drawing to win one of 10 $25 Amazon gift certificates by the last week of January and the drawing taking place the second week in February. The information collected for the drawing would be solicited and kept separately from the survey for this study; thus, further protecting the identity of participants and the institution. The email concluded with instructions for accessing the online survey and a statement indicating proceeding to the survey would constitute informed consent. A copy of this e-mail can be found in Appendix B.

After accessing the hyperlink, participants were directed to the informed consent to review and print for their records. The informed consent repeats the information about the study contained in the email. In addition, the informed consent outlines potential risks, identity and institution protection measures, incentive information, contact information for drug use or the like, and contact information for the principal investigator, advisor, and Office of Research overseeing the conduct of this study (see Appendix C). The conclusion of the informed consent provided a hyperlink to the research survey with a statement informing participants that proceeding to the survey implied informed consent.

After distributing the first email, the principal investigator waited a week and sent another email, almost identical to the first email, to each participant. The principal investigator

waited an additional week and sent a third email to all participants. The second and third emails were identical (see Appendix D). The identity of those who chose to participate was protected by sending emails to all graduate students multiple times. In order to protect participants further, the email list was destroyed after the third email was sent. Students' responses remained anonymous since an individual email was sent to each student requesting participation, thereby protecting participants from seeing other participants email addresses. If students chose to respond to the survey, their answers were not linked to their email address or IP address, thus protecting their identity and responses.

The survey data were initially stored on Psychdata's servers, the host for the online survey, while survey data were being collected. The data were encrypted and not made available to anyone other than the principal investigator. Upon analysis, the data were downloaded to the primary investigator's external hard drive, which is double password protected. Furthermore, the external hard drive will be stored in a locked desk drawer in the principal investigator's office at 1021 Francis St., Knoxville, Tennessee. The data were deleted from the server after being downloaded and properly secured. The data will be destroyed from the principal investigator's external hard drive in five years, in accordance with Department of Defense 5220 deletion standards.

Data Analysis

The data were imported into the statistical package SPSS 20 and cleaned for any possible outliers and missing data. There were no outliers in the dataset. Participants' answers were deleted if they quit the survey before completion.

In order to answer research question one, What is the extent of prescription stimulant abuse among graduate students on college campuses?, descriptive statistics were calculated. These included frequencies, means, and percentages identifying the prevalence of prescription stimulant use by graduate students.

To answer research question two, What are the reasons for graduate students' illicit use of prescription stimulants?, central tendencies and frequencies were calculated.

To answer question three, Are graduate students who abuse prescription stimulants more likely to abuse other substances?, a stepwise logistic regression was calculated to determine the relationships between prescription stimulant abuse and illicit use of other substances such as cocaine, marijuana, ecstasy, LSD, steroids, inhalants, and psychedelics. The logistic regression analysis provides an odds ratio for determining the likelihood a participant who illicitly uses prescription stimulants will engage in other deviant behavior such as smoking marijuana or consuming cocaine. Additionally, the logistic regression was the most appropriate test because the dependent variable was binomial (Tabachnick & Fidell, 2007). Furthermore, logistic regression accounts for significantly unequal group sizes between those who used prescription stimulants and those who did not (Tabachnick & Fidell, 2007). The independent variables included alcohol use, drug use, reasons for use, and frequency of use.

CHAPTER IV

Findings of the Study

The purpose of this study is to measure graduate student prescription stimulant use by assessing the extent of use, reasons for use, and poly-substance use. Graduate students enrolled at a large Southeastern university completed the Student Life Survey (CJ Boyd & McCabe, 2010). The data were analyzed using descriptive statistics, frequencies, and a stepwise logistic regression in order to answer the research questions guiding this study:

1. What is the extent of prescription stimulant abuse among graduate students on college campuses?
2. What are the reasons for graduate students' illicit use of prescription stimulants?
3. Are graduate students who abuse prescription stimulants more likely to abuse other substances?

The findings of the study are presented in this chapter. Following the demographic description of the participants in the study, the findings are presented in terms of three research questions.

Demographic Data

The 5,042 graduate students at the selected university were invited to participate in the study. Of this population, 1,015 graduate students completed the study for a 20% response rate. The participants included 314 males (31.7%) and 658 females (66.3%), with 37 participants not reporting their gender (3.6%). The average age of participants was 29.7 years old. The majority of respondents were 23 years old (12.4%), 24 years old (11.7%), and 25 years old (10.3%).

The majority of graduate students who responded to the survey were Caucasian (873; 88%), followed by African Americans (40; 4.1%), Asian (25; 2.5%), Hispanic/Latino (19; 1.9%), and American Indian (11; 1.1%). Twenty-three (2.2%) graduate students opted not to disclose their race. Full-time master's students accounted for 37.3% (370) of participants, while full-time doctoral students accounted for 31.9% (312). Part-time master's students were 13.3% (132) of the population, while part-time doctoral students were 5.8% (58). Professional students accounted for 8.9% (88) of the population.

The majority of participants indicated they had an annual income of less than $30,000 (633, 64.8%); 13.9% (138) indicated an annual income between $30,000 and $49,000; and 12.5% (122) indicated an annual income of $50,000 to $99,999. A majority of the participants were single (542, 54.6%) or married (376, 37.9%). A small percentage was divorced or separated (43, 4.3%).

Findings

Research Question 1: What is the extent of prescription stimulant abuse among graduate students on college campuses?

The Student Life Survey solicited information about the students' use of prescription stimulants throughout their life by asking, "In your lifetime, have you ever taken prescription stimulant medication for ADHD, not prescribed to you by a doctor?" Additionally, the survey solicited information about the illicit use over the past twelve months without a prescription by asking "On how many occasions in the past twelve months have you used prescription stimulant medication for ADHD, not prescribed to you?" Of the 1,015 graduate students responding to these questions, 15.8% (157) indicated illicit use of prescription stimulants without a prescription

over their lifetime. Females accounted for 57% (91) compared to 41% (65) of males indicating illicitly using prescription stimulants within the past year. Graduates students between the ages of 23 and 29 accounted for 64.9% (102) of those illicitly using prescription stimulants over their lifetime.

Individuals with incomes of less than $30,000 accounted for 70% (110) of those illicitly using prescription stimulants whereas individuals with an income of $30,000 to $49,999 accounted for 14%. Full-time masters (63, 40%) and doctoral students (50, 31.8%) accounted for the largest number of individuals illicitly using prescription stimulants. Professional students (19, 12.1%), part-time masters students (11, 7%), and part-time doctoral students (8, 5%) followed, in that order. Caucasian students accounted for 91% (143) of those illicitly using prescription stimulants. Two (1%) African Americans indicated illicit use as well as one Asian, four (2.5%) American Indians, two (1%) Hispanics; 11 participants did not identify their race/ethnicity.

Graduate students that responded in the affirmative for taking prescription stimulants without a prescription over their lifetime were asked, “On how many occasions in your lifetime have you used prescription stimulant medication for ADHD not prescribed to you?” Of the 1,015 participants, 4.6% indicated illicitly taking the drug one to two times over their lifetime; 4.0% indicated three to five times; 1.9% indicated six to nine times; 2.1% indicated 10 to 19 times; 1.4% indicated 20 to 39 times; and 1.3% indicated they had taken prescription stimulants without a prescription 40 or more times. Most of the 157 graduate students (106, 67.5%) had not taken prescription stimulants in the past twelve months. A small percentage (51, 5.1%) of the 157 graduate students reported taking prescription stimulants within the past twelve months without a prescription; the other 95% had illicitly taken prescription stimulants not within the past twelve

months, but at some other point during their lifetime. Those respondents indicating use in the past twelve months were asked, “On how many occasions in the past 12 months have you used prescription stimulant medication for ADHD, not prescribed to you?” Of the 51 students who had taken prescription stimulants in the past twelve months, 27(17.2%) had taken them on one to two occasions, 10 (6.4%) had taken the drugs on three to five occasions, seven (4.5%) had used them on six to nine occasions, and seven (4.5%) on 10 to 39 occasions within the past twelve months. Additionally, of those 51 students who took a prescription stimulant without a prescription in the last twelve months, only 16 (31.3%) had done so within the last thirty days.

The drug of choice for graduate students who illicitly used prescription stimulants without a prescription over the past twelve months was Adderall® (36, 70.6%). The second most popular drug was Adderall® XR (19, 37.3%), followed by Vyvanse® (12, 23.5%). Nine graduate students (17.6%) indicated using Concerta, and four indicated Ritalin® (7.8%).

Graduate students that used prescription stimulants without a prescription in the last twelve months obtained the drugs primarily from friends who were not graduate students (76, 48.4%). Twenty-two graduate students indicated both a friend who was a fellow graduate student (14%) and an acquaintance who was not a graduate student (14%) as the source for the drug. Some students reported they obtained the prescription stimulants from roommates (19, 12.1%), romantic partners (17, 10.8%), siblings (11, 7%), or a drug dealer (7, 4.4%).

Research Question 2: What are the reasons for graduate students’ illicit use of prescription stimulants?

Graduate students that indicated illicit use in their lifetime were asked to “provide the reason(s) why you used stimulant medication not prescribed to you.” Graduate students indicated

academic reasons as the primary reason for illicitly using prescription stimulants. A majority of graduate students (106, 67.5%) indicated they illicitly used prescription stimulants to concentrate better while studying; 56% (88) to increase their alertness in order to study longer, or 36.31% (57) to concentrate better while working. Furthermore, some graduate students took the drugs to enhance their academic performance (50, 31.85%) or help keep track of academic assignments (11, 7.01%). Other reasons included using the simulants illicitly to prolong the effects of other substances such as alcohol (20, 12.74%), experimentation (32, 20.38%), to get high (28, 17.83%), self-medicate (18, 11.46%), to lose weight (12, 7.64%), calm down while working (18, 11.46%), increase alertness while driving (9, 5.73%), prevent other students from having an academic edge (6, 3.82%), or because it is safer than street drugs (5, 3.18%).

Participants indicated other, non-academically–related reasons for taking prescription stimulants. The other responses indicated by respondents included running out of insurance coverage to obtain own prescription, running out of a personal prescription when the stimulant was needed, a girlfriend who was taking the drugs persuaded the respondent to take stimulants, to enhance sexual intercourse, to complete domestic chores more quickly and effectively, and to test whether the stimulants were effective and worth obtaining a prescription.

As indicated in Table 1, women indicated academics slightly more often than men as a reason for illicitly using prescription stimulants. In terms of recreational reasons, men and women had comparable responses. Women indicated using prescription stimulants to lose weight. Women were the only ones to indicate losing weight as a reason for using prescription stimulants illicitly.

Table 1
Reason for use by Gender

	Men	Women
To increase my alertness while driving	5	4
To get high	14	14
To counteract the effects of other drugs	2	2
To concentrate better while studying	46	60
To increase my alertness in order to study longer	35	52
To lose weight	0	12
To enhance my athletic performance	0	0
To prolong the intoxicating effects of alcohol or other substances	9	11
To prevent other students who do this from having an "edge" over me academically	3	3
To feel restless while studying	5	2
Because I have ADHD	8	10
To keep better track of my class assignments	4	7
To concentrate better while working	27	29
To feel less restless while working	10	8
Because I'm addicted	1	1
Because it's safer than street drugs	3	2
To enhance my academic performance	26	23
To increase my alertness in order to work longer	18	27
To experiment	14	18

Research Question 3: Are graduate students who abuse prescription stimulants more likely to abuse other substances?

A stepwise logistic regression analysis was used to answer research question three because of logistic regression's predictive power. A six step logistic model was constructed to analyze whether using prescription stimulants without a prescription in their lifetime increased the likelihood graduate students would abuse marijuana, cocaine, ecstasy, heroin, steroids, inhalants, psychedelics, crystal meth, or LSD. The stepwise logistic regression model produced two blocks: the beginning model (Block 1) and the subsequent model. Block one controlled for gender, race, and income. Without controlling for gender, race, and income, the model failed the Hosmer and Lemeshow Test indicating the model did not adequately fit the data; therefore, the model could not accurately predict correct classification of illicit stimulant use. Block 2 began the forward stepwise logistic regression for marijuana, cocaine, ecstasy, heroin, steroids, inhalants, psychedelics, crystal meth, and LSD. Step one added marijuana, step two added LSD, step three added ecstasy, step four added crystal meth, step five removed LSD, and step 6 added cocaine. Steroids, heroin, and inhalants were not entered into the model because no respondent indicated using these drugs within the last twelve months.

The step with the best goodness of fit was selected, which was the sixth. The sixth step included yearly use of marijuana, cocaine, crystal meth, and ecstasy. The sixth step passed the Hosmer and Lemeshow test (χ^2 (7) = 11.501, p = .074) as a good fit for the data, indicating illicit stimulant use significantly predicts polysubstance use. Additionally, step six had the lowest -2Log Goodness of Fit value of 699.515 (χ^2 (6) = 123.439, p < .001) with a Cox & Snell R^2 of .123 also indicating the model to be a good fit for the data.

The classification metrics indicate the sensitivity and specificity of the model in predicting illicit use of illegal drugs and prescription stimulants. In other words, as indicated in Table 2, the classification table indicates the accuracy for predicating illicit use of prescription stimulants. Of those that did not illicitly use prescription stimulants, 97.2% were correctly classified and 24.8% of those who did illicitly use prescription stimulants were also correctly classified, which presented an overall correct classification of 86%. The model was able to correctly predict those who illicitly used prescription stimulants 24.8% of the time, and for those who did not illicitly use prescription stimulants, the model was able to successfully predict respondents 97.2% of the time for an overall correct predication rate of 86%.

Table 2
Classification Table[a]

Observed			Predicted		
			Illicit use		Percentage
			No	Yes	Correct
Step 1	Illicit use	No	772	22	97.2
		Yes	112	37	24.8
	Overall Percentage				86.0

a. The cut value is .500

As indicated in Table 3, the odds of a graduate student who uses prescription stimulants illicitly in his or her lifetime was negatively related to yearly use of crystal meth (χ^2 (1) = < .001, p = .999), but positively related to yearly use of marijuana (χ^2 (1) = 61.149, p = < .001), cocaine (χ^2 (1) = 7.129, p = .008), and ecstasy (χ^2 (1) = 4.989, p = .026). In other words, graduate students that illicitly used prescription stimulants were 1.5 times more likely to use marijuana, 6.3 times more likely to use cocaine, and 2.4 times more likely to use ecstasy. The model controlled for race (χ^2 (1) = 1.972, p = .160), gender (χ^2 (1) = .632, p = .427), and income (χ^2 (1) = .182, p =

.669). Race, gender, and income were non-significant findings indicating little to no impact to predict polysubstance use. Table 3 identifies all of the variables in the equation and the level of prediction within the model.

Table 3
Summary of Logistic Regression Analysis Predicting Poly-substance Abuse

		β	S.E.	Wald	df	*p*	Exp(B)
Step 6 [a]	Race	.502	.358	1.972	1	.160	1.653
	Gender	-.163	.205	.632	1	.427	.850
	Income	-.027	.062	.182	1	.669	.974
	Marijuana	.429	.055	61.149	1	< .001	1.536
	Cocaine	1.854	.694	7.129	1	.008	6.386
	Crystal Meth	-5.854	5741.853	< .001	1	.999	.003
	Ecstasy	.894	.400	4.989	1	.026	2.445
	Constant	.401	5741.853	< .001	1	1	1.493

a. Variable(s) entered on step 1: Marijuana. Variable(s) entered on step 2: LSD. Variable(s) Entered on step 3: Ecstasy. Variable(s) entered on step 4: Crystal Meth. Variable(s) entered on step 6: Cocaine. Variables controlled for are Race, Gender, and Income.

CHAPTER V

Summary, Discussion, and Conclusions

Prescription stimulant use among undergraduate students is a well-documented area of concern. Additionally, it is evident from the research that undergraduate students who illicitly use prescription stimulants are more likely to illicitly use other illegal drugs such as marijuana, LSD, cocaine, crystal meth, and other prescription drugs. In contrast, we know almost nothing about the use of prescription stimulants by graduate students.

The purpose of this study was to measure graduate student prescription stimulant use by assessing the extent of use, reasons for use, and poly-substance use. Graduate students (n = 1,015) enrolled at a large Southeastern university completed the Student Life Survey (CJ Boyd & McCabe, 2010). The data were analyzed using a variety of analytical techniques including descriptive statistics, frequencies, and a stepwise logistic regression in order to answer the research questions guiding this study:

1. What is the extent of prescription stimulant abuse among graduate students on college campuses?
2. What are the reasons for graduate students' illicit use of prescription stimulants?
3. Are graduate students who abuse prescription stimulants more likely to abuse other substances?

Following is a summary of the findings, discussion of the findings, conclusions, implications of the study, and recommendations for further research.

Summary of Findings

1. Of the 1,015 respondents, 15% of graduate students indicated lifetime illicit use of prescription stimulants, and 5.1% indicated illicit use of prescription stimulants within the last twelve months.

2. For those graduate students who had illicitly used prescription stimulants within the last twelve months, Adderall® (70.6%) was the drug of choice followed by Adderall XR® (37.3%) and Vyvanse® (23.5%).

3. For those graduate students that had illicitly used prescription stimulants within the last twelve months, 48.4% of them obtained the prescription stimulants from friends not in graduate school; 14% of them obtained the prescription stimulants from an acquaintance who was not a fellow graduate student; and 14% obtained the prescription stimulants from a friend who was in graduate school.

4. Graduate students indicated academic-related reasons as the primary reason for illicitly using prescription stimulants (67.5%), with recreational use occurring at a smaller rate (30.57%).

5. Graduate students who illicitly used prescription stimulants in their lifetime were more likely to use other illegal drugs than those who had not illicitly used prescription stimulants in their lifetime. Specifically, they were 1.5 times more likely to use marijuana, 6.3 times more likely to use cocaine, and 2.4 times more likely to use ecstasy.

Discussion

Findings of the study about illicit prescription stimulant use among graduate students were different from those reported for undergraduate students' lifetime use, but similar in other

areas. Approximately 15% of graduate students had used prescription stimulants without a prescription in their lifetime. This was greater than that found most recently for undergraduate students (8.1%) (Teter et al., 2005); although reports of undergraduate use vary from 20.9% (Babcock & Byrne, 2000) to 8.1% (Teter et al., 2005). Thus, it is possible that undergraduate rates of lifetime use may be as large, or larger, than those reported by graduate students. In speaking about the range of rates in the literature for undergraduate use, McCabe, Knight, et al. (2005), posited that variations in rates might be explained by differences in regional use. Undergraduate students attending colleges and universities located in the southeastern United States were found to be twice as likely to illicitly use prescription stimulants. With respect to the rate of graduate student lifetime use found in this study, it may be that variations might emerge if the study was replicated at other institutions in other regions of the country. If, however, the lower figure for undergraduates is correct, graduate students are more than twice as likely as undergraduate students to have used prescription stimulants illicitly in their life. What might account for such a difference is neither clear nor known. One hypothesis might be that it is an indication of a generational change since those graduate students were undergraduates. Alternatively, the variance in use might be explained by graduate students' greater extended exposure to prescription stimulants in a collegiate environment.

As opposed to lifetime use, there was little variance in past-year illicit use between graduate students and undergraduate students. The past-year illicit use of prescription stimulants by graduate students (5.1%) is comparable to the 5.4% past-year use reported for undergraduate students by Teter et al. (2005) and the 5.9% reported by Teter et al. (2006), which suggests graduate students were as likely to use prescription stimulants as undergraduates during the

previous twelve month period. This similarity in rate of use between graduate and undergraduate students would appear to exist in spite of potential differences in coursework, campus, lifestyle, and collegiate environment. This raises questions about whether there are, as yet unidentified, commonalities between graduate and undergraduate affecting the two populations' illicit use; reasons beyond the purely academic. Thus, if the type and difficulty of academic work is not a direct cause, it might be speculated that fluctuation in levels of stress associated with academics could be a common variable influencing both types of students. Students may decide to illicitly use prescription stimulants to treat the stress caused by academics; this would account for the reports of academics being the primary reason for using stimulants. The levels of stress necessary to cause students to use prescription stimulants may be intermittent and rare. This could also explain the rate of use reported by graduate students. The majority of illicit use by graduate students occurred on one to two occasions (53%) or three to five occasions (19.6%) over the twelve month period suggesting whatever provoked the graduate students' illicit use occurred only a few times. The prescription stimulant may have addressed the stress, and after the stress was addressed, they may have no longer felt a need to continue using prescription stimulants. While we have no evidence about the frequency of use by undergraduates, and whether it too, is intermittent, stress has been reported to be a predictor of illicit stimulant use for undergraduate students (DeSantis et al., 2008).

Another similarity found between graduate and undergraduate students was the drug of choice. Graduate students that illicitly used prescription stimulants preferred Adderall® (70.6%), Adderall XR® (37.3%) and Vyvanse® (23.5%), in that order. Undergraduate students also preferred Adderall® with a few students preferring Ritalin®, the second most preferred drug

(National Center on Addiction and Substance Abuse, 2005). It is not surprising that both graduates and undergraduates preferred Adderall® since it is the most widely prescribed stimulant, reported by the National Center on Addiction and Substance Abuse (2005) to be the most abused prescription stimulant used by undergraduate students. As undergraduates, graduate students disposed to use it are likely to have used Adderall® and thus to seek the same stimulant as graduate students. Adderall XR® would appear to be merely another version of the same drug they knew and took. The illicit use of Vyvanse® was surprising considering it is a relatively new drug, first introduced in 2008. Thus, the amount of exposure students have had to the drug has been limited and the likelihood of having known about the drug as undergraduates was either small or nonexistent. It will be interesting to see if Vyvanse® is increasingly mentioned in future studies of undergraduate use as it becomes a more well-known prescription stimulant.

Research on undergraduates indicated friends and fellow undergraduate students as the primary source for acquiring prescription stimulants (McCabe & Boyd, 2005; Novak et al., 2007). Graduate students who illicitly used prescription stimulants were least likely to obtain the prescription stimulant drugs from other graduate students, and more likely to obtain them from friends that were not graduate students. It may be that graduate students are less personally involved with other graduate students than undergraduate students, and thus less likely or comfortable about asking them about their use and possession of stimulants. A more intimate relationship may be needed to discover whether or not fellow students are taking prescription stimulants. This may help to explain why graduate students obtain prescription stimulants primarily from friends that are not graduate students. The friendship could be more personal and long-standing, and their knowledge of the friend make it likely that they know about the friend's

possession of prescription stimulants; know them in a way that makes it comfortable to ask for the drug. Furthermore, it may be that graduate students do not have the same level of access to prescription stimulants from fellow students or undergraduates as undergraduate students. Many undergraduate students live in a close environment, such as residence halls or apartments catering to undergraduate students, and may be more likely to be able to find students with a prescription who are willing to sell, trade, or give the drugs to others. No matter the method for obtaining prescription stimulants, it appears the acquisition of such drugs is not difficult for either graduate students or undergraduate students, on or off campus. The issue of how students get illicit stimulants and how easy it is to get them is an aspect of illicit use, which might reasonably be investigated for both graduates and undergraduates. One finding related to the source of drugs for graduate students, drug dealers, is particularly interesting and potentially worrisome for college administrators. Just how easy is it for students to make contact with drug dealers and to secure any drugs they choose?

The National Survey on Drug Use and Health (NSDUH) indicated young adults between the ages of 18 and 25 were at the greatest risk for illicitly using prescription stimulants (Substance Abuse and Mental Health Services Administration, 2010). The findings of this study confirm this, but also suggest that the age-range may be even greater than identified. This study surveyed graduate students, and found those up to the age of 30 to be as much at risk as undergraduate students between the ages of 18 and 25.

It is interesting to consider that of the 157 graduate students who illicitly used prescription stimulants in their lifetime, only 51 had illicitly used prescription stimulants in the past-year. This begs the question of why the majority of them, 106, no longer continued to use

the drug, and only a minority did? What led them to alter their behavior, particularly since academic reasons were the primary ones given for their use, and presumably, they were subject to the same academic pressures and stress as graduates as they had been as undergraduates, or whenever they used them? One might reasonably have expected a rate of use equal to or greater than that of undergraduates as the academic pressures of graduate school are presumed to be greater than those in undergraduate levels of schooling. The drop in use by graduate students cannot be explained by the findings of the study; however, they do lead to speculative considerations. Graduate students may have initiated use during their undergraduate career with the belief that prescription stimulants would help alleviate their stress and academic pressures. However, as they matured and become more acclimated to the graduate school culture, they improved their stress or academic management techniques, thereby minimizing their need to continue using illicit prescription stimulants. In contrast, those graduate students who continued the illicit behavior may not have developed such stress or academic management techniques, resulting in continued dependence on the drugs. Continuing with speculation, graduate students that did not continue illicitly using prescription stimulants may have lost access to the drug resulting in discontinued use. Additionally, some students may have tried prescription stimulants once in their lifetime and felt little to no benefit thereby also deciding to discontinue use.

Undergraduate's recreational use of prescription stimulants has been correlated to higher rates of poly-substance abuse (Teter et al., 2005). This was also true for graduate students. The present study found that graduate students who illicitly used prescription stimulants were more likely to use marijuana, cocaine, and ecstasy. The increased likelihood of poly-substance use among both groups of students suggests their poly-substance use is part of a pattern of poly-

substance use and potentially represents a larger cluster of problem behaviors (Jessor et al., 1991). According to Arria, Caldeira, Vincent, et al. (2008), undergraduate students who do not perceive prescription drugs as harmful were more likely to illicitly use prescription stimulants, which usually followed illicitly using other substances. It could be hypothesized that, in addition to undergraduate students, graduate students may not perceive prescription stimulants as harmful and thus are more likely to illicitly use prescription stimulants for academics or recreation, which, unbeknownst to the user, results in the prescription stimulants becoming a gateway drug to other illicit substance use. After undergraduate and graduate students begin illicitly using prescription stimulants, they may feel more at ease in using other drugs recreationally, or for stress relief, energy, or experimentation. It is not surprising graduate students who illicitly use prescription stimulants were 6.3 times more likely to use cocaine, since students may seek other drugs with a similar chemical and physiological response to prescription stimulants. Cocaine would provide that response since cocaine and prescription stimulants affect the same parts of the brain (Drug Enforcement Agency, 2011).

The sensitivity and clandestine nature of studying illicit prescription stimulant use presented many challenges, which included obtaining responses that were ultimately confessions of illegal activity. It is interesting to note that during data collection, I received many responses via email regarding the topic of my dissertation. A majority of the emails expressed interest in the topic of illicit prescription stimulant use among graduate students. I received requests to meet and discuss illicit stimulant use, requests to send the results after analysis, and was provided with theories as to why students were illicitly using prescription stimulants. These responses suggested there was great interest in the topic among the population studied. In addition, the

responses and e-mails suggested that graduate students were quite familiar with prescription stimulants and their use by students.

Conclusion

Based on the findings of the study, it is reasonable to conclude that graduate students use illegal prescription stimulants, and their use is similar to that found for undergraduate students, and for the same primary reason. Further, those who have used it are at considerable risk for poly-substance abuse, as has been reported for undergraduates. It is not unreasonable to conclude, with caution, that graduate students who used prescription stimulants as undergraduates are at risk for using them as graduate students.

Implications

While the findings of the study are limited to the institution studied, they are suggestive of what may be happening among graduate students in other institutions and have implications for various involved groups. The findings of the study have potential implications for health officials, academic and student affairs administrators, and faculty members. National surveys, such as Monitoring the Future, have shown that prescription stimulant use among teenagers has continually increased over the past ten years and shows no signs of slowing; this is true for undergraduate students and appears to be true for graduate students. There are a growing number of programs and initiatives targeting undergraduates and illicit prescription stimulant use (National Center on Addiction and Substance Abuse, 2005, 2007). While the findings that graduate students past-year use in this study showed a decrease, there is no guarantee that that is what is happening with graduate students across the nation. Therefore, programs and initiatives attempting to address the problem of illicit prescription stimulant use need to focus on graduate

students as well as undergraduate students, particularly given the ease of securing prescription stimulants illicitly and the disposition for poly-substance abuse in the future.

The ease with which graduate students, no less undergraduate students, can obtain prescription stimulants from sources outside, as well as inside academe, is something about which leaders within and outside of academia must be concerned, if not alarmed. One recommendation to combat this issue could be to require students to register controlled prescriptions with disability services and as part of that registration receive information on the legality of distributing drugs as well as signing a notice indicating they will not distribute their prescriptions. This could be helpful to combat the issue since students have been found to be largely unaware that distributing their medication is a violation of the law (Quintero et al., 2006). Health officials and university administrators need to take serious steps to address the trafficking of prescription stimulants on college campuses, which is something both have failed to address.

According to the National Center on Addiction and Substance Abuse (CASA) (2005), production of Adderall® increased 9,008% from 1992 to 2002, Dexedrine® increased by 211%, and Ritalin® increased by 187%. All of this was in response to a 369% increase in written prescriptions for these drugs during that same time. The growing number of written prescriptions suggests doctors and physiatrists are readily prescribing these drugs to patients. Part of the problem rests with the vague guidelines for diagnosing and treating ADHD, and the ease with which individuals can claim the symptoms covered in the guidelines. Doctors and psychiatrists need to be more cautious in prescribing stimulants and to consider alternative treatments for ADHD among adults such as non-stimulant medications, self-help guides, and behavioral

therapy. Additional research is also needed for non-pharmaceutical tactics to address the symptoms of ADHD, which could be an alternative to prescribing stimulants.

Social workers, doctors, and other health professionals should consider prevention strategies when working with abusable prescription drugs such as stimulants. One such prevention program could include enhanced screening to help identify potential stimulant abuse among graduate students or patients seeking multiple prescriptions. Furthermore, the increased number of written prescriptions suggests more students are coming to colleges and universities with prescriptions. Colleges and universities need to address the increased number of students attending school with prescriptions by developing educational programs that inform students on the dangers of distributing and illicitly consuming prescription stimulant medication. This would not only help educate students on the legality of having a prescription, but also help address the growing ease of access to these drugs by students without a prescription.

Institutions of higher education that have undergraduate and graduate populations need to provide educational programs and materials to graduate students not just undergraduate students. These programs must address the realities of illicit prescription stimulant use and help students understand the dangers and myths that may allow the ease of use. Students may perceive prescription stimulants as a safe alternative to illegal drugs and rely on information from peers more than doctors (Quintero et al., 2006). Furthermore, students may believe sharing these drugs is harmless and are not a violation of the law (Quintero et al., 2006). Programs need to directly confront the myths regarding prescription stimulant use in an effort to curb its illicit use. The information presented to students also needs to include the legality of distributing prescription stimulants. It could be that students are unaware that by sharing their prescriptions, they are

susceptible to large fines and possible imprisonment. However, educating students on the dangers of prescription stimulants needs to be carefully balanced in order to avoid unintentionally informing students of new drugs and perpetuating myths.

Health and campus officials should take notice and develop holistic programs that combat illicit use, and acquisition of prescription stimulants. Graduate and undergraduate students that are illicitly using prescription stimulants do so primarily for academic reasons. Programs that help reduce stress and increase motivation could provide a promising approach to reduce the illicit use of prescription stimulants. Additionally, programs that address the campus culture of competition may also help reduce the need for illicit prescription stimulants. Since another reason for use among graduate students was recreational, a third program might focus on the information and dangers of experimentation, poly-substance use, and countering the effects of other drugs.

The illicit use of prescription stimulants, whether among graduate or undergraduate students, is associated with the increased likelihood of poly-substance use. Campus and health officials should regularly assess the levels of substance abuse on college campuses in order to determine the campus culture and likelihood that students may be engaging in other dangerous behaviors since there is a correlation to poly-substance use and prescription stimulant use. University officials should also address poly-substance use with strict policies and procedures that limit students' involvement in illegal drugs.

Recommendations for Further Research

Based on the findings of the study several follow-up studies are recommended.

1. The study should be replicated with graduate students at other institutions to see if similar findings emerge.

2. The study should be replicated with undergraduate and graduate students at the same institution to provide group comparisons.

3. In this study, women were more likely to illicitly use prescription stimulants than men. While that finding would appear to be due to an overrepresentation of women in the study, there might be more to it than that. Therefore, a quantitative study should be conducted to compare women's and men's use of prescription stimulants among graduate students, to determine if there are differences in use in terms of gender.

4. Graduate students in this study cited academic assistance as the primary reason for illicitly using prescription stimulants. A quantitative study should be undertaken to assess the relationship between use of stimulants and academic performance.

5. Graduate students in this study cited non-graduate students as sources for prescription stimulants. A qualitative study should be conducted to evaluate the relationship between graduate students and those from whom they are getting prescription stimulants.

6. The majority of graduate students who illicitly reported using prescription stimulants in their lifetime indicated non-use in the past twelve months. A qualitative study should be conducted to learn more about why graduate students who illicitly used prescription stimulants in their lifetime chose not to take them in graduate school.

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Appendix

APPENDIX A

To the best of your ability please complete each question. At any point during the survey, if you feel uncomfortable with the questions you can stop the survey. If you have any questions, please feel free to contact the principal investigator, Matt Varga, via email at mvarga@utk.edu or by phone. At the conclusion of the survey, you will have an opportunity to complete a separate form to enter into a drawing. The incentive information is **not** connected to this study; thus, protecting your identity and the identity of the institution. If you are selected, you will be notified via email.

Q1 - 5. Please answer the questions below, rating yourself on each of the criteria. As you answer each question, please indicate what best describes how you have felt and conducted yourself in the past 6 months.

	Never	Rarely	Sometimes	Often	Very Often	Rather not say
How often do you have trouble wrapping up final details of a project, once the challenging parts have been done?						
How often do you have difficulty getting things in order when you have to do a task that requires organization?						
How often do you have problems remembering appointments or obligations?						
When you have a task that requires a lot of thought, how often do you avoid or delay getting started?						
How often do you feel overly active and compelled to do things like you were driven by a motor?						

Q6. Have you ever been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD, commonly referred to as ADD)?

- ○ Yes
- ○ No
- ○ Rather Not Say

Q7. How old were you when you were first diagnosed with ADHD (commonly referred to as ADD)?

_____ Age

☐ Rather not say

Q8. Are you currently diagnosed with ADHD (commonly referred to as ADD)?

- ○ Yes
- ○ No
- ○ Rather Not Say

Q9 – 17. The next questions ask about your use of various types of drugs. On how many occasions in your lifetime have you used the following types of drugs? Do not include drugs used under a doctor's prescription.

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Marijuana or hashish (hash)								
Cocaine in any form (e.g., powder, crack, freebase, etc.)								
LSD ("acid")								
Other psychedelics (e.g., mescaline, peyote, psilocybin, PCP, salvia)								
Crystal meth ("ice")								
Heroin (smack, horse, skag)								
Inhalants (glue, aerosol spray, nitrites, other gases or sprays)								
Ecstasy (MDMA)								

Anabolic Steroids								

Q9A – 17A. How old were you when you first started using each drug? Do not include drugs used as prescribed by a doctor.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 9 – 17]

	Grade K - 4	Grade 5 - 6	Grade 7 - 8	Grade 9 - 10	Grade 11 - 12	Under graduate	Graduate	Rather not say
Marijuana or hashish (hash)								
Cocaine in any form (e.g., powder, crack, freebase, etc.)								
LSD ("acid")								
Other psychedelics (e.g., mescaline, peyote, psilocybin, PCP, salvia)								
Crystal meth ("ice")								
Heroin (smack, horse, skag)								
Inhalants (glue, aerosol spray, nitrites, other gases or sprays)								
Ecstasy (MDMA)								
Anabolic Steroids								

Q9B – 17B. On how many occasions in the past 12 months have you used the following types of drugs? Do not include drugs used under a doctor's prescription.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 9 – 17]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say

Marijuana or hashish (hash)								
Cocaine in any form (e.g., powder, crack, freebase, etc.)								
LSD ("acid")								
Other psychedelics (e.g., mescaline, peyote, psilocybin, PCP, salvia)								
Crystal meth ("ice")								
Heroin (smack, horse, skag)								
Inhalants (glue, aerosol spray, nitrites, other gases or sprays)								
Ecstasy (MDMA)								
Anabolic Steroids								

Q9C – 17C. On how many occasions in the past 30 days have you used the following types of drugs? Do not include drugs used under a doctor's prescription.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 9 – 17]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Marijuana or hashish (hash)								
Cocaine in any form (e.g., powder, crack, freebase, etc.)								
LSD ("acid")								

Other psychedelics (e.g., mescaline, peyote, psilocybin, PCP, salvia)								
Crystal meth ("ice")								
Heroin (smack, horse, skag)								
Inhalants (glue, aerosol spray, nitrites, other gases or sprays)								
Ecstasy (MDMA)								
Anabolic Steroids								

Q18 – 19. Based on a doctor's prescription, have you ever taken prescription medication in your lifetime?

	Yes	No
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)		
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)		

Q18A – 19A. Based on a doctor's prescription, on how many occasions in your lifetime have you used the following types of drugs?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18 – 19]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall,								

Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Q18B – 19B. Based on a doctor's prescription, when did you first start using each prescription drug?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18 – 19]

	Grade K - 4	Grade 5 - 6	Grade 7 - 8	Grade 9 - 10	Grade 11 - 12	Under graduate	Graduate	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Q18C – 19C. Based on a doctor's prescription, on how many occasions in the past 12 months have you used the following types of drugs?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18 – 19]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate,								

Vyvanse) ***if true answer 54a & 54b***								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone) ***if true answer 55a***								

Q19D. Please indicate if any of the following pain medications have been prescribed to you in the past 12 months.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 19]

(Select all that apply.)

- ☐ Tramadol (e.g., Ultram)
- ☐ Codeine (e.g., Tylenol #3 with Codeine)
- ☐ Hydromorphone (e.g., Dilaudid)
- ☐ Meperidine (e.g., Demerol)
- ☐ Methadone
- ☐ Oxycodone (e.g., OxyContin, Roxicodone, Percocet, Tylox, Percodan)
- ☐ Morphine
- ☐ Fentanyl (e.g., Actiq, Duragesic, Sublimaze)
- ☐ Hydrocodone (e.g., Vicodin, Lortab, Lorcet)
- ☐ Propoxyphene (e.g., Darvon, Darvocet)
- ☐ Other (please specify) _____
- ☐ Don't know names of same I have used
- ☐ None
- ☐ Rather not say

Q18D. Please indicate if any of the following stimulant medications have been prescribed to you in the past 12 months.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18]
(Select all that apply.)

- ☐ Ritalin
- ☐ Adderall XR
- ☐ Dextroamphetamine
- ☐ Dexedrine
- ☐ Ritalin SR
- ☐ Methylin ER

- ☐ Concerta
- ☐ Focalin XR
- ☐ Dextrostat
- ☐ Dexedrine Spansules
- ☐ Focalin
- ☐ Metadate ER
- ☐ Methylphenidate
- ☐ Ritalin LA
- ☐ Dextroamphetamine Extended Release
- ☐ Daytrana
- ☐ Amphetamine/Dextroamphetamine Combination
- ☐ Metadate CD
- ☐ Methylin
- ☐ Adderall
- ☐ Methylphenidate Extended Release
- ☐ Vyvanse
- ☐ Other (please specify) _____
- ☐ Don't know names of same I have used
- ☐ None
- ☐ Rather not say

Q18E. On how many occasions (if any) in the past 12 months have you…
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
deliberately stopped taking your stimulant medication for ADHD with your physician's approval for the purposes of drug holidays?								
used too much (e.g., higher doses, more frequent doses) of your prescribed stimulant medication for ADHD?								
intentionally gotten high on your prescribed stimulant medication for ADHD?								
misused your prescribed stimulant medication for ADHD?								

intentionally used your prescribed stimulant medication for ADHD with alcohol or other drugs?								
given away, loaned or sold your prescribed stimulant medication for ADHD to someone?								

Q18F – 19F. On how many occasions in the past 12 months have you been approached to sell, trade, or give away your prescription medication?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 18 – 19]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Sometimes people use prescription drugs that were meant for other people, even when their own doctor has not prescribed them.

Q20 – 21. In your lifetime, have you ever taken prescription medication, not prescribed to you by a doctor?

	Yes	No
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)		
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)		

Q20A – 21A. On how many occasions in your lifetime have you used the following types of drugs, not prescribed to you?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20 – 21]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Q20B – 21B. When did you first start using each drug, not prescribed to you by a doctor?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20 – 21]

	Grade K - 4	Grade 5 - 6	Grade 7 - 8	Grade 9 - 10	Grade 11 - 12	Under graduate	Graduate	Rather not say

Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Q20C – 21C. On how many occasions in the past 12 months have you used the following types of drugs, not prescribed to you?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20 – 21]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate, Vyvanse)								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone)								

Q20D – 21D. On how many occasions in the past 30 days have you used the following types of drugs not prescribed to you?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20 – 21]

	Never	1 - 2 Occasions	3 - 5 Occasions	6 - 9 Occasions	10 - 19 Occasions	20 - 39 Occasions	40+ Occasions	Rather not say
Stimulant medication for ADHD (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate,								

Vyvanse) ***if true answer 54a & 54b***								
Pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone) ***if true answer 55a***								

Q21E. Please indicate if you have used any of the following pain medications not prescribed to you in the past 12 months.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 21]

(Select all that apply.)

- ☐ Tramadol (e.g., Ultram)
- ☐ Codeine (e.g., Tylenol #3 with Codeine)
- ☐ Hydromorphone (e.g., Dilaudid)
- ☐ Meperidine (e.g., Demerol)
- ☐ Methadone
- ☐ Oxycodone (e.g., OxyContin, Roxicodone, Percocet, Tylox, Percodan)
- ☐ Morphine
- ☐ Fentanyl (e.g., Actiq, Duragesic, Sublimaze)
- ☐ Hydrocodone (e.g., Vicodin, Lortab, Lorcet)
- ☐ Propoxyphene (e.g., Darvon, Darvocet)
- ☐ Other (please specify) _____
- ☐ Don't know names of same I have used
- ☐ None
- ☐ Rather not say

Q20E. Please indicate if you have used any of the following stimulants not prescribed to you in the past 12 months.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20]
(Select all that apply.)

- ☐ Ritalin
- ☐ Adderall XR
- ☐ Dextroamphetamine
- ☐ Dexedrine
- ☐ Ritalin SR
- ☐ Methylin ER

- ☐ Concerta
- ☐ Focalin XR
- ☐ Dextrostat
- ☐ Dexedrine Spansules
- ☐ Focalin
- ☐ Metadate ER
- ☐ Methylphenidate
- ☐ Ritalin LA
- ☐ Dextroamphetamine Extended Release
- ☐ Daytrana
- ☐ Amphetamine/Dextroamphetamine Combination
- ☐ Metadate CD
- ☐ Methylin
- ☐ Adderall
- ☐ Methylphenidate Extended Release
- ☐ Vyvanse
- ☐ Other (please specify) _____
- ☐ Don't know names of same I have used
- ☐ None
- ☐ Rather not say

Q20F. Please provide the reason(s) why you used stimulant medication not prescribed to you.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20]

(Select all that apply.)

- ☐ To increase my alertness while driving
- ☐ To get high
- ☐ To counteract the effects of other drugs
- ☐ To concentrate better while studying
- ☐ To increase my alertness in order to study longer
- ☐ To lose weight
- ☐ To enhance my athletic performance
- ☐ To prolong the intoxicating effects of alcohol or other substances
- ☐ To prevent other students who do this from having an "edge" over me academically
- ☐ To feel restless while studying
- ☐ Because I have ADHD
- ☐ To keep better track of my class assignments
- ☐ To concentrate better while working
- ☐ To feel less restless while working
- ☐ Because I'm addicted
- ☐ Because it's safer than street drugs
- ☐ To enhance my academic performance
- ☐ To increase my alertness in order to work longer
- ☐ To experiment
- ☐ Other (please specify) _____
- ☐ Rather not say

Q21F. Please provide the reason(s) why you used pain medication not prescribed to you.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 21]

(Select all that apply.)

- ☐ Because it's safer than street drugs
- ☐ Because it helps me sleep
- ☐ Because it relieves pain
- ☐ Because it helps decrease anxiety
- ☐ Because of experimentation
- ☐ Because I'm addicted
- ☐ Because it counters the effects of other drugs
- ☐ Because it gives me a high
- ☐ Other (please specify) _____
- ☐ Rather not say

Q20G. Which of the following routes of administration have you used for taking the following stimulant medication not prescribed to you?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20]

	N/A	Orally	Snorting	Smoking	Injecting	Inhaling	Other
Methylphenidate							
Methylphenidate Extended Release							
Ritalin							
Ritalin SR							
Ritalin LA							
Concerta							
Metadate CD							
Metadate ER							
Methylin ER							
Focalin							
Focalin XR							
Daytrana							
Amphetamine/Dextroamphetamine Combination							
Adderall							
Adderall XR							
Dextroamphetamine							
Dextroamphetamine Extended Release							
Dexedrine							
Dexedrine Spansules							
Dextrostat							
Vyvanse							

Q21G. Which of the following routes of administration have you used for taking the following pain medication not prescribed to you?
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 21]

	N/A	Orally	Snorting	Smoking	Injecting	Inhaling	Other
Codeine (e.g., Tylenol #3 with Codeine)							
Fentanyl (e.g., Actiq, Duragesic, Sublimaze)							
Hydrocodone (e.g., Vicodin, Lortab, Lorcet)							
Hydromorphone (e.g., Dilaudid)							
Meperidine (e.g., Demerol)							
Methadone							
Morphine							
Oxycodone (e.g., OxyContin, Roxicodone, Percocet, Tylox, Percodan)							
Propoxyphene (e.g., Darvon, Darvocet)							
Tramadol (e.g., Ultram)							

Q20H. Please indicate who you obtained stimulant medication from that was not prescribed to you by a doctor.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20]
(Select all that apply.)

- ☐ Friend who is a fellow graduate student
- ☐ Friend who is not a graduate student
- ☐ Acquaintance who is a fellow graduate student
- ☐ Acquaintance who is not a graduate student
- ☐ Roommate
- ☐ Boyfriend/Girlfriend/Romantic partner
- ☐ Parent
- ☐ Sibling
- ☐ Child/Stepchild
- ☐ Aunt/Uncle
- ☐ Other family member
- ☐ Drug dealer
- ☐ Abroad
- ☐ Internet
- ☐ Other (please specify) _____
- ☐ Don't know
- ☐ Rather not say

Q21H. Please indicate who you obtained pain medication from that was not prescribed to you by a doctor.
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 21]

(Select all that apply.)

- ☐ Friend who is a fellow graduate student
- ☐ Friend not is not a fellow graduate student
- ☐ Acquaintance who is a fellow graduate student
- ☐ Acquaintance who is not a graduate student
- ☐ Roommate
- ☐ Boyfriend/Girlfriend/Romantic partner
- ☐ Parent
- ☐ Sibling
- ☐ Child/Stepchild
- ☐ Aunt/Uncle
- ☐ Other family member
- ☐ Drug dealer
- ☐ Abroad
- ☐ Internet
- ☐ Child
- ☐ Other (please specify) _____
- ☐ Don't know
- ☐ Rather not say

Q20I. In the past 12 months, how many days have you used prescription stimulant medication (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate), not prescribed to you by a doctor at the same time you were drinking alcohol? (Enter "0" for none)
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20]

NUMBER OF DAYS: _____

Q21I. In the past 12 months, how many days have you used prescription pain medication (i.e., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone), not prescribed to you by a doctor at the same time you were drinking alcohol? (Enter "0" for none)
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 21]

NUMBER OF DAYS: _____

The following questions ask about drugs other than alcoholic beverages.

Read each statement and decide if your answer is "Yes" or "No". Check the most appropriate response for each statement.

In the statements below, "drug" refers to:

(1) Use of prescription drugs not prescribed to you (e.g., using a family member or friend's prescription drug);
(2) Use of prescription drugs in a manner not intended by the prescribing clinician (e.g. you take too much or use too often);
(3) Use of other drugs such as marijuana, cocaine, LSD, ecstasy, etc.

Q22. In the past 12 months…
[ONLY SHOW QUESTIONS THAT WERE TRUE FROM 9 – 17] OR [ONLY SHOW QUESTIONS THAT WERE TRUE FROM 20 – 21]

	Yes	No
have you used drugs other than those required for medical reasons?		
have you used more than one drug at a time?		
are you always able to stop using drugs when you want to?		
have you had blackouts or flashbacks as a result of drug use?		
have you ever felt bad or guilt about your drug use?		
have family members ever complained about your involvement with drugs?		
have you stayed away from your family because of your use of drugs?		
have you engaged in illegal activities in order to obtain drugs?		
have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?		
have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding)?		

These next questions are about OTHER people's use of alcohol and other drugs. Please make your best estimate based on your observations of others.

Q23. Please estimate the percentage of graduate students who, in the past 12 months used…

(Please enter numeric percentage responses only, do not include symbols such as "%".)

marijuana or hashish	_____%
pain medication (i.e. opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone) that was not prescribed to them.	_____%
stimulant medication (e.g., Ritalin, Dexedrine, Adderall, Concerta, methylphenidate) that was not prescribed to them.	_____%

Now, we'd like to learn a little about you…

Q24. Please indicate your position at the university:

- ○ Fulltime Masters Graduate Student
- ○ Part time Masters Graduate Student
- ○ Fulltime Doctoral Graduate Student
- ○ Part time Doctoral Graduate Student
- ○ Post-graduate training
- ○ Not seeking a degree
- ○ Other (Specify) _____
- ○ Don't know
- ○ Rather Not Say

Q25. Are you:

- ○ Male
- ○ Female
- ○ Rather Not Say

Q26. What is your race? Check all that apply.

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Asian American
- ☐ Black or African American

- ☐ Native Hawaiian or other pacific islander
- ☐ White
- ☐ Other _____
- ☐ Rather not say

Q27. Are you:

- ○ Married
- ○ Divorced/Separated
- ○ Single
- ○ Rather Not Say

Q28. Please enter your age:

_____ Years

Q29. What is your average annual income?

- ○ Less than $30,000
- ○ $30,000 – $49,999
- ○ $50,000 - $99,999
- ○ $100,000 - $149,999
- ○ $150,000 - $199,999
- ○ $200,000 - $249,999
- ○ $250,000 or more
- ○ Don’t know
- ○ Rather not say

Q30. Is English your first language?

- ○ Yes
- ○ No
- ○ Rather Not Say

Q31. Is the United States your native country?

- ○ Yes
- ○ No
- ○ Rather Not Say

If at any time during the survey you felt uncomfortable or believe you, or someone you know, may have a problem with substances please contact any of the resources below:

Off campus Resource
Bradford Health Services
301 S. Gallaher View RD
Suite 300
Knoxville, TN 37919
Phone: (865) 693-9326

Counseling Center
University of Tennessee
900 Volunteer Blvd.
Knoxville, TN 37996-4250
Phone: (865) 974-2196
Email: counselingcenter@utk.edu

Thank you for completing the survey. If you would like to participate in the drawing for one of 10 $25 Amazon.com gift certificates, please go to this link.

APPENDIX B

Dear Graduate Student,

My name is Matt Varga and I am a doctoral candidate in the Department of Educational Leadership and Policy Studies at The University of Tennessee, Knoxville. For my dissertation, I am conducting a survey of graduate students' use of prescription stimulants and request your participation in this study.

The purpose of this study is to understand prescription stimulant use among graduate students. The survey is currently used each year to assess undergraduate students' use of prescription stimulants at the University of Michigan. This is the survey's first use with graduate students, although they are identified as a population similarly at risk for prescription stimulant use. The survey asks sensitive information about the use of prescription and illicit drugs; however, the survey is to be completed anonymously, no individuals will be identifiable, and all data will be aggregated for reporting purposes. Further, participation is voluntary.

The survey should take approximately 15 to 20 minutes. The survey does not ask any identifiable information, record IP addresses, or record who participated. At the conclusion of the survey, you will have an opportunity to participate in a drawing for one of 10 $25 gift certificates to Amazon.com until the last week of January. The drawing for the incentive will take place the first week of February and winners will be notified via email. The information solicited for the gift certificate is not linked to the research study; thus, protecting your identity. It is important you read the Informed Consent.

If you wish to participate in the study, please click here. This will direct you to the Informed Consent. Please read the Informed Consent carefully. At the conclusion of the Informed Consent is a link to the survey. Proceeding to the survey implies informed consent. It is strongly suggested you print a copy for your records.

I thank you for your participation in this doctoral dissertation study. If any point during or after the survey you need to contact the principal investigator, please feel free to do so either via email or by phone. If you choose not to participate in the survey, you can access the incentive form here: Incentive. However, your participation would be valued greatly! You can access the survey by clicking here: Survey.

Sincerely,

Matt Varga
Doctoral Candidate
Higher Education Administration
Department of Educational Leadership and Policy Studies
University of Tennessee

APPENDIX C
Study Information Sheet

This research study is being conducted by Matt Varga, a Ph.D. candidate in the Higher Education Administration program in the Department of Educational Leadership and Policy Studies at The University of Tennessee, Knoxville. This is a doctoral dissertation on graduate students' and prescription stimulant use.

Your help would be greatly appreciated in completing the survey. The survey is currently used each year to assess undergraduate students' use of prescription stimulants at the University of Michigan. This is the survey's first use with graduate students, although they are identified as a population similarly at risk for prescription stimulant use. This research will aid faculty, student affairs practitioners, health care providers, and others about prescription stimulant use among graduate students.

PROTECTION MEASURES

The survey, which is available by means of an electronic link, does include information that is considered personal and sensitive in nature. Your answers will not be connected to any identifiable information since the survey does not request any names. Your email address or IP address will not be recorded during the research survey, since the research survey does not record any IP addresses or request your email address. Your email address will be deleted from the principal investigators computer after the third correspondence is sent requesting participation, as well as from the mailbox from which the email was sent. All forms of contact with participants will be deleted; this includes any email correspondence that may occur before or after your participation in the survey.

After data collection, all data will be deleted from the survey database and stored on an external hard drive that is double password protected and locked in a drawer accessible only to the principal investigator. The data will remain on the hard drive for a maximum of five years. At the conclusion of those five years, the principal investigator will delete the data in accordance with the Department of Defense 5220.20 deletion standards. During the reporting of the data, no identifiable information of participants will be revealed. All data will be aggregated for reporting purposes and neither individuals nor institution will be reported. Participation is strictly voluntary without penalty, and you may withdraw from participation at any point without penalty. Any answers you provided prior to your withdrawal will be destroyed since the survey records answers as you progress through the survey.

CONTACT INFORMATION

If, at any time, you have any questions or concerns prior to, or during, the study, you can contact either the principal investigator or his advisor for information about the study, and Brenda Lawson for questions or concerns about the conduct of the study:

Investigator
Matt Varga M.S.,
Educational Leadership and Policy Studies

Advisor
Dr. Norma Mertz
Educational Leadership and Policy Studies

1021 Francis St
Knoxville, TN 37916

1122 Volunteer Boulevard
315 Bailey Education Complex
Knoxville, TN 37996

Compliance Officer
Brenda Lawson
Office of Research
1534 White Avenue
A102 White Avenue Building
Knoxville, TN 37996
blawson@utk.edu

RESOURCES

The survey should take approximately 15 – 20 minutes to complete. Should you become uncomfortable at any time, you may stop the survey and skip to the end of the survey to enter into the drawing. There will be no penalty for non-participation or for withdrawing from the survey.

Below, and at the conclusion of the survey, are external and institutional resources for you to speak with in the event you feel you may want to speak with someone regarding a substance problem.

Off Campus Resource
Bradford Health Services
301 S. Gallaher View RD
Suite 300
Knoxville, TN 37919
Phone: (865) 693-9326

Counseling Center
University of Tennessee
900 Volunteer Blvd.
Knoxville, TN 37996-4250
Phone: (865) 974-2196
Email: counselingcenter@utk.edu

INCENTIVES

Additionally, you will have an opportunity to be directed to a form, separate from this survey, to be entered into a drawing for one of 10 $25 Amazon gift certificates. The incentive information will not be linked to this research study in any way; thus, protecting your identity. Ten people will be selected and notified via email. The drawing will take place the first week of February 2012. The winners will be notified via email and sent an electronic Amazon gift card. The electronic communication further protects your identity. At the conclusion of the drawing, all names and email addresses associated with the incentive will be destroyed.

PARTICIPATION

You must be at least 18 years of age to participate in this research study. There are no direct benefits from participating in this study. It is important to note that despite all the protections taken to protect your identity, anonymity cannot be guaranteed. Should you have concerns with the nature and/or conduct of this study, please feel free to contact the principal investigator, advisor, or institutional compliance officer.

If you choose to participate in the study, please click here. Remember, proceeding to the survey implies your acceptance of informed consent, that you are over the age of 18 and have read the informed consent. It is strongly suggested you print the informed consent for your records. If you do not agree to participate in this research study, you may still enter for the incentives by accessing this link: LINK

APPENDIX D

Dear Graduate Student,

This is a reminder email. If you have already participated in the Graduate Student Prescription Stimulant Survey, thank you.

Please note: you do not need to take prescription stimulants in order to participate in this study.

My name is Matt Varga and I am a doctoral candidate in the Department of Educational Leadership and Policy Studies at The University of Tennessee, Knoxville. For my dissertation, I am conducting a survey of graduate students' use of prescription stimulants and request your participation in this study.

The purpose of this study is to understand prescription stimulant use among graduate students. The survey is currently used each year to assess undergraduate students' use of prescription stimulants at the University of Michigan. This is the survey's first use with graduate students, although they are identified as a population similarly at risk for prescription stimulant use. The survey asks sensitive information about the use of prescription and illicit drugs; however, the survey is to be completed anonymously, no individuals will be identifiable, and all data will be aggregated for reporting purposes. Further, participation is voluntary.

The survey should take approximately 15 to 20 minutes. The survey does not ask any identifiable information, record IP addresses, or record who participated. At the conclusion of the survey, you will have an opportunity to participate in a drawing for one of 10 $25 gift certificates to Amazon.com until the last week of January. The drawing for the incentive will take place the first week of February and winners will be notified via email. The information solicited for the gift certificate is not linked to the research study; thus, protecting your identity. It is important you read the Informed Consent.

If you wish to participate in the study, please click here. This will direct you to the Informed Consent. Please read the Informed Consent carefully. At the conclusion of the Informed Consent is a link to the survey. Proceeding to the survey implies informed consent. It is strongly suggested you print a copy for your records.

I thank you for your participation in this doctoral dissertation study. If any point during or after the survey you need to contact the principal investigator, please feel free to do so either via email or by phone. If you choose not to participate in the survey, you can access the incentive form here: Incentive. However, your participation would be valued greatly! You can access the survey by clicking here: Survey.

Sincerely,

Matt Varga
Doctoral Candidate
Higher Education Administration
Department of Educational Leadership and Policy Studies
University of Tennessee

APPENDIX E

IRB Approval

VITA

Matthew Donald Varga was born in Akron, Ohio to the parents of Dave and Meg Varga. He was the first of two children in the Varga family, which consists of one boy and one girl.

His formative education began at Norge Elementary School followed by Toano Middle School in Williamsburg, Virginia. His secondary education was at Lafayette High School. After his high school graduation, he entered Christopher Newport University where he would go to school to major in Philosophy and Religious Studies. In December, 2004, he would receive his undergraduate degree from Christopher Newport University graduating with honors.

Upon graduating from Christopher Newport University, he went to work at Shenandoah University as the Housing Coordinator. After spending time at Shenandoah University, he went on to graduate school at The University of Tennessee, Knoxville. While at The University of Tennessee, Knoxville, he would serve as a graduate assistant and receive his graduate degree in May, 2007. After obtaining his master's degree, he transitioned into the position of Hall Director at The University of Tennessee, Knoxville in June, 2007. At that time, he entered into the doctoral program at The University of Tennessee, Knoxville.

He expects to receive his Ph.D. from The University of Tennessee, Knoxville in May, 2012. Presently, he and his wife, Mary Alice, reside in Knoxville, Tennessee. Mary Alice has earned her undergraduate degree from Shenandoah University and her graduate degree from Western Carolina University. She is currently working on her doctoral degree at The University of Tennessee, Knoxville.