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THE PRESCRIPTION STIMULANT DRUG CRISIS: A STUDY OF MISUSE AND ABUSE AMONG COLLEGE STUDENTS

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ABSTRACT

PURPOSE: This thesis examines the relationship between a student's social life and out of class activities as it relates to prescription stimulant misuse and abuse. Specifically, it investigates whether prescription stimulant use differs between the student organizations on campus and if the usage differs among more socially active students. This thesis also investigates if students are misusing and abusing prescription stimulants as a result of their obligation to their peers.

METHODS: A web-based survey was administered at The Pennsylvania State University during the end of November and early December of 2018. The survey was sent through an email list-serv from seven different faculty members to their respective classes. In order to participate in the survey, the respondent had to be at least 18 years old and less than 25 years old, be currently enrolled as a Penn State student at the University Park campus.

RESULTS: The survey had a sample size of 1,036 total respondents with 206 (19.9%) being non-medical users. Statistical analysis showed respondents diverted their medical prescription to help a friend (68.9%) or to make money (73.8%). Students misused to concentrate better while studying (43.7%) and to be able to study longer (45.5%). Non-Hispanic white students had a 10% greater probability, students with a GPA of 2.51 – 3.0 had a 13% greater probability, and first generation students had a 6% greater probability to misuse prescription stimulants. All three of these results were statistically significant at the $p < 0.05$ level.

CONCLUSION: Prescription stimulant misuse and abuse is occurring at Penn State at a rate similar to rates found at other major universities. There is a strong relationship between misuse and academic school work. Students who are non-medical users are socially active, and involved

in Greek-lettered or academic organizations. Further underlying reasons need to be examined in greater detail to understand additional factors into misuse/abuse.

TABLE OF CONTENTS

LIST OF TABLES

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Chapter 1

Introduction

Prescription stimulants, when used as prescribed under certified doctor orders, can be extremely beneficial. However, against doctor orders, prescription stimulants can pose serious threats and dangers to the user. Prescription stimulants work by increasing levels of dopamine and norepinephrine in the human body which are neurotransmitters that play a key role in emotional responses, pleasure, movement, attention, and getting tasks started ("How ADHD Medication Works," 2016; "Prescription Stimulants," 2011). Individuals with lower levels of these neurotransmitters may be diagnosed and treated with prescription stimulant medication.

This diagnosis, better known as Attention Deficit Hyperactivity Disorder (ADHD), is defined by the National Institute of Mental Health as a "brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development" ("Attention Deficit Hyperactivity Disorder," 2016). ADHD is an extremely common diagnosed psychiatric disorder (Lakhan & Kirchgessner, 2012). In fact, a study using the National Health Interview Survey found that 10.2% of children and adolescents are being diagnosed with ADHD (Xu, Strathearn, Liu, Yang, & Bao, 2018). In an analysis of the 2016 National Survey of Children's Health, findings revealed that "6.1 million children aged 2-17 years living in the U.S. had been diagnosed with attention-deficit/hyperactivity disorder [ADHD]" (Danielson et al., 2018). That means for every 10 children, one child will be diagnosed with ADHD. The numbers are staggering and evidently portray the severity of this psychiatric disorder.

Individuals with an ADHD diagnosis are typically prescribed medication that includes, but is not limited to, methylphenidate (Brand Name – Concerta or Ritalin), dextroamphetamine sulfate (e.g., Dexedrine), lisdexamfetamine (e.g., Vyvanse), or a combination of dexmethylphenidate and amphetamine (e.g., Adderall). The medications listed above work to treat individuals with ADHD by increasing stimulation in the brain. By definition, stimulation is the act of producing wakefulness, altering attention, elevating mood, and increasing impulsivity (Rasmussen, 2015). When using prescription stimulants for reasons other than prescribed or in heavy consumption, however they can become addictive.

As such, stimulants are classified as Schedule II drugs due to their abuse potential. Other Schedule II drugs include Vicodin, cocaine, OxyContin, fentanyl, and methamphetamine (e.g., meth). Interestingly, Weyandt and colleagues cited amphetamines were ranked as 6th and 8th for substances known to cause physical harm and dependence respectively (Weyandt et al., 2016). When taken into consideration the increasing diagnoses, increasing levels of treatment, increasing positive feelings associated with stimulant use coupled with the tendencies listed above, these rankings could help to explain why prescription stimulants are only second to marijuana in terms of non-medical use among college students (Lakhan & Kirchgessner, 2012). Non-medical use is defined as "taking stimulants without a valid prescription, or use of stimulants other than as prescribed" (Weyandt et al., 2016).

Consequently, prescription stimulant misuse among college students has been an increasingly recognized phenomenon among researchers. Stimulant misuse has developed into a serious problem today on university campuses and trends are indicating that use, misuse, and/or abuse are increasing rather than decreasing (Benson, Flory, Humphreys, & Lee, 2015; Lakhan & Kirchgessner, 2012). The availability students have to prescription stimulants is far easier than in

the past given the rise in diagnoses and treatments. The increase in technological capabilities and disposable income coupled with the added stress created in a college environment provide for a perfect combination to enable students to resort to other means to achieve a desired state. Prescription stimulants serve as a quick, easy way to alter one's mind and body for rapid improvement resulting in what society now refers to it as "smart doping." As a New York Times title eludes too, the college community is in the midst of relatively serious and new generation – Generation Adderall (Schwartz, 2016).

The following thesis seeks to explore the prescription stimulant drug use, misuse, and/or abuse among college students at The Pennsylvania State University. The principal focus of the thesis is to further understand why this phenomenon is occurring and to see if there is any direct correlation to a student's likelihood of use depending on their social lifestyle. An individual's social lifestyle simply refers to one's activities and habits outside of the traditional classroom setting. The examination of this central idea will serve as an aid in the development of interventions and program designs to address the usage of prescription stimulants at The Pennsylvania State University for reasons other than medically prescribed. The outline provided below will introduce and inform the reader of the core concepts that will be discussed in the remaining chapters of this thesis.

In Chapter 2, I will review the literature surrounding prescription stimulant drugs and their use, misuse, and/or abuse among college students. The purpose of the literature review is to examine what is already known. As already mentioned, researchers have increasingly recognized prescription stimulants as a growing phenomenon. The literature review will clearly inform the reader of this issue and will greatly aid in the understanding of this problem. The literature review has been constructed in a way to provide an overview of the main themes that have

emerged during the analysis of past knowledge. It will serve as a guide in explaining why the prescription stimulant research that will be conducted during this thesis is needed and will provide added value to the current literature. As will be discussed further, the main question of interest to be answered during this thesis is to understand the student characteristics and behaviors that are related to prescription stimulant use, misuse, and/or abuse among college students.

In Chapter 3, I will describe the methods and data collection measures used throughout the research process. Chapter 3 will provide a strong foundation on how the research was performed, including information on the survey and research methods. It will present the inclusion criteria used to determine the sample and will sufficiently define the instrument used to collect the data. This refers to the measures being analyzed and explanation for how they were measured through the survey instrument. As well, Chapter 3 will detail the data analysis used to examine the collected data.

In Chapter 4, I will provide a quantitative analysis of the data results. The reader will be provided with the statistical findings from the survey responses collected. The results of the data will be based upon my findings after running a series of tabulations, correlations, and regressions. The results chapter will quantitatively discuss what the prescription stimulant use, misuse, and/or abuse status is at The Pennsylvania State University.

In Chapter 5, I will discuss what the results mean from the statistical analyses. I will compare my research findings with results from prior research studies. This will purposefully be done to understand if past literature either supports or contradicts my outcomes. Additionally, this chapter will seek to provide context of the data on a larger scale. More specifically, what does it mean for The Pennsylvania State University? What is the data revealing about this

phenomenon among college students? Is there a direct and/or indirect relationship to an individual's prescription stimulant use, misuse, and/or abuse as it relates to their social life and activities outside of class? Additionally, I will discuss the various limitations within the research design. As is the case for most research studies, there are variables and factors that limit the study. This chapter will identify these limitations and what they mean for the research study. It will provide recommendations for future research in the hopes of addressing and preventing these limitations from happening again. Finally, I will provide a comprehensive overview of the entire research study. It will clearly summarize the main purpose of the study, what was found during the study, and what future studies should seek to explore. The conclusion of this thesis will describe the current landscape of prescription stimulant drug use among college students at The Pennsylvania State University.

Chapter 2

Literature Review

Prescription stimulant use among college students has been examined to great depths over the years. In an extensive review of the existing academic literature, multiple themes have emerged among various research studies and findings. The themes italicized and underlined below provide a summarization of the literature, establish a foundation of what is currently known, and serves as an aid in identifying gaps to explore.

Diversion

To obtain prescription stimulants non-medically, one must seek assistance from a prescribed user. This act, better known as diversion, can be defined as "sharing, selling, or trading to others who do not have a prescription" (Arria & Dupont, 2010). However, it should be noted that it is both illegal to sell or give away prescription stimulant medication to other people and obtain stimulant drugs without a medical prescription (Arria & Dupont, 2010). College students are most likely to obtain prescription stimulants through four different sources – peers, family members, drug dealers, or clinicians (Vrecko, 2015). Multiple studies have cited the most common source for obtaining stimulant medication was through a peer or friend (Arria & Dupont, 2010; Cassidy et al., 2015; Lakhan & Kirchgessner, 2012; Vrecko, 2015). A survey study of 243 dental and dental hygiene students found that 87% of student received their medication from a friend (McNiel et al., 2011). Similarly, DeSantis et al. found 91% of students

obtained prescription stimulant medication "from friends or significant others" (2008). Interestingly, Vrecko's study reported that "sharing between family members was expected as a matter of course" and students are more likely to approach close acquaintances for their medication (Vrecko, 2015). Considering the legal issues associated with diversion, students may be mitigating their risk by receiving prescription stimulant medication from close friends and family and/or selling their medication to someone they trust. While students appear to be using protective behaviors, prescription stimulant diversion is still occurring and remains a big issue on campus today.

It appears that little research has been done to assess the prevalence of diversion among college students. Of the studies that have been conducted, there is wide variation in the reported rates of diversion and differences between the methods of assessing diversion. Upadhyaya and colleagues surveyed 334 college students and found roughly 29% had sold or diverted their medication (2005), while another study found 36% of 55 past-year medically prescribed users indicated they diverted their medication (Sepúlveda et al., 2011). As well, McCabe, Teter & Boyd (2006) found 54% of 184 undergraduates students "had been approached to divert their medication", whereas 62% of 81 ADHD-diagnosed college students diverted to non-prescription stimulant holders (Garnier et al., 2010). Additionally, 43.8% of college participants "diverted their prescription at least once in their lifetime" (Schultz, Silvestri, & Correia, 2017). Gallucci and colleagues found "58.9% of students with a current prescription had diverted in their lifetime" and of those, "32.4% had done so during the previous 30 days" (2015). As apparent, there is a lack of consistency among diversion rates, time frames studied, methods used to analyze prevalence, and participants assessed – prescription holders' vs non-prescription holders'

– thus indicating further research is needed among college students and prescription stimulant diversion.

Prevalence and Misuse Rates

It is evident from research that college students are using, misusing and/or abusing prescription stimulants, but the actual extent this issue is affecting college campuses remains unknown due to the wide range of reported and varied rates. It should be noted that there are underlying factors that make the comparison between studies rather difficult. Research studies vary by sample method, sample size, and how the data is analyzed resulting in diversity among reported numbers.

Commonly stated, the misuse of stimulant medication (using without a prescription or using other than medically prescribed) by ADHD and non-ADHD individuals "has dramatically increased over recent years" from "3.6% in 2000 to 5.4% in 2006" (Lakhan & Kirchgessner, 2012). A study conducted over 15 years ago reported misuse in the last year at 35.5% (Low & Gendaszek, 2002), but this study may not accurately be representative of college campuses today. Similarly, DeSantis et al. found 34% of 1,733 undergraduate non-prescription holders illegally used ADHD medication (DeSantis et al., 2008) McCabe and colleagues (2005) analyzed a self-administered mail survey in "one hundred and nineteen nationally representative 4-year colleges in the United States." Their analysis of the data revealed "past year rates of non-medical use ranged from zero to 25% at individual colleges" (S. E. McCabe et al., 2005). While zero to 25% is a wide range to draw conclusions from, it should be noted that the "prevalence of 25% was found in only one out of the 119 colleges surveyed, with only 3 colleges reporting rates over 15% – the median estimate being only 3%" (Zohny, 2015). Other studies have stated 11.3%

(Bossaer et al., 2013), 5.3% (DuPont, Coleman, Bucher, & Wilford, 2008), 19.8 % of non-prescription holders (Dussault & Weyandt, 2013), and "47.6% of prescription holders and 18.3% of non-prescription holders reporting illicit use" (Judson & Langdon, 2009). Finally, Benson and colleagues (2015) found a "substantial number of college students are misusing stimulant medication (17%)" after running a meta-analysis of twenty different research studies. Please review Table 1 for a summary of each study reviewed.

Studies offer contradictory evidence on the trend in the prevalence of prescription stimulants among college students; one study indicates the prevalence "at least appears to be falling" (Zohny, 2015) with a steady decline in trends and reported rates. As cited by Kapner (2008), the prevalence rate (percent using prescription stimulant regardless of illicit vs. non-illicit reasons) has declined from 5.7% in 2002 to 3.9% in 2006. However, two studies have reported opposite trends and found the rate of prescription stimulant use among college students ranged from 5.3% to 11.2% (Rabiner, Anastopoulos, Costello, Hoyle, & Swartzwelder, 2010; Shillington, Reed, Lange, Clapp, & Henry, 2006).

Table 1. Rate of Misuse

Reference	***Sample***	***Sample Size***	***Study Method***	***Misuse Definition & Keywords***	***Misuse Rate***
(Bossaer et al., 2013)	Medical, pharmacy, and respiratory therapy students at East Tennessee State University	621	Survey	Using without a prescription or using more often than prescribed	11.3% (44 students)
(DeSantis et al., 2008)	Undergraduates at a large, public, southeastern research university in	1,733	Two-part Survey	Using non-prescribed medication; illegal uses	34% (585 students)

	the United States				
(DuPont et al., 2008)	Students currently enrolled at a two- or four-year college	2,087	Survey	Any use that was not prescribed for the user by an authorized practitioner	5.3% (110 students)
(Dussault & Weyandt, 2013)	Undergraduate students from five universities located in the northeastern, southeastern, northwestern, southwestern, and midwestern regions of the United States	1,033	Survey	Using medications for reasons they were not intended (i.e., non-medical purposes)	19.8% (205 students)
(Judson & Langdon, 2009)	Students from two small, competitive, New England colleges	333 (21 stimulant prescription holders; 312 non-prescription holders)	Survey	Not available	20% (47.6% of prescription holders; 18.3% of non-prescription holders)
(Low & Gendaszek, 2002)	Students from a small, competitive college in the United States	150	Survey	Using legal amphetamines without a prescription	35.3% (53 students)
(S. E. McCabe et al., 2005)	119 nationally representative 4-year colleges in the United States	10,904	Survey	Using prescription stimulant drugs without a doctor's order	0 – 25%

Population Characteristics

Prescription stimulant misuse and/or abuse are occurring across all demographics and encompass a wide range of individuals. Although there are statistics supporting every population has used prescription stimulants non-medically, there appears to be characteristics that are more likely to be associated with this phenomenon. To start, there is greater occurrence of prescription stimulant misuse among males compared to females (Dussault & Weyandt, 2013; Herman, Shtayermman, Anzalone, Cormerais, & Liodice, 2011; Low & Gendaszek, 2002; S. E. McCabe et al., 2005; Rabiner et al., 2009). Illicit prescription stimulant use is more commonly found in Caucasians than persons with other racial backgrounds (Herman et al., 2011; S. E. McCabe et al., 2005; Rabiner et al., 2009) while members of Greek-lettered fraternities and sororities had increased association with non-medical use than members of other non-Greek-lettered organizations (Benson et al., 2015; S. E. McCabe et al., 2005; Rabiner et al., 2009). Lastly, cited by Weyandt and colleagues (2016), students who have a lower grade point average are reported to have higher rates of misuse than students with higher grade point averages. Multiple studies have reported similar findings as shown in the literature above; however, additional outcomes are warranted as they may strengthen or challenge these generalizations.

Theoretical Approaches to Understand Stimulant Misuse

Carefully understanding the underlying reasons why a student would participate in prescription stimulant use can greatly benefit in designing prevention and reduction strategies on campus. Many college students are using, misusing, and/or abusing stimulant medication to achieve a desired state. However, when discussing and analyzing why students are using

prescription stimulants non-medically, one must take into consideration the underlying factors associated with this behavior.

To explain why a student might use prescription stimulant medication, the theory of planned behavior can provide insight into this phenomenon. The theory of planned behavior in essence combines individual's "attitudes, beliefs about social norms and perceived control" to predict a certain behavior (Judson & Langdon, 2009). Originally coined by Azjen (1991), the theory allows us to predict why a student would use prescription stimulant drugs. A student would have greater intent to use stimulant medication if, in theory, they were to believe the medication is "safe and ethical, thinks others perceive it as acceptable and feels the stimulant would improve his/her ability to control behavior" (Judson & Langdon, 2009). Quintero and colleagues (2006) found through their analysis of interviews that college students consider prescription stimulants to be more harmless than other drugs due to the laboratory manufacturing and testing that is conducted, knowing family members have used the prescription before, and a visible warning of potential side effects labeled on the prescription stimulant medication bottle. Intent to misuse prescription stimulants may be reduced if the student perceives there is "more risk or have less positive expectancies" about illicit stimulant usage (Benson et al., 2015). It should be noted that students with low perceived harmfulness were ten times more likely to use prescription stimulants for non-medical purposes (Arria, Caldeira, Vincent, O'Grady, & Wish, 2008). Additionally, Judson and Langdon have presented the idea of self-diagnosis as a possible explanation to stimulant use. If a non-diagnosed student perceives themselves to have corresponding symptoms associated with attention-deficit/hyperactivity disorder, then they are more inclined to use prescription stimulants in comparison to someone who does not have the same perceptions.

Furthermore, as cited by Abelman (2017), Khantzian's 'Self-Medication Hypothesis' asserts "that an individual uses a drug to achieve a particular emotional state which the substance promotes." These emotional states include, but are not limited to, addressing "feelings of stress, feeling overwhelmed, or of low self-esteem" (Abelman, 2017) while Dussault and Weyandt found impulsivity and restlessness are catalyzers (2013). Students may experience increases in pressure while in a college environment, and as a result, might fall behind academically. In an effort to improve their grades, students are resorting to using prescription stimulants to achieve a higher academic status (Arria & Dupont, 2010; Dussault & Weyandt, 2013; Rabiner et al., 2009). Along these lines, feelings of failure and anxiety to impress "family, peers, and even personal expectations" (Herman et al., 2011) while individual conditions of being in pain and overweight (Quintero et al., 2006) can encourage a student to non-medically use prescription stimulants.

Moreover, students may use stimulant medication to enhance their mood for a variety of reasons. To start, it has been cited that higher rates of prescription stimulant usage are directly correlated to increases in depression symptoms. Zullig and Divin (2012) found students are 1.22 – 1.38 times more likely to use stimulants if they "reported feeling sad, depressed, or considered suicide." Similarly, Teter et al. (2010) found supporting evidence and stated this act may be a form of self-medication to cope with the symptoms of depression that negatively affect a student's mood in hopes of elevating it to positive levels. Abelman (2017) suggests stimulant usage can promote "feelings of confidence, calmness, and being in control" which in return aids in a student's motivation to achieve a particular positive emotional state. Individuals who are sensation seekers and/or perfectionist have been reported to be more likely to use prescription stimulants (Low & Gendaszek, 2002).

While it may go overlooked, it should be noted that many students are responsible for management of their own medication for the first time when they get to college (Sean Esteban McCabe, West, Teter, & Boyd, 2014). Thus, a lack of experience, understanding, and control on how to safely and effectively manage medications could potentially lead to higher substance usage.

Empirical Findings on Stimulant Use, Misuse, and Abuse

i) Reasons for Use

Prescription stimulant misuse and/or abuse among college students are occurring for a variety of reasons. Studies have found that the reason students are misusing stimulant medication range from academic performance enhancement to getting high and having fun (Lakhan & Kirchgessner, 2012). The most commonly cited motives were "getting good grades" (Herman et al., 2011), to help "perform better at work, school or other tasks" (Cassidy et al., 2015), and "to improve study skills" (Peterkin, Crone, Sheridan, & Wise, 2011). Other prominent reasons are to improve concentration (Judson & Langdon, 2009; McNiel et al., 2011), to increase alertness (Cassidy et al., 2015), and to "aid in memorization" (Herman et al., 2011). A web-based survey among 243 dental and dental hygiene students (McNiel et al., 2011) reported 70% took the stimulant to improve attention and concentration, whereas Herman and colleagues (2011) found 93.5% of medical and health profession students used stimulant medication to focus. Additional study findings were consistent with 72% and 66% of students using prescription stimulants to stay awake and concentrate respectively (DeSantis et al., 2008). Additional sensations of euphoria, enjoyment, and to get high have been cited as well (Cassidy et al., 2015; Herman et al.,

2011; Upadhyaya et al., 2005; Vrecko, 2013). According to a survey conducted by Upadhyaya (2005), 25% of 334 respondents misused their medication to get high while DeSantis similarly found 22% of survey respondents misused to have fun (2008). Less commonly endorsed, Benson and colleagues suggest intentions to "prolong efforts of alcohol and other drugs, and to lose weight" were reasons for prescription stimulant use (2015).

ii) Cognitive Enhancement

College students are persuaded to believe prescription stimulants will provide cognitive enhancement. This idea of improving cognitive ability through a pill can be very appealing and would explain why use, misuse, and/or abuse is an issue on campus today. It is no wonder students have this belief considering the role media has in disseminating information. In an empirical study conducted by Partridge et al. (2011), they found "95% of articles mentioned at least one possible benefit of using prescription drugs for neuroenhancement, but only 58% mentioned any risks/side effects." As cited by Abelman (2017) and defined by Bostrom and Sandberg (2009), cognitive enhancement results from using "artificial means to optimize one's learning and memory systems." Zohny cites it as increasing "information-processing functions such as learning, planning, concept formation, perception, attention, memory, reasoning and problem solving" (2015). Multiple studies have documented both positive and negative correlations to prescription stimulant use and its effect on a student's cognitive enhancement.

Given the general consensus among students that prescription stimulants improve performance, researchers have found there is little to no evidence that cognitive enhancers actually work and often result in a student's cognitive ability remaining unchanged (Abelman, 2017; Lakhan & Kirchgessner, 2012; Zohny, 2015). Supported by Abelman (2017), they

additionally found these “drugs do not offer as much help to people with greater intellectual abilities.” Due to increased impulsivity, stimulant usage may worsen a student’s distractibility, attention, and forward-thinking (Advokat, 2010; Lakhan & Kirchgessner, 2012). Furthermore, in a review of the literature, Advokat (2010) found that individuals without ADHD who are using stimulant medication may actually hinder their ability to perform tasks that “require adaptation, flexibility, and planning” as well as the lack of short-term memory preservation and reduced creativity. In a study of thirteen cognitive performance measures, Illieva et al. (2013) found no evidence of enhancement among young healthy adults either. The study focused on: “episodic memory, working memory, inhibitory control, convergent creativity, intelligence and scholastic achievement.”

Some researchers challenge the above findings and suggest stimulant medication does offer cognitive enhancement in one form or another. By using stimulant medication, students are able to improve their capability to focus and pay attention on their current tasks (Lakhan & Kirchgessner, 2012). Similarly, Weyandt et al. quoted improvements in response inhibition and working memory for individuals with ADHD (2013). Per Advokat’s review of the literature (2010), increased awareness and memory consolidation of previously acquired knowledge were enhanced. In a cross-sectional survey of adults with ADHD on cognitive outcomes, the researchers interestingly reported “treated ADHD subjects had statistically significant better scores on measures of IQ than did untreated ones” (Biederman et al., 2012). Therefore, it is evident that prescription stimulant usage and its correlation to cognitive enhancement are somewhat uncertain. As discussed, researchers have cited both positive and negative enhancements; however, it is difficult to draw conclusions as to how stimulant medication affects the cognitive function of a student indicating the need for additional exploration.

iii) Academics

As a primary motive to enhance academic performance, students may be relying more and more on the use of prescription stimulants to achieve higher academic levels. Stimulants are likely to "increase the quality of note taking, scores on quizzes and worksheets, writing output, and homework completion" (Advokat, 2010). The level of improvement was assessed upon observational analysis and the correctness of the student's notes in comparison to the teacher's lesson plan (Evans et al., 2001). In Zohny's analysis of the literature, stimulant medication can be "used to enhance the mood and motivation necessary for effective study" (2015). Zohny describes this level of induced confidence and drive as a beneficial aid to increase a student's experience while studying and actually may help the student's success long-term.

Interestingly, preliminary studies have shown prescription stimulants do not actually enhance or improve academic performance and appear to have a negative correlation associated with it (Advokat, 2010; Vrecko, 2013; Weyandt et al., 2016). Lakhan and Kirchgessner reported students who use stimulant medication to improve academic performance and are diagnosed with ADHD are still less likely to achieve the same academic success as students without ADHD (2012). In a review of the literature, grade point averages were inversely correlated to the non-medical use of stimulants among college students (Benson et al., 2015). Ironically, in a study of 303 college participants, 50% of non-users and 45.7% of users indicated they felt stimulant medications usage "leads to an unfair advantage on exams" (Brandt, Taverna, & Hallock, 2014). What is intriguing is that almost half of prescription stimulant users consider this to be cheating when used as an aid to boost performance in school. In a similar study conducted by Bossaer et al. (2013), 621 medicine, pharmacy, and respiratory therapy students were surveyed. Of those, 372 responded to the survey with a total of 329 students providing their grade point average. The

study found that those who misused prescription stimulant medication (44 students) received a 3.42 GPA while students who did not use prescription stimulant medication had a GPA of 3.51. Additionally, the study hypothetically asked students about their opinion on another student using prescription stimulant medication to maintain their superior performance in school. Roughly 55.8% of the 372 respondents "believed this constituted academic dishonesty, and 59.9% agreed that using prescription stimulants provides an unfair advantage" (Bossaer et al., 2013).

Contrary to the preconceived belief that students are using prescription stimulants to enhance academic functioning, Green and Rabiner (2012) have cited that multiple studies found college students with ADHD might actually be using prescription stimulants as a coping mechanism to overcome their lack of confidence to academically succeed. To support this theory, Blase et al. (2009) found self-reported ADHD students expressed increased academic concerns while in college and reported lower grade point averages.

Due to how stressful the college environment can be, it appears that students may partake in non-medically using these medications to achieve an upper-hand over their peers. However, as cited by McCabe et al. (2014), the effect to which prescription stimulant medication actually increases academic performance remains relatively unknown. The current literature is lacking research around ADHD diagnosed versus non-ADHD prescription stimulant users and the positive or negative academic outcomes associated with them. Whether or not there is a direct correlation on academic performance, students appear to perceive them as a way to enhance their academic status suggesting the need for more empirical research.

iv) Usage with Other Substances

Aside from the reasons why a student uses prescription stimulants non-medically, it often goes overlooked that students are using them in addition to other substances. If a college student misuses prescription stimulants, then they are more likely to be using other substances as well (i.e., drugs or alcohol). This idea has been supported by multiple research studies examining the correlation between misuse and the likelihood of engaging in other risky drug behaviors. Non-prescription stimulant holders are more likely to use "alcohol, cigarettes, marijuana, ecstasy, and cocaine" (Arria & Dupont, 2010; Lakhan & Kirchgessner, 2012; S. E. McCabe et al., 2005).

McCabe et al. reported non-prescription stimulant misusers were "ten times more likely to report marijuana use in the past year, almost seven times more likely to report frequent binge drinking, and over 20 times more likely to report cocaine use in the past year" (2005). Typically, misusers are using these substances simultaneously or better known as concomitant use. Concomitant use can be defined as using other substances "at the same time or on a single occasion" (Cassidy et al., 2015). In the study, 224 individuals reported non-medical use of prescription stimulants with nearly half (47.3%) typically using other drugs at the same time with prescription stimulants (Cassidy et al., 2015). Of this population, marijuana (76.4%), alcohol (63.2%), pain relievers (18.9%), and other prescription medications (<10%) were used in combination with prescription stimulants. In a similar study, Brandt et al. (2014) found of the 110 students who reported prescription stimulant misuse, roughly 41.8% reported mixing them with other drugs consisting of marijuana (86.8%), alcohol (81.6%), cocaine (10.5%), and ecstasy (7.9%). While not every non-prescription stimulant misuser uses other drugs in addition to stimulants, there is enough evidence to suggest this population is more likely to partake in these risky behaviors.

v) Adverse Effects

In general, Benson and colleagues have cited prescription stimulants as safe and effective when used as prescribed (2015). However, there are numerous dangers associated with misuse and/or abuse of prescription stimulants. As cited by Cassidy et al., prescription stimulants when used for purposes other than prescribed can pose serious health risks (2015). The American Addiction Centers has reported Adderall as an addictive drug and when used "recreationally may increase the chances of developing a psychological and physical dependence on them" (2018). These dangers include, but are not limited to, "psychosis, myocardial infarction, cardiomyopathy, and even sudden death" (Lakhan & Kirchgessner, 2012) as well as "loss of appetite, confusion, dizziness or blurred vision, insomnia, headaches, sweating, and dryness of the mouth and eyes" (Herman et al., 2011). Herman and colleagues also found associations to irregular heartbeat, disruption in sleep patterns, delusions, and hallucinations (2011) while the National Institute on Drug Abuse (2018) describes increased body temperature, muscle pains, seizures, vomiting, and diarrhea as potential symptoms. Further adverse effects include subsequent weight loss (Kent, Blader, Koplewicz, Abikoff, & Foley, 1995; Weyandt et al., 2014) and hyperactivity among college students (Lakhan & Kirchgessner, 2012).

Purpose of Study

After carefully exploring the current academic literature, I have identified an area of opportunity to guide and direct my research study. The objective of the study is to examine the relationship between student characteristics and out-of-class activities and prescription stimulant use, misuse and/or abuse among college students.' Among this broad overarching theme, I have narrowed my focus to examine the research question through three different lenses. The first lens seeks to observe how stimulant usage varies between different organizations a student might be involved in (e.g., Greek-lettered organizations, business organizations, service organizations, etc.). The second lens looks into how usage and/or abuse differ among more socially active students. The third and final lens seeks to understand if using, misusing, and/or abusing prescription stimulants occur as a result of social obligations a student has to their peers.

Chapter 3

Methods

Data Collection

The present study used a web-based administered survey questionnaire. The questionnaire was designed and constructed based on The Ohio State University – College Prescription Drug Study survey instrument (*College Prescription Drug Study*, 2015) and Benson and colleagues (2015) recommended instrument queries that examined prescription stimulant drug use among college students. The survey software REDCap [Research Electronic Data Capture] was used to study and collect the data (Harris et al., 2009). The data collected was then analyzed using the Stata Statistical Software: Release 15 program (College Station, TX). The present protocol was examined and approved by The Pennsylvania State University Institutional Review Board. The study instrument received an "exempt" status from the Institutional Review Board.

To increase survey response and diversity among participants, recruitment was targeted towards the largest academic classrooms at Penn State University without preference to specific majors or areas of study. I contacted the professors in charge of these classes by email and asked permission to administer the study instrument to their students. The method of survey delivery depended on classroom format (i.e., in-person vs. online) and teacher preference – either a brief presentation in the beginning or end of class or online through their email list-serv. I received approval from seven faculty members to administer my survey instrument to their class. Due to the lack of classroom time available, all of the teachers preferred the outreach be conducted

through email list-serv. As such, students were contacted about participation in the survey via email list-serv with an access link to the study. All students were informed that participation in the survey was completely voluntary and they were able to terminate the survey at any time. All students had the choice not to answer specific questions and could continue to answer only the questions they wanted. The students were informed no identifiable data information was going to be asked or collected during the survey and were reassured they would not be able to get tracked and their identity and responses would remain completely anonymous. Students had the freedom to complete the survey at a location of their choice. There was no written consent obtained in the survey instrument and student participation implied voluntary consent. This was a one-time survey and students were not provided with an incentive.

Eligibility Criteria

For participants to qualify for the research study, they had to meet three inclusion criteria requirements. Participants needed to be at least 18 years old and no more than 25 years old. Participants also had to be currently enrolled as a Penn State student at the University Park campus. If all three criteria were met, then the participant was eligible to proceed with the survey.

Sample

The sample population consisted of a total of 1,036 survey respondents. The survey was evenly distributed with 554 females, 468 males, and 9 other respondents indicated they preferred not to answer or identified as another gender. Of this population, 124 were Asian, 61 were Black, 67 were Hispanic, 727 were non-Hispanic white, and 51 other respondents indicated they

preferred not to answer or identified with another race. A large majority identified themselves as heterosexual (951) with the remaining respondents indicating they were lesbian (6), gay (8), bisexual (33), or preferred not to answer, were questioning, or identified with another sexual orientation (33). With the exception of seven respondents, everyone indicated they were currently an undergraduate student (1,022). A more detailed description of the sample population can be found in Table 2.

Of the total survey respondents, 206 indicated they have a current medical prescription for stimulant use and have used prescription stimulants for non-medical reasons or do not have a current medical prescription for stimulant use, but have used stimulants for non-medical reasons. This group of respondents (i.e., non-medical users) will be used as the focal point during my data analysis. Those who indicated they had a prescription stimulant were asked to identify their prescription medication. The most used prescription medication type was Adderall with 37 users (54%). The other choices included Vyvanse with 15 users (22%), Ritalin with 8 users (11%), and Other medication type with 9 users (13%). The option 'Dexedrine' was not chosen by a single respondent. The average diagnosis of ADHD was 13.6 years old with the youngest diagnosis at age 4 and the oldest diagnosis at age 23. Please refer to the 'Results' section for a more in-depth explanation of this population.

Instrument and Measures

Students were asked to reflect on several questions regarding their out-of-class lifestyle, involvement in extracurricular activities, and prescription stimulant usage. Questions about their perception and belief around prescription stimulants within the Penn State community and

demographics were asked. The estimated time to complete the survey was six minutes. The complete survey instrument can be found in Appendix A.

Prescription Status

To assess the respondent's stimulant prescription status, I used three different questions. Respondents were asked to identify if they have a current prescription for stimulant medication. If answered affirmatively, they were presented with brand name options to define their current medication. Responses included (a) Ritalin, (b) Dexedrine, (c) Adderall, (d) Vyvanse, and (e) Other. To capture past diagnoses, participants were asked: "Have you ever been diagnosed with ADHD?"

Prescription Stimulant Misuse

Respondents were assessed if they have ever used prescription stimulants for non-medical reasons. Non-medical reasons was defined as using a prescription stimulant that was not prescribed to you, only using it for the experience or feeling it caused, or using in a way that was not prescribed. An affirmative answer prompted a series of questions to analyze what kind of non-medical behaviors the participants engaged in and how often. If the participant answered "Yes" to having a current prescription and "Yes" to having used prescription stimulants for non-medical reasons, then they were presented with: (i) Took too much of your medication (a greater dosage), (ii) Took your medication more often than prescribed, (iii) Snorted stimulant medication, (iv) Took stimulant medication with other drugs, (v) Took stimulant medication that you did not have a prescription for. If the participant answered "No" to having a current prescription and "Yes" to having used prescription stimulants for non-medical reasons, then they

were presented with: (i) Snorted stimulant medication, (ii) Took stimulant medication with other drugs, (iii) Took stimulant medication that you did not have a prescription for. Response options provided for both branching routes to assess the prevalence of misuse were: (a) Not at all, (b) Less than once a Month, (c) Once a Month, (d) 2-3 times a Month, or (e) 4 or more times a Month.

To understand where participants were using prescription stimulants for non-medical reasons, they were asked to identify where they most often use prescription stimulants. The options presented were: (a) At the gym, (b) At parties, bars, or clubs, (c) While studying, (d) Hanging out with friends, (e) I'd rather not say, or (f) Other.

Prescription Stimulant Effectiveness

To assess the effectiveness of prescription stimulant misuse, respondents were asked to identify how often it actually helped them: (i) To concentrate better while studying, (ii) To be able to study longer, (iii) To concentrate better in class, (iv) To complete other tasks not related to school, (v) To stay awake longer, (vi) To improve athletic performance, (vii) To get high, (viii) To offset the effects of alcohol or other substances, (ix) To prevent other students from having an academic edge over you, (x) To lose weight, (xi) Other? Participant's answers were measured on a scale of: (a) Never, (b) Rarely, (c) Sometimes, (d) Often, or (e) Always.

Diversion

Respondents that indicated they had a current prescription were asked if they had ever given away their prescription to someone else. To understand their motivation to divert their medication, respondents were asked if they had done so to (a) Look cool, (b) Help a friend out,

(c) Make extra money, or were (d) Pressured into selling/giving away medication. Respondents that did not have a prescription were asked their opinion on why someone would divert their medication using the same responses from above. Both respondents were then asked a question to assess where they most often obtain their prescription stimulant medication.

Out-of-Class Activities & Social Involvement

I assessed the respondent's social lifestyle through a series of a few questions. To identify if prescription stimulant use varies by the individuals involvement in extracurricular clubs, participants had to indicate if they were indeed a part of any and if so which ones they were involved in. Then, respondents were asked: "How many times a week do you typically go out partying (e.g., to a bar, to a club, to an apartment, to a fraternity?" In order to capture the prevalence rate of partying, response options included: (a) 0-1, (b) 2-3, (c) 4-5, or (d) 6-7. Additionally, respondents were asked to provide what their typical hours per week were spent on. The objective of this survey question is to assess if there is any difference between the rates of misuse depending on how many hours are associated with each activity. This survey question consisted of options including: (i) Hanging out with friends, (ii) Exercising, (iii) Hanging out with a significant other, (iv) Studying, (v) Going to the bars or clubs, (vi) Going to Greek or apartment parties, (vii) Leisure, (viii) Other. The response scale was arranged from (a) 0-5 Hours, (b) 6-10 Hours, (c) 11-15 Hours, (d) 16-20 Hours, or (e) 21+ Hours.

Demographics

Participants were asked to self-identify various demographic questions, including: gender, race/ethnicity, sexual orientation, current semester standing (i.e., undergraduate,

graduate, prefer not to answer, other), and field of study or major. Other demographic questions include cumulative grade point average (GPA), current employment status, United States citizenship, and if participants are a first generation college student or not.

Data Analysis

Statistical analyses were carried out using procedures available in the Stata software package for analysis of the survey data. The data was recoded to usable variables and was then examined using a variety of tests. I ran an initial tabulation of all demographic variables to get an overview of my sample population. Then I ran a cross-tabulation between demographic variables and the non-medical use status variable to examine the frequencies and percentages of respondents who have and have not used prescription stimulant medication for non-medical reasons. Descriptive statistics for diversion, prescription source, student organization involvement, and reasons for prescription stimulant medication use were displayed in frequency tables and examined in greater detail. Additionally, I ran a correlation analysis between multiple variables to understand the relationship between the chosen variable and the non-medical use status variable. I first examined the correlation of demographics of respondents to non-medical use status. To examine the influence partying has on an individual, I ran a correlation between the party frequency variable and the different types of organizations a student may be involved in as well as the activities a student typically participants in during the week. All correlation analyses were assessed on a *p* value of .05 and .01 as indicated in the tables that follow. Finally, I ran a linear probability regression between the non-medical use variable and demographic variables to understand the relationship between each independent variable and the dependent variable, non-medical use. The interpretation of the coefficient of each independent variable is

the impact of a unit change in that variable on the probability of non-medical use of prescription stimulants. All independent variables were statistically assessed on a *p* value of less than .10, .05, and .01.

Chapter 4

Results

Descriptive Statistics

The survey was completed by 1,036 total respondents (See Table 2). A total of 554 (53.7%) females and 468 (45.4%) males completed the survey. In comparison to Penn State University Park's fall 2018 demographic analysis, which was composed of 46% females and 54% males, there was a slight difference between the representations of gender in my survey versus the population at Penn State. More than 70% of survey respondents were non-Hispanic white with the next largest race being Asian students. Similarly, University Park is composed mostly of non-Hispanic white students with Hispanic then Asian students representing the next largest categories. The most frequent colleges students were enrolled in were the College of Liberal Arts, Smeal College of Business, College of Engineering, and Donald P. Bellisario College of Communications. A large majority of students have GPA's of 3.01 or higher and indicated they are not employed. Roughly 90% of survey respondents were United States citizens and only 15% were first generation students.

As also seen in Table 2, the response total of students who indicated they used prescription stimulants for non-medical reasons was 206 (19.9%). Roughly 51.2% of the respondents using prescription stimulants for non-medical reasons were female and 48.8% were male. When comparing the number of misusers to their respective gender categories, we found that 21.2% of men have used prescription stimulants for non-medical reasons whereas only 19.1% of female misused. A large majority of these misusers were non-Hispanic white with a frequency rate of 165 respondents (81.3%). The next group of misusers with the highest frequency was Hispanics at 8.9%. Interestingly, when comparing those who did not misuse

versus those who have misused, I found that 27.7% of all Hispanic respondents indicated they had used stimulants for non-medical purposes. In comparison, only 23% of non-Hispanic whites indicated they misused.

Roughly 50% of survey respondents who have misused prescription stimulants were either in the Smeal College of Business (25.3%) or College of Liberal Arts (25.7%). The Donald P. Bellisario College of Communications had the third highest percentage of misusers at 11.4%, with the College of Health and Human Development at 10.9%. The College of Nursing, College of Architecture, and College of Earth and Mineral Sciences only had 0, 1, and 3 respondents indicating they used prescription stimulants non-medically respectively. Each of these colleges only had a very small number of 7, 10, and 21 total survey respondents. The most common GPA range students indicated they had was 3.01 – 3.5 with 41.7%. A GPA range of 2.51 – 3.0 had 57 students (27.9%), a GPA range of 3.01 – 3.5 had 85 students (41.7%), and a GPA range of 3.51 – 4.0 had 50 students (24.5%). The greatest percentage of students who misuse prescription stimulants for a designated GPA range are those students who have a GPA of 2.51 – 3.0. Of the 211 total students in the entire sample that have a 2.51 – 3.0 GPA, more than a quarter of them (27.4%) misuse prescription stimulants.

Only 27.5% of misusers (56) currently have a job. Their employment hours varied. Approximately 55% of misusers worked anywhere from 10-19 hours per week. The remaining students either worked fewer than 10 hours per week (27.8%) or worked 20-29 hours per week (11.1%). Most the survey respondents who have misused were United States citizens (195) and were not first generation college students (164). In comparison to those who are and are not first generation students, my statistical analyses show that students who are first generation have a higher misuse rate (25.1%) than of those who are not first generation (19.7%). Descriptive

statistics for both groups of respondents (i.e., those who have used prescription stimulants for non-medical reasons and those who have not used prescription stimulants for non-medical reasons) can be found in Table 2.

Table 2. Demographics of Respondents

	All Respondents (n = 1,036)[a]		*Non-Medical Use Respondents (n = 206 [19.9%])*[b]		
	n	**%**	**n**	**% (of row)**[c]	**% (of column)**[d]
Gender					
Female	554	53.7	104	19.1	51.2
Male	468	45.4	99	21.2	48.8
No Answer	5	0.4	0	0.0	0.0
Other	4	0.5	0	0.0	0.0
Race					
Asian	124	12.0	10	8.1	4.9
Black	61	5.9	5	8.3	2.5
Hispanic	67	6.5	18	27.7	8.9
No Answer	9	0.9	0	0.0	0.0
Other Race	42	4.1	5	11.9	2.5
White	727	70.6	165	23	81.3
Sex Orientation					
Heterosexual	951	92.2	194	20.7	95.1
Lesbian	6	0.6	0	0.0	0.0
Gay	8	0.8	2	25	1
Bisexual	33	3.2	6	18.2	2.9
Questioning	11	1.1	1	9.1	0.5
Prefer Not to Answer	17	1.7	1	5.9	0.5
Other	5	0.5	0	0.0	0.0
Semester					
Undergraduate	1,022	99.3	203	20.1	99.5
Graduate	3	0.3	1	33.3	0.5
Prefer Not to Answer	4	0.4	0	0.0	0.0
Double Major					
No	914	88.9	184	20.3	90.6
Yes	114	11.1	19	17	9.4
College					
College of Agricultural Science	24	2.3	4	16.7	2
College of Architecture	10	1.0	1	10	0.5

Smeal College of Business	203	19.7	51	25.5	25.3
Donald P. Bellisario College of Communications	140	13.6	23	16.8	11.4
College of Earth and Mineral Sciences	21	2.0	3	14.3	1.5
College of Education	57	5.5	7	12.7	3.5
College of Engineering	161	15.7	16	9.9	7.9
College of Health and Human Development	83	8.1	22	26.5	10.9
College of Information Sciences and Technology	39	3.8	8	20.5	4
College of Liberal Arts	205	19.9	52	25.7	25.7
College of Nursing	7	0.7	0	0.0	0.0
Eberly College of Science	79	7.7	15	19.2	7.4
GPA					
< 2.0	6	0.6	2	33.3	1
2.01 - 2.5	44	4.3	10	23.3	4.9
2.51 - 3.0	211	20.5	57	27.4	27.9
3.01 - 3.5	428	41.6	85	20.1	41.7
3.51 - 4.0	340	33.0	50	14.9	24.5
Employment					
No	778	75.4	148	19.3	72.6
Yes	254	24.6	56	22.3	27.5
Employment Hours					
Fewer than 10 hours per week	73	29.0	15	21.1	27.8
10-19 hours per week	133	52.8	30	22.7	55.6
20-29 hours per week	32	12.7	6	18.6	11.1
30-39 hours per week	8	3.2	3	37.5	5.6
40 or more hours per week	6	2.4	0	0.0	0.0
Citizen					
No	114	11.1	9	7.9	4.4
Yes	918	89.0	195	21.5	95.6
First Generation					
No	870	84.4	164	19.7	80.4
Yes	161	15.6	40	25.1	19.6

Note: Percentages may not total 100% because of rounding.

a.) The total number of survey respondents was 1,036. Due to missing responses, the total number for each category may not add up to 1,036.
b.) The total number of survey respondents who have used prescription stimulants for non-medical reasons was 206. Due to missing responses, the total number for each category may not add up to 206.
c.) Percentage is expressed as a percent of total responses for all survey respondents in that row (e.g., 99 Males / 468 Males).
d.) Percentage is expressed as a percent of total responses for all survey respondents who have used a prescription stimulant for non-medical reasons in that column (e.g., 99 Males / 203 Males & Females).

Diversion Behaviors

As shown in Table 3, the two most common reasons a student might divert their prescription stimulant medication has to do with "helping a friend out" or "making money." With 142 respondents (68.9% of the 206 total respondents) and 152 respondents (73.8% of the 206 total respondents) respectively, it is evident that more than 2/3 of the students identify with these reasons. Although they are less commonly endorsed as a motive, diverting due to pressure from a friend or diverting to look cool, these two reasons were nonetheless still common reasons why a student would divert their prescription stimulant medication.

Table 3. Diversion of Medication Motives

	Frequency	**% of Non-Medical Use Respondents** (n = 206)
Divert Cool	28	13.6
Divert Help	142	68.9
Divert Money	152	73.8
Divert Pressure	49	23.8

Note: The percentage is expressed as a percent of total responses for all survey respondents who have use prescription stimulants for non-medical purposes (e.g., 28 respondents / 206 respondents).

Prescription Stimulant Sources

The most frequently used source to obtain prescription stimulant medication was from a college friend. A substantial 150 students indicated this as their primary method of attaining the medication. Students appear to be more likely to seek assistance from a friend they know and trust rather than someone else. Only 9 students (33% of the 27 students who indicated they were prescription holders) had overused their own medication. Interestingly, 15 students procured their prescription stimulant medication for non-medical use from another source that we have yet to identify.

Table 4. Prescription Stimulant Medication Source

	Frequency	**% of Non-Medical Use Respondents** (n = 206)
College Friend	150	72.8
Family Member	7	3.4
A Friend not in School	6	2.9
Drug Dealer	6	2.9
Overuse my own Prescription	9	4.4
Other*	15	7.8

Note: The percentage is expressed as a percent of total responses for all survey respondents who have use prescription stimulants for non-medical purposes (e.g., 150 respondents / 206 respondents).
* Only 193 respondents answered this option instead of 206 respondents. As a result, the percentage is skewed due to the difference.

Non-Medical Use Motives

After analyzing the reasons for why a student would use prescription stimulants for non-medical reasons, the most commonly endorsed motive was to be able to study longer with 90 respondents (45.5%) indicating this is a reason all of the time and 45 respondents (22.7%) indicating this is often a reason. The second most common motive was to concentrate better

while studying with 87 respondents (43.7%) indicating this is a reason all of the time and 45 respondents (22.6%) indicating this is often a reason. The four least endorsed motives were to lose weight, to prevent other students from having an academic edge over them, to offset the effects of alcohol of other substances, and to get high with only 1, 4, 4, and 4 respondents indicating this was a reason all of time. As a result of the frequency of respondent's reasons of use, a pattern appears to emerge. Misuse more often is endorsed as it relates to studying for academic purposes and class assignments and does not appear to have much of an effect on other factors outside of the academic realm.

Table 5. Reasons for Non-Medical Use

	Never	**Rarely**	**Sometimes**	**Often**	**Always**	**Total** (n)
To concentrate better while studying?	12 (6%)	21 (10.6%)	34 (17.1%)	45 (22.6%)	87 (43.7%)	199
To be able to study longer?	11 (5.6%)	20 (10.1%)	32 (16.2%)	45 (22.7%)	90 (45.5%)	198
To concentrate better in class?	86 (44.8%)	15 (7.8%)	25 (13%)	31 (16.2%)	35 (18.2%)	192
To complete other tasks not related to school?	94 (48.2%)	25 (12.8)	25 (12.8%)	26 (13.3%)	25 (12.8%)	195
To stay awake longer?	54 (27.7%)	24 (12.3%)	28 (14.4%)	33 (16.9%)	56 (28.7%)	195
To improve athletic performance?	154 (80.2%)	14 (7.3%)	11 (5.7%)	4 (2.1%)	9 (4.7%)	192
To get high?	157 (80.9%)	17 (8.8%)	9 (4.6%)	7 (3.6%)	4 (2.1%)	194
To offset the effects of alcohol of other substances?	144 (74.6%)	20 (10.4%)	19 (9.8%)	6 (3.1%)	4 (2.1%)	193
To prevent other students from having an academic edge over you?	156 (80.8%)	9 (4.7%)	14 (7.3%)	10 (5.2%)	4 (2.1%)	193
To lose weight?	163 (84.5%)	11 (5.7%)	13 (6.7%)	5 (2.6%)	1 (0.5%)	193

Any other reason	156 (92.7%)	2 (1.2%)	5 (3%)	3 (1.8%)	2 (1.2%)	165

Note: The total column depicts the total responses for both non-prescription and prescription holders for each variable. The frequency is shown as well as the percentage on a horizontal comparison. The percentage is expressed as a percent of total responses for all survey respondents (e.g., 12 respondents / 199 respondents).

Organization Association

After examining the frequency of different types of organizations a student might participate in, I found that the most represented organization on campus among respondents was Greek-lettered (i.e., fraternities and sororities). Slightly less than 40% of all 206 respondents are members of a Greek-lettered organization. Additionally, academic and professional organizations (i.e., business club, engineering club) also had high representation with 73 respondents (35.4%) indicating they were a part of one. Philanthropy organizations and special interest organizations were represented by 60 and 43 survey respondents. The least represented organization on campus was Club Sports with only 14 respondents. One pattern that emerges from the different types of organizations on campus is that students who use prescription stimulant medication for non-medical purposes appear to be in organizations that are either socially focused (Greek-lettered) or academic focused (academic and professional clubs).

Table 6. Respondents Organization Affiliation

	Frequency	**% of Non-Medical Use Respondents** (n = 206)
Academic/Professional Organization	73	35.4
Greek-Lettered Organization	80	38.8
Special Interest Organization	43	20.9
Service Organization	18	8.7
Club Sport Team	14	6.8
Philanthropy Organization	60	29.1

Other Organization	19	9.2
No Organization	42	20.4
Note: The percentage is expressed as a percent of total responses for all survey respondents who have use prescription stimulants for non-medical purposes (e.g., 73 respondents / 206 respondents).		

Correlation Analysis

As shown in Table 7, there a few interesting takeaways from the correlation analysis of respondent demographics to the likelihood of non-medical use status. Consistent with prior literature, females are less likely than their male counterparts to use prescription stimulants non-medically. The correlation between non-Hispanic whites and non-medical use was 0.1177, which is stronger than any other race variable. Hispanics have a positive correlation coefficient of 0.0507 while Asians have the greatest negative correlation of -0.1107.

Students who have higher grade point averages (above 3.0) and appear to excel more in school are less likely to misuse and/or abuse than students who have lower grade point averages. Those students who are in the mid-GPA range have the strongest positive correlation. This is not surprising considering these students may misuse and/or abuse to boost their grades and academic performance. Additionally, students who are in the College of Engineering actually had the lowest correlation coefficient out of all other colleges at Penn State with a -0.1101. This trend followed with the College of Nursing and Eberly College of Science. Conversely, Smeal College of Business had the greatest positive coefficient of 0.0657.

Finally, of those students who work fewer hours per week, there is a positive relationship with the use of prescription stimulants non-medically. Those who work more hours are less likely to misuse prescription stimulants even though they probably have busier schedules and

must balance the responsibilities of employment with school work. However, none of the employment variable correlations were statistically significant.

Table 7. Correlation of Demographics of Respondents to Non-Medical Use Status

Variable	Correlation	Variable	Correlation
Female*	-0.0265	Undergraduate	-0.0132
		Double Major	-0.0251
Asian**	-0.1107		
Black*	-0.0727	College of Agricultural Sciences	-0.0135
Hispanic	0.0507	College of Arts and Architecture	-0.0252
No Answer Race	-0.0471	Smeal College of Business*	0.0657
Other Race	-0.0417	Donald P. Bellisario College of Communications	-0.0330
White**	0.1177	College of Earth and Mineral Sciences	-0.0212
		College of Education	-0.0442
Heterosexual	0.0422	College of Engineering**	-0.1101
Lesbian	-0.0386	College of Health and Human Development	0.0471
Gay	0.0107	College of Information Sciences and Technology	0.0018
Bisexual	-0.0090	College of Liberal Arts*	0.0691
Questioning	-0.0288	College of Nursing	-0.0417
No Answer Sex	-0.0463	Eberly College of Science	-0.0046
Other sex	-0.0351		
GPA Less than 2.0	0.0252	No Employment	-0.0330
GPA 2.01 - 2.5	0.0162	Work 1 -9 hours per week	0.0066
GPA 2.51 - 3.0**	0.0913	Work 10-19 hours per work	0.0247
GPA 3.01 - 3.51	-0.0023	Work 20 - 29 hours per work	-0.0630
GPA 3.51 - 4.0**	-0.0908	Work 30 - 39 hours per work	0.0384
		Work more than 40 hours per week	-0.0827
Citizenship**	0.1074	*Note*: Each variable was run as a separate correlation with the non-medical use status variable	
First Generation	0.0552		
Prescription Status**	0.1273	*Indicates Significance ($p < .05$)	
		**Indicates Significance ($p < .01$)	
Diagnosis**	0.1077	(n = 206)	

Further looking into an individual's social life, I conducted a correlation analysis between two sets of variables. The analysis examined the different types of organizations a student might

be involved in and the party frequency variable. I wanted to assess what the relationship was between a student's organization involvements and how often they partied. The second set of variables looks into the different types of activities a student does and how often they do them in relationship to the party frequency variable.

After running the analysis, I found that Greek-lettered organizations had the highest positive association with partying. In other terms, the more often a student parties the higher their chances are of being in a Greek-lettered organization. This variable was found to have a statistical significance as well ($p < .01$). Interestingly, members of a Club Sport Team were the only organization that had a positive correlation between the amounts of partying a student does. All of the other organizations had a negative association. Special Interest Organization, Service Organization, and Other Organization had the greatest negative coefficient with -0.1709, -0.1334, and -0.1119. It appears that organizations that are built more around a team-based foundation have higher links to partying in comparison to organizations that function to serve other people and the community.

On the other hand, there was a statistically significant correlation ($p < .01$) between the typical activities a student partakes in during their free time and the amount they party. My analyses found that Hanging out with Friends, Going to a Bar or Club, and Going to a Greek-letter or Apartment party had correlation coefficients of 0.3822, 0.3111, and 0.4372 respectively. These three variables clearly indicate that students who lead a lifestyle more focused on hanging with other people and doing less academic work are more likely to go out and party more during the week as compared to students who spend less time on these activities. This is supported by the negative correlation coefficients found on the variables Leisure (-0.0681) and Hanging out with a Significant Other (-0.0792).

Table 8. Correlation of Party Frequency to Leisure Time Activities/Organizations

Variable - *Activities an Individual Typically Does Each Week (in Hours)*	**Correlation**	**Variable -** *Organizations*	**Correlation**
Hanging out with Friends**	0.3822	Academic Organization	-0.0858
Exercising	0.1128	Greek-lettered Organization**	0.3317
Hanging out with a Significant Other	-0.0792	Special Interest Organization*	-0.1709
Studying	0.0818	Service Organization	-0.1119
Going to a Bar or Club**	0.3111	Club Sport Team	0.0197
Going to a Greek-lettered or Apartment Party**	0.4372	Philanthropy Organization	-0.0560
Leisure	-0.0681	Other Organization	-0.1334
Doing Something Else	0.0048	No Organization	-0.0697

Note: Each variable was run as a separate correlation with the party frequency variable.
*Indicates Significance ($p < .05$)
**Indicates Significance ($p < .01$)
(n = 206)

Regression Analysis

To start, I chose to utilize a linear regression model instead of a logistic regression model due to its simplicity in interpretation. The reason for this choice is that I want to examine only one outcome variable – non-medical use – which is coded as a dichotomous variable with only a value of 0 or 1. The "0" value signifies that there is no non-medical use and the "1" variable represents that there is a non-medical use. I am seeking to examine the relationship between my outcome variable and more than one independent variable in my survey. Thus, does each independent variable have a positive or negative percentage increase or decrease on the non-medical use variable? As such, each independent variable was run in the regression model. For each unit increase in my independent variable, the interpretation is essentially straight forward. For example, if my independent variable has a coefficient of .05, then that means there is a 5

percent increase in the probability of non-medical use, my dependent variable, for each 1 unit change in the independent variable. The results from the regression model are described in greater detail below (See Table 9).

Findings with Statistical Significance

The analysis results reveal a couple of interesting findings. Of all the variables examined, only a few were statistically significant. The variable with the highest probability of misusing and abusing stimulant medication were students who had a grade point average of 2.51 – 3.0. They had more than a 13% greater chance of using prescription stimulants for non-medical reasons. This variable was statistically significant with a p value of < .01. Additionally, I controlled for all race and ethnicity variables besides the variable white. My regression analysis found that the white variable was statistically significant with a p value of < .01. If a student is non-Hispanic white, there is a 10% increase in their probability of misusing and abusing stimulant medication. On a side note, additional regression was run using every race and ethnicity variable while excluding non-Hispanic white students and it found that Asian students are .15 points less likely than non-Hispanic white students to use prescription stimulants non-medically. During that regression, the Asian variable was the only statistical significant variable (p < .001). Black students also were .15 points less likely to use for non-medical reasons while Hispanic students are the only ones who are .05 points more likely to use than non-Hispanic white students while running that supplemental regression.

Furthermore, the College of Engineering was found to be statistically significant with a p value of < .10. Students enrolled in engineering majors were .11 points lower than students who are science majors (reference variable). Finally, the first generation variable was statistically

significant with a *p* value of < .10. Those who are first generation students are .06 points higher to use non-medically than who are not first generation students.

Findings without Statistical Significance

Although they were not found to be statistically significant, other variables warrant further discussion as they paint a better picture surrounding the probability of misuse and abuse among college students. First, females and males have essentially the same likelihood to use prescription stimulants non-medically. There is less than a 1% variation between the two genders. All sexual orientation identities are likely to have a greater change to use more than the reference variable other (i.e., any sexual orientation not listed on the survey). Students who identify as being gay, bisexual, or heterosexual have a 19%, 13%, and 16% greater chance of using prescription stimulants for non-medical purposes. Those who are United States citizens are .06 points higher than those who are not United States citizens.

As well, the study found that students who are nursing majors and education majors are .20 and .10 points lower than students who are science majors in using prescription stimulants non-medically. Students who are in the Smeal College of Business, College of Liberal Arts, or in the College of Health and Human Development are the only ones who are had a positive point increase compared to science majors. Considering the different types of majors and academic course load found in the Smeal College of Business, I was surprised to see that there was no statistical significance found. Moreover, a grade point average of less than 2.0 had a 20% increase and every other GPA variable had a positive increase in comparison to the reference variable. Lastly, individuals who work less than 30 – 39 hours per week have a negative

percentage to use prescription stimulants in comparison. Only the variable 30-39 hours per week had a positive increase.

Table 9. Regression of Respondents Demographics to Non-Medical Use Status

	Parameter Estimate	Standard Error
Gender		
Female	0.0006	0.0280687
Race		
White***	0.0946	0.0319445
All Other Race Categories (Reference)	-	-
Sex Orientation		
Heterosexual	0.1638	0.1808982
Lesbian	0.0112	0.2698399
Gay	0.1896	0.230951
Bisexual	0.1330	0.1917854
Questioning	0.0535	0.217837
Prefer Not to Answer	0.0835	0.2132094
Other (Reference)	-	-
Semester		
Undergraduate	-0.0572	0.1675825
Double Major		
Yes	-0.0357	0.0420944
College		
College of Agricultural Science	-0.0409	0.0943877
College of Architecture	-0.0661	0.1357283
Smeal College of Business	0.0569	0.0537314
Donald P. Bellisario College of Communications	-0.0516	0.0568365
College of Earth and Mineral Sciences	-0.0244	0.0993828
College of Education	-0.1009	0.0709777
College of Engineering*	-0.1081	0.0552544
College of Health and Human Development	0.0352	0.0631072
College of Information Sciences and Technology	-0.0098	0.0800321
College of Liberal Arts	0.0512	0.0535469
College of Nursing	-0.1968	0.1563278
Eberly College of Science (Reference)	-	-
GPA		
< 2.0	0.2093	0.1652683
2.01 - 2.5	0.0812	0.0662153

2.51 - 3.0***	0.1341	0.0362533
3.01 - 3.5	0.0468	0.029646
3.51 - 4.0 (Reference)	-	-
Employment		
No	-0.0833	0.1543407
Employment Hours		
Fewer than 10 hours per week	-0.0464	0.1604647
10-19 hours per week	-0.0564	0.1571397
20-29 hours per week	-0.1096	0.1692944
30-39 hours per week	0.0424	0.2091714
40 or more hours per week (Reference)	-	-
Citizen		
Yes	0.0637	0.0459483
First Generation		
Yes*	0.0595	0.0355636
Constant	0.0040	0.2835727
Note: *Indicates Significance ($p < .10$); **Indicates Significance ($p < .05$); ***Indicates Significance ($p < .01$); (n = 1,006)		

Chapter 5

Discussion

After statistical analyses were conducted, the results of the study provide a better understanding of the misuse and abuse among college students at Penn State. There are a few main takeaways that render further discussion. To start, it appears that diversion among Penn State students is a result of the student's desire to either help a friend out or make money for themselves. Regardless of the motive, the act of diverting a prescription stimulant is illegal in nature and could potentially lead to serious consequences. Students may not be aware of the criminal nature of the act or downplay the potential penalties. To prevent and minimize diversion from occurring, it would be recommended that the University offers educational awareness surrounding the act of illegally selling or giving away drugs. This can be accomplished through freshman seminars, adding a section in the student handbook, or hanging poster signs around campus and at the University Health Services building. While it is necessary and does make sense why a substantial portion of the university's effort is devoted to alcohol awareness and prevention, we need to make sure that we address emergent issues such as the opioid epidemic, misuse and abuse with prescription stimulants, and illegal drug usage of similar nature. This is an increasing problem that warrants greater attention. Future research needs to ask more questions about diversion and the reason why students are doing so. It is a relatively new research focus and we could greatly benefit from understanding additional factors about why a student would divert their medication.

Additionally, the primary motives to misuse and abuse prescription stimulant medication was to concentrate better while studying and to be able to study longer. Misuse and abuse is predominantly occurring for academic purposes and class assignments. Students are resorting to prescription stimulants to gain an academic advantage when it comes to their course load. While the University needs to make academic resources (i.e., tutoring, academic advisors, study groups, library functionalities, etc.) more transparent to incoming and current students in particular through emails and resident assistants, this is not the only effective solution. There are questions that still need to be answered to assist in the development of a meaningful solution. As such, are students falling behind in school due to other reasons such as lack of time management or inefficient organizational skills? Are students unable to cope with stress and the rigors of balancing social life with academic requirements and personal leisure time? The University needs to examine in further depth the underlying reasons why a student is using prescription stimulants for academic purposes and seek to attack the issue directly, rather than take a reactive approach.

Furthermore, my analysis indicated that students who are misusing or abusing prescription stimulants are most active in academic and professional organizations and Greek-lettered organizations. By narrowing down the types of organizations that a student who uses prescription stimulants non-medically participates in, University outreach can be more focused and defined towards these individuals. For example, one recommendation may be that it should be mandatory that all Greek-lettered organizations attend a seminar on the negative consequences of prescription stimulants or that this information be featured more prominently in existing educational programs. Similar programs are in place for alcohol and tobacco use, but none to my knowledge exist for prescription stimulants. The first step in addressing this misuse

and abuse among college students is talking about it and raising awareness. If these organizations have a better understanding of what some of their members are doing, then they could potentially reduce or completely stop the usage. This would not only improve the entire organization but also create a positive culture for future students.

Similarly, my findings showed that students who party more frequently and are more socially involved (i.e., going out with friends or going to the bar or a party) have a higher correlation to misuse and abuse. It might be beneficial to add questions regarding prescription misuse or abuse to current University-wide student surveys to identify how often students are partaking in these activities. Each year, these reports can be compiled and used to guide programming in University Health Services or Student Affairs. If there is an increase, the University can target this population and market healthy and safe alternatives to occupy their time rather than going out and drinking alcohol.

Finally, the results of my regression analysis identified four different areas to focus future research and preventative efforts. The first is that non-Hispanic white students are more probable to use prescriptions stimulants for non-medical reasons. While educational and health and wellness efforts can be used for all populations, Penn State and other large universities similar to it should recognize that prescription stimulant use and abuse is more prevalent among a group of students that is a large majority of the University Park undergraduate.

The College of Engineering had the only statistical significance compared to the other colleges at Penn State. I found that there is a 10% decrease in the probability of using prescription stimulants non-medically. Considering the rigorous academic course load and time-consuming nature of engineering work, the probability goes against my presumption. I believe further research is needed to truly understand the differences between the types of colleges a

student may be enrolled in. If we have a better understanding of which majors and areas of interest are more or less likely to have students using prescription stimulants non-medically, then preventative efforts would be much more effective in targeting this population.

Additionally, students with a grade point average of 2.51 – 3.0 had a 13% increase in the probability of misuse and abuse. This population of students may be using prescription stimulants to recover from their low GPA. It may be possible that these students know they are struggling academically and the stress of trying to make sure they succeed is causing them to look for ways that they can enhance their academic performance. These students may be involved in too many activities or are poorly managing their time, or are in hard majors where the average GPA is lower than others. Regardless of the reason, these students may be resorting to prescription stimulants because they believe it will help them accomplish their work and achieve a better grade point average. Faculty, advisers, resident assistants, and health professionals at universities may need to understand that students with this characteristic may have elevated risk for prescription stimulant misuse and needs targeted outreach to minimize the risk of misuse and abuse.

The last finding that warrants discussion is that first generation students have a positive probability increase to misuse and abuse. First-generation students often feel greater pressure to succeed, as they carry the burden of family expectations. In addition, they may not have the same social and family support of other students who have close relatives that have attended college. This is an opportunity for the University to intervene immediately during a student's initial period at school. If we can develop an outreach platform or specifically gear advertising towards first generation students, then we could greatly reduce the misuse and abuse among this group. These students may have not had any exposure to prescription stimulants before college. Policy

development and actions may need to educate, inform, and lead first generation students to healthy habits before they become curious and exploratory and try prescription stimulants, as they face the pressures of being the first member of their family to attempt university education.

Limitations

Although my study had statistically significant variables and revealed consistent data with previous literature, there are several limitations to this research study. An important limitation is that I picked certain courses I assumed would have a generally representative population of the entire University. These courses were broad in nature and did have a wide range of students in terms of semester standing, college enrollment, GPA, etc., but there still may have been more variation if we had a larger sample size and a greater variety of courses to examine. Additionally, there may be bias from the students completing the survey. Some students may have lied about their misuse and abuse frequency and/or were not truthful when completing the survey to protect themselves. Students may have been nervous to admit they have misused and abused in the past and/or are currently still doing so.

Moreover, another important limitation is that I did not ask what types of organizations a student is involved in to the entire sample. I only asked this question to the students who indicated they have used prescription stimulants for non-medical reasons. At the time of my survey creation, I believed this was the right way to go about it. However, my statistical findings might have revealed a different story if I gathered organization information from all of the students. As well, the survey sample was only limited to Penn State University Park's campus. The data does not represent all of Penn State's Commonwealth campuses.

Along with these limitations, be cautious of making the causality link between prescription stimulant non-medical use and the factors examined in the survey. Just because my data indicates that there are certain characteristics that or more-or-less likely to have an association with prescription stimulant misuse and abuse does not mean that every student who has these factors will use prescription stimulants. There are many other factors that play into the non-medical use decision than just the ones identified in my study.

Lastly, there may be a limitation with the time frame used to gather data. Much of my analysis was conducted during late November and early December of 2018. If another time period were to be examined (i.e., midterms week, early semester, end of the year), then there may be differing results from the ones found in my study.

Conclusion

In conclusion, prescription stimulant misuse and abuse is occurring at The Pennsylvania State University at rates similar to what has been found at other large universities. The results from this research indicate that students want to increase their academic performance, gain a completive advantage, or simply use the medication for other reasons than medically intended to enhance their ability to study for school. The issue is significant enough that university leaders should be considering efforts to address the issue as it will continue to be a problem among the undergraduate population. Further research is imperative if we want to help reduce and prevent this phenomenon for occurring in future students. Policy makers and program developers need to identify populations with the Penn State community to effectively market educational awareness and useful on-campus resources that would be applicable to them. Not all solutions will work for everyone. By being proactive and test-running certain programs, the University can effectively

and efficiently manage the misuse and abuse on campus. More attention needs to be given to this topic as prescription stimulant use is continuing to rise. I recommend a longitudinal study on campus for freshman students to their senior year to truly understand what the underlying reasons are as to why a student would misuse and abuse prescription stimulants. On the positive side, prescription stimulants is an issue that can be counteracted and the undergraduate student population habits and health will be improved as a result of these efforts.

Appendix A

Prescription Stimulant Survey Questions

Section 1: Prescription Stimulant Use – Filter Questions (All Respondents)

1. Do you currently have a prescription for stimulant medication (generally used for the treatment of Attention-deficit/Hyperactivity Disorder - ADHD)?
    i. Yes
    ii. No
2. What kind of stimulant medication do you have a prescription for (e.g., Ritalin, Dexedrine, Adderall, Vyvanse)?
    i. Ritalin
    ii. Dexedrine
    iii. Adderall
    iv. Vyvanse
    v. Other
3. Have you ever been diagnosed with ADHD?
    i. Yes
    ii. No
4. How old were you when you were diagnosed?
    i. _____ (answer in years)

Section 2a: Non-Medical Prescription Stimulant Use (For respondents who currently have a prescription for stimulant medication and have used prescription stimulant medication for non-medical reasons)

1. Since attending Penn State, have you ever used a stimulant (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) for non-medical reasons (e.g., it was not prescribed to you, only used it for the experience or feeling it caused, or used it in a way that was not prescribed)?
    i. Yes
    ii. No
2. What behaviors did you engage in related to stimulant medication and how often did you engage in these behaviors? (choose one response per row)

	Not at all	**Less than once a Month**	**Once a Month**	**2-3 times a Month**	**4 or more times a Month**

Took too much of your medication (a greater dosage)					
Took your medication more often than prescribed					
Snorted Stimulant Medication					
Took Stimulant Medication with other Drugs					
Took stimulant medication that you did not have a prescription for					

3. Have you ever sold or given away your prescription stimulant medication?
    i. Yes
    ii. No
4. What were your reason(s) for doing so? (choose all that apply)
    i. To look cool
    ii. To help a friend out
    iii. To make extra money
    iv. Pressured into selling/giving away their medication
5. If you are using more prescription stimulant medication than you are prescribed, where do you most often get the additional stimulant medication?
    i. A college student
    ii. A family member
    iii. A friend who is not in college
    iv. A drug dealer
    v. I overuse my own prescription
    vi. Other
6. If you have used a stimulant medication more than prescribed, how often did it actually help you…

	Never	**Rarely**	**Sometimes**	**Often**	**Always**
To concentrate better while studying?					
To be able to study longer?					
To concentrate better in class?					
To complete other tasks not related to school?					
To stay awake longer?					
To improve athletic performance?					
To get high?					
To offset the effects of alcohol or other substances?					
To prevent other students from having an academic edge over you?					
To lose weight?					
Other					

7. If you are using stimulant medication more than prescribed, where are you doing it? (choose all that apply)

At the gym	**At parties, bars, or clubs**	**While studying**	**Hanging out with friends**	**I'd rather not say**	**Other**

8. How easy do you think it is to obtain the following prescription medications without a prescription (e.g., Ritalin, Adderall, Dexedrine, Vyvanse)?
    i. Very easy
    ii. Somewhat easy
    iii. Somewhat difficult
    iv. Very difficult
    v. I don't know
    vi. I'd rather not say
9. Since attending Penn State, what percentage of students do you believe used the following medications (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) that were not prescribed to them or over-the-counter, non-prescription drugs for non-medical reasons (e.g. to get high or for the feeling they cause, in a way that was not prescribed or for a reason not listed on the instructions)?
    i. 0-10%

ii. 11-20%
iii. 21-30%
iv. 31-40%
v. More than 40%

10. How often do you believe a typical student at Penn State uses the following medications (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) that were not prescribed to them, or over-the-counter drugs for non-medical purposes (e.g. to get high or for the feeling they cause, in a way that was not prescribed or for a reason not listed on the instructions)?
    i. Never
    ii. At least once a year
    iii. At least once an academic term
    iv. At least once a month
    v. At least one a week
    vi. At least once a day
    vii. I'd rather not say
11. Do you think people misuse stimulant medication to enhance their academic performance?
    i. Yes
    ii. No
12. How much do you think their grades improved and/or worsened by, or stayed the same?
    a. Improve half a letter grade
    b. Improve a full letter grade
    c. Stay the same
    d. Receive a worse letter grade
13. Do you think another student would perceive this as cheating?
    i. Yes, very
    ii. Yes, somewhat
    iii. I don't know
    iv. I'd rather not say
    v. No
14. Do you perceive this as cheating?
    i. Yes, very
    ii. Yes, somewhat
    iii. I don't know
    iv. I'd rather not say
    v. No
15. What do you think other students perceive to be the most important benefits of using prescription stimulants? (choose all that apply)

To get high	
To study or improve grades	
To counter the effects of alcohol or other drugs	
To enhance social interactions or situations	
To improve athletic performance	
To stay awake longer	
To lose weight	
To complete other tasks not related to school?	
Other	

16. Are you involved in any extracurricular clubs? (choose all that apply)
    i. Yes, Academic/Professional
    ii. Yes, Fraternities/Sororities
    iii. Yes, Special Interest (e.g., Legion of Blue, Photography Club, Chess Club)
    iv. Yes, Service (e.g., Best Buddies, Habitat for Humanity, Student Red Cross Club)
    v. Yes, Club Sport
    vi. Yes, Philanthropic (e.g., THON, Project: PAWS, UNICEF)
    vii. Yes, Other
    viii. No
17. How many times a week do you typically go out partying (e.g., to a bar, to a club, to an apartment, to a fraternity)?
    i. 0-1
    ii. 2-3
    iii. 4-5
    iv. 6-7
18. What are you typical hours per week spent on?

	0-5 hours	**6-10 hours**	**11-15 hours**	**16-20 hours**	**21+ hours**
Hanging out with friends					

Exercising					
Hanging out with a significant other					
Studying					
Going to the bars or clubs					
Going to Greek or apartment parties					
Leisure					
Other					

Section 2b: Non-Medical Prescription Stimulant Use (For respondents who do not currently have a prescription for stimulant medication, but have used prescription stimulant medication for non-medical reasons)

1. Since attending Penn State, have you ever used a stimulant (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) for non-medical reasons (e.g., it was not prescribed to you, only used it for the experience or feeling it caused, or used it in a way that was not prescribed)?
    i. Yes
    ii. No
2. What behaviors did you engage in related to stimulant medication and how often did you engage in these behaviors? (choose one response per row)

	Not at all	**Less than once a Month**	**Once a Month**	**2-3 times a Month**	**4 or more times a Month**

Snorted Stimulant Medication					
Took Stimulant Medication with other Drugs					
Took stimulant medication that you did not have a prescription for					

3. If you are using stimulant medication that you do not have a prescription for, where do you most often get the stimulant medication? (choose all that apply)
    i. A college student
    ii. A family member
    iii. A friend who is not in college
    iv. A drug dealer
    v. Other
4. Which reason(s) do you think best explains why a person might divert (i.e., transferring drugs to people they were not prescribed for) their medication? (choose all that apply)
    i. To look cool
    ii. To help a friend out
    iii. To make extra money
    iv. Pressured into selling/giving away their medication
5. If you have used a stimulant medication that you did not have a prescription for, how often did it actually help you…

	Never	**Rarely**	**Sometimes**	**Often**	**Always**
To concentrate better while studying?					
To be able to study longer?					
To concentrate better in class?					
To complete other tasks not related to school?					
To stay awake longer?					
To improve athletic performance?					
To get high?					

To offset the effects of alcohol or other substances?					
To prevent other students from having an academic edge over you?					
To lose weight?					
Other					

6. If you are using stimulant medication that you do have a prescription for, where are you doing it? (choose all that apply)

At the gym	**At parties, bars, or clubs**	**While studying**	**Hanging out with friends**	**I'd rather not say**	**Other**

7. How easy do you think it is to obtain the following prescription medications without a prescription (e.g., Ritalin, Adderall, Dexedrine, Vyvanse)?
    a. Very easy
    b. Somewhat easy
    c. Somewhat difficult
    d. Very difficult
    e. I don't know
    f. I'd rather not say
8. Since attending Penn State, what percentage of students do you believe used the following medications (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) that were not prescribed to them or over-the-counter, non-prescription drugs for non-medical reasons (e.g. to get high or for the feeling they cause, in a way that was not prescribed or for a reason not listed on the instructions)?
    a. 0-10%
    b. 11-20%
    c. 21-30%
    d. 31-40%
    e. More than 40%
9. How often do you believe a typical student at Penn State uses the following medications (e.g., Ritalin, Adderall, Dexedrine, Vyvanse) that were not prescribed to them, or over-the-counter drugs for non-medical purposes (e.g. to get high or for the feeling they cause, in a way that was not prescribed or for a reason not listed on the instructions)?
    a. Never
    b. At least once a year

c. At least once an academic term
d. At least once a month
e. At least one a week
f. At least once a day
g. I'd rather not say

10. Do you think people misuse stimulant medication to enhance their academic performance?
    i. Yes
    ii. No
11. How much do you think their grades improved and/or worsened by?
    a. Improve half a letter grade
    b. Improve a full letter grade
    c. Stay the same
    d. Receive a worse letter grade
12. Do you think another student would perceive this as cheating?
    a. Yes, very
    b. Yes, somewhat
    c. I don't know
    d. I'd rather not say
    e. No
13. Do you perceive this as cheating?
    a. Yes, very
    b. Yes, somewhat
    c. I don't know
    d. I'd rather not say
    e. No
14. What do you think other students perceive to be the most important benefits of using prescription stimulants? (choose all that apply)

To get high	
To study or improve grades	
To counter the effects of alcohol or other drugs	
To enhance social interactions or situations	
To improve athletic performance	

To stay awake longer	
To lose weight	
To complete other tasks not related to school?	
Other	

15. Are you involved in any extracurricular clubs? (choose all that apply)
    i. Yes, Academic/Professional
    ii. Yes, Fraternities/Sororities
    iii. Yes, Special Interest (e.g., Legion of Blue, Photography Club, Chess Club)
    iv. Yes, Service (e.g., Best Buddies, Habitat for Humanity, Student Red Cross Club)
    v. Yes, Club Sport
    vi. Yes, Philanthropic (e.g., THON, Project: PAWS, UNICEF)
    vii. Yes, Other
    viii. No
16. How many times a week do you typically go out partying (e.g., to a bar, to a club, to an apartment, to a fraternity)?
    i. 0-1
    ii. 2-3
    iii. 4-5
    iv. 6-7
17. What are you typical hours per week spent on?

	0-5 hrs	**6-10 hrs**	**11-15 hrs**	**16-20 hrs**	**21+ hrs**
Hanging out with friends					
Exercising					
Hanging out with a significant other					
Studying					
Going to the bars or clubs					

Going to Greek or apartment parties					
Leisure					
Other					

Section 3: Demographics (All Respondents)

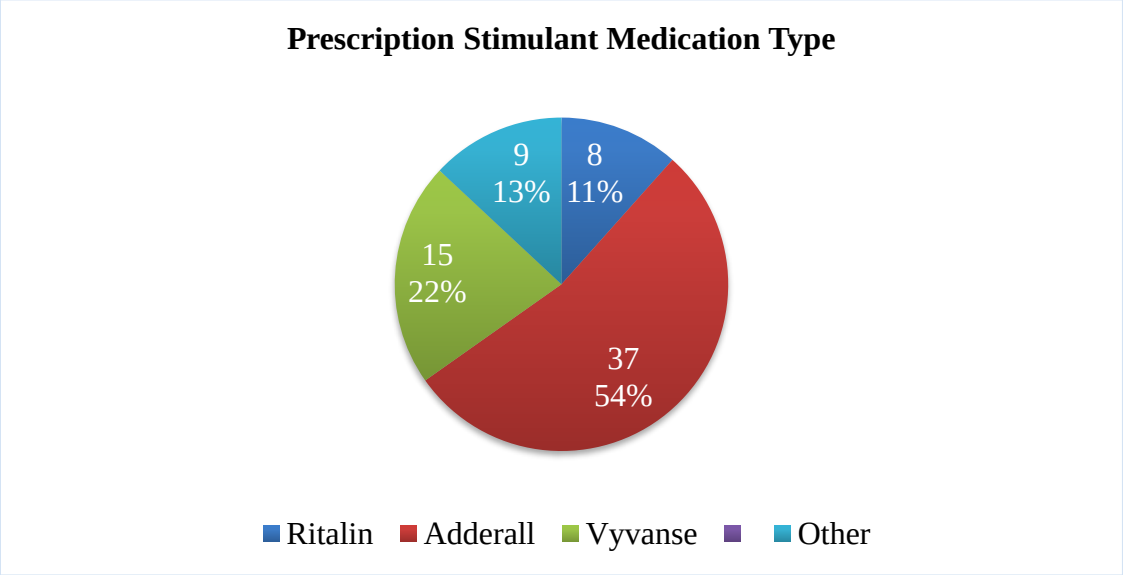
1. What is your gender?
    i. Male
    ii. Female
    iii. Prefer not to answer
    iv. Other
2. What is your race/ethnicity?
    i. Asian
    ii. Black or African American
    iii. Hispanic or Latino(a)
    iv. White
    v. Other
    vi. Prefer not to answer
3. What is your sexual orientation?
    i. Heterosexual
    ii. Lesbian
    iii. Gay
    iv. Bisexual
    v. Questioning
    vi. Other
    vii. Prefer not to answer
4. What is your current semester standing?
    i. Undergraduate
    ii. Graduate
    iii. Prefer not to answer
    iv. Other
5. Are you majoring in more than one field of study?
    i. Yes
    ii. No
6. Which of the following best describes your FIRST field of study or major?
    i. College of Agricultural Sciences

   ii. College of Arts and Architecture
   iii. Smeal College of Business
   iv. Donald P. Bellisario College of Communications
   v. College of Earth and Mineral Sciences
   vi. College of Education
   vii. College of Engineering
   viii. College of Health and Human Development
   ix. College of Information Sciences and Technology
   x. College of the Liberal Arts
   xi. College of Nursing
   xii. Eberly College of Science
7. What is your cumulative grade point average (GPA)?
   i. <2.0
   ii. 2.01 – 2.5
   iii. 2.51 – 3.0
   iv. 3.01 – 3.5
   v. 3.51 – 4.0
8. Are you currently employed?
   i. No
   ii. Yes
9. On average, how many hours do you typically work each week?
   i. Fewer than 10 hours per week
   ii. 10-19 hours per week
   iii. 20-29 hours per week
   iv. 30-39 hours per week
   v. 40 or more hours per week
10. Are you a United States citizen?
   i. Yes
   ii. No
11. Are you a first generation college student?
   i. Yes
   ii. No

Appendix B

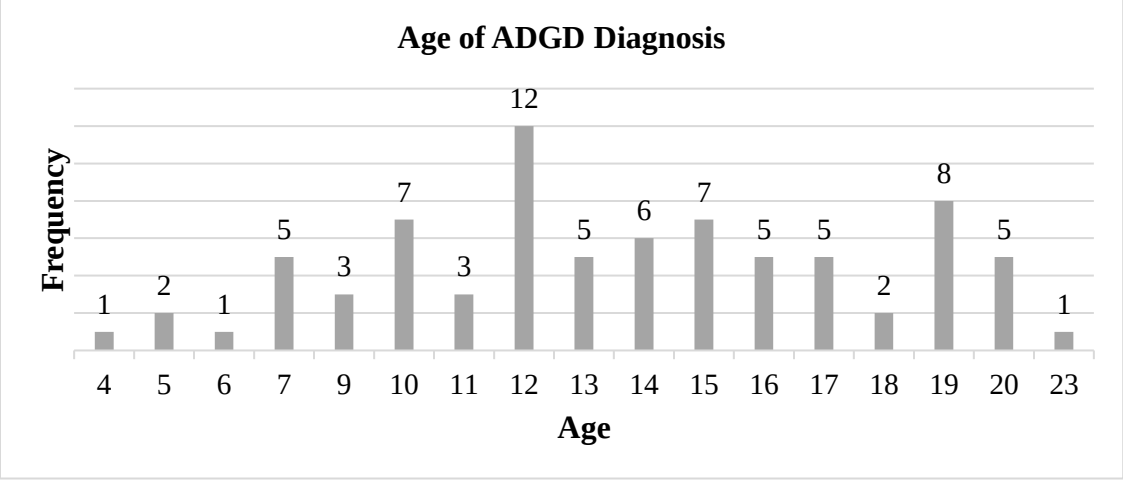
Supporting Data Tables

Prescription Stimulant Medication Type:



Diagnosis Frequency and Age:

- Total respondents indicating they have been diagnosed with ADHD before = 80
- Respondents that answered what their diagnosis age was = 78
- Average age = 13.6 years old



Appendix C

STATA Input

```
clear
set more off
capture log cl

log using "X:/REDCap Survey Data/Problem Set #4", text replace
use "X:/REDCap Survey Data/prescription_stimulant_survey_1.dta", replace

/* Examining how non-medical use breaks down by different individual demographic
characteristics. Running a cross tabulation with non-medical use variable.*/

        tab rx_type
        tab dx_age
        sum dx_age
        tab dx

        tab2 rx_status nmu_status, row column
        tab2 dx nmu_status, row column
        tab2 gender nmu_status, column row
        tab2 race nmu_status, column row
        tab2 sex_orientation nmu_status, column row
        tab2 semester nmu_status, column row
        tab2 dbl_major nmu_status, column row
        tab2 college nmu_status, column row
        tab2 gpa nmu_status, column row
        tab2 employment nmu_status, column row
        tab2 hours_worked nmu_status, column row
        tab2 citizen nmu_status, column row
        tab2 first_gen nmu_status, column row

/* Converting gender and race string variables into numerical data. Recoding employment hours,
sexual orientation, semester, college, and GPA. */

        *Gender*
        gen female = 1 if gender=="female"
                replace female = 0 if gender=="male"

        *Race*
        gen asian = 1 if race=="asian"
                replace asian = 0 if race=="black" | race=="hispanic" | race=="no_ans_race" |
                race=="oth_race" | race=="white"
```

```
gen black = 1 if race=="black"
        replace black = 0 if race=="asian" | race=="hispanic" | race=="no_ans_race" |
        race=="oth_race" | race=="white"
gen hispanic = 1 if race=="hispanic"
        replace hispanic = 0 if race=="black" | race=="asian" | race=="no_ans_race" |
        race=="oth_race" | race=="white"
gen no_ans_race = 1 if race=="no_ans_race"
        replace no_ans_race = 0 if race=="black" | race=="hispanic" | race=="asian" |
        race=="oth_race" | race=="white"
gen oth_race = 1 if race=="oth_race"
        replace oth_race = 0 if race=="black" | race=="hispanic" | race=="no_ans_race" |
        race=="asian" | race=="white"
gen white = 1 if race=="white"
        replace white = 0 if race=="black" | race=="hispanic" | race=="no_ans_race" |
        race=="oth_race" | race=="asian"

*Employment Hours*
gen workhrs_0 = 1 if employment==0
        replace workhrs_0 = 0 if employment==1
gen workhrs_1_9 = 1 if hours_worked==1
        replace workhrs_1_9 = 0 if hours_worked>1
gen workhrs_10_19 = 1 if hours_worked==2
        replace workhrs_10_19 = 0 if hours_worked>2 | hours_worked<2
gen workhrs_20_29 = 1 if hours_worked==3
        replace workhrs_20_29 = 0 if hours_worked>3 | hours_worked<3
gen workhrs_30_39 = 1 if hours_worked==4
        replace workhrs_30_39 = 0 if hours_worked>4 | hours_worked<4
gen workhrs_40more = 1 if hours_worked==5
        replace workhrs_40more = 0 if hours_worked<5

*Sex Orientation*
gen heterosexual = 1 if sex_orientation==1
        replace heterosexual = 0 if sex_orientation>1
gen lesbian = 1 if sex_orientation==2
        replace lesbian = 0 if sex_orientation>2 | sex_orientation<2
gen gay = 1 if sex_orientation==3
        replace gay = 0 if sex_orientation>3 | sex_orientation<3
gen bisexual = 1 if sex_orientation==4
        replace bisexual = 0 if sex_orientation>4 | sex_orientation<4
gen questioning = 1 if sex_orientation==5
        replace questioning = 0 if sex_orientation>5 | sex_orientation<5
gen no_ans_sex = 1 if sex_orientation==6
        replace no_ans_sex = 0 if sex_orientation>6 | sex_orientation<6
gen oth_sex = 1 if sex_orientation==7
        replace oth_sex = 0 if sex_orientation<7
```

```
*Semester*
gen undergraduate = 1 if semester==1
        replace undergraduate = 0 if semester>1

*College*
gen agscience = 1 if college==1
        replace agscience = 0 if college>1
gen arts_architecture = 1 if college==2
        replace arts_architecture = 0 if college>2 | college<2
gen smeal = 1 if college==3
        replace smeal = 0 if college>3 | college<3
gen communications = 1 if college==4
        replace communications = 0 if college>4 | college<4
gen mineralscience = 1 if college==5
        replace mineralscience = 0 if college>5 | college<5
gen education = 1 if college==6
        replace education = 0 if college>6 | college<6
gen engineering = 1 if college==7
        replace engineering = 0 if college>7 | college<7
gen hhd = 1 if college==8
        replace hhd = 0 if college>8 | college<8
gen ist = 1 if college==9
        replace ist = 0 if college>9 | college<9
gen liberalarts = 1 if college==10
        replace liberalarts = 0 if college>10 | college<10
gen nursing = 1 if college==11
        replace nursing = 0 if college>11 | college<11
gen eberly = 1 if college==12
        replace eberly = 0 if college<12

*GPA*
gen gpa_lessthan2 = 1 if gpa==1
        replace gpa_lessthan2 = 0 if gpa>1
gen gpa_201_25= 1 if gpa==2
        replace gpa_201_25 = 0 if gpa>2 | gpa<2
gen gpa_251_30= 1 if gpa==3
        replace gpa_251_30 = 0 if gpa>3 | gpa<3
gen gpa_301_35= 1 if gpa==4
        replace gpa_301_35 = 0 if gpa>4 | gpa<4
gen gpa_351_40= 1 if gpa==5
        replace gpa_351_40 = 0 if gpa<5
```

```
/* Examining the correlation of demographics of respondents to non-medical use status. Finding
if any of the values are statistically significant as well. */

        pwcorr female nmu_status, sig star (.01)

        pwcorr asian nmu_status, sig star (.01)
        pwcorr black nmu_status, sig star (.01)
        pwcorr hispanic nmu_status, sig star (.01)
        pwcorr no_ans_race nmu_status, sig star (.01)
        pwcorr oth_race nmu_status, sig star (.01)
        pwcorr white nmu_status, sig star (.01)

        pwcorr heterosexual nmu_status, sig star (.01)
        pwcorr lesbian nmu_status, sig star (.01)
        pwcorr gay nmu_status, sig star (.01)
        pwcorr bisexual nmu_status, sig star (.01)
        pwcorr questioning nmu_status, sig star (.01)
        pwcorr no_ans_sex nmu_status, sig star (.01)
        pwcorr oth_sex nmu_status, sig star (.01)

        pwcorr gpa_lessthan2 nmu_status, sig star (.01)
        pwcorr gpa_201_25 nmu_status, sig star (.01)
        pwcorr gpa_251_30 nmu_status, sig star (.01)
        pwcorr gpa_301_35 nmu_status, sig star (.01)
        pwcorr gpa_351_40 nmu_status, sig star (.01)

        pwcorr agscience nmu_status, sig star (.01)
        pwcorr arts_architecture nmu_status, sig star (.01)
        pwcorr smeal nmu_status, sig star (.01)
        pwcorr communications nmu_status, sig star (.01)
        pwcorr mineralscience nmu_status, sig star (.01)
        pwcorr education nmu_status, sig star (.01)
        pwcorr engineering nmu_status, sig star (.01)
        pwcorr hhd nmu_status, sig star (.01)
        pwcorr ist nmu_status, sig star (.01)
        pwcorr liberalarts nmu_status, sig star (.01)
        pwcorr nursing nmu_status, sig star (.01)
        pwcorr eberly nmu_status, sig star (.01)

        pwcorr workhrs_0 nmu_status, sig star (.01)
        pwcorr workhrs_1_9 nmu_status, sig star (.01)
        pwcorr workhrs_10_19 nmu_status, sig star (.01)
        pwcorr workhrs_20_29 nmu_status, sig star (.01)
        pwcorr workhrs_30_39 nmu_status, sig star (.01)
        pwcorr workhrs_40more nmu_status, sig star (.01)
```

```
pwcorr undergraduate nmu_status, sig star (.01)
pwcorr dbl_major nmu_status, sig star (.01)
pwcorr citizen nmu_status, sig star (.01)
pwcorr first_gen nmu_status, sig star (.01)
pwcorr rx_status nmu_status, sig star (.01)
pwcorr dx nmu_status, sig star (.01)

/* Creating a new variable that captures the different types of non-medical use and prescription
status combinations. */

gen rxnm = 1 if nmu_status==0 & rx_status==1
        replace rxnm = 0 if nmu_status==0 & rx_status==0
        replace rxnm = 10 if nmu_status==1 & rx_status==0
        replace rxnm = 11 if nmu_status==1 & rx_status==1

/* Recoding the different Divert variables. Then running a cross tabulation with non-medical use
variable. */

gen divertcool = 1 if divert_why_with___cool==1 | divert_why_without___v_2==1
        replace divertcool = 0 if divert_why_with___cool==0 &
        divert_why_without___v_2==0
gen diverthelp = 1 if divert_why_with___help==1 | divert_why_without___v_3==1
        replace diverthelp = 0 if divert_why_with___help==0 &
        divert_why_without___v_3==0
gen divertmoney = 1 if divert_why_with___money==1 | divert_why_without___v_4==1
        replace divertmoney = 0 if divert_why_with___money==0 &
        divert_why_without___v_4==0
gen divertpressure = 1 if divert_why_with___pr_v_1==1 |
        divert_why_without___v_5==1
        replace divertpressure = 0 if divert_why_with___pr_v_1==0 &
        divert_why_without___v_5==0

tab2 divertcool nmu_status, column
tab2 diverthelp nmu_status, column
tab2 divertmoney nmu_status, column
tab2 divertpressure nmu_status, column

/* Recoding the different Prescription Source variables. Then running a cross tabulation with
non-medical use variable. */

gen collegefriend = 1 if rx_source==1
        replace collegefriend = 0 if rx_source>1
gen familymember= 1 if rx_source==2
        replace familymember = 0 if rx_source>2 | rx_source<2
```

```
gen otherfriend= 1 if rx_source==3
        replace otherfriend = 0 if rx_source>3 | rx_source<3
gen drugdealer= 1 if rx_source==4
        replace drugdealer = 0 if rx_source>4 | rx_source<4
gen ownprescription= 1 if rx_source==5
        replace ownprescription = 0 if rx_source>5 | rx_source<5
gen othersource= 1 if rx_source==6
        replace othersource = 0 if rx_source<6

tab2 collegefriend nmu_status, column
tab2 familymember nmu_status, column
tab2 otherfriend nmu_status, column
tab2 drugdealer nmu_status, column
tab2 ownprescription nmu_status, column
tab2 othersource nmu_status, column

/* Running a cross tabulation with the different reasons for use and rxnm variable. */

tab2 study_better rxnm, column
tab2 study_longer rxnm, column
tab2 concentrate rxnm, column
tab2 complete rxnm, column
tab2 awake rxnm, column
tab2 athletics rxnm, column
tab2 high rxnm, column
tab2 offset rxnm, column
tab2 prevention rxnm, column
tab2 reduce rxnm, column
tab2 other_ben_resp rxnm, column

/* Renaming extracurricular variables then running a cross tabulation with non-medical use
variable. */

rename extracurricular_invo_v_6 academic_org
rename extracurricular_invo_v_7 greek_org
rename extracurricular_invo_v_8 special_org
rename extracurricular_invo_v_9 service_org
rename extracurricular_invo_v_10 club_org
rename extracurricular_invo_v_11 philanthropy_org
rename extracurricular_invo_v_12 other_org
rename extracurricular_invo_v_13 no_org

tab2 academic_org nmu_status, column
tab2 greek_org nmu_status, column
tab2 special_org nmu_status, column
```

```
tab2 service_org nmu_status, column
tab2 club_org nmu_status, column
tab2 philanthropy_org nmu_status, column
tab2 other_org nmu_status, column
tab2 no_org nmu_status, column

/* Running a correlation analysis of party frequency variables to leisure time activities and
student organizations. */

pwcorr friends_hour party_freq, sig star (.01)
pwcorr exercise_hour party_freq, sig star (.01)
pwcorr significant_hour party_freq, sig star (.01)
pwcorr study_hours party_freq, sig star (.01)
pwcorr bar_club_hour party_freq, sig star (.01)
pwcorr greek_apart_hour party_freq, sig star (.01)
pwcorr leisure_hour party_freq, sig star (.01)
pwcorr other_hour party_freq, sig star (.01)

pwcorr academic_org party_freq, sig star (.01)
pwcorr greek_org party_freq, sig star (.01)
pwcorr special_org party_freq, sig star (.01)
pwcorr service_org party_freq, sig star (.01)
pwcorr club_org party_freq, sig star (.01)
pwcorr philanthropy_org party_freq, sig star (.01)
pwcorr other_org party_freq, sig star (.01)
pwcorr no_org party_freq, sig star (.01)

/* Running a linear regression model for non-medical use variable and all individual
demographic variables. */

regress nmu_status female white heterosexual lesbian gay bisexual questioning
no_ans_sex undergraduate dbl_major agscience arts_architecture smeal communications
mineralscience education engineering hhd ist liberalarts nursing gpa_lessthan2
gpa_201_25 gpa_251_30 gpa_301_35 workhrs_0 workhrs_1_9 workhrs_10_19
workhrs_20_29 workhrs_30_39 citizen first_gen
```

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ACADEMIC VITA

PAUL P. SORBO, JR.
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EDUCATION

The Pennsylvania State University | Schreyer Honors College | College of Health and Human Development
Major: Bachelor of Science in Health Policy & Administration
Minor: Labor & Employment Relations
Graduation: May 2019

Protégé, Schreyer Honors College, Society of Distinguished Alumni Mentoring Program
Member, PSU Student Chapter, American College of Health Care Administrators
Member, PSU Chapter of the Honor Society of Phi Kappa Phi
Member, National Health Care Honor Society, Upsilon Phi Delta
Golden Key International Honor Society & International Society of Collegiate Scholars

PROFESSIONAL EXPERIENCE

Mercer, Health & Benefits Summer Analyst, New York, NY June 2018 – Aug 2018

- Managed multiple employer solution development; monitored 75 association health plan prospects, created and provided standardized FAQ template, Pipeline Report, and SmartSheet for senior executives.
- Initiated preparation of client deliverables through data collection, benchmarking, financial modeling, and projections.
- Reviewed and analyzed plan documents, coverage analysis, and underwriting calculations.
- Completed requests for proposals, strategy renewals, and market analysis for insurance carriers and clients.
- Wrote and structured client communications, including reports, spreadsheets, and presentations.
- Designed and presented company-wide strategic initiatives to office leadership focused on penetrating new buyer markets, improving office and colleague engagement, and developing a sales culture among employees.
- Utilized Mercer Software Programs which included SMRT, MedPrice, CERT, and Contribution Modeling.
- Actively engaged in Wellness Compliance Seminar Programs for HIPAA and ERISA.
- Participated in Training Modules focused on Risk Assessment, Stop Loss, and Financial Analytic Tools.

All American Sewer & Drain Services, Inc., Stamford, CT Summer 2015, 2016, 2017

- Bookkeeping assistant handling accounts receivable, accounts payable, bank reconciliations, invoicing, and proposals.
- Conducted inventory management, scheduling and field coordination.

LEADERSHIP & INVOLVEMENT

US Army Reserve Officers' Training Corps (ROTC) **Aug 2015 – Mar 2017**
Penn State University, Nittany Lion Battalion, MSL II, Scholarship Recipient

- Acted as Squad Team Leader responsible for leading cadets through maneuvers and drills.
- Achieved standard of excellence in performance and execution of platoon and company-wide training events.
- Member of Tactics Club charged with improving basic officer skills and leadership.
- Member of Cadet Recruiting Team focused on communications, member recruitment, and served as point of contact.
- Mentored incoming freshmen providing peer assistance with school work, physical fitness, and social adjustment.

Operation Smile, President **April 2018 – May 2019**
Vice President & Director, Outreach Program *Aug 2015 – Mar 2018*
Non-profit medical service organization providing funding for cleft lip/palate surgeries to children in third world countries.

- Develop and facilitate fundraising efforts; which successfully resulted in raising $4,000 last year.
- Oversee implementation and hosting of Involvement Fair and Awareness Days.
- Expanded Club enrollment by 300% within the past year.
- Promote awareness of the club's mission, and ensure goals are explained and a focus of the event.
- Organize and lead biweekly board meetings, create agendas, and support all executive branches.

Sigma Alpha Epsilon, Member **Jan 2016 – May 2018**
Prepared young men with the leadership, scholarship, service and social experiences they need to excel upon graduation.

- Actively participated in volunteer fundraising efforts for charitable organizations including Pet Shelter and THON; resulting in our organization having collected over $100,000 per year, for the last two years.
- Led community service initiatives to keep Penn State and neighboring communities clean.

THON **Aug 2015 – May 2019**
Student-run philanthropy committed to enhancing the lives of children and families impacted by childhood cancer.

- Collaborate on - and contribute in - campus-wide events, fundraisers, THON 5k, Hershey Kisses for The Cure.
- Partake in organizing of canning trips, including enlisting participation members, and coordinating target locations.

Proficient in Microsoft Excel, PowerPoint, Word