

---

Electronic Theses and Dissertations, 2004-2019

---

2015

## Undergraduate Prescription Stimulant Misuse: The Impact of Academic Strain, Social Norms, and Gender

Lauren Norman  
*University of Central Florida*

 Part of the [Sociology Commons](#)

Find similar works at: <https://stars.library.ucf.edu/etd>

University of Central Florida Libraries <http://library.ucf.edu>

This Doctoral Dissertation (Open Access) is brought to you for free and open access by STARS. It has been accepted for inclusion in Electronic Theses and Dissertations, 2004-2019 by an authorized administrator of STARS. For more information, please contact [STARS@ucf.edu](mailto:STARS@ucf.edu).

---

### STARS Citation

Norman, Lauren, "Undergraduate Prescription Stimulant Misuse: The Impact of Academic Strain, Social Norms, and Gender" (2015). *Electronic Theses and Dissertations, 2004-2019*. 703.

<https://stars.library.ucf.edu/etd/703>

UNDERGRADUATE PRESCRIPTION STIMULANT MISUSE: THE IMPACT OF  
ACADEMIC STRAIN, SOCIAL NORMS, AND GENDER

by

LAUREN B. NORMAN  
B.S. Middle Tennessee State University, 2008  
M.A. Middle Tennessee State University, 2011

A dissertation submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy  
in the Department of Sociology  
in the College of Sciences  
at the University of Central Florida  
Orlando, Florida

Summer Term  
2015

Major Professor: Jason A. Ford

## **ABSTRACT**

This study investigates the misuse of prescription stimulants among undergraduates for a variety of different purposes, including: academic, other instrumental, and recreational. This research is important as existing literature as well as national level surveillance data indicates a substantial increase in this type of prescription drug misuse, especially among young adults aged 18-25. Drawing from several theoretical frameworks, this research focuses on how academic strain, social norms, and gender influence prescription stimulant misuse among undergraduates. Roughly 900 quantitative surveys were collected that specifically address undergraduate prescription stimulant misuse. The results indicate that college students are at an increased likelihood of misusing prescription stimulants if they experienced academic impediments and/or grade strain during the past academic year. Additionally, the findings show that undergraduates who have accepting attitudes of prescription stimulant misuse and who have peers that misuse prescription stimulants are also at an increased likelihood of misusing prescription stimulants. Furthermore, males were at an increased likelihood of prescription stimulant misuse for academic purposes if they had experienced grade strain during the past academic year in comparison to their female counterparts. Female undergraduates, on the other hand, were four times more likely than male undergraduates to obtain prescription stimulants from their close friends for free.

In memory of my baby brother, Gaylon James Richardson.

“Unable are the loved to die. For love is immortality.” – Emily Dickinson

## ACKNOWLEDGEMENTS

I can in no way take full credit for the creation and completion of this research endeavor as countless individuals have been influential to my overall success. Although, it is impossible to name them all, I will try to illustrate my gratitude to those that I feel deserve recognition here. To my family who have always been supportive of my aspirations, regardless of how long they took, I am thankful. They say “it takes a village to raise a child” and I wholeheartedly feel that is the case. To my grandmother, you are one of the strongest women that I have ever known, you have encouraged me and reassured me my entire life through. Without your guidance and continuous prayers, I would not be the person that I am today and for that I am ever indebted. To my Aunt Bev and Uncle Jay, thank you for taking time out of your busy lives to get me relocated and situated in Florida in the first place. I cannot say that it will be the last time that I move, but hopefully in the future I will actually be able to afford a professional moving company. To my baby brother (to whom this document is dedicated) although your life ended entirely too shortly, you have given me new found purpose. Thank you for all of the cherished memories and for being with me in spirit. I will strive to bring awareness to suicide prevention in your honor.

Additionally, I need to say thank you to the many friends and colleagues who have assisted me throughout this daunting process. To all of the wonderful and intelligent women in the 2012 Sociology Ph.D. cohort my deepest thanks. The journey that we embarked on three years ago will also hold a special place in my heart as will each of you. You are truly some of the brightest ladies I have ever had the pleasure of knowing and working with. Although, we may be heading in different directions and down different paths I know that the relationships that we have established will persist. With that said, I would also like to send a special shout out to

Lindsey Singer, Abigail Malick, and Nicole Owens. I owe my sanity in part to each of you. To my committee, Dr. Jason Ford, Dr. Amy Reckdenwald, Dr. Amanda Anthony, and Dr. Hugh Potter I am extremely grateful for the opportunity to have worked with you and for the insight that you provided me. To the faculty in the Department of Sociology, all of you have played an instrumental role in my success and for that I am greatly appreciative. Special thanks to Traci Milbuta for dealing with my obsessive compulsive behaviors and helping me format my teaching portfolio, which ultimately landed me a tenure-track position. ☺

It is also necessary for me to acknowledge my dissertation chair and mentor, Dr. Jason Ford. I sincerely appreciate the time and attention that you have devoted not just to this project, but to helping me develop academically over the past three years. The knowledge that you have provided me with is invaluable and for that I am ever grateful.

## TABLE OF CONTENTS

LIST OF TABLES .....	ix
CHAPTER 1: INTRODUCTION .....	1
CHAPTER 2: LITERATURE REVIEW .....	6
Misuse of Prescription Stimulants.....	6
Correlates.....	9
Academic Strain .....	12
Plans after Graduation .....	17
College Major .....	18
Social Norms .....	21
Gender .....	29
CHAPTER 3: HYPOTHESES AND METHODS.....	38
Hypotheses .....	38
Academic Strain .....	38
Social Norms .....	38
Gender .....	39
Sample.....	39
Measures.....	40
Academic Strain .....	40

Social Norms .....	42
Gender .....	44
Controls .....	45
Analytic Strategy .....	46
Academic Strain .....	46
Social Norms .....	47
Gender .....	47
CHAPTER 4: RESULTS .....	49
Academic Strain .....	49
Social Norms .....	53
Gender .....	57
CHAPTER 5: DISCUSSION .....	64
Findings .....	66
Academic Strain .....	66
Social Norms .....	68
Gender .....	69
Control Variables .....	71
CHAPTER 6: LIMITATIONS, IMPLICATIONS, AND FUTURE DIRECTIONS .....	73
Limitations .....	73
Implications .....	74



Future Directions.....	77
APPENDIX A: IRB APPROVAL LETTER .....	80
APPENDIX B: SURVEY INSTRUMENT .....	82
REFERENCES .....	89

## LIST OF TABLES

Table 1 Descriptive Analysis of Academic Strain Measures (N=924).....	50
Table 2. Logistical Regression (with Odds Ratios) for Academic Strain Measures .....	52
Table 3. Descriptive Analysis of Social Norms Measures (N=924).....	55
Table 4. Logistical Regression (with Odds Ratios) for Social Norms Measures .....	57
Table 5. Descriptive Analysis of Gender Measures (N=924).....	58
Table 6. Logistical Regression (with Odds Ratios) for Gendered Differences in Academic Strain Measures and Academic Prescription Stimulant Misuse.....	60
Table 7. Logistical Regression (with Odds Ratios) for Gendered Differences in Social Norms Measures and Prescription Stimulant Misuse for Academic Purposes.....	61
Table 8. Logistical Regression (with Odds Ratios) for Source of Diversion and Gender .....	62
Table 9. Logistical Regression (with Odds Ratios) for Route of Administration and Gender .....	63

## CHAPTER 1: INTRODUCTION

Prescription drug misuse (PDM) is defined as, “the use of prescription type psychotherapeutic drugs not prescribed for the respondent by a physician or used only for the experience or the feeling they caused” (Substance Abuse and Mental Health Services Administration (SAMSHA), Office of Applied Studies, 2008). The most commonly misused prescription drugs include: pain relievers, tranquilizers, stimulants, and sedatives (SAMSHA, 2010a). The National Survey on Drug Use and Health (NSDUH) reported that in 2012 nearly 16 million persons aged 12 or older misused prescription drugs in the past year and nearly 7 million misused them in the past month (SAMSHA, Center for Behavioral Health Statistics and Quality, 2013). Of those numbers, roughly 14% of young adults, aged 18 to 25, and 7% of youths, aged 12 to 17, had used in past year (SAMSHA, Center for Behavioral Health Statistics and Quality, 2013). The average age of initiation of PDM among recent initiates aged 12 to 49, was 22.9 years old in 2012 (SAMSHA, Center for Behavioral Health Statistics and Quality, 2013). Overall, it appears that PDM is fairly common and rates are highest among young adults.

PDM is a serious public health concern. The adverse effects of PDM on one’s physical health may include: irregular heartbeat, seizures, heart attack, psychosis, potential for dependence, and/or overdose (National Institute on Drug Abuse (NIDA), 2009). In addition, PDM often negatively impacts one’s personal relationships, leads to employment difficulties and/or job loss, creates legal and financial issues, as well as psychological problems (SAMSHA, 2010a). Research has also found that individuals who engage in PDM are at an increased risk of using other drugs such as cocaine and marijuana (McCabe, Teter, & Boyd, 2006a). With an increased likelihood of poly drug use, also comes an increased likelihood of medical

complications and fatality (Massello & Carpenter, 1999; McCabe et al., 2006a). The Drug Abuse Warning Network (DAWN), a national level surveillance system in the United States that monitors drug-related emergency department (ED) visits and drug-related deaths as based on coroner/ medical examiner investigations, reported that ED visits for PDM increased 132% from 2004 to 2011 (Center for Behavioral Health Statistics and Quality, 2013). In fact, recent data collected by DAWN indicated that over half of the medical emergencies seen in ED's in 2011 resulted from PDM in combination with other drugs, with roughly one in five involving PDM and alcohol (Center for Behavioral Health Statistics and Quality, 2013). It is necessary for scholars to focus on current trends in substance use in an effort to better understand the dynamics surrounding PDM as well as the characteristics of users.

Due to this public health issue several scholars have examined PDM, especially among adolescents and young adults. For example, studies have examined prevalence rates and correlates (Huang et al., 2006; McCabe et al., 2006a; McCabe et al., 2007; Johnston, O'Malley, Bachman, & Schulenberg, 2011; SAMSHA, 2010), demographic characteristics (Ford, 2009; Ford & Arrastia, 2008; Ford & Lacerenza, 2011; Ford & Rivera, 2008; Harrell & Broman, 2009), as well as personality and behavioral correlates (Arria, Caldeira, Vincent, O'Grady, & Wish, 2008; Ford, 2009; Ford & Rivera, 2008; Harrell & Broman, 2009). In addition scholars have looked at route of administration (McCabe et al., 2007), source of diversion (McCabe et al., 2007; McCabe, Teter, & Boyd, 2006), motive for use (Johnston & O'Malley, 1986; McCabe et al., 2007; Quintero, Peterson, & Young, 2006), and negative health consequences (Hernandez & Nelson, 2010; SAMSHA, 2010a). Furthermore, studies have found that people tend to believe that prescription medications are relatively safe drugs to use as they are manufactured by pharmaceutical companies, regulated by the Food and Drug Administration, and are prescribed

by members of the medical profession in comparison to “street drugs” such as cocaine or heroin, which they perceive as being more dangerous, stigmatized, and less accessible (DeSantis & Curtis-Hane, 2010).

While several studies have looked at PDM in general, which may include a variety of drugs; other studies have examined the misuse of prescription opioids or stimulants in particular. Based on national level surveillance data, the misuse of prescription opioids, such as OxyContin, has increased. For instance, DAWN reported that the misuse of prescription opioids resulted in 475,000 ED visits in 2009, which was twice the number of opioid related emergencies in 2004 (SAMSHA, 2010a). This spike has led many scholars to study the misuse of prescription opioids as a traditional drug problem related to street use, arrest rates, and health problems (such as: addiction, overdose, and even death). In addition to focusing on opioids, some scholars have shifted their attention to the misuse of prescription stimulants and have found significant differences in use compared to opioids. For example, individuals tend to misuse prescription opioids for recreational purposes, whereas, the motives for the misuse of prescription stimulants appear to be instrumental in nature with the sole purpose being to maximize time and prolong studying capacity (Garnier-Dyksra et al., 2012; McCabe, Knight, Teter, & Wechsler, 2005; Vecitis, 2011). In addition, to motives and the outcomes of use, the types of people who misuse prescription stimulants are vastly different from the types of people who misuse prescription opioids and are significantly more likely to include college students (SAMSHA, 2013).

Prescription stimulants (e.g. methylphenidate or amphetamines), such as Adderall, Concerta, Dexedrine, or Ritalin are commonly prescribed to treat attention-deficit/ hyperactivity disorder (ADHD). Recent academic research has indicated that the misuse of prescription stimulants among adolescents and young adults is a growing concern (McCabe et al., 2005;

McCabe et al., 2006). Surveillance data shows an increase in Adderall use for individuals aged 18-25 from 2006-2010, more so than for any other age bracket (Center for Behavioral Health Statistics and Quality, National Survey of Drug Use and Health, 2011). This type of drug use appears to be predicated on misconceptions about risks, as many young adults perceive the misuse of prescription stimulants as a convenient option to increase academic performance (Sussman, Pentz, Spruijt-Metz, & Miller, 2006; White, Becker-Blease, & Grace-Bishop, 2006). Although, undergraduates perceive that the misuse of prescription stimulants is relatively harmless, national surveillance data indicates that the consequences of such misuse are more severe. For instance, DAWN reported that the number of emergency department visits related to the misuse of stimulant medications increased roughly 200% between 2005 and 2010 (SAMSHA, Center for Behavioral Health Statistics and Quality, 2013).

Building on the extent literature on PDM in general and the misuse of prescription stimulants in particular the current research has three primary areas of focus. First, while students report that a primary motive for this type of drug use is to increase alertness and concentration to study, the existing research shows a negative correlation between GPA and misuse of prescription stimulants (Advokat, Lane, & Lou, 2011; Arria et al., 2008; Ford & Schroeder, 2009). Thus, the current research will focus on the relationship between academic strain and prescription stimulant misuse for academics, specifically it will examine if misuse varies by type of academic strain experienced, plans after graduation (e.g., enter the workforce vs. continue to graduate school), and/or academic major (e.g., STEM vs. non-STEM).

Second, one of the more popular areas of drug use research among college students is the relationship between social norms and the use of alcohol. This research has shown that social norms are strong predictors of binge drinking among college students (Borsari & Carey, 2003;

Litt, Lewis, Stahlbrandt, Firth, & Neighbors, 2012; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007) and many intervention programs that target college student alcohol use focus on changing this normative environment (Fibiano, 2003; Lewis, Neighbors, Oster-Aaland, Kirkbey, & Larimer, 2007; Mattern & Neighbors, 2004). In an initial study on social norms and PDM, McCabe (2008) found that undergraduate students overestimated PDM among their peers and that these misperceptions of norms were promoting this type of behavior among undergraduates, as a rise in PDM had recently occurred. The current research applies what we have learned from this body of research to the study of the misuse of prescription stimulants for three specific types of misuse: academic, other instrumental, and recreational.

Finally, this research also examines gender differences in the misuse of prescription stimulants and contributes to the literature on “doing gender”- “doing drugs.” Existing literature shows evidence of gender differences in motives given for the misuse of prescription stimulants with females misusing to maintain/lose weight and males misusing to party and/or to get high (DeSantis, Webb, & Noar, 2008; Teter, McCabe, LaGrange, Cranford, & Boyd, 2006).

Differences in academic strain, social norms, source of diversion, and route of administration may impact the reasons why undergraduate females and males misuse prescription stimulants. This area of research is of particular importance as little prior research examines gender differences for this type of PDM.

## CHAPTER 2: LITERATURE REVIEW

### Misuse of Prescription Stimulants

Based on data collected by Monitoring the Future, prevalence rates for the misuse of prescription stimulants among college students increased sharply from 5.7% in 2008 to 10.6% in 2013 (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014). Johnston and colleagues (2014) noted in regards to this trend, "Since the late 1990's there has been a greater difference between use among 8<sup>th</sup> graders and use by older students, suggesting that an age effect has emerged, possibly due to older students becoming more likely to use amphetamines to aid their academic performance" (p.19). In addition to national level surveillance data, academics have also sought to examine prevalence rates for the misuse of prescription stimulants among undergraduates and the results have tended to fluctuate.

McCabe and colleagues (2005) utilized national data from the 2001 College Alcohol Study, which surveyed 119 American 4-year colleges and universities in 39 states, and found that lifetime prevalence of the misuse of prescription stimulants was 6.9%, past year use was 4.1% (with a range of 0-25% at individual colleges), and past month use was 2.1% (McCabe et al., 2005). Others studies have found the misuse of prescription stimulants to be much more prevalent than did McCabe and his colleagues. For example, Low and Gendaszek (2002) surveyed undergraduates at a small college in the U.S. and found a prevalence rate of 35.5%. Garnier-Dykstra and colleagues (2012) examined four year trends in exposure opportunity and misuse of prescription stimulants among undergraduates enrolled in the College Life Study, a longitudinal study that uses a single cohort of students from a large, public university in the mid-Atlantic region of the U.S., and found that by year four roughly 62% of undergraduates had been



offered prescription stimulants for nonmedical use and that 31% of undergraduates had misused prescription stimulants (Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012). Overall, it appears as though roughly 4.1% to 10.8% of undergraduates have misused prescription stimulants in the past year (Arria et al., 2008a; McCabe et al. 2005; McCabe et al., 2006; Teter et al., 2006), with lifetime prevalence estimates ranging from 6.9% to 35.6% (Arria et al., 2008a; Arria et al., 2011; DeSantis et al., 2008; Hall, Irwin, Bowman, Frankenberger, & Jewett, 2005; White et al., 2006).

Besides prevalence rates and trends, other studies on the misuse of prescription stimulants have examined motives for use. Undergraduates reported engaging in the misuse of prescription stimulants for both academic purposes as well as for recreational reasons (DeSantis et al., 2008; Garnier-Dykstra et al., 2012; McCabe et al., 2005). Academic reasons for this type of prescription drug misuse included: to help improve academic performance, increase concentration, to increase energy, and to stay awake longer to study and/or complete assignments (Bavarian, Flay, Ketcham, & Smit, 2013; DeSantis et al., 2008; McCabe et al., 2005; Teter et al., 2006). Interestingly, undergraduates perceived that their grades showed improvement based on their increased ability to focus and study longer while engaging in the misuse of prescription stimulants (Advokat et al., 2008). Recreational reasons for the misuse of prescription stimulants included: to party, for experimentation, for feelings of euphoria that simulate those induced by cocaine, and for increased sociability (DeSantis et al., 2008; McCabe et al., 2005; Teter et al., 2006).

Some scholars have focused specifically on how undergraduates obtain prescription stimulants, which is also referred to as source of diversion (Garnier et al., 2010; Garnier-Dykstra et al., 2012; Lord et al., 2009). Overall, most studies indicate that college students typically

obtain prescription stimulants via their friends and/or close acquaintances who have prescriptions for the medications (Bavarian et al., 2013; Garnier-Dykstra et al., 2012; Lord et al., 2009; McCabe et al., 2006). Garnier and colleagues (2010) found that approximately 5.3% of college undergraduates were currently prescribed ADHD medications; this is relevant as it provides for a source of diversion, which refers to the illicit sharing, selling, and/or trading of prescription medications. The same authors also found that 67.1% of college undergraduates who were diagnosed with ADHD reported diverting their prescription stimulants (Garnier et al., 2010). Risk factors for diversion include: cannabis use disorder (Garnier-Dykstra et al., 2012) and childhood conduct problems (Garnier et al., 2010).

The primary routes of administration for the misuse of prescriptions stimulants includes: orally, intra-nasally, and/or intravenously. Several scholars have sought to examine routes of administration specifically (Bavarian et al., 2013; Garnier-Dykstra et al., 2012; Teter et al., 2006; White et al., 2006). For example, White and colleagues (2006) found that among a sample of undergraduate and graduate students the preferred route of administration was oral (55%), followed by intranasal (40%), and other (4%), which the authors presumed to refer to intravenous misuse. Similarly, Teter and colleagues (2006) found that the vast majority of undergraduates sampled reported oral administration (95.3%) and that 38.1% had reported intra-nasal administration. Other studies have found much lower rates of intra-nasal and intravenous prescription stimulant misuse by undergraduates (Babcock & Byrne, 2000). Overall, studies indicate that the majority of students who use non-medical prescription stimulants do so orally rather than intra-nasally or through injection (Babcock & Byrne, 2000; Bavarian et al., 2013; Garnier-Dykstra et al., 2012; Teter et al., 2006; Weyandt et al., 2009; White et al., 2006).

## *Correlates*

Other studies have analyzed correlates of the misuse of prescription stimulants. For the most part these studies indicate that among undergraduates the misuse of prescription stimulants is higher for males, Whites, individuals with lower grade-point averages (GPA), and for individuals who are members of Greek fraternities and sororities (DeSantis et al., 2009; Garnier-Dykstra et al., 2012; Lord et al., 2009; McCabe et al., 2006; Teter et al., 2006). In regards to Greek membership, fraternity members are at a much greater risk for misusing prescription stimulants with lifetime estimates ranging as high as 55% in comparison to undergraduates who are not fraternity members and whose lifetime estimates range from 7% to 36% (DeSantis, Noar, & Webb, 2009). The misuse of prescription stimulants has also been found to be higher at Northeast colleges and at colleges with competitive admission standards (McCabe et al., 2005). In addition, it appears as though undergraduates misuse prescription stimulants more during periods of high academic stress, such as during mid-terms or finals week (DeSantis et al., 2008). Most studies have found that undergraduates report that prescription stimulants are readily available on their campuses and that they perceive prescription stimulants to be relatively harmless (Arria et al., 2008a; Johnston, O'Malley, Bachman, & Schulenberg, 2012). Furthermore, research has also shown that undergraduates overestimate the prevalence of this type of drug use, which can have negative consequences as individuals are more likely to engage in prescription stimulant misuse when they perceive others to be engaging in similar behaviors (Sussman et al., 2006).

Additionally, studies have sought to examine the relationship between prescription stimulant misuse and a variety of sociological perspectives. For example, Sykes and Matza's (1957) neutralization theory postulated that individuals are constantly aware of their moral

obligation to abide by the law and therefore argued that when an individual does commit a deviant and/or criminal act they must employ some type of mechanism to neutralize the feelings of guilt or shame that may arise from violating said moral obligations. For example, they may justify their behaviors by arguing that no one was physically injured on the basis of their actions, which is also known as denial of injury. In relation to prescription stimulant misuse, DeSantis and Curtis-Hane (2010) sought to analyze how undergraduates at a large public, Southeastern university conceive of ADHD stimulants and their illegal use by conducting in-depth interviews with approximately 175 students (94 males and 81 females). In doing so, they found that students framed stimulant misuse as both morally acceptable and physically harmless and justified their misuse via four reoccurring pro-stimulant arguments (DeSantis & Curtis-Hane, 2010). First of all, the majority of students interviewed justified their misuse of prescription stimulants by comparing and contrasting it with “party drugs”. These justifications included: using stimulants for the right reasons (to study rather than party), they come from medical establishments (and hence are safer than street drugs such as cocaine), they do not produce a euphoric high, and there are no internal/physical or external side effects. Secondly, undergraduates justified their misuse of prescription stimulants by describing moderation of use. Most students claimed that they only engaged in the misuse of prescription stimulants during periods of high academic stress such as finals week. The third type of justifications offered by undergraduates focused on the self-medicating argument. Basically, the participants described how they had identified ADHD like symptoms in their behaviors, how the drug had corrected those behaviors, and hence they must have ADHD. The last type of justification that DeSantis and Curtis-Hane (2010) found was that of a minimalization argument. In other words, students

sought to minimize the dangerous nature of amphetamines by framing them as harmless and as a socially approved means of fighting fatigue.

Studies have also examined the misuse of prescription stimulants in relation to theoretical perspectives such as general strain theory and social learning theory (Ford & Schroeder, 2009; Peralta & Steele, 2010). More specifically, Ford and Schroeder (2009) utilized data from the Harvard School of Public Health's college of alcohol study and applied Agnew's general strain theory to determine if academic strain is associated with the misuse of prescription stimulants. The authors found support for general strain theory, as students who experienced academic strain reported higher levels of depression (negative affect) and those students who reported higher levels of depression were more likely to report having engaged in the misuse of prescription stimulants (Ford & Schroeder, 2009). Peralta and Steele (2010) examined the misuse of prescription stimulants from the perspective of social learning theory and found that peer associations influenced the misuse of prescription stimulants; although, the authors noted that peer associations were only a partial explanation for the misuse of prescription stimulants among their sample and that more research needs to be conducted.

Some research has also examined psychological variables associated with prescription stimulant misuse among undergraduates (Teter, Falone, Cranford, Boyd, & McCabe, 2010; Weyandt et al., 2009; Zullig & Divin, 2012). For example, Weyandt and colleagues (2009) found that undergraduates with higher rates of prescription stimulant misuse also reported higher degrees of internal restlessness and psychological distress. Zullig and Divin's (2012) found that college students who reported feelings of sadness, depression, or suicide were 1.22-1.38 times more likely to report stimulant misuse in comparison to undergraduates who did not feel suicidal, depressed, or sad. In addition, data has also shown that a variety of individual factors are

associated with increased risk of the misuse of prescription stimulants: Axis 1 psychiatric diagnoses, psychiatric symptoms, and alcohol and other substance abuse (Huang et al., 2006). Weyandt and colleagues (2009) found that the odds of misuse of prescription stimulants and drug use disorders were greater among men, Native Americans, young and middle-aged, those residing in the West, and those who are widowed/ divorced or never married. Furthermore, they found that the majority of individuals with PDM disorders never received medical treatment (Weyandt et al., 2009).

Several studies have found that individuals who binge drink or use other illicit drugs are at an increased risk for the misuse of prescription stimulants and they are also at an increased risk of experiencing drug use related problems (Lord et al., 2009; McCabe et al., 2005; Teter, McCabe, Cranford, Boyd, & Gutherie, 2003). More specifically, individuals who engaged in misuse of prescription stimulants were significantly more likely to report heavy episodic drinking and marijuana use, as well as ecstasy, cocaine, and opiate use (McCabe et al., 2005; Teter et al., 2003). In addition, students who reported the misuse of prescription stimulants described higher rates of substance use related problems, than students who did not report the misusing prescription stimulants (Garnier-Dykstra et al., 2012; McCabe et. al., 2005; Teter et. al., 2003).

### Academic Strain

Based on the existing literature, it has become quite evident that undergraduates are engaging in the misuse of prescription stimulants, in large part, to meet academic demands (DeSantis et al., 2008; Garnier-Dykstra et al., 2012). Studies have found that students misuse prescription stimulants more during periods of high academic stress, such as during mid-terms or

finals week (DeSantis et al., 2008) and at Northeast colleges and colleges with more competitive admission standards (McCabe et al., 2005). In addition, Hall and colleagues (2005) found that undergraduates reported prescription stimulant misuse due to feeling pressure from time commitments and claimed that fatigue and tiredness rendered it difficult for them to study, yet only 14% of those sampled believed that the misuse of these illicit drugs had positive long-term effects on their academic achievements.

We are also quite aware of the fact that college can be an extremely stressful period for young adults due to high expectations of success from parents, fear of personal failure, heavy academic workloads, and competitiveness for high grades (Cottrell, 1992; Moore, Burgard, Larson, & Ferm, 2014). In addition, researchers also argue that emerging adulthood, or the transition from adolescence into adulthood, increases stress levels among undergraduates as they must now live independently, handle finances, maintain academic standards, and adjust to a new social life (Arnett, 2000; Roisman, Masten, Coatsworth, & Tellegran, 2004). This stage of life, which typically lasts from age 18 to 25, can be beneficial to the individual in that it increases their personal responsibility; however, negative behaviors such as heavy drinking and increased illicit drug misuse often occur during this transitional period as well (Arnett, 2005). The internal and external demands of emerging adulthood create significant pressure to consistently perform at one's best and the research bears out that overtime these demands have increased as have overall stress levels of undergraduates (Moore et al., 2014; Pryor, Hurtado, DeAngelo, Palucki-Blake, & Tran, 2011; Sax, 2003). For example, Pierceall and Keim (2007) found that 75% to 80% of community college undergraduates reported being moderately stressed and that 10% to 12% of undergraduates reported being severely stressed. Research shows that college stressors include: academics, finances, social relationships, daily hassles (such as parking or being late to

class), and familial relationships (Brougham, Zail, Mendoza, & Miller, 2009; Crespi & Becker, 1999; Ross, Neibling, & Heckert, 1999). Academic stressors include the undergraduate's perception of the extensive knowledge base required as well as their perception of an inadequate amount of time to develop it (Misra & McKean, 2000). For all types of college stressors insufficient resources, time demands, and new responsibilities have characterized stress (Brougham et al., 2009; Ross et al., 1999).

This stress in return plays a large role in many problems common among undergraduates, such as anxiety and depression, which in turn increases the likelihood that an individual will use illicit drugs such as prescription stimulants (Cottrell, 1992; Zullig & Divin, 2012). Thomas (2013) analyzed a sample of undergraduates to determine if a relationship existed between symptoms of anxiety, depression, ADHD, or Attention Deficit Disorder (ADD) and students self-medicating with marijuana and prescription medications. The author found that: 1) students who engaged in PDM reported higher rates of anxiety, depression, and impulsivity; 2) Adderall was one of the most commonly misused prescription drugs; 3) students were self-medicating with Adderall for academic purposes; and 4) the majority of individuals who engaged in PDM did not use before they began college nor did they misuse when classes were not in session, which further offers support for the self-medication argument (Thomas, 2013). Overall, it appears as though undergraduates are self-medicating with prescription stimulants in an effort to help them better manage/improve their academic performance (Thomas, 2013; Weyandt et al., 2009). In a similar study, Ford and Schroeder (2009) applied Agnew's general strain theory and found that undergraduates who reported academic strain are at a greater risk of depression and those students who reported higher levels of depression were at an increased likelihood of misusing prescription stimulants. It has been well established in the literature that



undergraduates cited stress and negative affect as the primary reasons for their illicit drug misuse (Flynn, 2000; Kassel, Jackson, & Unrod, 2000; O'Hare & Sherrer, 2000).

Research has also found that certain subgroups within the college population have significantly higher prevalence rates of mental health problems including: students from lower socio-economic backgrounds (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Silverman, Meyer, Sloane, Raffel, & Pratt, 1997; Weitzman, 2007); individuals with relationship stressors (Blanco et al., 2008; Kisch, Leino, & Silverman, 2005); individuals with low social support (Blanco et al., 2009); and individuals who have been the victims of sexual assault (Stepakoff, 1998). In addition, existing research has shown gender differences in mental health problems among undergraduates with males being more likely to commit suicide (Silverman et al., 1997) and females being more likely to screen positive for major depression and anxiety issues (Eisenberg et al., 2007). Overall it appears as though, undergraduates turn to illicit drugs in an effort to cope with stress and that stress is associated with mental health issues, which is also associated with an increased likelihood of engaging in illicit drug misuse.

Other studies that have assessed the relationship between academic strain and prescription stimulant misuse and have found that undergraduates who misuse prescription stimulants were more likely to have had a significantly lower GPA in high school, were significantly more likely to skip classes in college and/or withdrawal from classes in comparison to their peers who did not misuse prescription stimulants (Advokat et al., 2011; Arria et al., 2008; Stock, Litt, Arlt, Peterson, & Sommerville, 2013). In addition, studies have found that undergraduates who misuse prescription stimulants spend more time socializing and less time studying in comparison to undergraduates who did not misuse prescription stimulants (Advokat et al., 2011; Arria et al., 2008; Garnier-Dykstra et al., 2012). Arria and colleagues (2008) found

that the misuse of prescription stimulants in the past year independently predicted lower college GPA by the completion of the first year of college, which can be partially explained by skipping classes either way they argue that college undergraduates who engage in PDM are a high risk group for academic problems at the collegiate level. The negative relationship between the misuse of prescription stimulants and GPA is now quite established in the literature. In other words, undergraduates who misuse prescription stimulants are more likely to have a lower GPA than are undergraduates who do not misuse prescription stimulants (Advokat, Guidry, & Martino, 2008; Arria et al., 2008; Garnier-Dykstra et al., 2012; Stock et al., 2013). Despite the negative relationship between the misuse of prescription stimulants and GPA, undergraduates still perceive of this type of illicit drug misuse as an effective academic strategy; therefore, it may be necessary to focus interventions on students who struggle academically, especially during periods of high academic stress, when undergraduates are at an increased likelihood of misusing prescription stimulants (Stock et al., 2013).

While several studies have focused on the relationship between academic strain and the misuse of prescription stimulants, important holes still exist in the literature regarding the relationship between other academic variables and this type of PDM. Currently it is not clear if plans after graduation impact the misuse of prescription stimulants among undergraduates. In other words, do undergraduates who plan on attending graduate school experience greater levels of academic strain than their peers who do not plan on attending graduate school? If so, are these undergraduates at a greater propensity of misusing prescription stimulants in an effort to continue meeting stringent academic demands? In addition, it is not clear if differences in majors (e.g., STEM vs. non-STEM) impact the likelihood that an undergraduate will misuse prescription stimulants. Some majors may be more stressful and demanding than other majors

and hence individuals in these majors may be at an increased likelihood of misusing prescription stimulants than are individuals in less demanding majors. These issues will be addressed more thoroughly in the following sections.

### *Plans after Graduation*

As mentioned above, plans after graduation may also impact one's level of academic strain. For example, undergraduates who plan on attending graduate school (particularly competitive programs) may be under more stress than students who plan on entering the workforce after graduation due to the fact that they must maintain competitively high GPA's, meet graduate school admission requirements, and go through rigorous application processes. It has been shown in the literature that prevalence rates for the misuse of prescription stimulants is higher at colleges and universities with more competitive admission standards (McCabe et al., 2005). Maintaining a high GPA may be less relevant to individuals who plan on going into the workforce as employers typically do not concern themselves with a prospective employee's college GPA, but whether or not the prospect has a college degree. Additionally, employers tend to place more weight on work-related experience, specifically internships and employment during school rather than on academic credentials (Chronicle of Higher Education, 2012).

For example, Velasco (2012) explored employers' emphasis on grades during the hiring process for recent graduates and found that employers no longer hire candidates solely based on their grades, experience or hard skills, but rather employers focus on softer skills such as communication, leadership, and teamwork when making their hiring decisions. Furthermore, the author found that good academic standing only mattered in the public sector (Velasco, 2012). In a similar study that analyzed employer priorities, 93% of employers said that a demonstrated

capacity to think critically, communicate clearly, and solve complex problems is more important than a candidate's undergraduate major (Hart Research Associates, 2013). It is speculated then that individuals who plan on entering the workforce after graduation may be under less academic strain than are individuals who will be judged on the basis of such criteria upon applying for graduate school. This issue is important as other scholars have found that high levels of stress increases the likelihood that an individual will engage in the misuse of prescription stimulants (Ford & Schroeder, 2009; Zullig & Divin, 2012). Additionally, recent research also shows gender differences in graduate school attendance. The Department of Education estimated that in 2013 women earned 61.6% of all associate's degrees, 56.7% of all bachelor's degrees, 59.9% of all master's degrees, and 51.6% of all doctor's degrees; therefore female undergraduates may be under greater academic strain than male undergraduates due to their plans to attend graduate school (U.S. Department of Education, 2013). Overall, if undergraduates have the intention of attending graduate school and feel greater levels of stress due to those plans they may be at a greater risk of misusing prescription stimulants in comparison to their college peers who do not plan on attending graduate school.

### *College Major*

Less is known about the relationship between the misuse of prescription stimulants and college major (e.g., STEM vs. Non-STEM). In simplest form, the acronym STEM refers to the academic disciplines of science, technology, engineering, and mathematics. Understanding the relationship between prescription stimulant misuse and college major may be important as different majors are under greater stress and may be more demanding and rigorous than are other majors.

According to the 2011 National Survey of Student Engagement (NESSIE) the average full-time undergraduate studies approximately fifteen hours a week, but the duration varies by major (NESSIE, 2011). The survey found that engineering majors spend the most time studying at approximately 19 hours per week, yet nearly a quarter still often show up to class without completed assignments; whereas, business majors and social science majors study the least at roughly 14 hours per week (NESSIE, 2011). In examining the process of undergraduates choosing a college major, Stinebrickner and Stinebrickner (2011) found that students enter into college as open to a major in math or science as to any other major, but a large portion of those students move away from the fields of math and science after realizing that their grade performance will be significantly lower than expected. Some studies have also provided evidence that alcohol and illicit drug use may impact one's decision of college major, with heavy drinkers being more likely to gravitate towards less demanding majors (Gilksman, Newton-Taylor, Adlaf, & Giesbrecht, 1997; Wolaver, 2002). For instance, Wolaver (2002) found that heavy drinkers were more likely than their counterparts to choose a social science or business major and less likely to choose engineering, education, or the natural sciences.

Furthermore, college majors also tend to differ based on an individual's gender. For example, males are more likely to be STEM majors in comparison to females (Higher Education Research, 2007). Planty and colleagues (2009) found that women received 17% of bachelor degrees in engineering, compared to 79% of bachelor's degrees in education. In addition, studies have found that women are more likely to drop out of STEM majors than are their male counterparts (Saucerman & Vasquez, 2014). Clemancia Cosentino de Cohen, a senior researcher at Mathematica Policy Research and STEM specialist, remarked in regards to this trend, "If women get a B, they think they are failing. A man gets a B, and he's happy. They say they are

acing the class. Women who go into hard sciences, they're very driven, they're very high achieving, and if they are not performing at that very top level, they become discouraged, and they think that it is not for them" (Newlon, 2013, pg. 1). Other scholars have noted that from an early age women receive overt messages that lead them to believe that failures in STEM disciplines are due to lack of ability (Dickhauser & Meyer, 2006), that men are naturally more talented in STEM fields, and that identifying oneself as feminine is at odds with identifying as a professional in STEM fields (Pronin, Steele, & Ross, 2003). Gender differences in academic strain and major are important due to the fact that males are more likely to be STEM majors and STEM majors have been linked to higher levels of academic strain; therefore, males may be more likely than females to engage in the misuse of prescription stimulants for academic purposes in comparison to females. In addition, it is also important to determine if gender differences exist in the misuse of prescription stimulants between female STEM majors and female non-STEM majors as female STEM majors may be more likely than female non-STEM majors to misuse prescription stimulants due to higher academic demands and requirements.

When it comes to existing empirical studies regarding specific college majors as they relate to the misuse of prescription stimulants among undergraduates, most of the existing studies have focused on health and medical majors (Bossaer et al., 2013; Habibzadeh et al., 2011; Lord et al., 2009; McNeil et al., 2011). For instance, McNeil and colleagues (2011) surveyed dental education institutions located in the south-central region of the U.S. and found that among a sample of fourth-year dental and senior dental hygiene students approximately 12% had reported the misuse of prescription stimulants. In addition, they found that 74% of those students reported being stressed although stress was not significantly correlated to the misuse of prescription stimulants (McNeil et al., 2011). Lord and colleagues (2009) focused their attention

on pharmacy students and found that rates of usage were comparable with reported rates in general college populations with 7% of their sample reporting lifetime use and 5% reporting past year use. In addition, Bossaer et al. (2013) assessed the misuse of prescription stimulants at one academic health sciences center and found that 11.5% of respiratory care and medical students reported the misuse of prescription stimulants. In reviewing the existing literature, it becomes quite evident that more research is needed on the misuse of prescription stimulants as it relates to academic strain, plans after graduation, and college major as currently no studies really compare different groups of students and how these differences impact the misuse of prescription stimulants for academic purposes.

### Social Norms

One of the most critical transitions in an individual's life is moving from high school to college (Newcomb & Bentler, 1987). During this time, individuals experience various changes in their social environment as well as an increase in role responsibility (Arnett, 2005; Newcomb & Bentler, 1987). This stage of life, typically lasting from age 18 to 25, has been named "emerging adulthood" and is characterized by the adoption of new roles, new friendship networks, and separation from an individual's family (Arnett, 2005; Schulenberg & Maggs, 2002). While emerging adulthood can benefit individuals by increasing personal responsibility, negative behaviors, such as heavy drinking and increased illicit drug use, often occur during this transition (Arnett, 2005). Arnett (2005) states prevalence for most types of drug use is the highest during this age period. With that being said an abundance of research has shown that risk-related behaviors, especially among college students, are largely affected by social norms (Borsari &

Carey, 2003). For example, scholars have found that undergraduates consume larger amounts of alcohol due to a misperception about the quantity of alcohol that their peers are consuming (descriptive norms) and because they believe that their peers approve of this behavior (injunctive norms) (Borsari & Carey, 2003; Prentice & Miller, 1993).

In general, social norms refer to the unspoken rules of a given society or social group (Deutsch & Gerard, 1955). These rules denote what behaviors are viewed as socially acceptable or unacceptable for various cultures, groups, and social settings (Cialdini, Kallgren, & Reno, 1991). Social norms are typically classified as either 1) descriptive, which are statements of how people generally act in a given situation or 2) injunctive, which denote what behaviors are expected or required in a given social setting (DeBono, Shmueli, & Muraven, 2011; Neighbors, Geisner, & Lee, 2008). Social norms act as an informal mechanism of social control that attempts to guide individuals to engage in certain behaviors, while avoiding other behaviors all together (Lakin & Chartrand, 2003). Compliance to social norms maintains one's popularity and acceptance within that social group; whereas, failure to comply may result in the individual becoming labeled as deviant and marginalized from the group (Mattern & Neighbors, 2004). When it comes to undergraduates this becomes even more relevant as they are introduced to a new social environment where they need to act appropriately in an effort to establish and maintain peer relationships.

Existing research has found that compliance to social norms can be beneficial to individuals in that it allows them to experience an increased sense of social solidarity and social connectedness (Lakin & Chartrand, 2003; Mattern & Neighbors, 2004). For example, Mattern and Neighbors (2004) found that college students benefit from following social norms due to social comparison processes. These processes “create a strong desire to implement and maintain



the same attitudes as peers and to comply with their expectations and behaviors” (Mattern & Neighbors, 2004). As mentioned previously, college is a crucial transition in which one enters into a new environment with a new set of rules and for the first time in their lives they are away from their families who have been primarily responsible for socializing them. This may lead the emerging adult to rely on perceived ideas about the norms of the environment as a means of navigating this new terrain.

The misperception of social norms can inadvertently have negative effects for the individual as it may lead to an increase in the involvement in deviant/ risky behaviors (Lewis, Neighbors, Oster-Aaland, Kirkbey, & Larimer, 2007; Neighbors et al., 2008). Research has previously shown that young adults, specifically college students, tend to engage in high risk behaviors, such as alcohol use, drug use, and unsafe sexual behaviors, due to misperceptions of normative behaviors (Baer & Carney, 1993; Lewis et al., 2007; Neighbors et al., 2008). Borsari and Carey (2003) found that students are more likely to consume larger amounts of alcohol because they believe that their peers approve of this behavior. Similarly, Neighbors and colleagues (2007) found that rates of undergraduate alcohol use are significantly related to undergraduates’ perceptions of alcohol use (descriptive norm) (Neighbors et al., 2007). In looking at marijuana use, Lewis and colleagues (2007) found that undergraduates engaged in higher amounts of personal marijuana use when they perceived their peers to be frequent marijuana users and when they perceived that their peers were approving of such behaviors. Overall, it appears as though undergraduates tend to overestimate the amount of alcohol and marijuana being consumed and the amount of undergraduates that are actually using and these misperceptions in turn increases the likelihood that the individual will engage in illicit drug misuse as they perceive these behaviors as being socially acceptable and/or the norm.

Borsari and Carey (2003) also found that descriptive norms for proximal reference groups (e.g. close friends) are more strongly related to actual drinking than are distal reference groups (e.g. the typical student). Although, it should be noted that undergraduates tend to overestimate the drinking of more distance reference groups to a larger extent than that of closer reference groups (Carey, Bosari, Carey, & Maisto, 2006). Prince and Carey (2010) noted in regards to social influence processes, “drinking attitudes are inferred from the most salient observable drinking behaviors and conversations about alcohol with peers; such inferred attitudes may be simultaneously hard to disprove and also divergent from reality” (pg.940). In sum, the research shows that close friends have a greater impact on a person’s behaviors than do biological, personality, religious, familial, and culture factors and this impact is strongest during late adolescence and early adulthood (Bosari & Carey, 2001).

Fewer studies have analyzed college social norms and the misuse of prescription stimulants specifically; however, the initial findings indicate that undergraduates tend to also overestimate the misuse of prescription stimulants by college students in general (McCabe, 2008; Sussman et al., 2006). For example, McCabe (2008) examined a random sample of college students and found that approximately 70.2% of the sample population overestimated the prevalence of prescription stimulant misuse among their peers. The author found that approximately 6% of students were actually misusing prescription stimulants; however, undergraduates perceived stimulant misuse to be much higher (mean=20%, median 15%) (McCabe, 2008). In a similar study, conducted by Dussault and Weyandt (2011), the authors compared fraternity and sorority members to nonmembers and found that undergraduates with Greek affiliation were more likely to overestimate the prevalence of prescription stimulant misuse than were nonmembers, suggesting that individuals whom are Greek affiliated are more

likely to perceive of the misuse of prescription stimulants as the norm than are nonmembers. Furthermore, Saunders and colleagues (2014) sought to determine if undergraduates perceived the recreational use of prescription medications as more common among their peers than it is in reality and found that undergraduates perceived the misuse of prescription medications to be both more common and more frequent than their peer's reported use (Saunders, Stogner, Seibert, & Miller, 2014). In addition, the same authors found that these misperceptions were more common among users than non-users (Saunders et al., 2014).

In looking at other studies on student's perceptions regarding the misuse of prescription stimulants, Advocat and colleagues (2008) found that undergraduate students perceived that their high standing classmates were using stimulants to achieve such standing. This can also have negative consequences if students perceive that the misuse of prescription stimulants can increase their academic standing and they misperceive how many people are actually misusing prescription stimulants then they are more likely to view these behaviors as socially acceptable and hence are more likely to misuse prescription stimulants as well. In a more recent study, social scientists examined the discussion of Adderall on Twitter and found that: 1) in less than a year "Adderall" had been mentioned in approximately 213,633 tweets from 132,099 unique user accounts; 2) these tweets peaked during exams periods; and 3) were highest among college and universities clusters in the northeast and south regions of the U.S. (Hanson et al., 2013). The authors went on to argue that these Adderall discussions through social media networks such as Twitter may be contributing to normative behavior regarding its misuse (Hanson et al., 2013).

In addition, studies have also found that undergraduate students often believe that this type of illicit drug use is less likely to cause physical harm in comparison to other illicit drugs, such as crack cocaine or heroin (Lookatch, Dunne, & Katz, 2012; Quintero et al., 2006; Stock et

al., 2013; Sussman et al., 2006; Weyandt et al., 2009). Arria and colleagues (2008) found that among a sample of first year undergraduates, students with low perceived harmfulness of prescription stimulants were more than ten times more likely to misuse prescription stimulants in the past year than were students with high perceived harmfulness. To offer some comparison, the authors also found that among these first-year students the perceived level of harmfulness was higher for cocaine, but lower for marijuana or binge drinking, which they defined as having five or more drinks once or twice every weekend (Arria et al., 2008). A review of the existing literature on risk perception surrounding the misuse of prescription stimulants indicates that overall students do not perceive the misuse of these illicit drugs to be risky. Some scholars have sought to examine where these misperceptions are coming from and have found evidence of a “false consensus effect” or the tendency of individuals to overestimate the extent to which others share one’s own behaviors and attitudes (Sherman, Presson, Chassin, Corty, & Olshavsky, 1983; Wolfson, 2000). For example, Wolfson (2000) analyzed the actual and perceived usage of marijuana and amphetamines (e.g. pep pills and speed) and found that students overestimated the actual rates for both, with overestimates being the greatest among those who used each of the drugs. The author concluded that overestimation is impacted by one’s own drug use as well as one’s social network of friends (Wolfson, 2000).

These findings are important as undergraduates who perceive that the misuse of prescription stimulants is harmless are at an increased risk of engaging in such PDM. Furthermore, if undergraduates also perceive that binge drinking and using marijuana are harmless and normative behaviors among their fellow students this also increases the likelihood that they will engage in poly-drug use, which can have deadly consequences. As mentioned previously, recent data collected by DAWN indicated that over half (53%) of the medical

emergencies seen in emergency departments (ED) in 2011 resulted from PDM in combination with other drugs, with roughly one in five (17.6%) involving PDM and alcohol (Center for Behavioral Health Statistics and Quality, 2013).

These risk perceptions, or lack thereof, are also appearing in research that looks at how undergraduates justify their misuse of prescription stimulants. Studies have found that safety is the most well documented justification given for the misuse of prescription stimulants (Cutler, 2014). More specifically, students argue that prescription stimulants, as opposed to street stimulants (e.g. methamphetamine or cocaine), are “safer” as they are regulated by the Food and Drug Administration (FDA) and they are “pure” having known chemical compositions and predictable side effects (Cutler, 2014; DeSantis & Curtis-Hane, 2010). DeSantis and Curtis-Hane (2010) noted:

Perhaps the most interesting aspect of this justification was *not* that students put such absolute faith in the medical establishment, but how strategically selective they were about what they trusted. Without equivocation, for example, our participants believed that the FDA, medical doctors, pharmaceutical companies, and health experts would not lie, cheat, or deceive them about the quality of ADHD stimulants. These same participants, however, also thought that the potential dangers of these drugs detailed by these same health experts were exaggerations at best, if not conspiratorial lies (pg.36).

In addition, studies have also found that the misuse of prescription stimulants can also be further justified as students’ report that the physical effects of these substances are harder to detect than other illicit stimulants and that they are overall easier to conceal (DeSantis & Curtis-Hane, 2010; Garnier-Dystra et al., 2012; Lakhan & Kirchgessner, 2012; Rabiner et al., 2009). Furthermore, undergraduates have reported misusing stimulants as they claim that there are no internal/physical or external/societal side effects (DeSantis & Curtis-Hane, 2010). More specifically, students perceive that misusing prescription stimulants is a socially acceptable behavior as prescription stimulants do not have damaging side effects like other illicit street

drugs (e.g. brain damage, addiction, or death) nor do they carry as harsh of legal penalties as other illicit drugs (e.g. cocaine or meth).

These initial findings have dangerous implications and more research is needed. Based on the existing literature, it appears that similar to undergraduate social norms about alcohol and marijuana consumption, undergraduates are also misperceiving the prevalence rates and consequences of engaging in prescription stimulant misuse, which in turn is negatively impacting their own behaviors. This has numerous implications for university and college based education and prevention programs. Currently many universities only educate the student body on the misperceptions surrounding alcohol consumption patterns; although, a few are beginning to include marijuana as well (Haines & Spear, 1996; Mattern & Neighbors, 2004; Perkins and Craig, 2006). Overall these programs appear to be successful in lowering undergraduate alcohol and marijuana consumption and hence may offer a route to also decrease prescription stimulant misuse among undergraduates (Mattern & Neighbors, 2004). It is important for colleges and universities to inform their student bodies on the actual rates of prescription stimulant misuse and on the actual negative consequences that can result from this type of PDM, especially when mixed with other psychoactive substances, such as alcohol and/or cocaine, as this information can be critical in undergraduate's decisions to misuse or not to misuse prescription stimulants.

The current study examines how social norms impact undergraduate prescription stimulant misuse for academic reasons, other instrumental reasons, as well as recreational reasons. More specifically, this study examines the relationship between undergraduate stimulant misuse (academic, instrumental, and recreational) and such risk factors as attitudes of acceptability of prescription stimulant misuse, having friends who misuse prescription stimulants and undergraduate prescription stimulant misuse in general.

## Gender

Prior to the 1990's gender differences in rates of illicit drug use were quite consistent with men being significantly more likely than women to both use, abuse and to become dependent (Greenfield, Back, Lawson, & Brady, 2010). Since the 1990's, however, empirical studies and national surveys have indicated that the gender gap for drug use over the lifetime seems to be closing with women increasingly experimenting with drugs (Grucza, Norberg, Bucholz, & Bierut, 2008; Wagner & Anthony, 2007). Studies have shown that overall more young women are offered and experiment with illicit drugs in their early teenage years in comparison to young men who tend to "catch-up" in their mid-teens and by adulthood men tend to exceed women in terms of experimentation with illicit drugs (Measham, 2000; Measham, Aldridge, & Parker, 2001; Parker, Aldridge, & Measham, 1998). When it comes to PDM, the data regarding gender differences is less consistent. Some studies have indicated that women are more likely to misuse prescription medication than are men, especially when it comes to tranquilizers and narcotic analgesics (Simoni-Wastila, Ritter, & Strickler, 2004); whereas, others studies report similar or higher rates of PDM among men (Blanco et al., 2007). Overall, findings generally show that adolescent females are more likely to engage in PDM, but that changes in young adulthood when men tend to exceed women in PDM.

When it comes to gender differences in the misuse of prescription stimulants among undergraduate students, studies have found that males are more likely to misuse prescription stimulants than are females (Teter, McCabe, Cranford, Boyd, & Guthrie, 2005; Poulin, 2007); however, Wu and Schlenger (2003) found that females were at an increased likelihood of

developing dependency to prescription stimulants in comparison to males. In their study, stimulant dependency was a clinical measure based on the *Diagnostic and Statistical Manual of Mental Disorders, Version IV (DSM-IV)* (Wu & Schlenger, 2003). Additionally, Hall and colleagues (2005) found that men's misuse was predicted by knowing how to get stimulants and women's misuse was predicted by being offered stimulants.

In looking at motives for the misuse of prescription stimulants several studies have found no gender differences in motivations (McCabe & Boyd, 2005). Stated differently, these studies found that both males and females misuse prescription stimulants to improve academic performance, to increase concentration, and to party (McCabe & Boyd, 2005). On the other hand, other studies that have examined motives have noted some gender differences with females being more likely to report use for weight loss purposes; whereas, males were more likely to report using to party or get high (DeSantis et al., 2008; McCabe et al., 2005; Teter et al., 2006). For example, Desantis and colleagues (2008) noted in regards to male motives for use, "ability to fight fatigue (party longer), increased sociability, heighten the effects of alcohol, decrease the depressant qualities of alcohol, and simulate cocaine" (pg. 318). For females, weight loss motives appear to be related to gendered concerns about weight and body image, which are prevalent in Western societies, especially among whites (Measham, 2002; Vecitis, 2011). It appears as though these differences in motives are grounded in traditional ideals of masculinity and femininity and hence, men and women are misusing prescription stimulants, in part, to present themselves to others as being more masculine or more feminine.

With that said, there appears to be evidence of "doing gender"- "doing drugs" within the misuse of prescription stimulants. The term "doing gender" was coined by West and Zimmerman (1987) and refers to the idea that in Western culture gender is socially constructed



and actively surfaces in our everyday interactions, rather than being an innate quality of the individual. In other words, individuals perform gender during interactions with others in hopes that this behavior will be interpreted as occurring naturally. It is through the process of socialization that specific patterns of masculinity and femininity are learned, Krienert (2003) noted in regards to masculinity specifically, “Masculinity must be performed and presented recurrently in any situation—constant self-presentation occurs throughout every social interaction in which a man is involved” (pg.4).

In “doing gender” there are both traditional as well as alternative routes that may be taken in an effort to accomplish the same end result. For instance, there are certain qualities that have been socially defined as masculine such as: having dependents, providing for said dependents, having physical and mental strength, and being dominant; therefore, if a man possesses these characteristics he would be able to appropriately display his gender (Krienert, 2003; Messerschmidt, 1993). The consequences of creating such an illusion, is the fact that individuals may then be judged as a failure if their behaviors do not meet gendered societal expectations (West & Zimmerman, 1987). For example, when men deviate from such societal norms they may be sanctioned by being called names such as wimp or fag; therefore, men in Western societies are strongly encouraged to feel that they have to live up to these masculine ideals or else they will be considered as less masculine and/or less of a man (Connell, 1987). This argument identifies the ways in which expressing masculinity and femininity is directly related to criminal behavior, including the misuse of prescription stimulants (Krienert, 2003). Instead of seeing gender as something that just happens and is done to men and women, gender is seen as something that men and women actively do.

Messerschmidt's (1993) theory of structured action and the concept of "doing gender" through "doing crime" is also relevant to an understanding of "doing gender" through "doing drugs". Messerschmidt's (1993) work stems out of three previous areas of research that focused on the relationship between structure and agency. First of all, Messerschmidt relied on the work of Giddens (1976) who argued that social action is implemented in structure and structure is implicated in social action. Secondly, he pulled from R. Connell's (1987) notion of gender as an ongoing concern that stems out of gendered relations of power, with hegemonic masculinity and emphasized femininity being identified as the idealistic forms of gender in Western societies. Thirdly, he drew from the work of West, Zimmerman, and Fenstermaker and the notion of gender as being a situated accomplishment (West & Zimmerman, 1987; West & Fenstermaker, 1995). Messerschmidt (1993) argued that three social structures specifically form the foundation of relationships between men and women in Western societies including: the gendered division of labor, sexuality, and gendered relations of power. He noted, "Social action is creative, inventive, and novel, but it never occurs separately from, or external to, social structures" (Messerschmidt, 1993:77). In considering that gender is socially constructed, masculinities and femininities themselves are forms of structured action, Messerschmidt (1995) went on to describe this as follows:

Because women reproduce feminine ideals in socially structured specific practices, there are a variety of ways to do femininity. Although femininity is always individual and personal, specific forms of femininity are available, encouraged and permitted, depending upon one's social situation, class, race and sexual orientation. Accordingly, femininity must be viewed as *structured action*-what women do under specific social constraints (pg.172-3).

Messerschmidt (1993) hypothesized that criminal behavior can be used as a means for accomplishing masculinity, when other means are not available. As Krienert (2003) explained, "if a person does not have a steady, reliable job, a stable family life, or other traditional

indicators of successful masculinity, violent behavior may be considered an acceptable way to convey the “toughness” that is linked with masculine traits” (pg.5). Messerschmidt (1993) found that men, who had used violence as an alternative outlet for the expression of masculinity, came to recognize violent behavior as an acceptable route of exhibiting their manhood. In this regard, gender is not only systematically accomplished, but it is also regulated, changed, and reproduced based on gendered ideals in a socially structured setting (Messerschmidt, 2000). Based on this perspective, certain social contexts, social occasions, and social activities such as substance use provide the tools necessary for one “do gender” (Measham, 2002). It should be understood that drug use does not only impact gender, but that gender impacts essentially the ways in which people “do drugs”. Measham (2002) stated, “...people construct their gender identity, their masculinities and femininities, in both traditional and non-traditional ways, through their experiments with and experiences of drugs, the socio-cultural context of drug cultures, and the drug related attitudes and behavior of men and women within those drug cultures” (pg.351-2).

For instance, when analyzing club goers and illicit drug use in the North West of England Measham and colleagues (2001) data indicated that stimulant dance drug use and prolonged physical exertion from dancing positively appealed to young women as it led to weight loss, which relates to body image concerns that are more prevalent among women than they are among men in Western societies. One female drug user interviewed noted that it was both far more effective and more fun than going to the gym (Henderson, 1997). This is very similar to the reasons why young women seem to be engaging in the misuse of prescription stimulants as mentioned above.

Research has found that certain subgroups of the population are at an increased likelihood in engaging in inappropriate weight loss techniques such as vomiting or taking laxatives, in

particular college-aged women (Trautmann, Worthy, & Lokken, 2007). Additionally, female undergraduates are much more likely to have a lower physical self-perception, to have a distorted body image, and to categorize themselves as being overweight than are their male counterparts (Kilbourne, 1999; Wharton, Adams, & Hampl, 2008). It has been argued that body dissatisfaction and overestimation of BMI is more prevalent among female undergraduates as they are frequently assessed based upon their physical attractiveness, which has also been referred to as objectification theory (Swierkosz, 2010). As Sheldon (2010) noted, “women are often defined as their bodies; and their bodies are treated as objects that exist for the sexual pleasure of men” (p.278). Other researchers have found that this promotes self-objectification in which women scrutinize their own bodies, which may in turn lead to body shame and increases the likelihood that females will develop eating disorders and/or depression (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). Lowery and colleagues (2007) analyzed a sample of undergraduates and found that women were significantly more likely to report a greater discrepancy between their ideal and real body figures and reported higher degrees of body shame, dissatisfaction with physical appearance and weight, and body surveillance than did men in the sample. Furthermore, Wharton and colleagues (2008) found that women were twice as likely as men to report that they were currently attempting to lose weight. Seeing as though, women are more likely than men to engage in inappropriate weight loss techniques and also considering that initial studies on prescription stimulant misuse have indicated that women are more likely than men to cite weight loss as a motive for misusing prescription stimulants, it is necessary to explore this topic in more depth (Teter et al., 2006; Trautmann et al., 2007).

Another gender difference that has been noted in the literature is the complex ways that females use drugs in an effort to accomplish femininity via “...use of time, of time management,

and of drugs in an attempt to control, distort, or “create” time” (Measham, 2002: 361). This is more readily apparent when it comes to women who have children or among women who are pursuing higher education. In this regard, stimulants allowed females to misuse drugs and miss a night’s sleep creating additional leisure time, which can be viewed as “a significant resource for women who experience the competing demands on their time of paid and unpaid work both inside and outside of the home” (Measham, 2002: 361). In looking at misuse of prescription stimulants it appears as though both males and females misuse these stimulants to “create” time in an effort to prolong studying capabilities or to have more time to complete required assignments. Although, this is the case gender differences in their consumption patterns also persist such as males using more to party and females using more for weight loss purposes (Desantis et al., 2008; McCabe et al., 2005; Vecitis, 2011).

Gender differences have also been noted in the literature regarding the experiences and perceptions of the illicit drug’s effects, especially when the given drug was used excessively (Measham, 2002). Several studies have found that experiences such as hangovers, sickness, “come downs”, intoxication, and even hospitalization are described by male participants with glorification, bravado, and amusement as a means of achieving masculinity (Iwamoto, Cheng, Lee, Takamatsu, & Gordon, 2011; Measham et al., 2001; Peralta, Steele, Nofziger, & Rickles, 2010; Wells et al., 2014). For instance, Wells and colleagues (2014) examined the link between masculinity and negative drinking consequences among college men and found that, “men who embrace traditional constructions of masculinity are not only more likely to experience harms from drinking as a consequence of their masculine norms, they may also develop expectations regarding the effects of alcohol that match their masculine ideals, such as believing that alcohol will make them become more aggressive, courageous, or more likely to take more risks” (pg.

516). These alcohol expectancies in turn increase the likelihood that men will engage in risky behaviors while under the influence (Iwamoto et al., 2011; Wells et al., 2014). Men are also expected to drink heavily in college and using stimulants helps to facilitate that (DeSantis et al., 2008; McCabe et al., 2005).

Undergraduate women, on the other hand, are much more likely to express feelings of guilt and shame and to minimize the consequences of their illicit drug misuse, especially when the participant was a mother or expecting a child and when the drug misuse was excessive (De Visser & Smith, 2007; Measham, 2000; Mesham et al., 2001). Measham (2002) noted, “The gendering of the experience of excessive intoxication resulted in a perceived failure in the accomplishment of emphasized femininity, which increased the negative aspects of the psychoactive drug experience for these women” (pg.359). Several exploratory studies have suggested that young women’s alcohol-related behaviors may be equally shaped by gendered norms about femininity and attempts to accomplish a certain feminine identity (Griffin, 2008; Sheehan & Ridge, 2001). This is consistent with the findings of Prince and Carey (2010) and numerous other scholars who have found that among college students femininity is associated with less permissive normative beliefs about the acceptability of excessive drinking; whereas, masculinity is associated with elevated perceptions of peer drinking (Iwamoto et al., 2011; Peralta et al., 2010). In general, public drinking by men has been discussed as a symbol of manliness; whereas, sobriety has been discussed as a symbol of femininity (Eriksen, 1999; Wenner & Jackson, 2009). When it comes to the misuse of prescription stimulants this is relevant as unlike alcohol intoxication, both males and females are able to function somewhat normally while under the influence of prescription stimulants; therefore, prescription stimulants may allow members of both sexes to further perform hegemonic gendered roles and hence may

mitigate negative feeling states associated with illicit drug misuse for women. For example, females are often expected to work outside of the home, while also maintaining the home and caring for dependents (also known as the second shift), hence misusing prescription stimulants may further aid them in accomplishing ideal femininity by aiding them in completion of their daily tasks through the creation of time as mentioned earlier (Measham, 2002).

Overall, a review of the existing literature surrounding gender differences and the misuse of prescription stimulants reveals several interesting patterns. It appears as though both college men and women are misusing stimulants at fairly similar rates and they are both reportedly misusing them instrumentally for academic purposes (McCabe & Boyd, 2005). Although, some studies have noted gender differences in motives given for use with males being more likely to misuse stimulants with the intent of getting high or partying and women being more likely to misuse stimulants for the purpose of losing weight (DeSantis et al., 2008; Measham, 2002; Vecitis, 2011). These findings present evidence of “doing gender” through “doing drugs” as the misuse of prescription stimulants allows for both men and women to successfully present their gendered identities as based on hegemonic ideals of masculinity and femininity. More specifically, the misuse of prescription stimulants allows men to party longer and harder which society deems as masculine behaviors; whereas, the misuse of prescription stimulants allows women to lose weight and thinness is a societal ideal that accompanies femininity (Connell, 1987; Griffin, 2008; Sheldon, 2010). The present study seeks to further examine how gender impacts the misuse of prescription stimulants for academic purposes among undergraduates. Additionally, this research will also seek to determine if gender differences exist in route of administration and/or for source of diversion.

## CHAPTER 3: HYPOTHESES AND METHODS

### Hypotheses

The purpose of the current research is to build on to the existing literature that examines prescription stimulant misuse among college undergraduates. This study has three distinct areas of research: academic strain, social norms, and gender differences.

#### *Academic Strain*

1. Students who report higher levels of academic strain are more likely to report prescription stimulant misuse for academic reasons.
2. Is the relationship between academic strain and prescription stimulant misuse for academic purposes different based on the respondent's plans after graduation (career vs. continue education)?
3. Is the relationship between academic strain and prescription stimulant misuse for academic purposes different based on the respondent's academic major (STEM vs. non-STEM)?

#### *Social Norms*

1. Respondents who report that more of their friends misuse prescription stimulants are more likely to report prescription stimulant use.
2. Respondents who believe that a higher percentage of college students misuse prescription stimulants are more likely to report prescription stimulant misuse.



3. Respondents who believe that the misuse of prescription stimulants is an acceptable behavior among college students are more likely to report prescription stimulant misuse.

### *Gender*

1. Is the relationship between academic strain and prescription stimulant misuse for academic purposes different for males and females?

2. Is the relationship between social norms and prescription stimulant misuse for academic purposes different for males and females?

3. Females are more likely than males to obtain prescription stimulants from friends for free, compared to other sources of diversion.

4. Females are more likely than males to use prescription stimulants orally, compared to other routes of administration.

### Sample

Data for this study was drawn from a self-report survey of a non-probability sample of undergraduates at a large public university that focused on factors related to prescription stimulant misuse during the past academic year (fall 2013 to spring 2014). Several professors were contacted to obtain consent to survey their students during their regularly scheduled class time. Surveys were distributed during the last few weeks of the semester (spring 2014) and at the beginning of their classes. Data was collected from the respondents in a large group setting. Participation was voluntary and survey responses were anonymous. We sampled students enrolled in lower level courses that were either in STEM disciplines (four classes) or part of the general education program, or GEP (five classes). The GEP is a requirement for graduation that

involves students taking thirty-six hours of lower level courses in five different foundational areas. The criteria for survey inclusion was that the participant must be at least eighteen years old and enrolled as an undergraduate at that university, no incentives were given to respondents for their participation.

## Measures

### *Academic Strain*

The dependent variable for this section was the *misuse of prescription stimulants* for academic reasons. Respondents were given a brief description that listed a variety of prescription stimulants such as Adderall, Dexedrine, Concerta, Ritalin, Focalin, or Vyvanse. Respondents were asked “During the past academic year did you use any prescription stimulants, not prescribed to you, to help with academics?” This variable is dummy coded in the analysis with 0 = no use and 1 = use.

For the current study *Academic Strain* was measured in three separate ways. First, a scale was created to measure *Academic Stress*. The Academic Stress scale ( $\alpha = 0.67$ ) consisted of seven items regarding their academic experiences during the past academic year...”courses were easy; you enjoyed your classes; you were satisfied with your academic performance; you felt pressure from your family members to get better grades; you felt pressure from peers to get better grades; you had enough time to meet your academic obligations; you struggled to meet your own academic standards.” The response categories for all items were based on a 5 point Likert scale ranging from strongly disagrees to strongly agrees and all items were coded so that a higher number indicated greater academic stress.

The second measure, *Grade Strain*, was based on two items: importance of academic work and current GPA. This measure indicated a disjunction between academic aspirations and academic outcomes. To measure the importance of academic work, students were asked, “How important is your academic work?” This variable was coded so that 0 = moderately or not at all important and 1 = very important. GPA was an open ended response and was coded to distinguish between below average students (0 = GPA under 3.0) and above average students (1 = GPA of 3.0 or higher). Based on these two measures, a four-category measure was constructed and coded 1-4 with higher numbers signifying greater strain. First, determined achievers were students who believed that their academic work was very important and had a GPA above 3.0, and hence these students reported little strain (coded 1). Second, apathetic achievers believed that their academic work was moderately important/not at all important, but had a GPA above 3.0 (coded 2). Third, apathetic underachievers believed that their academic work was moderately important/not at all important and had a GPA below 3.0 (coded 3). Fourth, determined underachievers believed their academic work was very important but had a GPA under a 3.0, which indicated that these undergraduates experienced a high level of academic strain (coded 4).

The third measure of academic strain was a scale created to measure *Academic Impediments*. The Academic Impediments scale (alpha = 0.79) included ten items regarding personal experiences during the past academic year. Respondents were asked, “Have the following negatively impacted your ability to get good grades this academic year...alcohol use; other drug use; physical health problems; mental health problems; criminal victimization; concern for a friend or family member; time spent on the internet (e.g. social networking); playing video games, including phone/tablet; involvement in extracurricular activities; your job; and relationship difficulties.” The response categories were based on a 5 point Likert scale that

ranged from strongly disagrees to strongly agree and all items were coded so that a higher score indicated more academic impediments.

In order to determine *major* students were asked the open ended question “What is your academic major?” In the analysis, this variable is dummy coded with 0 = non-STEM major and 1 = STEM major. The following majors are considered STEM majors for the purposes of this study: biological and biomedical sciences; chemistry; computer sciences; engineering; mathematics and statistics; and physics.

To determine *plans after graduation*, respondents were asked “Do you plan to continue your education after you graduate from this university?” In the analysis, this variable is coded 0 = no and 1 = yes. This measure divided respondents into two groups, one that wants to enter some form of graduate or professional school and another that wants to enter the workforce after graduation.

### *Social Norms*

The survey was constructed to measure various types of prescription stimulant misuse during the past academic year. For this section, we focus on three specific types of misuse: academic, other instrumental, and recreational (all were coded 0 = no use and 1 = use). The misuse of prescription stimulants for *academic reasons* was the same variable as in the academic strain section. A similar set of questions were used to measure prescription stimulant misuse for *other instrumental reasons*. Participants were asked, “During the past academic year did you use any prescription stimulants...to help with your job; to get through your day (e.g. help with household chores); to maintain or help lose weight?” If a participant responded yes to any of those three survey questions they were considered as having misused prescription stimulants for

other instrumental purposes. A similar measure was created for prescription stimulant misuse for *recreational reasons*. Specifically, respondents were asked “During the past academic year did you use any prescription stimulants... to get high; while drinking alcohol; while using prescription drugs; while using marijuana; while using other drugs?” If a participant responded yes to any of those five survey questions, they were considered as misusing prescription stimulants for recreational reasons. It should be noted that variations of these questions were used in the creation of the following social norms measures.

In this section, three measures related to social norms were included: acceptability, use among close friends, and use among college students in general. Separate measures were created to measure *acceptability* of prescription stimulant misuse for academic reasons, other instrumental reasons, and recreational reasons. For academic reasons respondents were asked, “Do you believe it is acceptable for students to use prescription stimulants that are not prescribed to help with academics?” Again similar questions were used to measure acceptability for other instrumental misuse as well as recreational misuse. All measures in this section are coded so that a higher score indicates greater acceptability of the given type of prescription stimulant misuse.

Three measures were also used to examine use among *close friends*. In looking at academic reasons respondents were asked, “How many of your close friends use prescription stimulants that are not prescribed for academics?” Again, similar questions were asked to determine how many of the respondents’ close friends engaged in prescription stimulant misuse for other instrumental purposes and for recreational purposes. All measures in this section were coded so that a higher score on this scale indicated that most of the participant’s friends misused prescription stimulants during the past academic year.

Finally, three items were used to measure perception of undergraduate prescription stimulant misuse among other college students for academic reasons, other instrumental reasons, and recreational reasons. In looking at academic misuse participants were asked, “What percentage of students do you think use prescription stimulants that are not prescribed for academics?” Similar questions were utilized to measure estimations of general student use for other instrumental purposes as well as recreational purposes. Possible responses were measured from 0%-100% in five point increments (1 = 0-10%, 2 = 10-25%, 3 = 25-50%, 4 = 50-75%, and 5 = 75-100%). A higher number on this scale indicates that participants perceived that a large percentage of undergraduates misused prescription stimulants during the past academic year.

### *Gender*

For this section, I utilized variables described earlier. More specifically, I included the variable for prescription stimulant misuse for academic purposes. Additionally, I also included: the academic strain measures, plans after graduation, major (STEM vs. non-STEM), as well as the social norms measures.

To measure *source of diversion* respondents were asked, “How have you generally gotten prescription stimulants...from close friends for free, from acquaintances for free, from family members for free, I take pills from people I know without asking, I buy pills from people I know, I buy pills from strangers, other, and/or I do not use prescription stimulants.” This variable was coded so that 0= obtained prescription stimulants from sources other than close friends for free and 1= obtained prescription stimulants from close friends for free. This coding was based on previous findings which have indicated that undergraduates most commonly obtain

prescription stimulants from their close friends for free (Bavarian et al., 2013; Garnier-Dykstra et al., 2012; Lord et al., 2009).

To measure *route of administration* respondents were asked “Which of the following routes of administration have you used for prescription stimulants...orally, snorting, smoking, injecting, or other. This variable was coded so that 0= used prescription stimulants via routes other than orally (smoking, snorting, injecting, other) and 1= used prescription stimulants orally. Like source of diversion, this coding was based upon previous findings, which have shown that the most common route of administration for prescription stimulant misuse is orally (Teter et al., 2006; White et al., 2006).

### Controls

Several controls, measured as dichotomous variables, were included in the analyses: gender (coded 0 = male and 1 = female), Greek affiliation (0 = no and 1 = yes), and race (0 = non-white and 1 = white). Age and GPA (coded 0 = GPA under 3.0 and 1 = GPA of 3.0 or higher) were also included as controls. Previous research has found that other forms of illicit drug use were significantly related to the PDM (Lord et al., 2009; McCabe et al., 2005; Teter et al., 2003); therefore, two measures of substance use (binge drinking and marijuana use) were also included as controls. Binge drinking was defined as four or more drinks in a row for females and five or more drinks in a row for males. A drink was defined as a glass of wine, a beer, or a shot of liquor straight or in a mixed drink. Both binge drinking and marijuana use were coded 0 = no and 1 = yes. A measure of stress was also included, respondents were asked, “During the past academic year, how would you rate your overall level of stress?” The response categories

included: no stress (coded 0), less than average stress (coded 1), about average stress (coded 2), more than average stress (coded 3), and tremendous stress (coded 4). Finally, a measure of psychological distress based on the K-10 was included. Respondents were asked, “In the past 4 weeks, about how often did you feel...tired for no good reason; nervous; so nervous that nothing could calm you down; hopeless; restless or fidgety; so restless you could not sit still; depressed; that everything was an effort; so sad that nothing could cheer you up; and worthless?” These ten survey questions were used to create a scale that measured overall psychological distress. All items used to create this scale had Likert-type responses that ranged from 0 (no psychological distress) to 4 (strong psychological distress). A higher score on this scale indicated that the respondent experienced greater psychological distress in the month prior to data collection.

### Analytic Strategy

#### *Academic Strain*

Several logistic regression models were estimated to test the hypotheses related to academic strain. To begin, a logistic regression model was estimated with all three measures of academic strain (academic stress, grade strain, and academic impediments) and the control variables. Next, to determine if the relationship between academic strain and prescription stimulant misuse for academic purposes varies based on plans after graduation two models were estimated. The first model included all three measures of academic strain and the controls only for undergraduates who did not plan on furthering their education post-graduation. The second model included all three measures of academic strain and the controls only for undergraduates who did plan on furthering their education after graduation. Lastly, to determine if the relationship between academic strain and prescription stimulant misuse for academic purposes



varies based on major (STEM vs. non-STEM) two models were estimated. The first model included all three measures of academic strain and the controls only for undergraduates who were non-STEM majors. The second model included academic strain measures and the control variables only for students who were STEM majors.

### *Social Norms*

The second question to be addressed by the current study examines the influence of social norms on the misuse of prescription stimulants for academic, other instrumental, and recreational purposes. To do this, separate sets of logistic regression models were estimated for each dependent variable. Model 1 examined prescription stimulant misuse for academic purposes and includes all three social norms measures (acceptability of college student use, friends' use, and student's use). Model 2 examined prescription stimulant misuse for other instrumental purposes and included all three social norms measures. Model 3 examined prescription stimulant misuse for recreational purposes and included all three social norms measures. The following control variables were included in each of the three models: gender, race, age, Greek affiliation, GPA, binge drinking, marijuana use, stress, and psychological distress.

### *Gender*

The final set of hypotheses examined gender differences in prescription stimulant misuse for academic purposes. In looking at correlates of prescription stimulant misuse for academic purposes, separate logistic regression models are estimated for males and females. Model 1 assesses for females only and includes the academic strain measures as well as the controls. For Model 2, we examined males only along with the academic strain measures and the control

variables. Next in determining if the relationship between social norms and prescription stimulant misuse for academic purposes varies by gender, two logistic regression models are estimated. Model 1 focuses on females only and includes the social norms measures as well as the control variables. Model 2 focuses on males only and includes the social norms measures as well as the control variables.

This section also focused on gender differences in source of diversion and route of administration. In order to test these hypotheses two, separate logistic regression models were estimated. The first logistic regression included source of diversion as the dependent variable along with gender and the control variables. The second logistic regression included route of administration as the dependent variable as well as gender and the control variables.

## CHAPTER 4: RESULTS

### Academic Strain

Table 1 shows the descriptive statistics for the academic strain measures. When it comes to the prevalence of prescription stimulant misuse during the past academic year, nearly 13% of the sample reported misusing prescription stimulants for academic purposes. In looking at the grade strain measure, most of the participants were determined and/or apathetic achievers ( $M=1.63$ ,  $SD=1.06$ ). Stated differently, the majority of the sample believed that their academic work was not important to very important and they had a GPA of 3.0 and higher. The mean level of academic stress was 23.6 with a standard deviation of 4.88. The mean level of strain regarding their personal experiences during the past academic year was 23.5, with a standard deviation of 6.99.

The sample is approximately 50% female, 58% white, and has an average age of nearly twenty years old. Additionally, 9% of the sample was Greek affiliated. During the previous academic year, approximately 47% of the sample reported binge drinking. Approximately 48% of the participants were STEM majors and 70% planned to continue their education. On average undergraduates studied twelve hours per week during the past academic year.

Table 1 Descriptive Analysis of Academic Strain Measures (N=924)

	<b>Range</b>	<b>Mean</b>	<b>S.D.</b>
Misuse of Rx Stimulants For Academic Purposes	0, 1	0.13	0.33
Academic Strain			
Academic Stress	9- 39	23.6	4.88
Grade Strain	1- 4	1.63	1.06
Academic Impediments	11- 46	23.5	6.99
Controls			
Gender (female)	0, 1	0.50	0.50
Race (White)	0, 1	0.58	0.49
Age	18-25	19.7	1.49
Greek Affiliation	0, 1	0.09	0.29
GPA	0, 1	0.81	0.40
Binge Drinking	0, 1	0.47	0.50
Plans after Graduation	0, 1	0.70	0.46
Major	0, 1	0.48	0.49
Hours Spent Studying	0 – 100	12.1	11.3

Table 2 shows the results for the logistic regression models that analyzed the impact of academic strain on the misuse of prescription stimulants for academic purposes. When it comes to the academic strain measures, Model 1, the measures of grade strain (*O.R.* =1.26) and academic impediments (*O.R.* =1.06) significantly impacted undergraduates misuse of prescription stimulants for academic purposes. Stated differently, the likelihood of misusing prescription stimulants for academic purposes increased for students who reported having experienced grade strain during the past academic year and for students who had experienced other academic impediments during the past academic year.

Model 2a sought to determine the influence of academic strain on the misuse of prescription stimulants for academic purposes among undergraduates who did not plan to further

their education after graduation; whereas, Model 2b looked at the influence of academic strain on prescription stimulant misuse for academic purposes among undergraduates who did plan to continue their education post-graduation. In considering the academic strain measures (academic stress, grade strain, and academic impediments) for undergraduates who do not intend on going to graduate school, the relationship to prescription stimulant misuse for academic reasons was not significant. Model 2b indicated that experiencing academic impediments (O.R. =1.06) during the previous academic year was significantly correlated to academic prescription stimulant misuse for undergraduates planning on furthering their education post-graduation. In other words, undergraduates who plan on going to graduate school were at an increased likelihood of misusing prescription stimulants academically if they reported having experienced academic impediments during the previous academic year.

Model 3a analyzed the influence of academic strain on the misuse of prescription stimulants academically for undergraduates who were non-STEM majors; whereas, Model 3b looked at the impact of academic strain on prescription stimulant misuse academically for undergraduates who were STEM majors. The academic strain measures demonstrated no direct effect on prescription stimulant misuse for academic purposes for non-STEM majors. In regards to the academic strain measures, the variable of academic impediments (O.R. = 1.08), was significantly correlated to misusing prescription stimulants for academic purposes among undergraduates who were STEM majors. Undergraduate STEM majors who reported having experienced academic impediments during the past academic year were at an increased likelihood of misusing prescription stimulants for academic purposes.

Table 2. Logistical Regression (with Odds Ratios) for Academic Strain Measures

	Model 1	Model 2a	Model 2b	Model 3a	Model 3b
<b>Academic Strain Measures</b>					
Academic Stress	0.99	0.97	1.00	1.01	0.96
Grade Strain	1.26*	1.23	1.26	1.25	1.30
Academic Impediments	1.06**	1.06	1.06**	1.05	1.08**
<b>Controls</b>					
Female	0.80	1.01	0.71	0.68	0.80
White	1.18	1.22	1.17	1.09	1.19
Age	1.06	0.91	1.15	1.12	0.97
Greek	2.68**	1.44	3.25***	1.86	4.99**
Binge Drinking	3.59***	4.91**	3.30***	3.99***	3.02**
Plans to Continue Education	1.03	-----	-----	1.02	1.04
Major	0.98	1.03	1.03	-----	-----
Hours Spent Studying	1.02*	1.04	1.01	1.01	1.03

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

### Social Norms

Table 3 displays the descriptive analyses for the social norms measures. In looking at the prevalence of prescription stimulant misuse for intentions other than academic purposes, 4% reported misusing for other instrumental purposes and approximately 6% of the sample reported misusing for recreational purposes. When it comes to beliefs about the acceptability of undergraduates misusing prescription stimulants for academic purposes, students were more likely to disagree or remain neutral on their beliefs of acceptability to help with schoolwork ( $M=2.41$ ,  $SD=1.27$ ). When asked if they believed that misusing prescription stimulants for other instrumental purposes was acceptable behavior among undergraduates, the majority of respondents disagreed ( $M=5.89$ ,  $SD=2.82$ ). In comparison, when asked if participants believed that the misuse of prescription stimulants for recreational purposes was acceptable behavior among undergraduates, the majority of students strongly disagreed ( $M=7.45$ ,  $SD=3.82$ ).

When participants were asked about their friends prescription stimulant misuse for academic, other instrumental, and recreational purposes, most participants claimed that either none of their friends engaged in said behaviors or that a few of them did (to help with schoolwork  $M=1.58$ ,  $SD=0.64$ ; for other instrumental purposes  $M=3.64$ ,  $SD= 1.09$ ; for recreational purposes  $M=6.13$ ,  $SD=1.99$ ). Respondents were then asked about the percentage of students that they believed engaged in prescription stimulant misuse for all three intentions. Participants believed that 10-50% of undergraduates misuse prescription stimulants to help with their academics; 10-25% misused for other instrumental purposes; and 10-25% misused for recreational reasons. In regards to the control variables used in the social norms models.

Roughly, 33% of undergraduates reported having used marijuana. Most students claimed to have experienced about average to more than average stress over the past academic year ( $M=3.50$ ,  $SD=0.89$ ). Students also reported moderate levels of psychological distress during the course of the past academic year ( $M=20.0$ ,  $SD=8.16$ ).



Table 3. Descriptive Analysis of Social Norms Measures (N=924)

	Range	Mean	S.D.
Misuse of Rx Stimulants	0, 1		
For Academic Purposes		0.13	0.33
For Other Instrumental Purposes		0.04	0.19
For Recreational Purposes		0.06	0.24
Belief in Acceptance of College Student Use			
For Academic Purposes	1-5	2.41	1.27
For Other Instrumental Purposes	3-15	5.89	2.82
For Recreational Purposes	5-25	7.45	3.82
Peers Rx Stimulant Use			
For Academic Purposes	1-4	1.58	0.64
For Other Instrumental Purposes	3-12	3.64	1.09
For Recreational Purposes	5-20	6.13	1.99
Belief in Prevalence of College Student Use			
For Academic Purposes	1-5	2.75	0.87
For Other Instrumental Purposes	3-15	6.16	2.37
For Recreational Purposes	5-25	10.9	4.49
Controls			
Gender (female)	0, 1	0.50	0.50
Race (White)	0, 1	0.58	0.49
Age	18-25	19.7	1.49
Greek Affiliation	0, 1	0.09	0.29
GPA	0, 1	0.81	0.40
Binge Drinking	0, 1	0.47	0.50
Marijuana Use	0, 1	0.33	0.47
Stress	0-4	3.50	0.89
Psychological Distress	10-50	19.9	8.16

Table 4 shows the findings for the logistic regression models that examined the influence of social norms on the misuse of prescription stimulants for academics (Model 1), other instrumental purposes (Model 2), and for recreational purposes (Model 3). In Model 1, the social

norms measures of viewing prescription stimulant misuse for academic purposes as an acceptable college behavior (O.R. = 1.87) and having friends who misuse prescription stimulants for academic purposes (O.R. = 3.48) significantly impacted undergraduates misuse of prescription stimulants for academic purposes. Regarding the social norms measures the likelihood of misusing prescription stimulants for academic reasons was increased for undergraduates who had accepting attitudes towards academic misuse and for undergraduates who had peers who misused stimulants for academic purposes. For Model 2, like Model 1, the social norms measures of viewing prescription stimulant misuse for other instrumental purposes as an acceptable behavior among undergraduates (O.R. =1.17) and having peers who misused prescription stimulants for other instrumental purposes (O.R. 1.41) demonstrated a direct effect on prescription stimulant misuse for other instrumental purposes among undergraduates. For Model 3 the social norms measures of viewing prescription stimulant misuse for recreational purposes as an acceptable behavior (O.R. = 1.11) and having friends who misuse prescription stimulants for recreational purposes (O.R. = 1.19) significantly impacted the misuse of prescription stimulants for recreational reasons among undergraduate students. In other words, the risk of misusing prescription stimulants for recreational reasons was increased for undergraduates who had accepting attitudes towards recreational misuse and who had peers who misused stimulants to get high.

Table 4. Logistical Regression (with Odds Ratios) for Social Norms Measures

	Academic Misuse	Instrumental Misuse	Recreational Misuse
<b>Social Norms Measures</b>			
Acceptability	1.87***	1.17*	1.11**
Peer Use	3.48***	1.41*	1.19*
Student Use	1.35	1.11	1.00
<b>Controls</b>			
Female	0.70	0.66	0.50
White	1.12	1.37	1.88
Age	1.20*	1.17	1.04
Greek	1.72	0.53	1.07
GPA	0.75	1.13	0.84
Binge Drinking	0.90	1.04	4.29*
Marijuana Use	4.77***	2.83*	9.95***
Stress	1.21	0.99	0.99
Psychological Distress	0.99	1.09**	1.02

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

### Gender

Table 5 shows the descriptive analyses for the gender measures. In looking at source of diversion for participants who engaged in prescription stimulant misuse, 32% of undergraduates obtained their prescription stimulants from close friends for free. Approximately 84% of the undergraduates who misused prescription stimulants during the past academic year did so orally, rather than smoking, snorting, injecting, and/ or using other routes of administration.

Table 5. Descriptive Analysis of Gender Measures (N=924)

	Range	Mean (F/M)	S.D. (F/M)
Misuse of Rx Stimulants For Academic Purposes	0, 1	0.13 (0.11/0.14)	0.33 (0.32/0.34)
<b>Academic Strain</b>			
Academic Stress	9- 39	23.6 (24.0/23.2)	4.88 (4.89/4.86)
Grade Strain	1- 4	1.63 (1.47/1.79)	1.06 (0.97/1.12)
Academic Impediments	11- 46	23.5 (24.0/23.0)	6.99 (6.90/7.04)
Major	0, 1	0.48 (0.20/0.56)	0.49 (0.40/0.50)
Plans after Graduation	0, 1	0.70 (0.74/0.66)	0.46 (0.44/0.47)
Hours Spent Studying	0 - 100	12.1 (12.1/12.2)	11.3 (10.9/11.7)
<b>Social Norms Measures</b>			
Belief in Acceptance of Academic Use	1-5	2.41 (2.32/2.49)	1.27 (1.26/1.27)
Peers Use for Academic Purposes	1-5	1.58 (1.59/1.57)	0.64 (0.65/0.62)
Prevalence of Academic Student Use	1-5	2.75 (2.89/2.61)	0.87 (0.90/0.82)
<b>Source of Diversion</b>			
Close Friends for Free	0, 1	0.32 (0.41/0.24)	0.47 (0.50/0.43)
<b>Route of Administration</b>			
Orally	0, 1	0.84 (0.89/0.80)	0.37 (0.32/0.41)
<b>Controls</b>			
Gender (female)	0, 1	0.50 (N/A)	0.50 (N/A)
Race (White)	0, 1	0.58 (0.54/0.62)	0.49 (0.50/0.49)
Age	18-25	19.7 (19.6/19.8)	1.49 (1.49/1.46)
Greek Affiliation	0, 1	0.09 (0.12/0.07)	0.29 (0.32/0.26)
GPA	0, 1	0.81 (0.85/0.76)	0.40 (0.35/0.43)
Binge Drinking	0, 1	0.47 (0.46/0.48)	0.50 (0.50/0.50)
Marijuana Use	0, 1	0.33 (0.30/0.37)	0.47 (0.46/0.48)
Stress	0-4	3.50 (3.68/3.32)	0.89 (0.80/0.94)
Psychological Distress	10-50	19.9 (21.3/18.6)	8.16 (8.37/7.67)

\*The means and standard deviations for females and males are listed separately in parentheses in the order of females followed by males.

Table 6 shows the findings of the regression models that sought to determine if the relationship between academic strain and prescription stimulant misuse for academic purposes varied by gender. Model 1, the females only model, showed that having experienced academic impediments (O.R. = 1.07), being Greek affiliated (O.R. = 2.25), and having binge drank (O.R. = 4.20) significantly impacted the misuse of prescription stimulants for academic purposes among female undergraduates. In Model 2, with male students, the following variables were significantly correlated to prescription stimulant misuse among undergraduates: grade strain (O.R. = 1.36), academic impediments (O.R. = 1.05), Greek affiliation (O.R. = 3.08), and having binge drank (O.R. = 3.14). Overall, both female and male undergraduates are at an increased risk of misusing prescription stimulants for academic purposes if they experienced academic impediments, were Greek affiliated, and if they reported having binge drank during the past academic year. The only gender difference was the finding that males, unlike their female counterparts, were also at an increased risk of misusing stimulants academically if they had experienced grade strain during the course of the past academic year.

Table 6. Logistical Regression (with Odds Ratios) for Gendered Differences in Academic Strain Measures and Academic Prescription Stimulant Misuse

	Model 1(Females)	Model 2 (Males)
<b>Academic Strain Measures</b>		
Academic Stress	0.95	1.03
Grade Strain	1.11	1.36*
Academic Impediments	1.07*	1.05*
<b>Controls</b>		
White	1.37	1.03
Age	1.08	1.06
Greek	2.25*	3.08*
Binge Drinking	4.20**	3.14**
Plans to Continue Education	0.93	1.09
Major	1.50	0.76
Hours Spent Studying	1.01	1.02

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 7 depicts the findings for the logistic regression model that sought to determine if the relationship between social norms and prescription stimulant misuse for academic purposes varied by gender. Model 1, the females only model, showed that having accepting attitudes towards prescription stimulant misuse for academic purposes (O.R. = 2.37), having peers who misuse stimulants for academic purposes (O.R. = 4.74), and smoking marijuana (O.R. = 5.56) were significantly correlated to prescription stimulant misuse for academic purposes for female undergraduates. Model 2, the males only model, is also significant in predicting prescription stimulant misuse among male undergraduates. Similar to female undergraduates, having accepting attitudes towards prescription stimulant misuse for academic purposes (O.R. = 1.64), having peers who misuse stimulants for academic purposes (O.R. = 2.95), and having smoked

marijuana (O.R. = 5.13) were significantly correlated to prescription stimulant misuse for academic purposes for male undergraduates.

Table 7. Logistical Regression (with Odds Ratios) for Gendered Differences in Social Norms Measures and Prescription Stimulant Misuse for Academic Purposes

	Model 1 (Females)	Model 2 (Males)
<b>Social Norms Measures</b>		
Acceptability	2.37***	1.64**
Peer Use	4.74***	2.95**
Student Use	1.13	1.46
<b>Controls</b>		
Female	-----	-----
White	1.87	0.80
Age	1.24	1.25
Greek	1.80	1.63
Binge Drinking	0.77	0.88
Marijuana Use	5.56**	5.13***
Stress	1.40	1.08
Psychological Distress	0.97	1.01

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 8 shows the results for the logistic regression model that sought to determine if gender differences exist in source of diversion. The overall model was significant in predicting gender differences in source of diversion. More specifically, being a female (O.R. = 4.07) and having experienced stress during the past academic year (O.R. = 0.43) were significantly correlated to source of diversion. Stated differently, female undergraduates were four times more likely to obtain prescription stimulants from their friends from free in comparison to their male

counterparts. Furthermore, undergraduates who experienced low levels of stress during the past academic year were at a decreased likelihood of obtaining prescription stimulants from their close friends for free.

Table 8. Logistical Regression (with Odds Ratios) for Source of Diversion and Gender

	Model 1
Controls	
Female	4.07**
White	1.24
Age	0.94
Greek	2.79
Binge Drinking	0.62
Stress	0.43**
Psychological Distress	0.94

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 9 exhibits the results for the logistic regression model that investigated gender differences in route of administration. The overall model was significant. The risk of misusing prescription stimulants orally was decreased for younger undergraduates (O.R. = 0.66) and for undergraduates who reported that they experienced low levels of psychological distress during the past academic year (O.R. = 0.93).



Table 9. Logistical Regression (with Odds Ratios) for Route of Administration and Gender

Model 1	
Controls	
Female	3.18
White	1.46
Age	0.66*
Greek	3.76
Binge Drinking	0.28
Stress	0.62
Psychological Distress	0.93*

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

## CHAPTER 5: DISCUSSION

In summary, the present study identified correlates of prescription stimulant misuse for academic purposes, other instrumental purposes, and recreational purposes among undergraduate students. Specifically, the current research sought to determine the impact of academic strain, social norms, and gender on various types of prescription stimulant misuse. This research was crucial as prescription stimulant misuse among college students continues to rise (Johnston et al., 2014) as do emergency department visits for prescription stimulant related issues (SAMSHA, Center for Behavioral Health Statistics and Quality, 2013). Although undergraduates tend to perceive that prescription stimulant misuse is harmless, the negative health consequences associated with this type of PDM cannot be ignored. Considering these current trends it is essential for us to continue addressing this health concern empirically.

The present study filled several voids in the literature. First of all, this study sought to better understand how various types of academic strain, plans after graduation, and college major (STEM vs. non-STEM) impacted the misuse of prescription stimulants among undergraduate students. Although previous literature indicated that undergraduates are misusing stimulants to meet academic demands, this is the first study that has assessed for various types of academic strain. Additionally, I am unaware of any studies that have analyzed the relationship between prescription stimulant misuse and plans to continue one's education or college major (STEM vs. non-STEM). This research is important as existing literature has shown that individuals who experience high levels of stress are at an increased likelihood of misusing prescription stimulants (Ford & Schroeder, 2009; Zullig & Divin, 2012). Furthermore, college based educational and

prevention programs may seek to incorporate these findings into their current initiatives in an attempt to reduce the misuse of prescription stimulants for academic purposes among college students.

Secondly, this study adds to the existing body of literature on prescription stimulant misuse and social norms as thus far, very few studies have specifically examined the relationship between social norms and the misuse of prescription stimulants. Even fewer studies have focused on various types of prescription stimulant misuse. This research is important as other scholars have found that risk-related behaviors, especially among undergraduates, are largely affected by social norms (Borsari & Carey, 2003). This information is beneficial to social marketing campaigns, which may need to broaden their focus to include marketing tools that focus on this specific type of substance misuse in an effort to decrease overall consumption rates among undergraduates.

Thirdly, this research adds to the existing literature on prescription stimulant misuse. More specifically, I am unaware of any studies that have explored gender differences in academic strain and social norms as they related to prescription stimulant misuse for academic purposes. Furthermore, I am also unaware of studies that have examined gender differences in route of administration and source of diversion. This research is important for a variety of reasons. It is necessary for scholars to determine how academic strain impacts prescription stimulant misuse differently for men and women, in hopes that health and wellness services may cater their services to these differences thereby minimizing the academic stressors experienced by both. Additionally, and seeing as though source of diversion has been significantly correlated

to frequency of PDM as well as dependency and abuse, this information can also benefit substance abuse prevention programs (Ford & Lacerenza, 2011).

## Findings

### *Academic Strain*

The results showed support for the variables associated with academic strain including: grade strain and academic impediments. Stated differently, students who reported having experienced grade strain and students who reported having experienced more academic impediments during the previous academic year were at an increased likelihood of having misused prescription stimulants for academic purposes during that same time period. These findings add to the existing literature on prescription stimulant misuse as it relates to academic demands. Previous studies have shown that undergraduates misuse prescription stimulants to meet academic demands, especially during periods of high academic stress, such as during finals week (DeSantis et al., 2008; Garnier-Dykstra et al., 2012). These findings are consistent in that undergraduates, in this sample, were at an increased likelihood of misusing prescription stimulants for academic purposes if they experienced academic strain during the previous academic year. Like previous studies, undergraduates are treating prescription stimulants as study aids with the belief that they help them to overcome the various impediments that they face in their daily lives. This too impacts grade strain, as the existing research has indicated that undergraduates who misuse prescription stimulants are more likely to have had a significantly

lower GPA than undergraduates who do not misuse prescription stimulants (Arria et al., 2008; Garnier-Dykstra et al., 2012; Stock et al., 2013).

The relationship between academic strain and prescription stimulant misuse for academic purposes did vary based on plans to continue one's education. More specifically, undergraduates who intended on continuing their education were at an increased likelihood of misusing prescription stimulants for academic reasons if they reported having experienced academic impediments during the past academic year in comparison to undergraduates who were not intending on continuing their education. This adds to the existing literature as it is the first study that has analyzed how plans to continue one's education impacts the relationship between prescription stimulant misuse for academic reasons and academic strain. This is important as college-based educational programs may seek to offer undergraduates who plan on continuing their education more resources in an effort to help them develop better coping mechanisms when faced with academic impediments; thereby, reducing prescription stimulant misuse among undergraduates who plan on going to graduate school.

Similar to the variation that existed among those planning to continue their education and those who did not, variation was also present in the relationship between academic strain and prescription stimulant misuse based on college major (STEM vs. non-STEM). More specifically, STEM majors were at an increased likelihood of misusing prescription stimulants academically if they experienced academic impediments during the past academic year in comparison to non-STEM majors. This is also the first study that has assessed how one's declared major (STEM vs. non-STEM) impacts the relationship between prescription stimulant misuse for academic purposes and academic strain. Academic impediments may be more

important among STEM majors, in comparison to non-STEM majors, as existing literature has shown that STEM majors are under greater academic strain than are non-STEM majors (NESSIE, 2011). Furthermore, this is also congruent with literature that has exhibited a positive correlation between prescription stimulant misuse and stress (Ford & Schroeder, 2009; Zullig & Divin, 2012).

### *Social Norms*

The results also showed support for the social norms measures including acceptability and peer use for all three types of prescription stimulant misuse (academic, other instrumental, and recreational). This adds to the existing literature as previous studies have yet to examine whether or not social norms actually influence prescription stimulant misuse among undergraduate students. The current study found that respondents who had accepting attitudes towards the misuse of prescription stimulants for academic purposes, other instrumental purposes, and recreational purposes were more likely to report prescription stimulant misuse for similar purposes during the past academic year. Acceptability is important as this type of injunctive norm denotes what behaviors are expected and/or required in a given situation (DeBono, Shmueli, & Muraven, 2011). If students perceive that it is acceptable and/or the norm to misuse prescription stimulants during college and they want to comply with said norms to increase/ maintain their popularity, they are more likely to misuse prescription stimulants as well.

In addition, this study found that having peers who misused prescription stimulants (academically, instrumentally, or recreationally) also increased the likelihood that the respondent reported having also misused prescription stimulants for like reasons over the course of the past academic year. Peer use is important as this descriptive norm tends to be highly influential on undergraduate behaviors surrounding substance misuse (Lewis et al., 2007). More specifically, undergraduates typically overestimate the amount of illicit substances being consumed by their peers, which leads to them engage higher rates of substance misuse as a mechanism of “keeping up” with the norm so to speak (McCabe, 2008; Saunders et al., 2014). This finding is consistent with existing literature that has found that close friends have a greater impact on personal behaviors than do distal reference groups, such as the general study body (Borsari and Carey, 2003; Prince and Carey, 2010). This would also explain why general student use was not significant in predicting prescription stimulant misuse among undergraduates.

### *Gender*

The relationship between academic strain and prescription stimulant misuse for academic purposes did vary based on gender. More specifically, male undergraduates were at an increased likelihood of misusing prescription stimulants academically if they had experienced grade strain during the past academic year in comparison to their female counterparts. It is important to contemplate why males would turn to prescription stimulant misuse in the face of grade strain, but females do not. It is possible that females engage in fewer deviant behaviors than their male counterparts, therefore making them less likely to opt for a deviant coping mechanism when experiencing academic strain (Broidy and Agnew, 1997).

It is important to discuss why the relationship between the social norms and prescription stimulant misuse for academic purposes and gender did not significantly vary. It is highly probable that males and females alike are exposed to similar social norms regarding this type of PDM and therefore both hold the belief that this is normative behavior among college students. Taking that into consideration it is not illogical to think that both females and males would find prescription stimulant use to be an acceptable behavior of undergraduates. Additionally considering the importance of normative influence during the transitional period between high school and college, both females and males are likely to conform to the perceived social norms surrounding prescription stimulant misuse in an effort to better fit in their new social environment (Arnett, 2005; Mattern & Neighbors, 2004). Existing research has shown that compliance to social norms is beneficial to individuals as it allows them to experience a greater sense of social connectedness (Lakin & Chartrand, 2003). Seeing as though, this is the first study that has assessed for gender differences in social norms and prescription stimulant misuse more research is needed to determine if males and females hold similar misperceptions regarding the social norms that surround prescription stimulant misuse.

The results also indicated gender differences in source of diversion. Female undergraduates were four times more likely than male undergraduates to have obtained prescription stimulants from their friends for free as opposed to buying them or taking them from others. Existing literature has shown that undergraduates typically obtain prescription stimulants via their close friends and/or acquaintances that have prescriptions for the medication, but have shown no gender differences in source of diversion (Bavarian et al., 2013; Lord et al., 2009). In a related study, however, Hall and colleagues (2005) looked at factors that predicted prescription



stimulant misuse and found that men's misuse was predicted by knowing how to get the stimulants; whereas, women's misuse was predicted by being offered stimulants. Additionally, studies that have looked at illicit drug use in general have found that young women are offered illicit drugs more commonly than are young men (Measham, 2000). It is possible that females are less deviant than males and hence are less likely to seek out, purchase, and/or obtain prescription stimulants from casual acquaintances or strangers. This finding adds to that existing literature on prescription stimulant misuse as it is the first study that had specifically looked at the relationship between source of diversion and gender. With that being said, these findings warrant future study in an attempt to more fully understand this relationship.

When it comes to route of administration, the findings indicated that there were no significant gender differences. This finding is consistent with previous studies, which have shown that the most preferred route of administration among undergraduates is orally, rather than intra-nasally or through injection (Teter et al., 2006; White et al., 2006). It appears as though both female undergraduates as well as male undergraduates primarily misused prescription stimulants via oral consumption. This is the first study that had sought to analyze the relationship between gender and route of administration; therefore, more research is needed.

### *Control Variables*

In considering the impact of the control variables on prescription stimulant misuse for all three intentions, it is necessary to briefly discuss the consistent positive correlation that existed between binge drinking and marijuana use and prescription stimulant misuse for academic purposes, other instrumental purposes, and recreational purposes. More specifically,

undergraduates were roughly three to five times more likely to have misused prescription stimulants for academic purposes if they reported having binge drank during the past academic year. This finding was significant regardless of if the respondent intended on continuing their education or not and regardless of the respondent's declared major (STEM vs. non-STEM). When it comes to the logistic regression models on the social norms measures and the various types of prescription stimulant misuse (Table 4), marijuana use was significantly correlated to all three types of prescription stimulant misuse. Stated differently, undergraduates were at an increased likelihood of misusing prescription stimulants for academic purposes, other instrumental purposes, and recreational purposes if they reported having used marijuana during the previous academic year. These findings are consistent with a plethora of existing literature that has found that undergraduates who binge drink and use other illicit drugs are at an increased likelihood of misusing prescription stimulants (Lord et al., 2009; McCabe et al., 2005; Teter et al., 2003).

An additional consistent finding that warrants discussion is the positive correlation that existed between Greek affiliation and prescription stimulant misuse for academic purposes. The results indicate that undergraduates who are Greek affiliated were roughly three times more likely to have misused prescription stimulants for academic purposes than are their non-Greek affiliated counterparts. This finding is consistent with existing research that has shown individuals who are Greek affiliated are more likely to perceive prescription stimulant misuse as the norm than are nonmembers and hence are more likely to engage in this type of PDM (Dussault and Weyandt, 2011).

## **CHAPTER 6: LIMITATIONS, IMPLICATIONS, AND FUTURE DIRECTIONS**

### Limitations

One of the limitations of the present study was that responses were based on self-report, which may call into question the validity of the data. Seeing as though data was collected in large group settings individuals may have underreported and/or over reported on several important questions due to fear of repercussions and/ or forgetfulness, as the study asked questions regarding the previous academic year. One method of assessing validity is comparison. For example, in examining the existing literature one may compare prevalence of misuse at other institutions that had collected self-reported data. Seeing as though, there was consistency in the results of this study compared to other self-report studies, validity appears to have been acquired from this population of undergraduates surrounding the misuse of prescription stimulants (Garnier-Dykstra et al., 2012; Low & Gendaszek, 2002). Additionally, numerous studies have found that self-report surveys are a legitimate way of assessing alcohol and drug use (Del Boca and Darkes, 2003; Harrell, 1997).

A second limitation of this study was the fact that the sample was drawn from a single university and therefore is not generalizable to all college students or at the national level, as existing research has shown that prevalence rates of prescription stimulant misuse varies across different U.S. universities and colleges. For example, McCabe and colleagues (2005) found that prevalence rates tend to be much higher at Northeast colleges and colleges with more competitive admission standards. This brings up issues related to reliability. Although, the

sample characteristics regarding prescription stimulant misuse did not vary substantially in comparison to national studies that have focused on this specific type of PDM among undergraduate students caution should be taken when implementing these findings into practical application (Johnston et al., 2014; McCabe et al., 2005).

A final limitation of the current study was the use of cross-sectional data to investigate various correlates of prescription stimulant misuse among undergraduate students for academic, other instrumental and recreational purposes. Although, the present research allowed us to determine and inspect significant correlations between the two, one cannot make statements of causation based on these findings. This can be problematic when it comes to making sound recommendations for policy and prevention programs. In considering the indirect relationship between prescription stimulant misuse, academic strain, and plans to continue education one cannot say with absolute conviction that plans to attend graduate school led to academic strain and that this academic strain in return led to prescription stimulant misuse for academic purposes. As is, one can only state that correlation exists between these concepts, not causation.

### Implications

The present study has numerous implications for university and college based education and prevention programs. The results of the academic strain measures, more specifically, the findings that undergraduates are at an increased likelihood of misuse if they experienced grade strain and/or academic impediments during the previous academic year needs to be seriously taken into account, especially among health and wellness services. Programs should focus their efforts on educating students on appropriate and safe coping mechanisms to help alleviate some

of the primary academic stressors typical among college undergraduates. Additional attention should be given to handling stress associated with personal experiences, such as poly-drug use, mental and physical health problems, time management, and familial and romantic relationship issues, as the findings showed that both female and male undergraduates were at an increased likelihood of misusing prescription stimulants for academic purposes if they had experienced such academic impediments. These programs should also consider providing additional resources to undergraduates who plan on continuing their education and for undergraduates who are declared STEM majors as the present study has indicated that these students are at an increased risk of misusing prescription stimulants in comparison to students who plan on entering the workplace and students who are non-STEM majors.

In considering the practical application of the social norms findings, several colleges and universities have utilized social norms campaigns as a means of educating their student bodies on the misperceptions surrounding alcohol and marijuana use. It is also common to use social norms feedback in intervention strategies geared towards undergraduate students. To date these campaigns have shown to be successful in reducing alcohol and marijuana consumption among college students at various institutions across the United States (Haines and Spear, 1996; Mattern and Neighbors, 2004; Perkins and Craig, 2006). Despite the success of the social norms campaigns and the rise in PDM among college students, to date these marketing tools have focused solely on alcohol and marijuana; thereby excluding prescription drug misuse altogether (Haines and Spear, 1996; Mattern & Neighbors, 2004). This research indicates that university and college based education and prevention programs surrounding the misuse of prescription stimulants should be put into place that inform undergraduates of the actual norms regarding this

type of PDM. Similar to the misperceptions regarding alcohol and marijuana use on college campuses, initial studies on the norms surrounding prescription stimulant misuse among college students seem to also be incorrect. McCabe (2008) noted that over 70% of undergraduates sampled overestimated the prevalence of prescription stimulant misuse. Although an actual rate of prescription stimulant misuse among undergraduates was roughly 6%, students estimated that 15-20% of the study body was misusing prescription stimulants (McCabe, 2008).

It seems as though these misperceptions are not limited to norms surrounding academic prescription stimulant misuse, but also include misperceptions regarding recreational prescription stimulant misuse (Saunders et al., 2014). With that being said, it is also necessary that these social norms campaigns address various types of prescription stimulant misuse. As was evident in the present study, for all three types of prescription stimulant misuse (academic, other instrumental, and recreational) undergraduates were at an increased likelihood of misusing if they had accepting attitudes towards that specific type of misuse and if they had peers who engaged in said misuse. By working to correct the misperceptions that prescription stimulant misuse is a normative behavior among undergraduates and that “everyone is doing it” mentality, it is predicted that universities and colleges will see an overall decrease in the prevalence of prescription stimulant misuse amongst their college students.

Finally, gender differences in prescription stimulant misuse need not be over looked in terms of policy and prevention initiatives. The finding that males, unlike their female counterparts, are at an increased likelihood of misusing prescription stimulants academically if they experienced grade strain deserves further attention. College based educational programs, as well as health and wellness programs, may need to offer different resources to undergraduate

students based on not only their gender, but also on their declared major (STEM vs. non-STEM) in an attempt to reduce the academic stress levels of the student body.

Furthermore, attention also needs to be given to the significant gender differences that existed for source of diversion. Existing literature has found source of diversion to be significantly correlated to frequency of PDM, abuse, and dependence (Ford and Lacerenza, 2011). These findings have dangerous implications; therefore, substance abuse prevention programs need to seriously consider including these results in their initiatives. It may also be beneficial for social norms campaigns to incorporate these findings into their marketing techniques as a means to further reduce prescription stimulant misuse among female and male undergraduates.

### Future Directions

Continued research on prescription stimulant misuse is crucial, especially considering that this type of PDM has been increased sharply among college students over the past several years (Johnston et al., 2014). When it comes to the findings on the relationship between academic strain and prescription stimulant misuse for academic purposes, a more in-depth examination is needed. Future studies may seek to explore this relationship qualitatively in focus groups or via in-depth interviews. In doing so, they could also seek to better comprehend the gender differences that existed for this type of prescription stimulant misuse among undergraduates. Additionally, scholars may seek to conduct longitudinal research in an effort to understand more completely the root causes of academic strain among undergraduates and how

these individual cope with said strain. In doing so, education programs, as well as health and wellness programs, may appropriately focus their attention on better preparing students for academic stressors that are common in college, while also educating them on appropriate and safe coping mechanisms to deal with said stressors.

Another avenue for future research, is to focus more heavily on the relationship between academic strain, prescription stimulant misuse for academic purposes, and plans to continue one's education. As mentioned previously, this is one of the first studies to assess the impact of plans to continue one's education as it relates to prescription stimulant misuse for academic purposes and academic strain; therefore, additional research is needed. This research is important as it too can benefit college based educational programs by providing them the knowledge that such differences exist within the student body therefore allowing them to provide students on the path to graduate school additional resources to reduce experienced strain as well as to ease them in their transition into graduate school.

Like plans to continue one's education, the relationship between academic strain, prescription stimulant misuse for academic purposes, and major (STEM vs. non-STEM) also warrants future exploration. This was the first study to assess this relationship, as existing studies have primarily only focused on health and medical majors; therefore, much research is needed. Once again, college based education programs could benefit from this information, by incorporating these findings into practice. STEM majors may need more assistance in succeeding academically, than non-STEM majors, as existing literature has shown that STEM majors tend to be under higher levels of academic strain than non-STEM majors (NESSIE, 2011).



Other avenues for future studies may include research that replicates the present study in various geographical locations and at various educational institutions, which could act as a means of comparison to the current research. This could also add to the existing literature on the differences that exist between institutions and rates of prescription stimulant misuse among undergraduate students. Additionally, it is through repetition that we as scholars increase the depth of data surrounding prescription stimulant misuse, while also allowing the results to become more reliably sound and representative of various educational institutions and student bodies.

Finally, future studies may benefit from focusing on gender differences in source of diversion. Seeing as though this was the first study to examine gender differences in source of diversion more exploration is needed. In other words, why is that females in the present study were much more likely than males to obtain prescription stimulants from their close friends for free? As mentioned previously, existing literature has found source of diversion to be significantly correlated to frequency of PDM, abuse, and dependence (Ford and Lacerenza, 2011). Therefore, it is important to better understand the relationship between gender and source of diversion. This information would be beneficial not only for college-based educational and prevention programs, but could also be a key component in social norms campaigns surrounding prescription stimulant misuse among undergraduates.

## **APPENDIX A: IRB APPROVAL LETTER**



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

### Approval of Exempt Human Research

From: **UCF Institutional Review Board #1  
FWA00000351, IRB00001138**

To: **Jason Ford and Co-PI: Lauren B. Norman**

Date: **April 08, 2014**

Dear Researcher:

On 04/07/2014, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination  
Project Title: College students and prescription stimulants  
Investigator: Jason Ford  
IRB Number: SBE-14-10203  
Funding Agency:  
Grant Title:  
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

A handwritten signature in black ink that reads 'Kanielle Chay' followed by a horizontal line.

IRB Coordinator

## **APPENDIX B: SURVEY INSTRUMENT**

**Instructions**

- You must be 18 years of age or older to participate in this study.
- Do not write your name on this questionnaire, your responses are anonymous.
- Please circle or write in the appropriate response (you may use a pen or pencil).
- Your participation is voluntary; do not answer any questions that make you feel uncomfortable.

1. What is your current age? \_\_\_\_\_
2. Are you? Female Male
3. Which of these racial/ethnic groups best describes you?
- White
  - Black
  - Hispanic
  - Asian
  - Bi- or Multi-racial
  - Other
4. What is your current year in school?
- Freshman
  - Sophomore
  - Junior
  - Senior
5. Did you receive an AA degree from another school? No Yes
6. What is your enrollment status?
- Part-time
  - Full-Time
7. Are you a member of a **social** fraternity or sorority? No Yes
8. If yes, Is your Greek social organization under the Interfraternity Council or the PanHellenic Council? No Yes
9. Is your Greek social organization under the Diversified Greek Council or the National Pan-Hellenic Council? No Yes
10. Have you ever been diagnosed with ADD or ADHD by a medical professional? No Yes
11. What is your relationship status?
- Not in a relationship
  - In a relationship **but** not living together
  - In a relationship **and** living together
12. What is your current grade point average? \_\_\_\_\_
13. What is your current academic major? \_\_\_\_\_
14. Please list any declared minors or certificates? \_\_\_\_\_
15. How many total credit hours did you take this past academic year, both Fall 2013 and Spring 2014? \_\_\_\_\_
16. How many hours per week do you generally work for pay? \_\_\_\_\_
17. How many hours per week do you typically study? \_\_\_\_\_
18. Do you want plan to continue your education after you graduate from UCF? No Yes
19. If yes, what type of program do you want to attend (e.g., medical, law, business, graduate, etc.)? \_\_\_\_\_

<b>How important are the following...</b>	<b>Not Important</b>	<b>Somewhat Important</b>	<b>Important</b>	<b>Very Important</b>
20...your academic work?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21...to be on the Dean's List?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22...to graduate with honors (cum laude)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23...to be involved in student clubs or organizations?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24...to be involved in volunteer work or community service?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25...to spend time with friends?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26...to get straight A's in order to get into graduate or professional school?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**This next set of questions asks about your academic experiences during this past academic year (Fall 2013 and Spring 2014)?**

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
27. Your courses were easy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. You enjoyed your courses?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. You were satisfied with your academic performance?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. You felt pressure from family members to get better grades?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. You felt pressure from peers to get better grades?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. You had enough time to meet your academic obligations?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. You struggled to meet your own academic standards?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<b>Have the following negatively impacted your ability to get good grades this academic year...</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
34...alcohol use?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35...other drug use?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36...physical health problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37...mental health problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38...criminal victimization?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39...concern for a friend or family member?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have the following negatively impacted your ability to get good grades this academic year...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
40...time spent of the internet (e.g., social networking)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41...playing video games, including phone/tablet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42...involvement in extracurricular activities?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43...your job?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44...relationship difficulties?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next few questions ask about the use of prescription stimulants (e.g., Adderall, Dexedrine, Concerta, Ritalin, Focalin, or Vyvanse). We are interested in the use of prescription stimulants that were not prescribed to you or used solely for the feeling or experience caused by the drug, during this past academic year (Fall 2013 and Spring 2014).

During the past academic year on how many days did you use any prescription stimulants...	never	1 or 2 days	Once a month or less	2 or 3 days a month	1 or 2 days a week	3 to 5 days a week	6 to 7 days a week
45...to help with academics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46...to help with your job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47...to get through your day (e.g., household chores)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48...to maintain or help lose weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49...to get high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50...while drinking alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51...while using prescription drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52...while using marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53...while using other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. How have you generally gotten prescription stimulants (mark all that apply)?	<input type="radio"/> From close friends for free <input type="radio"/> From acquaintances for free <input type="radio"/> From family members for free <input type="radio"/> I take pills from people I know without asking <input type="radio"/> I buy pills from people I know <input type="radio"/> I buy pills from strangers <input type="radio"/> Other <input type="radio"/> Do not use prescription stimulants						
55. Which of the following routes of administration have you used for prescription stimulants (mark all that apply)?	<input type="radio"/> Orally <input type="radio"/> Snorting <input type="radio"/> Smoking <input type="radio"/> Injecting <input type="radio"/> Other <input type="radio"/> Do not use prescription stimulants						

<b>Do you believe it is acceptable for students to use prescription stimulants that are not prescribed...</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
56...to help with academics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57...to help with your job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58...to get through your day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59...to maintain or help lose weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60...to get high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
61...while drinking alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
62...while using other prescription drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
63...while using marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
64...while using other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>How many of your close friends use prescription stimulants that are not prescribed...</b>	<b>None</b>	<b>A Few</b>	<b>Most</b>	<b>All</b>	
65...to help with academics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
66...to help with your job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
67...to get through your day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
68...to maintain or help lose weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
69...to get high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
70...while drinking alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
71...while using other prescription drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
72...while using marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
73...while using other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>What percentage of students do you think use prescription stimulants that are not prescribed...</b>	<b>0-10%</b>	<b>10-25%</b>	<b>25-50%</b>	<b>50-75%</b>	<b>75-100%</b>
74...to help with academics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
75...to help with your job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
76...to get through your day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
77...to maintain or help lose weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
78...to get high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
79...while drinking alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
80...while using other prescription drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
81...while using marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
82...while using other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



83. Which of the following reasons have you given (to yourself or to others) to explain your use of prescription stimulants, that were not prescribed, during the past academic year? (check all that apply)

- It's better than using illegal street drugs (i.e. crack, heroin, cocaine, etc.)
- To promote positive outcomes (i.e. to get better grades, to focus, to stay alert)
- To get high and/or party
- To lose weight/ suppress appetite
- Experimentation
- It's not addictive
- It does not impair cognitive functioning or motor skills
- There are no harmful side effects to using (i.e. poor health, brain damage, death, crime)
- Its government approved and regulated
- In moderation (i.e. during periods of academic stress such as finals week)
- None of the above are appropriate reasons

**The next few questions deal with the use of alcohol or other drugs. We are interested in use during this past academic year, the Fall 2013 and Spring 2014 semesters. We define "binge drinking" as 4 or more drinks in a row for females and 5 or more drinks in a row for males. A "drink" is a glass of wine, a can/bottle of beer, or a shot of liquor straight or in a mixed drink.**

During the past academic year on how many days did you...	Never	1 or 2 days	Once a month or less	2 or 3 days a month	1 or 2 days a week	3 to 5 days a week	6 to 7 days a week
84...binge drink?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
85...use marijuana?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**The next questions deal with the misuse of prescription drugs. We are interested in the use of prescription drugs that were not prescribed to you or that you used solely for the feeling or experience caused by the drug, during this past academic year (Fall 2013 and Spring 2014).**

During the past academic year on how many days did you...	never	1 or 2 days	Once a month or less	2 or 3 days a month	1 or 2 days a week	3 to 5 days a week	6 to 7 days a week
86...use any prescription pain pills (e.g., Darvocet, Percocet, Vicodin, OxyContin, or Hydrocodone)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
87...use any prescription benzodiazepines (e.g., Xanax, Valium, Klonopin, Librium, or Ativan)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

88. During this past academic year (Fall 2013-Spring 2014), how would you rate your overall level of stress?
- No stress
  - Less Than Average Stress
  - About Average Stress
  - More Than Average Stress
  - Tremendous Stress

89. How would you describe your body weight right now?
- Very Underweight
  - Slightly Underweight
  - About the Right Weight
  - Slightly Overweight
  - Very overweight

90. In the last 30 days, which of the following have you done to lose weight (mark all that apply)?
- Exercise
  - Diet
  - Skip Meals
  - Vomit
  - Take Laxatives
  - Over-the-counter supplements
  - I have done nothing to lose weight

In the past 4 weeks, about how often did you feel...	None of the Time	A little of the Time	Some of the Time	Most of the Time	All of the Time
91...tired out for no good reason?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92...nervous?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93...so nervous that nothing could calm you down?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94...hopeless?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95...restless or fidgety?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
96...so restless you could not sit still?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97...depressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98...that everything was an effort?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99...so sad that nothing could cheer you up?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100...worthless?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**The final set of questions consists of a few statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.**

	Strongly Agree	Agree	Disagree	Strongly Disagree
101. On the whole, I am satisfied with myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102. At times I think I am no good at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
103. I feel I have a number of good qualities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
104. I am able to do things as well as most other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105. I feel I do not have much to be proud of.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
106. I certainly feel useless at times.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
107. I feel that I'm a person of worth, at least on an equal plane with others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
108. I wish I could have more respect for myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
109. All in all, I'm inclined to feel that I am failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
110. I take a positive attitude toward myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Thank You for Your Time.**

## REFERENCES

- Advokat, C. D., Guidry, D., & Martino, L. (2008). Licit and illicit use of medications for attention-deficit hyperactive disorder in undergraduate college students. *Journal of American College Health, 56*, 601-606.
- Advokat, C., Lane, S. M., & Luo, C. (2011). College students with and without ADHD: comparison of self-report of medication usage, study habits, and academic achievement. *Journal of Attention Disorders, 15*(8), 656-666.
- Arria, A., Caldeira, K., Vincent, K., O'Grady, K. & Wish, E. (2008). Perceived harmfulness predicts non-medical use of prescription drugs among college students: Interactions with sensation seeking. *Prevention Science, 9*, 191-201.
- Arria, A. M., Caldeira, K. M., O'Grady, K. E., Vincent, K. B., Johnson, E. P., & Wish, E. D. (2008a). Nonmedical use of prescription stimulants among college students: Associations with attention-deficit-hyperactivity disorder and polydrug Use. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 28*(2), 156-169.
- Arria, A. M., Garnier-Dykstra, L. M., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., & Wish, E. D. (2011). Persistent nonmedical use of prescription stimulants among college students: possible association with ADHD symptoms. *Journal of attention disorders, 15*(5), 347-356.
- Arnett, J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480.
- (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues, 35*, 235-254.
- Babcock, Q. & Byrne, T. (2000). Student perceptions of methylphenidate abuse at a public liberal arts college. *Journal of American College Health, 49*, 143-5.
- Baer, J. S., & Carney, M. M. (1993). Biases in the perceptions of the consequences of alcohol use among college students. *Journal of Studies on Alcohol and Drugs, 54*(1), 54.
- Baker, S.R. (2004). Intrinsic, extrinsic, and amotivational orientations: their role in university adjustment, stress, well-being, and subsequent academic performance. *Current Psychology, 23*, 189-202.

- Bavarian, N., Flay, B. R., Ketcham, P. L., & Smit, E. (2013). Illicit use of prescription stimulants in a college student sample: a theory-guided analysis. *Drug and alcohol dependence*, 132(3), 665-673.
- Blanco, C., Okuda, M., Wright, C., Hasin, D.S., Grant, B.F., Liu, S.M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: results from the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of General Psychiatry*, 65, 1429–37.
- Blanco, C., Alderson, D., Ogburn, E., Grant, B.F., Nunes, E.V., Hatzenbuehler, M.L., & Hasin, D.S. (2007). Changes in the prevalence of non-medical prescription drug use and drug use disorders in the United States: 1991-1992 and 2001-2002. *Drug and Alcohol Dependence*, 90(2-3), 252-60.
- Borsari, B. & Carey, K.B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration.” *Journal of Studies on Alcohol*, 64(3), 331–341.
- Bossaer, J. B., Gray, J. A., Miller, S. E., Enck, G., Gaddipati, V. C., & Enck, R. E. (2013). The use and misuse of prescription stimulants as "cognitive enhancers" by students at one academic health sciences center. *Academic Medicine*, 88(7), 967-971.
- Bot, S.M., Engels, R.C., Knibbe, R.A., & Meeus, W.H.J. (2005). Friends’ drinking behavior and adolescent alcohol consumption: The moderation role of friendship characteristics. *Addictive Behaviors*, 30, 929-947.
- Broidy, L. & Agnew, R. (1997). Gender and crime: A general strain theory perspective. *Journal of Research in Crime and Delinquency*, 34, 275–306.
- Brougham, R. R., Zail, C. M., Mendoza, C. M., & Miller, J. R. (2009). Stress, sex differences, and coping strategies among college students. *Current Psychology*, 28(2), 85-97.
- Carey, K.B., Borsari, B., Carey, M.P., & Maisto, S.A. (2006). Patterns and importance of self-other differences in college drinking norms. *Psychology of Addictive Behaviors*, 20, 385-393.
- Center for Behavioral Health Statistics and Quality. (2011). *Results from the 2010 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Substance Abuse and Mental Health Services Administration. Retrieved from <http://www.samhsa.gov/data/nsduh/2k10NSDUH/tabs/Cover.pdf>
- Center for Behavioral Health Statistics and Quality. (2013). Drug Abuse Warning Network Methodology Report, 2011 Update. Rockville, MD: Substance Abuse and Mental Health Services Administration.

- Chronicle of Higher Education. (2012). The role of higher education in career development: Employer perceptions. Retrieved from: <https://chronicle.com/items/biz/pdf/Employers%20Survey.pdf>
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the roles of norms in human behavior. *Advances in Experimental Social Psychology*, 24, 201–234.
- Connell, R. (1987). *Gender and Power: Society, the Person and Sexual Politics*. Cambridge: Polity.
- Cottrell, R. (1992). *Stress Management*. Guilford, CT: The Dushkin Publishing Group, Inc.
- Crespi, T. D., & Becker, J. T. (1999). Mental health interventions for college students: Facing the family treatment crisis. *Family Therapy*, 26(3), 141–147.
- Cutler, K.A. (2014). Prescription stimulants are “okay”: Applying neutralization theory to college students’ nonmedical prescription stimulant use. *Journal of American College Health*, DOI: 10.1080/07448481.2014.929578.
- DeBono, A., Shmueli, D., & Muraven, M. (2011). Rude and inappropriate: The role of self-control in following social norms. *Personality and Social Psychology Bulletin*, 37(1), 136-146.
- Del Boca, F.K., & Darkes, J. (2003). The validity of self-reports of alcohol consumption: State of the science and challenges for research. *Addiction*, 98, 1-12.
- DeSantis, A.D. & Hane, A.C. (2010). “Adderall is definitely not a drug”: Justifications for the illegal use of ADHD stimulants. *Substance Use and Misuse*, 45, 31-46.
- DeSantis, A.D., Noar, S.M., & Webb, E.M. (2009). Nonmedical ADHD stimulant use in fraternities. *Journal of Studies on Alcohol and Drugs*, 70(6), 952-954.
- DeSantis, A.D., Webb, E.M., & Noar, S.M. (2008). Illicit use of prescription ADHD medications on a college campus: a multi-methodological approach. *Journal of American College Health*, 57, 315–24.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal Social Psychology*, 51, 629–636.
- De Visser, R.O. & Smith, J.A. (2007). Young men’s ambivalence toward alcohol. *Social Science and Medicine*, 64, 350–362.

- Dickhauser O., & Meyer, U. (2006). Gender differences in young children's math ability attributions. *Psychological Science*, 48, 3-16.
- Dussault, C. L., & Weyandt, L. L. (2011). An examination of prescription stimulant misuse and psychological variables among sorority and fraternity college populations. *Journal of attention disorders*, 1087054711428740.
- Eisenberg, D., Gollust, S.E., Golberstein, E., & Hefner J.L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77, 534-42.
- Eriksen, S. (1999). Alcohol as a gender symbol: Women and the alcohol question in turn-of-the century Denmark. *Scandinavian Journal of History*, 24, 45-73.
- Fabiano, P. (2003). Applying the social norms model to universal and indicated alcohol interventions at Western Washington University. In Perkins, W. H., *The social norms approach to preventing school and college age substance abuse: A handbook for educators, counselors, and clinicians* (pp. 83-100). San Fransico, CA: Jossey-Bass.
- Flynn, H. A. (2000). Comparison of cross-sectional and daily reports in studying the relationship between depression and use of alcohol in response to stress in college students. *Alcoholism: Clinical and Experimental Research*, 24, 48-52. doi:10.1111/j.1530-0277.2000.tb04552.x
- Ford, J. (2009) Non-medical prescription drug use among adolescents: The influence of bonds to family and school. *Youth & Society*, 40, 336-352.
- Ford, J. & Arrastia, M. (2008). Pill-poppers and dopers: A comparison of non-medical prescription drug use and other illicit/street drug use among college students. *Addictive Behaviors*, 33, 934-941.
- Ford, J. & Lacerenza, C. (2011). The relationship between source of diversion and prescription drug misuse, abuse, and dependence. *Substance Use and Misuse*, 46, 819-828.
- Ford, J. & Rivera, F. (2008). Non-medical prescription drug use among Hispanics. *Journal of Drug Issues*, 38, 285-310.
- Ford, J.A. & Schroeder, R. (2009). Academic strain and non-medical use of prescription stimulants among college students. *Deviant Behavior*, 38, 26-53.
- Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory. *Psychology of Women Quarterly*, 21(2), 173-206.

- Garnier, L. M., Arria, A. M., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., & Wish, E. D. (2010). Sharing and selling of prescription medications in a college student sample. *The Journal of clinical psychiatry*, *71*(3), 262.
- Garnier-Dykstra, L. M., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., & Arria, A. M. (2012). Nonmedical use of prescription stimulants during college: Four-year trends in exposure opportunity, use, motives, and sources. *Journal of American College Health*, *60*(3), 226-234.
- Giddens, A. (1976). *New Rules of Sociological Method: A Positivist Critique of Interpretive Sociologies*. London: Hutchison.
- Gliksman, L., Newton-Taylor, B., Adlaf, E., & Giesbrecht, N. (1997). Alcohol and other drug use by Ontario university students: The roles of gender, age, year of study, academic grades, place of residence and programme of study [1]. *Drugs: Education, Prevention, and Policy*, *4*(2), 117-129.
- Greenfield, S.F., Back, S.E., Lawson, K., & Brady, K.T. (2010). Substance abuse in women. *The Psychiatric Clinics of North America*, *33*(2), 339-355.
- Griffin, C. (2008). *Branded Consumption and Social Identification: Young People and Alcohol*. London: ESRC.
- Grucza, R.A., Norberg, K., Bucholz, K.K., & Bierut, L.J. (2008). Correspondence between secular changes in alcohol dependence and age of drinking onset among women in the United States. *Alcohol Clinical Experimental Research*, *32*(8), 1493-501.
- Haines, M. & Spear, S. F. (1996). Changing the perception of the norm: A strategy to decrease heavy-episodic drinking among college students. *Journal of American College Health*, *45*, 134-140.
- Hall, K.M., Irwin, M.M., Bowman, K.A., Frankenberger, W., & Jewett, D.C. (2005). Illicit use of prescribed stimulant medication among college students. *Journal of American College Health*, *53*, 167-74.
- Hanson, C. L., Burton, S. H., Giraud-Carrier, C., West, J. H., Barnes, M. D., & Hansen, B. (2013). Tweaking and tweeting: exploring Twitter for nonmedical use of a psychostimulant drug (Adderall) among college students. *Journal of Medical Internet Research*, *15*(4).
- Harrell, A.V. (1997). The validity of self-reported drug use data: The accuracy of responses on confidential self-administered answer sheets." Pp. 37-58 in *The Validity of Self Reported*

- Drug Use: Improving the Accuracy of Survey Estimates*, edited by Lana D. Harrison and Arthur Hughes. Rockville, MD: NIDA Research Monogram Series, US Department of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse.
- Harrell, Z. & Broman, C. (2009). Racial/ethnic differences in correlates of prescription misuse among young adults. *Drug and Alcohol Dependence*, *104*, 268-271.
- Hart Research Associates. (2013). *It takes more than a major: Employer priorities for college learning and student success*. Washington, DC: Association of American Colleges and Universities and Hart Research Associates.
- Habibzadeh, A., Alizadeh, M., Malek, A., Maghbooli, L., Shoja, M. M., & Ghabili, K. (2011). Illicit methylphenidate use among Iranian medical students: prevalence and knowledge. *Drug Design, Development, and Therapy*, *5*, 71.
- Henderson, S. (1997). *Ecstasy: Case Unsolved*. London: Pandora.
- Hernandez, S. & Nelson, L. (2010). Prescription drug abuse: Insight into the epidemic. *Clinical Pharmacology & Therapeutics*, *88*, 307-317.
- Higher Education Research Institute. (2007). *Survey of the American freshman: Special tabulations*. Los Angeles: Higher Education Research Institute.
- Huang, B., Dawson, D. A., Stinson, F. S., Hasin, D. S., Ruan, W. J., Sasha, T. D., ... Grant, B. F. (2006). Prevalence, correlates, and comorbidity of nonmedical prescription drug use and drug use disorders in the United States: Results of the national epidemiological survey on alcohol and related conditions. *Journal of Clinical Psychiatry*, *67*, 1062-1073.
- Iwamoto, D. K., Cheng, A., Lee, C. S., Takamatsu, S., & Gordon, D. (2011). "Man-ing" up and getting drunk: The role of masculine norms, alcohol intoxication and alcohol-related problems among college men. *Addictive behaviors*, *36*(9), 906-911.
- Johnston, L. & O'Malley, P. (1986). Why do the nation's students use drugs and alcohol? Self-reported reasons from nine national surveys. *Journal of Drug Issues*, *16*, 29-66.
- Johnston, L., O'Malley, P., Bachman, J., & Schulenberg, J. (2011). *Monitoring the Future National Results on Adolescent Drug Use: Overview of Key Findings, 2010*. Institute for Social Research: Ann Arbor, MI.
- Johnston, L., O'Malley, P., Bachman, J., & Schulenberg, J. (2012). *Monitoring the Future national survey results on drug use, 1975-2011: Volume II, College students and adults ages 19-50*. Ann Arbor: Institute for Social Research, The University of Michigan.



- Johnston, L., O'Malley, P., Bachman, J., Schulenberg, J., & Miech, R.A. (2014). *Monitoring the Future national survey results on drug use, 1975-2013: Volume I, secondary school students*. Ann Arbor: Institute for Social Research, The University of Michigan.
- Kassel, J. D., Jackson, S. I., & Unrod, M. (2000). Generalized expectancies for negative mood regulation and problem drinking among college students. *Journal of Studies on Alcohol*, *61*, 332–340.
- Kilbourne, J. (1999). *Deadly Persuasion: Why Women and Girls Must Fight the Addictive Power of Advertising*. New York: Free.
- Kisch, J., Leino, E.V., & Silverman, M.M. (2005) Aspects of suicidal behavior, depression, and treatment in college students: results from the spring 2000 National College Health Assessment Survey. *Suicide Life Threatening Behavior*, *35*, 3–13.
- Krienert, J.L. (2003). Masculinity and crime: A quantitative exploration of Messerschmidt's hypothesis. *Electronic Journal of Sociology*. ISSN: 1198 3655.
- Lakhan, S. E., & Kirchgessner, A. (2012). Prescription stimulants in individuals with and without attention deficit hyperactivity disorder: misuse, cognitive impact, and adverse effects. *Brain and behavior*, *2*(5), 661-677.
- Lakin, J. L., & Chartrand, T. L. (2003). Using nonconscious behavioral mimicry to create affiliation and rapport. *Psychological Science*, *14*, 334–339.
- Lewis, M.A., Neighbors, C., Oster-Aaland, L., Kirkbey, B.S., & Larimer, M.E. (2007). Indicated prevention for incoming freshman: personalized normative feedback and high risk drinking." *Addictive Behaviors*, *32*(11), 2495-2508.
- Litt, D.M., Lewis, M.A., Stahlbrandt, H., Firth, P., & Neighbors, C. 2012. Social comparison as a moderator of the association between perceived norms and alcohol use and negative consequences among college students." *Journal of Studies on Alcohol and Drugs*, *73*(6), 961-967.
- Lookatch, S.J., Moore, T.M., & Katz, E.C. (2014). Effects of gender and motivations on perceptions of nonmedical use of prescription stimulants. *Journal of American College Health*, *62*(4), 255-262.
- Lord, S., Downs, G., Furtaw, P., Chaudhuri, A., Silverstein, A., Gammaitoni, A., & Budman, S. (2009). "Nonmedical use of prescription opioids and stimulants among student pharmacists." *Journal of the American Pharmacists Association*, *49*(4), 519-U73.

- Low, K. G. & Gendaszek, A. E. (2002). Illicit use of psycho-stimulants among college students: A preliminary study. *Psychology, Health, and Medicine*, 7, 283-287.
- Lowery, S. E., Kurpius, S. E. R., Befort, C., Blanks, E. H., Sollenberger, S., Nicpon, M. F., & Huser, L. (2005). Body image, self-esteem, and health-related behaviors among male and female first year college students. *Journal of College Student Development*, 46(6), 612-623.
- MacKinnon, D. (2008). *Introduction to statistical mediation analysis*. New York: Lawrence Erlbaum.
- Massello, W. & Carpenter, D. A. (1999). A fatality due to the intranasal abuse of methylphenidate (Ritalin). *Journal of Forensic Sciences*, 44, 220-221.
- Mattern, J. L., & Neighbors, C. (2004). Social norms campaigns: Examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of Studies of Alcohol and Drugs*, 65, 489-493.
- McCabe, S. E. (2008). Misperceptions of non-medical prescription drug use: A web survey of college students. *Addictive Behaviors*, 33, 713-724.
- McCabe, S.E., & Boyd, C.J. (2005). Sources of prescription drugs for illicit use.” *Addictive Behaviors*, 30, 1342-1350.
- McCabe, S. E., Knight, J. R., Teter, C. J., & Wechsler, H. (2005). Non-medical use of prescription stimulants among US college students: prevalence and correlates from a national survey. *Addiction*, 100, 96-106.
- McCabe, S. E., Teter, C. J., & Boyd, C. J. (2006). Medical use, illicit use and diversion of prescription stimulant medication. *Journal of Psychoactive Drugs*, 38, 43-56.
- McCabe, S., Teter, C. & Boyd, C.J. (2006a). Medical use, illicit use, and diversion of abusable prescription drugs. *Journal of American College Health*, 54, 269-278.
- McCabe, S., Morales, M., Cranford, J., Delva, J., McPherson, M. & Boyd, C. (2007) race/ethnicity and gender differences in drug use and abuse among college students. *Journal of Ethnicity in Substance Abuse*, 6, 75-79.
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale development and validation. *Psychology of Women Quarterly*, 20(2), 181-215.
- McNiel, A. D., Muzzin, K. B., DeWald, J. P., McCann, A. L., Schneiderman, E. D., Scofield, J., & Campbell, P. R. (2011). The nonmedical use of prescription stimulants among dental and dental hygiene students. *Journal of Dental Education*, 75(3), 365-376.

- Measham, F., Aldridge, J. & Parker, H. (2001). *Dancing on Drugs: Risk, Health, and Hedonism in the British Club Scene*. London: Free Association Books.
- Measham, F. (2000). Locating leisure: feminist, historical, and socio-cultural perspectives on young people's leisure. substance use and social diversions in 1990's British pubs and clubs, unpublished Ph.D. thesis, University of Manchester.
- (2002). Doing gender - doing drugs: Conceptualizing the gendering of drugs cultures. *Contemporary Drug Problems*, 29, 335-373.
- Messerschmidt, J.W. (1993). *Masculinities and Crime: Critique and Re-conceptualization of Theory*. Lanham: Rowman and Littlefield.
- (1995) From patriarchy to gender: feminist theory, criminology and the challenge of diversity, in Nicole Hahn Rafter and Frances Heidensohn (eds.) *International Feminist Perspectives in Criminology: Engendering a Discipline*, pp. 167–88. Philadelphia: Open University Press.
- (2000). *Nine Lives: Adolescent Masculinities, the Body, and Violence*. Boulder, CO: Westview Press.
- Misra, R., & McKean, M. (2000). College student's academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, 16(1), 41-51.
- Moore, D. R., Burgard, D. A., Larson, R. G., & Ferm, M. (2014). Psychostimulant use among college students during periods of high and low stress: an interdisciplinary approach utilizing both self-report and unobtrusive chemical sample data. *Addictive behaviors*, 39(5), 987-993.
- National Institute on Drug Abuse. (2009). *DrugFacts: Stimulant ADHD medications—Methylphenidate and amphetamines*. Retrieved from <http://www.drugabuse.gov/publications/drugfacts/stimulant-adhd-medications-methylphenidate-amphetamines>
- National Survey of Student Engagement. (2011). *Fostering student engagement campus wide—annual results 2011*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- Neighbors, C., Geisner, I. M., & Lee, C. M. (2008). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors*, 22, 433–438.

- Neighbors, C., Lee, C.M., Lewis, M.A., Fossos, N. and Larimer, M.E.. (2007). Are social norms the best predictor of outcomes among heavy drinking college students? *Journal of Studies on Alcohol and Drugs*, 68(4), 556–565.
- Newcomb, M. D., & Bentler, P. M. (1987). Changes in drug use from high school to young adulthood: Effects of living arrangement and current life pursuit. *Journal of Applied Developmental Psychology*, 8, 221–246.
- Newlon, C. (2013, September 19). College STEM majors opting out for other degrees. *USA Today*, pp.1-4.
- O’Hare, T., & Sherrer, M. V. (2000). Co-occurring stress and substance abuse in college first offenders. *Journal of Human Behavior in the Social Environment*, 3, 29–44.  
doi:10.1300/J137v03n01\_02
- Pape, H. (2012). Young people’s overestimation of peer substance use: An exaggerated phenomenon? *Addiction*, 107(5), 878-884.
- Parker, H., Aldridge, J. & Measham, F. (1998). *Illegal Leisure: The Normalization of Adolescent Recreational Drug Use*. London: Routledge.
- Peralta, R.L. & Steele, J.L. (2010). Nonmedical prescription drug use among US college students at a Midwest University: A partial test of social learning theory. *Substance Use and Misuse*, 45, 865-887.
- Peralta, R. L., Steele, J. L., Nofziger, S., & Rickles, M. (2010). The impact of gender on binge drinking behavior among US college students attending a Midwestern university: An analysis of two gender measures. *Feminist Criminology*, 5(4), 355-379.
- Perkins, H.W., & Craig, D.W. (2006). A successful social norms campaign to reduce alcohol misuse among college student-athletes. *Journal of Studies on Alcohol*, 67(6), 880-889.
- Pierceall, E. A., & Keim, M. C. (2007). Stress and coping strategies among community college students. *Community College Journal of Research and Practice*, 31(9), 703-712.
- Planty, M., Hussar, W., Snyder, T., Kena, G., Kewal-Ramani, A., Kemp, J., ... Dinkes, R.K. (2009). *Condition of Education 2009 (NCES 2009-081)*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Poulin, C. (2007). From attention-deficit/ hyperactivity disorder to medical stimulant use to the diversion of prescribed stimulants to non-medical stimulant use: Connecting the dots. *Addiction*, 102, 740-751.

- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, 64, 243–256.
- Prince, M.A., & Carey, K.B. (2010). The malleability of injunctive norms among college students. *Addictive Behaviors*, 35, 940-947.
- Pronin, E., Steele, C. M., & Ross, L. (2003). Identity bifurcation in response to stereotype threat: Women and mathematics. *Journal of Experimental Psychology*, 40, 152-168.
- Pryor, J. H., Hurtado, S., DeAngelo, L., Palucki Blake, L., & Tran, S. (2011). The American Freshman: National Norms for Fall 2010. Los Angeles, CA: Higher Education Research Institute at UCLA.
- Quintero, G., Peterson, J., & Young, B. (2006). An exploratory study of socio-cultural factors contributing to prescription drug misuse among college students. *Journal of Drug Issue*, 36, 903-931.
- Rabiner, D. L., Anastopoulos, A. D., Costello, E. J., Hoyle, R. H., McCabe, S. E., & Swartzwelder, H. S. (2009). Motives and perceived consequences of nonmedical ADHD medication use by college students are students treating themselves for attention problems?. *Journal of Attention Disorders*, 13(3), 259-270.
- Rice, K.G., Leever, B.A., Christopher, J., & Porter, J.D. (2006). Perfectionism, stress, and social (dis)connection: a short-term study of hopelessness, depression, and academic adjustment among honors students. *Journal of Counseling Psychology*, 53, 524–34.
- Roisman, G. I., Masten, A. S., Coatsworth, J. D., & Tellegran, A. (2004). Salient and emerging developmental tasks in the transition to adulthood. *Child Development*, 75, 123–133.
- Ross, S. E., Neibling, B. C., & Heckert, T. M. (1999). Sources of stress among college students. *College Student Journal*, 33(22), 312–317.
- Saucerman, J., & Vasquez, K. (2014). Psychological Barriers to STEM Participation for Women Over the Course of Development. *Adultspan Journal*, 13(1), 46-64.
- Sanders, A., Stogner, J., Seibert, J., & Miller, B. L. (2014). Misperceptions of peer pill-popping: The prevalence, correlates, and effects of inaccurate assumptions about peer pharmaceutical misuse. *Substance Use and Misuse*, 49, 813-823.
- Sax, L. J. (2003). Our incoming students: What are they like? *About Campus*, 8(3), 15–20 (Retrieved from <http://www.eric.ed.gov/ERICWebPortal>).

- Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol, 14*, 54-70.
- Sheehan, M. & Ridge, D. (2001). "You become really close . . . you talk about the silly things you did, and we laugh": the role of binge drinking in female secondary students' lives. *Substance Use and Misuse, 36* (3), 347-372.
- Sheldon, P. (2010). Pressure to be perfect: Influences on college students' body esteem. *Southern Communication Journal, 75*(3), 277-298.
- Sherman, S. J., Presson, C. C., Chassin, L., Corty, E., & Olshavsky, R. (1983). The false consensus effect in estimates of smoking prevalence underlying mechanisms. *Personality and Social Psychology Bulletin, 9*(2), 197-207.
- Silverman, M.M., Meyer, P.M., Sloane, F., Rafflel, M., & Pratt, D.M. (1997). The Big Ten Student Suicide Study: a 10-year study of suicides on mid-western university campuses. *Suicide Life Threat Behavior, 27*, 285-303.
- Simoni-Wastila, L., Ritter, G., & Strickler, G. (2004). Gender and other factors associated with the nonmedical use of abusable prescription drugs. *Substance Abuse and Misuse, 39*(1), 1-23.
- Stepakoff, S. (1998). Effects of sexual victimization on suicidal ideation and behavior in U.S. college women. *Suicide Life Threat Behavior, 28*, 107-26.
- Stinebrickner, T. R., & Stinebrickner, R. (2011). *Math or science? Using longitudinal expectations data to examine the process of choosing a college major* (No. w16869). National Bureau of Economic Research.
- Stock, M. L., Litt, D. M., Arlt, V., Peterson, L. M., & Sommerville, J. (2013). The prototype/willingness model, academic versus health-risk information, and risk cognitions associated with nonmedical prescription stimulant use among college students. *British Journal of Health Psychology, 18*(3), 490-507.
- Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (2008). Nonmedical stimulant use, other drug use, delinquent behaviors, and depression among adolescents. *The NSDUH Report*. At: [www.oas.samhsa.gov/2k8/stimulants/depression.htm](http://www.oas.samhsa.gov/2k8/stimulants/depression.htm). Accessed: January 31, 2014.
- Substance Abuse and Mental Health Services Administration. (2010). *Results from the 2009 National Survey on Drug Use and Health: Volume I. Summary of National Findings* (Office of Applied Studies, NSDUH Series H-38A, HHS Publication No. SMA 10-4856 Findings) Rockville, MD.

- Substance Abuse and Mental Health Services Administration (2010a). *The DAWN Report: Highlights of the 2009 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits*. Center for Behavioral Health Statistics and Quality: Rockville, MD.
- Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (2013). *The Dawn Report: Emergency Department Visits Involving Attention Deficit/ Hyperactivity Disorder Stimulant Medications*, Rockville, MD.
- Sussman, S., Pentz, M. A., Spruijt-Metz, D., & Miller, T. (2006). Misuses of “study drugs”: Prevalence, consequences, and implications for policy”. *Substance Abuse Treatment, Prevention, and Policy*, 1, 1-7.
- Swierkosz, N. Body image perception of undergraduate females as it relates to disordered eating and psychological conditions. Undergraduate honors thesis. Ohio State University. 2010.
- Sykes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review*, 664-670.
- Teter, C. J., McCabe, S. E., Cranford, J. A., Boyd, C. J., & Guthrie, S.K. (2003). Illicit methylphenidate use in an undergraduate student sample: Prevalence and risk factors. *Pharmacotherapy*, 23, 609-617.
- Teter, C. J., McCabe, S. E., Cranford, J. A., Boyd, C. J., & Guthrie, S. K. (2005). Prevalence and motives for illicit use of prescription stimulants in an undergraduate student sample. *Journal of American College Health*, 53(6), 253-262.
- Teter, C. J., McCabe, S. E., LaGrange, K., Cranford, J. A., & Boyd, C. J. (2006). Illicit use of specific prescription stimulants among college students: prevalence, motives, and routes of administration. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, 26(10), 1501-1510.
- Teter, C. J., Falone, A. E., Cranford, J. A., Boyd, C. J., & McCabe, S. E. (2010). Nonmedical use of prescription stimulants and depressed mood among college students: frequency and routes of administration. *Journal of substance abuse treatment*, 38(3), 292-298.
- Thomas, M.A. How symptoms of anxiety, depression, Attention Deficit Disorder or Attention Deficit Hyperactivity Disorder contribute to students self-medicating via marijuana and non-medical prescription drugs. Undergraduate honors thesis. University of Central Florida. 2013.
- Trautmann, J., Worthy, S.L., & Lokken, K.L. (2007). Body dissatisfaction, bulimic symptoms, and clothing practices among women. *The Journal of Psychology*, 141(5), 485-498.

- Tyssen, R., Dolatowski, F.C., Rovik, J.O., Thorkildsen, R.F., Ekeberg, O., Hem, E... Vaglum, P. (2007). Personality traits and types predict medical school stress: a six-year longitudinal and nationwide study. *Medical Education*, 41, 781–7.
- United States Department of Education. (2013). Fast facts. *National Center for Education Statistics*. Retrieved from <http://nces.ed.gov/fastfacts/>
- Vecitis, K. S. (2011). Young Women's Accounts of Instrumental Drug Use for Weight Control. *Deviant Behavior*, 32(5), 451-474.
- Velasco, M. S. (2012). More than just good grades: candidates' perceptions about the skills and attributes employers seek in new graduates. *Journal of Business Economics and Management*, 13(3), 499-517.
- Wagner, F.A., & Anthony, J.C. (2007). Male-female differences in the risk of progression from first use to dependence upon cannabis, cocaine, and alcohol. *Drug and Alcohol Dependence*, 86, 191-8.
- Weitzman, E.R. (2007). Poor mental health, depression, and associations with alcohol consumption, harm, and abuse in a national sample of young adults in college. *Journal of Nervous Mental Disease*, 192, 269–77.
- Wells, S., Flynn, A., Tremblay, P.F., Dumas, T., Miller, P., & Graham, K. (2014). Linking masculinity to negative drinking consequences: The mediating roles of heavy episodic drinking and alcohol expectancies. *Journal of Studies on Alcohol and Drugs*, 75, 510-519.
- Wenner, L.A. & Jackson, S.J. (2009). Sport, beer and gender in promotional culture: the dynamics of a holy trinity. In: L.A. Wenner and S.J. Jackson eds. *Beer, Sport and Gender*. New York: Peter Lang, 1–34.
- West, C. & Fenstermaker, S. (1995). Doing difference. *Gender and Society*, 9(1), 8-37.
- West C. & Zimmerman DH. (1987). Doing gender. *Gender and Society*. 1, 125–51.
- Weyandt, L.L., Janusis, G., Wilson, K. G., Verdi, G., Paquin, G., Lopes, J,... Dussault, C. (2009). Nonmedical prescription stimulant use among a sample of college students: Relationship with psychological variables. *Journal of Attention Disorders*, 13, DOI: 10.1177/1087054709342212
- Wharton, C.M., Adams, T., & Hampl, J.S. (2008). Weight loss practices and body weight perceptions among US college students. *Journal of American College Health*, 56(5), 579-584.



- White, B. P., Becker-Blease, K. A., & Grace-Bishop, K. (2006). Stimulant medication use, misuse, and abuse in an undergraduate and graduate student sample. *Journal of American College Health, 54*(5), 261-268.
- Wilson, S. (200). Students' estimates of the prevalence of drug use: Evidence for a false consensus effect. *Psychology of Addictive Behaviors, 14*, 295-298.
- Wolaver, A. M. (2002). Effects of heavy drinking in college on study effort, grade point average, and major choice. *Contemporary Economic Policy, 20*(4), 415-428.
- Wolfson, S. (2000). Students' estimates of the prevalence of drug use: Evidence for a false consensus effect. *Psychology of Addictive Behaviors, 14*(3), 295.
- Wu, L.T., & Schlenger, W.E. (2003). Psycho-stimulant dependence in a community sample. *Substance Use and Misuse, 38*, 221-248.
- Zullig, K. J., & Divin, A. L. (2012). The association between non-medical prescription drug use, depressive symptoms, and suicidality among college students. *Addictive behaviors, 37*(8), 890-899.