

SOCIAL LEARNING AND GENERAL STRAIN THEORIES' RELATIONSHIP WITH
PRESCRIPTION STIMULANT MISUSE FOR ACADEMIC PURPOSES AMONG COLLEGE
STUDENTS

by

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ABSTRACT

The instrumental misuse of prescription stimulants as “study drugs”, particularly by college students, is a serious issue that needs to be further investigated. Using data from a sample of 549 University of Central Florida Orlando students, the current study tested the relationship between prescription stimulant misuse and social learning theory, as well as general strain theory. Approximately 17% of participants reported misusing prescription stimulants for academic purposes at least once in the past year. Findings show support for social learning theory; the number of friends who use prescription stimulants and the individual’s attitudes about the effectiveness of the drugs are both significant variables. General strain theory was divided into two parts; the first one tests the relationship between strain and negative affect, while the second tests negative affect, strain and prescription stimulant misuse. Overall, general strain theory was not found to explain prescription stimulant misuse. Also, results showed students who binge drink or use other substances are significantly more likely to report prescription stimulant misuse. Potential implications for these findings are discussed, as well as future research directions.

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INTRODUCTION

Prescription drug misuse, defined as the use of prescription drugs without a prescription, is a serious issue in society today; prevalence of use is now greater than that of all other illicit drugs (not including marijuana) (SAMHSA, 2009). According to 2009 National Survey on Drug Use and Health, approximately 20% of all respondents, or about 52 million Americans over the age of 12, reported misusing prescription drugs at least once (SAMHSA, 2009). Prescription drug misuse is especially prevalent among adolescents and young adults; nearly 30% of 18-24 year old NSDUH respondents reported lifetime use (SAMHSA, 2009).

The dramatic increase in prescription stimulant misuse is cause for concern, one of them being public health. These drugs can be dangerous and are responsible for a significant jump in the number of drug related emergency department visits. In 2009, 1.2 million emergency hospital visits were due to misuse or abuse of pharmaceuticals (DAWN Report, 2010). Pharmaceuticals actually accounted for more emergency department visits than illicit drugs. The number of emergency department visits due to pharmaceutical abuse has increased in recent years, nearly doubling from 2004 to 2009, with 98.4 percent more patients (DAWN Report, 2010). These numbers are alarming and show how serious of a problem prescription drug misuse has become.

Researchers have identified numerous motives for prescription drug misuse, including to get high, relieve pain, relax or fall asleep, have more energy and focus for

academics, or even to lose weight (Arkes & Iguchi, 2008; Sharp & Rosen, 2007). McCabe and his colleagues (2007) identified that motive is an important factor in understanding prescription drug misuse. Their research shows that students who report recreational motives (e.g., to get high or experiment) for use are more likely to report substance abuse related problems than students who report instrumental motives (e.g., to relieve pain, or help study) for use (McCabe et al., 2007; McCabe et al., 2007). A limitation of the existing research is that many studies do not take motive for use into consideration and fail to distinguish between recreational and instrumental prescription stimulant misuse.

The current study fills this gap in the literature by focusing on the use of prescription stimulants, such as Adderall or Ritalin, as “study drugs” by college students. This study will examine the prevalence of prescription stimulant use by undergraduate students at the University of Central Florida to find out more about user demographics, as well as attitudes toward and reasons for use. Possible theoretical reasons for use will be tested as well; specifically Akers’ social learning theory (Akers et al., 1979) and Agnew’s general strain theory (Agnew, 1992; Lilly, Cullen & Ball 66-67). It is important that more research investigates the instrumental use of stimulants as “study drugs” by students; as more information is found about why people are misusing these drugs, more can be done to educate others and help reduce the rapidly growing number of users. By studying the prevalence of and reasons for prescription stimulant misuse by

UCF students, more insight can be gained about how to control the problem, and develop new treatment approaches.

LITERATURE REVIEW

Prescription Stimulant Misuse: General Prevalence and User Demographics

According to data gathered from the 2009 National Survey on Drug Use and Health, 8.81% of respondents, about 22 million people, reported lifetime misuse of prescription stimulants. Only a handful of studies examine correlates of prescription stimulant misuse among adolescents and adults using data that is nationally representative (Arkes & Iguchi, 2008; Ford, 2009; Ford, 2008; Ford & Rivera, 2008; Kroutil et al., 2006; Simoni-Wastila et al., 2004; Wu et al., 2008). Findings generally indicate that females (Arkes & Iguchi, 2008; Ford, 2009; Ford, 2008) and whites (Arkes & Iguchi, 2008; Simoni-Wastila et al., 2004; Wu et al., 2008) are more likely to report misuse of prescription stimulants. In addition, low family income (Arkes & Iguchi, 2008; Kroutil et al., 2006), poor overall health (Arkes & Iguchi, 2008; Ford & Rivera, 2008), mental health problems (Wu et al., 2008), and substance use (Arkes & Iguchi, 2008; Ford, 2009, Ford, 2008; Simoni-Wastila et al., 2004; Wu et al., 2004) are all significant correlates of the misuse of prescription stimulants among adolescents and young adults.

Prescription Stimulant Misuse by College Students

The focus of the current research is the misuse of prescription stimulants among college students. Data from the 2009 NSDUH reports show full time college students, ages 18-22, were twice as likely to have misused Adderall when compared to others in the same age group who were not full time college students (SAMHSA, 2006). For this

reason, a number of researchers have examined prescription stimulants misuse among college students.

Approximately 11% of 18-25 year olds reported misusing prescription stimulants based on the 2009 National Survey on Drug Use and Health data. Past year rates varied widely by school from zero to 25% , based on factors such as demographic makeup of the samples, region of the country in which the university is located, and how academically competitive the school is. Use was more prevalent among north-eastern college students, and students at highly competitive universities (McCabe, Knight, Teter & Wechsler, 2005).

DuPont et al. (2008) surveyed 2,087 college students about prescription stimulant misuse, and found the lifetime prevalence to be 5.3%. Most (90%) reported getting the drugs for free from a friend or family member; recreational and academic reasons for misuse were reported. Almost three quarters of students who reported prescription stimulant misuse were white, and 46% lived in their own apartments off-campus.

Low and Gendaszek (2002) surveyed 150 undergraduate students at a small U.S. college about their use of both illegal (cocaine or MDMA) and legal (prescription) stimulants. Over a third of participants (35.5%) reported prescription stimulant misuse, and men were more likely than women to report the misuse. Academic purposes were a

primary motivation for prescription stimulant misuse, while illegal stimulants were used more recreationally.

Shillington et al. (2006) studied nonmedical prescription stimulant use by testing a random sample of undergraduate students attending a large public college in southwestern California. Shillington et al wanted to obtain data on prescription stimulant misuse in this particular region because most other studies on the topic have taken place in the east or Midwest regions of the U.S. Researchers sampled 1,998 students and results showed that 11.2% of students used prescription stimulants in the past year, and 4% had used them in the past month. Overall results showed that students who misused prescription stimulants were more likely to smoke or use other drugs, be in a fraternity or sorority, not be in a committed relationship and have lower grade point averages than non-users.

Judson and Langdon (2009) studied prescription stimulant misuse by surveying a sample of 333 undergraduate college students. Overall results show 20% of participants reported illicit use, and significant differences exist between students who have a prescription for the drugs and those who do not. Illicit users had higher numbers of motives for use, believed misuse was more ethical, and had significantly less health concerns. To improve alertness and concentration were the two main motives found for illicit prescription stimulant use.

Teter et al. (2005) sent online surveys to a random sample of 9,161 undergraduate college students; findings showed 8.1% of respondents had misused prescription stimulants at least once in their lives, and 5.4% reported illicit use in the past year. To help with focus and concentration, to increase alertness, and to get high were the top three reasons students listed for illicit use of prescription stimulants. Literature shows those who engage in prescription stimulant misuse are more likely to report using alcohol or other drugs as well (Teter, McCabe, Cranford, Boyd, & Guthrie, 2005).

White, Becker-Blease, and Grace-Bishop (2006) studied characteristics and patterns of prescription stimulant misuse among undergraduate and graduate students at a northeastern U.S. university. Researchers surveyed 1,025 students and results showed academic purposes (specifically improving grades) as well as recreational reasons for misuse of the stimulants. Frequency of use was another variable examined in this study; of students who reported ever misusing the drugs, half take them 2-3 times a year and roughly a third misuse prescription stimulants 2-3 times per month. This particular study found no significant differences in use between men and women. Majority of respondents who reported misuse of the pills took them orally, while 40% did so intranasally.

DeSantis and Hane (2010) researched students' attitudes towards and justifications for Attention Deficit Hyperactivity Disorder (ADHD) stimulant misuse. They

conducted in-depth interviews with 175 undergraduate college students at a large public university located in an urban area of the southeast U.S. Important findings show how students frame prescription stimulant misuse as morally and physically harmless. Results show four main arguments students use when rationalizing illicit prescription stimulant use: “1) comparison-and-contrast, 2) all-things-in-moderation, 3) self-medicating, and 4) minimization.” (p 35)

Researchers at a Midwestern University surveyed 381 students to determine the prevalence of ADHD prescription stimulant misuse, reasons for misuse, and factors that may predict illicit use of these drugs. Some significant gender differences were found; males were more likely to report prescription stimulant misuse, and more likely to know someone they can obtain the drugs from. Students claim the prescription stimulants increase their energy and alertness, which is helpful when they are under time constraints and academic pressure (Hall et al., 2005).

A study of 333 fraternity members at a large, public college located in the southeastern U.S. also found academic purposes to be students’ primary reason for prescription stimulant misuse. Prevalence was higher among those students who smoke marijuana regularly, are upperclassmen (DeSantis & Hane, 2010) and live off-campus. Students often obtain the prescription stimulants from a friend or dealer. Students who reported prescription stimulant misuse spent less time studying and more time socializing, and missed significantly more classes than non-users. Results also show

students who reported prescription stimulant misuse were more likely have low grade point averages when compared to their peers (DeSantis, Noar & Webb, 2009; Shillington et al, 2006).

THEORY

Social Learning Theory

Social learning theory was developed by Ronald Akers, as a contemporary addition to Sutherland's original differential association theory. They would be considered social process theorists, who believe that socialization is a key determinant of behavior. Social learning theory revolves around the idea that behavior is learned through close relationships with others, such as friends or family. There are four key elements to Akers social learning theory. First, differential association states that behavior is learned, and focuses on interactions with others and exposure to normative definitions. Associations that occur at an early age (priority), more frequently, for a longer period of time (duration), and that are more important to the individual (intensity), are more likely to influence an individual's actions and attitudes. Second, imitation describes how an individual shapes their behavior based on modeling, or imitating, other's social interactions, while definitions are the meanings people connect with behaviors (Akers et al., 1979). Third, definitions are attitudes and meanings people attach to behaviors. When an individual holds an attitude that is permissive of deviant/criminal behavior they are more likely to engage in that behavior. These definitions allow individuals to rationalize or justify their involvement in deviant/criminal behavior. Finally, differential reinforcement is based on actual or

anticipated consequences of behavior. Individuals are likely to participate in behaviors when they believe they will be rewarded (Ford, 2008).

Significant literature supports social learning theory as an explanation for crime, deviant behavior, and drug use (Akers et al., 1979; Higgins, Mahoney & Ricketts, 2009; Peralta & Steele, 2010). Social learning theorists examine peer associations when predicting substance use, especially among adolescents and young adults because peer bonds are so highly valued during these life stages. Peer influence is applied by exposure to deviant definitions and nonconforming behaviors, which are further shaped by social reinforcement (Akers, 1985). An individual's perceptions of social influences have a major impact on their behavior and decision to misuse prescription drugs (Higgins, Mahoney & Ricketts, 2009). When an individual observes substance use by their peers, they will become more likely to initiate this behavior in expectation of positive social reinforcement (Petraitis, Flay & Miller, 1995). Peer attitudes toward drug use are also highly influential in determining whether or not a young adult will decide to use drugs (Flom et al. 2001).

Social learning theory consists of a variety of components which work together to explain prescription stimulant misuse among college students. Differential association occurs when a college student has friends or peers who misuse prescription stimulants; the individual will be exposed to not only this behavior, but the peer attitudes that come with the behavior as well. Imitation occurs when a student models their behavior

after their peers', which in this case would be misusing prescription stimulants for academic purposes. The individual may define the behavior as morally acceptable to rationalize the misuse. Differential reinforcement occurs when a student sees peers' behavior rewarded, in this specific case, the individual may witness friends getting higher exam grades after misusing prescription stimulants to help them study. The student may anticipate rewards, getting better grades, will outweigh the costs of their behavior, and therefore decide to misuse prescription stimulants as a study aide.

Peralta and Steele (2010) studied nonmedical prescription drug use among college students, and found social learning theory to be a partial explanation for lifetime misuse. A quarter of respondents reported misuse of prescription stimulants, and based on survey data, several social learning theory hypotheses were supported. Research shows that peer associations play a significant role in misuse of prescription stimulants (Peralta & Steele, 2010). Support was also found for differential association, imitation of friends, and differential reinforcement, therefore students who have friends or fellow classmates who misuse the drugs will be more likely to report misuse as well (Peralta & Steele, 2010).

Researchers have found support for social learning theory as an explanation for misuse of prescription stimulants; based on analysis and tests of social learning theory using Monitoring the Future survey data, a consistent link exists between the theory and reasons for prescription drug misuse (Higgins, Mahoney, & Ricketts, 2009). Ford tested

social learning theory by dividing it into four major components: peer drug use, the individual's personal attitudes, their peers' attitudes, and their parents' attitudes toward drug use (Ford, 2008). Students are exposed to countless myths about prescription stimulants; many believe prescription drug misuse is safer than traditional illicit drug use, and that prescription stimulants are effective "study drugs" to achieve academic success (Arria & DuPont, 2010). Those who misuse the stimulants may then justify their choice by utilizing arguments learned from peers, possibly claiming their motives for use as more "morally acceptable" than recreational illicit drug use (Arria & DuPont, 2010). These learned attitudes, rationalizations and justifications strongly influence an individual's decision to misuse stimulants. These ideas or actions are then positively or negatively reinforced (differential reinforcement) by peers and family.

General Strain Theory

Agnew's (1992) general strain theory describes a process in which an individual experiences a type of strain due to one of many potential reasons; this often arouses negative emotions for the individual, who must then adapt to the situation in an attempt to minimize strain. According to Merton's theory, strain would come from failing to achieve a positively valued goal, such as graduating high school. Agnew expands on this concept and asserts there are various types of strain, not only does the blockage of a desired goal lead to strain, but so can a loss of positively valued stimuli, or presentation of a negative stimuli (Lilly, Cullen & Ball 66-67). When there is a disconnect

between an individual's goals and their actual achievement of these expectations a type of strain known as traditional strain, or the "failure to achieve positively valued goals" (p 66), takes place. A second type of strain occurs when positively valued stimuli is lost, for example ending a relationship with a boyfriend or girlfriend, or experiencing a death in the family. The third form of strain Agnew describes is the "presentation of negative stimuli" (Lilly, Cullen & Ball 66-67). There is a wide array of noxious stimuli and forms in which it can be presented; examples include child abuse or neglect, criminal victimization, traumatic school or social experiences, or numerous other stressful events individuals encounter throughout their lives (Agnew, 1992).

Agnew argues that individuals who are exposed to strain are more likely to experience negative affect, including anger, stress, or depression. According to the theory, one way to cope with the negative affect brought on by strain is deviant/criminal behavior, such as substance use. Extensive literature shows significant support for general strain theory as a theoretical approach for explaining criminal behavior (Agnew, 2001, Lilly, Cullen & Ball 66-67). Agnew conducted a study to determine what sorts of strain are most likely to lead to crime, and found four major types: those viewed as unjust, perceived as high in magnitude, connected to low self-control, and "create some pressure or incentive to engage in crime"(p 319) (Agnew, 2001).

General strain theory offers another explanation for prescription stimulant misuse among college students; this theory describes how academic strain causes negative affect, which leads an individual to misuse prescription stimulants. A student who values academic success may be struggling in their classes and making low grades, causing them to feel depressed or angry for not achieving their goals. This negative affect may then cause the individual to misuse prescription stimulants in an attempt to alleviate academic strain and make better grades.

Ford and Schroeder (2009) tested general strain theory in relation to prescription stimulant misuse for academic purposes among college students. Researchers examined survey results based on data gathered from over 14,000 college students' responses; the sample came from a wide variety of universities from all across the nation. Analysis supported general strain theory, as well as the relationship between academic strain and prescription stimulant misuse. The impact of academic strain has an indirect relationship with misuse based on measures of negative affect, such as high levels of depression. Due to the frustration or depression associated with academic strain, students may use drugs as a coping mechanism to reduce such negative emotions (Ford & Schroeder, 2009). When students desire, or are expected, to achieve good grades, but cannot reach this goal, it will usually prompt them to search for a solution to the problem in order to lessen the strain and negative affect they experience. Students see prescription stimulants as an effective tool for achieving academic success, and such strain may lead them to misuse these drugs (Ford & Schroeder, 2009).

RESEARCH QUESTION

The current study examines the prevalence of prescription stimulant misuse by a sample of University of Central Florida students, as well as user demographics, and tests potential theoretical reasons for the misuse of these drugs. Social learning theory and general strain theory both have significant empirical support for explaining drug use; various studies focusing specifically on the relationship between these theories and prescription stimulant misuse.

There is significant empirical support for social learning and general strain theories as an explanation for many behaviors, as well as various studies that investigate the theories' relationships with reasons for prescription drug misuse. The current study seeks to elaborate on existing literature, and further examine social learning theory and general strain theories as potential explanations for prescription stimulant misuse among college students at the University of Central Florida.

HYPOTHESES

Hypothesis 1: Respondents who report that more of their friends use prescription stimulants are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 2: Respondents who report that prescription stimulant misuse for academic purposes is acceptable are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 3: Respondents who report that there is no risk associated with misusing prescription stimulants regularly are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 4: Respondents who report that prescription stimulants are an effective study aid are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 5: Respondents who report higher levels of academic strain report higher levels of psychological distress.

Hypothesis 6: Respondents who report higher levels of academic strain report higher levels of anger.

Hypothesis 7: Respondents who report more academic strain are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 8: Respondents who report more anger are more likely to report the misuse of prescription stimulants for academic purposes.

Hypothesis 9: Respondents who report more psychological distress are more likely to report the misuse of prescription stimulants for academic purposes.

METHODS

In this research study, data was obtained using a pen and paper survey, based on a sample size of 549 University of Central Florida Campus students. There was a total of 775 students enrolled in the thirteen classes surveyed, 549 of which were present and chose to participate. The surveys were distributed in classes with professors' permission, making this a convenience sample. In order to conduct research on campus, the study had to be approved by the Institutional Review Board, which protects human participants and ensures ethical research. Students from upper-level courses were surveyed. Students were informed that the survey is anonymous, and that it is completely voluntary; IRB consent forms were attached to the front of each survey. Once all surveys were completed, they were collected and stored securely. Variables and data were then coded and entered into the computer to be statistically analyzed using SPSS.

The dependent variable for the current study is the misuse of **prescription stimulants for academic purposes**; lifetime as well as past year prevalence are measured. "Misuse" is defined as taking the drugs without a prescription, or not as prescribed by their doctor. All yes or no questions are coded as 0 for "no" and 1 for "yes."

Social learning theory questions cover the theory's four main components: differential association, imitation, definitions, and differential reinforcement.

Differential association involves students' interactions with their peers or significant others, and their attitudes toward prescription stimulant misuse. Participants were asked on a scale of 1 (none of them) to 4 (all of them), how many of their friends they believe misuse prescription stimulants for academic reasons. Responses falling on the high end of the scale show students who are more likely to differentially associate with friends or peers who use drugs (Ford, 2008). **Definitions**, another key concept of social learning theory, relate to students own attitudes toward behavior, in this case prescription stimulant misuse. Definitions also include justifications and neutralizations participants may use to rationalize their behavior. To test these attitudes participants were asked how strongly they agree or disagree with the statement "It is acceptable for college students to misuse prescription stimulants for academic purposes." Responses are based on a Likert scale measure of 1 ("Strongly Disagree") through 5 ("Strongly Agree"); the lower on the scale a respondent answers, the more likely they are to have definitions of prescription stimulant misuse as unacceptable behavior (Ford, 2008). Participants were also asked "How much do you think a college student risks harming themselves (physically or in other ways) if they misuse prescription stimulants regularly?" Students' responses about the behavior are based on a scale of 1 (No Risk) to 4 (Great Risk). **Differential reinforcement**, the final aspect of social learning theory, deals with anticipated or actual outcomes and consequences of behavior. If a student

feels the rewards of misusing prescription stimulants are greater than the costs, they are more likely to initiate or continue misusing the drugs. Participants were asked how strongly they disagree or agree with the statement "Prescription stimulants are an effective study aid." (1 = "Strongly Disagree", through 5 = "Strongly Agree"). The student's response to statement was used to test differential reinforcement; if someone perceives prescription stimulants to be a helpful studying tool they will be more likely to misuse the drugs.

General strain theory questions were based on two main components, academic strain and negative affect. **Academic strain** is what happens when a student wants to achieve academic goals and get good grades but fails to actually do so. The strain described was measured by comparing a participant's GPA to the value they place on academic work. Value is operationalized based on a scale of 1 (not important at all) to 4 (very important) in response to the question: "How important is academic work?" A student who values good grades but does not achieve them exemplifies academic strain. According to general strain theory, academic strain or failure to achieve valued goals leads to **negative affect**, including anger or depression. Anger was measured using the question "How often, if ever, does it make you angry when you receive a lower grade than you believe you deserve?" (1 = Never through 5 = Always). To measure depression, participants were asked to rank how often they have felt hopeless, tired for no reason, so nervous nothing could calm them down, worthless, restless or fidgety, so restless they are unable to sit still, nervous, depressed, that everything is an effort, or so sad

nothing could cheer them up within the past 30 days. These questions come from the K-10 psychological distress index. Responses range from 1 (none of the time) to 5 (all of the time), with higher scores indicating higher levels of depression. If the respondent answered yes to any of the previous questions, they were asked if these feelings were due to academic problems (0 = No, 1 = Yes).

A number of **control** variables are also included, such as demographic characteristics, college risk factors, and substance use. Demographic questions were asked about the participant's age, race and gender. Race and gender were coded as dichotomous variables (female =0, male = 1 and white =0, nonwhite =1). Risk factors for prescription stimulant misuse specific to college students will also be variables explored using a variety of survey questions. The respondent's year in college, and place or type of residence, such as on campus dorms, living at home with parents, off campus UCF-affiliated apartments, or non-affiliated apartments or houses, were also considered. Whether or not the student is a member of a fraternity or sorority (0 = non-member, 1 = member), works 20 or more hours a week (0 = no, 1 = yes), or formerly attended community college (0 = never attended, 1 = has attended) are some of the dichotomous variables that were used to test college risk factors. Additional control variables consist of questions measuring substance use, including whether or not the respondent binge drinks, uses marijuana or other illicit drugs, or misuses other prescription drugs. Binge drinking is defined as 4 or more drinks in a row for females, and 5 or more drinks in a row for males. Due to this difference in definitions, females only were asked to respond

to “Over the past 2 weeks have you had 4 or more drinks in a row?” and males only answer the question “Over the past 2 weeks have you had 5 or more drinks in a row?” All substance use questions can be answered either “yes” or “no”, making them dichotomous variables (0 = no, 1 = yes). Along with binge drinking questions, participants were asked “In the past 12 months have you used marijuana?”, “In the past 12 months have you used other illicit drugs: cocaine, crack, heroin, LSD, PCP, hallucinogens, inhalants, ecstasy, and/or methamphetamines?” and “In the past 12 months have you used prescription drugs (not including stimulants such as Adderall or Ritalin) that were not prescribed to you?” (0 = no, 1 = yes).

The goal of the current study is to determine the relationship between prescription stimulant misuse among college students and social learning and general strain theories as potential explanations for misuse. Hypotheses were tested with a series of logistic regression models. Finding out whether or not social learning theory has a significant association with the stimulant misuse requires tests of several hypotheses. First, individuals who maintain higher levels of differential association with substance using peers are more likely to report prescription stimulant misuse. Those who have acceptable or normative definitions of substance use are more likely to misuse prescription stimulants. The final aspect of social learning theory this study tests is differential reinforcement; if an individual believes the rewards for their actions outweigh the costs, they are more likely they to misuse prescription stimulants. Another key hypothesis of the study is that a significant relationship exists between academic

strain and prescription stimulant misuse. This relationship is indirect; academic strain leads to negative affect, in this case depression and/or anger, which then leads to the drug use.

FINDINGS

Surveys were distributed to students in thirteen courses on UCF's Orlando Campus, including courses offered by five different colleges: Business Administration, Education, Engineering and Computer Science, Health and Public Affairs, and Sciences. All courses were upper-level in order to avoid first semester freshmen, who would not have a college GPA necessary for testing strain theory. A total of 549 students completed surveys; participants' responses were then coded and analyzed using SPSS. The regression models that were estimated to test research hypotheses included 497 respondents, so approximately 9% of responses were missing. Sample characteristics for all variables used in the analysis are shown in Table 1.

The sample is approximately 51% female, with an average age of 22. Roughly 63% of respondents are white, 15% Hispanic, 9% black, and 4% Asian. These rates are similar to those of the UCF student population (61% white, 18% Hispanic, 10% black and 5% Asian), while 55% of UCF students are female. In addition, 55% of students in the sample received an AA degree, while 53% of all UCF students have an AA degree. The findings from the survey also closely match the findings from other surveys on substance use among college students (Johnston et al., 2011). In this survey 49% of the respondents reported binge drinking, 32% marijuana use, and 9% other illicit drug use.

The dependent variable is whether or not the student has misused prescription stimulants for academic purposes in the past year, 83.2% of respondents reported never having done so. 7.3% had done so on 1 to 2 occasions, 3.5% on 3 to 5 occasions, 3.6% on 6 to 9 occasions, 1.6% on 10 to 19 occasions, 0.4% 20 to 39 occasions, and 0.4% on 40 or more occasions. Due to the coding standard of the discipline, stimulant use was recoded into a dichotomous variable with 16.8% reporting use in the past year.

Social Learning Theory

The relationship between prescription stimulant misuse for academic purposes and social learning theory was analyzed using three separate logistic regression models (Table 2). Only two variables in the first or baseline model, which only includes controls, are significantly related to the misuse of prescription stimulants for academic purposes. Members of fraternities or sororities are more likely to report use than non-members (O.R. = 2.22), while students who live at home with family members are less likely to misuse than students who live in dorms, apartments, or homes on their own (O.R. = 0.36).

The second model added four variables used to test social learning theory to the baseline model. There is a strong positive relationship between the number of respondents' friends who misuse prescription stimulants and the dependent variable (O.R. = 4.55). The higher proportion of friends who misuse prescription stimulants, the more likely a student will be to do the same. Another significant social learning theory

variable is how effective a student believes prescription stimulants are as a study aid (O.R. = 1.92). This positive relationship shows how the more effective a student believes the drugs are the more likely they will be to misuse them.

The third regression model adds binge drinking, marijuana use, illicit drug use, and other prescription drug use to variables in Model 2. In this model both the use of illicit drug other than marijuana (O.R. = 3.17) and the misuse of prescription drugs other than stimulants (O.R. = 2.10) were significantly related to the use of stimulants as study aids. The addition of these substance use measures did not change the relationship between the significant social learning variables and the dependent variable found in Model 2. In this final regression model, both friends use (O.R. = 3.46) and effective study aid (O.R. = 1.87) are significantly associated with the dependent variable. So respondents who report that more of their friends use prescription stimulants and those who believe that prescription stimulants are an effective study aid are more likely to report the use of prescription stimulants for academic reasons.

General Strain Theory

General strain theory was tested and results were divided into two tables, each one containing two models for measuring each part of the theory and its relationship with prescription stimulant misuse. Academic strain is measured on a scale of 1 to 4. Students GPAs, as well as how important it was for them to receive good grades, were recoded as a dichotomous variables; a GPA of 3.0 or higher = 1, less than 3.0 = 0. Those

who answered that getting good grades was “very important” = 1, while “not important”, “somewhat important”, or “important” = 0. Levels of academic strain were then created using these variables. a student with a high GPA who says academic work is very important experiences a low level of strain ($1/1 = 1$), while a student who has a low GPA and finds academic work very important will have a high level of strain ($0/1 = 4$).

Table 3 shows how academic strain is related to negative affect; model 1 tests anger and model 2 tests psychological distress. Linear regression, or OLS, was used to determine that academic strain has a significant positive relationship with anger ($b = 0.08$), as well as distress ($b = 0.05$). Consistent with general strain theory persons who experience strain are more likely to report negative affect. In the current study, students who reported academic strain are more likely to report being both angry and higher levels of psychological distress.

According to general strain theory the relationship between strain and prescription stimulant misuse is indirect; theoretically, academic strain leads to negative affect, which in turn leads the student to misuse prescription stimulants. After analyzing the relationship between academic strain and negative affect (Table 3), the impact of strain and negative affect on prescription stimulant misuse must be determined. Table 4 displays data used to predict stimulant use based on two separate Logistic Regression Models. The first model shows a positive relationship between strain and stimulant use

(O.R. = 1.27); however, neither measure of negative affect is significantly related to stimulant use. These findings indicate that the relationship between strain and prescription stimulant use is only direct and not indirect via negative affect.

In the final regression model substance use variables are added. In this model all measures of substance use are significantly related to the use of stimulants for academic purposes. Respondents who report binge drinking (O.R. = 2.74), marijuana use (O.R. = 2.37), other illicit drug use (O.R. = 3.89), or misuse of other prescription drugs (O.R. = 2.82) are more likely to report the use of stimulants for academic reasons. Unfortunately, once the substance use measures are added the relationship between strain and stimulant is no longer significant.

DISCUSSION

The purpose of the current study is to determine the prevalence of prescription stimulant misuse for academic purposes among college students, and explore possible theoretical explanations by testing social learning and general strain theories. While there is some literature on the misuse of prescription drugs among college students, there is a lack of research on the instrumental use of drugs. This study fills an important gap in the literature by examining the misuse of prescription stimulants for academic purposes, a form of instrumental drug use.

Overall, 17% of respondents report the misuse of prescription stimulants for academic purposes at least once in the past year. Findings indicate that living at home had a significant negative relationship with the dependent variable, while Greek affiliation and substance use had a strong positive relationship with prescription stimulant misuse. These patterns could be for a variety of reasons; students living at home are more likely to be around parents or family members, making them less likely to use drugs. Literature consistently shows Greek members are more likely to use alcohol or other substances (DeSantis, Noar & Webb, 2009; Shillington et al, 2006), which explains why they may also be more likely to misuse prescription stimulants. Fraternity or sorority members are also more likely to be exposed to peers or other students who misuse the stimulants, which would increase their likelihood of doing the same, according to social learning theory. There is often a strong relationship between

binge drinking, marijuana use, illicit drug use or prescription drug misuse; students who engage in one type of substance use are much more likely to report using others, which may explain why students who misuse prescription stimulants would be likely to abuse other substances as well.

More importantly the current research found partial support for both social learning and general strain theory. Two out of the three social learning variables tested had a positive significant relationship with prescription stimulant misuse for academic purposes. The higher number of friends who misuse prescription stimulants a student has, the more likely the student is to report the misuse of prescription stimulants for academic purposes. This pattern reflects a key point of social learning theory, exposure to the values and norms of peers; if more of a student's peers use the drugs, he or she will be more likely to believe it is acceptable. This could be due to peer pressure, or the student may simply see their friends take the drugs and get higher test grades, and decide to model their behavior in hopes of improving their own grades as well. Also, the more effective a student believes the prescription stimulants are, the more likely he or she will be to misuse them. This part of the theory discusses positive or negative outcomes associated with use; if a student expects good things to happen when they use prescription stimulants, he or she will be more likely to use. If a student expects the stimulants to significantly improve their academic performance, they will want to use the drugs more than someone who believes stimulants do not help at all.

In order to test general strain separate regression models were estimated, the first tested the relationship between academic strain and negative affect. Results show support for the original hypothesis, there is a positive significant relationship between strain and anger as well as strain and psychological distress. Students who experience high levels of academic strain report more negative affect, most likely due to frustration with their low grades, or stress due to academic pressures. The second part tests the relationship between negative affect, strain, and the dependent variable, prescription stimulant misuse for academic purposes. Overall, findings show partial support for hypotheses testing general strain theory. In this model neither measure of negative affect is significantly related to the misuse of prescription stimulants for academic purposes. Furthermore, while the measure of academic strain is significantly related to the misuse of prescription stimulants for academic purposes, this relationship becomes non-significant once other forms of substance use are added to the model. Negative affect does not predict prescription stimulant misuse because the distress reported by students may not be due to strictly academic reasons. Strain also does not predict the dependent variable; it is possible students who misuse prescription stimulants for academic purposes may not experience a great deal of strain, but they feel the drugs will be helpful after seeing peers take them. When modeling friends' behaviors, personal academic standing may be considered insignificant.

By identifying the risk factors associated with prescription stimulant misuse, prevention efforts can be developed and improved. Data shows students whose peers

misuse prescription stimulants are much more likely to do the same. Prevention can therefore be aimed at specific peer groups who, based on research, are more likely to use the drugs, for example fraternities or sororities. A student's attitude toward misuse of the drugs is a significant predictor of use as well. By educating and informing students of the risks and potential harm associated with prescription stimulant misuse, they may change their attitudes toward the drugs and be less likely to use. Academic strain is another risk factor for prescription stimulant misuse; those who experience high levels of strain were found to be more likely to misuse the drugs. Prevention efforts could use this information to specifically help students experiencing great academic strain, and lower their risk of misusing prescription stimulants. Schools could teach students healthy ways to deal with stress, or provide academic tools or campus resources for helping students alleviate academic strain effectively.

One limitation of the current study is the use of a convenience sample, not a random sample. A random sample would be generalizable to the entire population, in this case all UCF students, however the sample used in the current study does not allow for this. Although the sample is not random, it is fairly representative of UCF's school wide rates when it comes to demographic characteristics such as race and gender, which strengthens the study's findings. Another possible limitation is validity related to self-report data. Self-reported data can be unreliable for various reasons; participants may misunderstand questions, give dishonest or biased responses, not be able to clearly remember information necessary to answer, or they may be reluctant to answer

questions admitting to certain attitudes or behaviors, especially pertaining to drug use. However participants were told the survey is completely anonymous, which encouraged honest and accurate answers.

Other possible theoretical explanations for prescription stimulant misuse should be explored in order to learn how we can prevent the misuse of these “study drugs”. The relationship between prescription stimulant misuse for academic purposes and other sociological theories such as control theory, symbolic interactionism or labeling theory could be explored in future research. It would also be interesting to compare students’ rates of use by major or college, and test whether significant differences between programs exist. A large portion of current literature on prescription stimulant misuse comes from the University of Michigan, making this study’s sample important because it represents patterns of use in a different region of the country. Further research on this subject can provide insight as to why students are misusing these drugs, and can help in shaping more effective prevention strategies on various levels. It is important to educate students on the risks and consequences of prescription stimulant misuse; this is one example of action that can be taken to curb the popularity of this current trend. High schools and colleges could use programs, similar to those utilized for alcohol education today, to teach students facts about the dangers of prescription drug misuse. Also the medical community, including doctors and pharmacists, must be aware of these trends and growing problems associated with prescription drug abuse. By informing society as a whole on the importance of this issue, people can work together

to prevent and reduce the misuse of prescription drugs, especially stimulants for academic purposes.

APPENDIX A: TABLE 1

APPENDIX A: TABLE 1

Table 1. Descriptive Statistics

<u>Measure</u>	<u>Range</u>	<u>Mean</u>	<u>Standard Deviation</u>
Dependent Variable			
Ever Misused Prescription Stimulants	0-1	0.1682	0.37438
Social Learning			
Friend P.S. Misuse	1-4	1.67	0.67
Acceptability of P.S. Misuse	1-5	2.27	1.096
Risk of P.S. Misuse	1-4	2.93	0.84
Effectiveness of P.S.	1-5	2.99	1.233
Strain			
Anger	1-5	3.46	1.018
Distress	1-5	1.8224	0.63616
Academic Strain	1-4	1.8821	1.17512
Controls			
Age	18-53	22.22	3.587
Gender	0-1	0.4862	0.50027
Race	0-1	0.6314	0.48287
Type of Residence	0-1	0.1974	0.39843
Greek	0-1	0.13	0.336
Work	0-1	0.45	0.498
AA from Different School	0-1	0.55	0.498
Binge Drank (past 2 weeks)	0-1	0.4888	0.50034
Used Marijuana (past year)	0-1	0.32	0.469
Used Other Illicit Drugs (past year)	0-1	0.09	0.284
Misused Other Prescription Drugs (past year)	0-1	0.14	0.343
Valid N (listwise)	497		

APPENDIX B: TABLE 2

APPENDIX B: TABLE 2

Table 2. Social Learning

<u>Measure</u>	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>		
	b	S.E.	Odds Ratios	B	S.E.	Odds Ratios	b	S.E.	Odds Ratios
Age	-0.075	0.052	0.928	0.032	0.058	1.033	-0.004	0.064	0.996
Gender	0.315	0.241	1.371	-0.241	0.299	0.786	-0.329	0.327	0.719
Race	0.258	0.263	1.295	-0.204	0.312	0.815	-0.339	0.339	0.712
Type of Residence	-1.032***	0.419	0.356	-0.541	0.458	0.582	-0.346	0.468	0.708
Greek	0.799***	0.303	2.223	0.464	0.362	1.59	0.374	0.404	1.454
Work	-0.065	0.245	0.937	-0.062	0.287	0.94	0.069	0.304	1.072
AA from Different School	-0.342	0.261	0.711	-0.252	0.303	0.778	-0.088	0.32	0.916
Friend P.S. Misuse				1.513***	0.251	4.539	1.24***	0.279	3.456
Acceptability of P.S. Misuse				0.258	0.164	1.295	0.199	0.174	1.22
Risk of P.S. Misuse				-0.161	0.212	0.851	-0.178	0.23	0.837
Effectiveness of P.S.				0.649***	0.159	1.913	0.624***	0.175	1.866
Binge Drank (past 2 weeks)							0.38	0.348	1.462
Used Marijuana (past year)							0.416	0.338	1.516
Used Other Illicit Drugs (past year)							1.154***	0.448	3.17
Misused Other Prescription Drugs (past year)							0.743***	0.376	2.103
Model Chi-Square		31.321***			145.754***			168.627***	
Nagelkerke R Square		0.095			0.406			0.469	

This table shows odds ratios (* p < .05, ** p < .01, *** p < .001)

APPENDIX C: TABLE 3

APPENDIX C: TABLE 3

Table 3. General Strain: Predicting Negative Affect

<u>Measure</u>	<u>Model 1</u>		<u>Model 2</u>	
	<u>Anger</u>		<u>Distress</u>	
	b	S.E.	B	S.E.
Age	-0.034***	0.013	0.007	0.008
Gender	0.094	0.089	-0.17***	0.056
Race	0.065	0.093	0.044	0.058
Type of Residence	-0.202	0.113	-0.006	0.071
Greek	0.089	0.137	0.018	0.086
Work	0.024	0.09	-0.055	0.057
AA from Different School	0.075	0.096	0.049	0.061
Academic Strain	0.08***	0.038	0.05***	0.024
F Test		2.093***		1.891***
R Square		0.031		0.029

Significance levels (* p < .05, ** p < .01, *** p < .001)

APPENDIX D: TABLE 4

APPENDIX D: TABLE 4

Table 4. General Strain: Predicting Stimulant Use

<u>Measure</u>	<u>Model 1</u>			<u>Model 2</u>		
	b	S.E.	Odds Ratios	b	S.E.	Odds Ratios
Age	-0.09	0.058	0.914	-0.106	0.065	0.9
Gender	0.27	0.253	1.31	-0.006	0.293	0.994
Race	0.253	0.271	1.288	-0.143	0.309	0.867
	-					
Type of Residence	1.158***	0.449	0.314	-0.77	0.47	0.463
Greek	0.859***	0.309	2.36	0.685	0.373	1.984
Work	-0.115	0.254	0.891	-0.103	0.293	0.902
AA from Different School	-0.339	0.269	0.712	-0.011	0.305	0.989
Academic Strain	0.236***	0.103	1.267	0.166	0.119	1.18
Distress	0.152	0.197	1.164	-0.055	0.23	0.947
Anger	0.09	0.125	1.094	0.153	0.138	1.165
Binge Drank (past 2 weeks)				1.007***	0.319	2.737
Used Marijuana (past year)				0.861***	0.309	2.366
Used Other Illicit Drugs (past year)				1.359***	0.437	3.891
Misused Other Prescription Drugs (past year)				1.038***	0.377	2.824
Model Chi Square		40.415***			115.764***	
Nagelkerke R Square		0.126			0.341	

This table shows odds ratios (* p < .05, ** p < .01, *** p < .001)

APPENDIX E: SURVEY

APPENDIX E: SURVEY

Instructions

- You must be at least 18 years of age to participate in this survey
- 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).
- You do not need to answer any question which makes you feel uncomfortable.

1. What is your current age? _____
2. Are you 1. Female 2. Male
3. What is your race
1. White
 2. Hispanic
 3. Black
 4. Asian
 5. Other
 6. Multiracial
4. What is your current year in school?
1. Freshman
 2. Sophomore
 3. Junior
 4. Senior
 5. Other
5. What is your current GPA? _____
6. What is your major? _____
7. Where do you currently live?
1. Residence hall
 2. Fraternity/Sorority House
 3. Off campus in UCF affiliated housing
 4. Off campus in house/apartment
 5. Off campus with parents/relatives
 6. Other _____
8. Are you a member of a fraternity or sorority? 1. Yes 2. No
9. Do you currently work more than 20 hours a week? 1. Yes 2. No
10. Do you have a AA degree from a community college? 1. Yes 2. No

11. How important is academic work?
1. Not important at all
 2. Somewhat important
 3. Important
 4. Very Important
12. How often do you become angry when you receive a lower grade in a class than you believe you deserve?
1. Never
 2. Rarely
 3. Sometimes
 4. Often
 5. Always

The next set of questions is about the use of prescription stimulants (e.g., Adderall, Ritalin, Concerta) for **academic purposes** only. We are only interested in the use of prescription stimulants that have **NOT** been prescribed to you.

13. On how many occasions in the past 12 months have you used prescription stimulants for academic purposes, which were not prescribed to you?
1. Never
 2. 1-2 occasions
 3. 3-5 occasions
 4. 6-9 occasions
 5. 10-19 occasions
 6. 20-39 occasions
 7. 40 or more occasions
14. Please indicate how you obtained the prescription stimulants used for academic purposes, which were not prescribed to you. (circle all that apply)
0. Did not use
 1. From friends for free
 2. From family for free
 3. Stole from friend/family
 3. Bought from friend/family
 4. Bought from stranger
 5. Other _____
15. Which of the following routes of administration have you used for taking prescription stimulants for academic purposes, which were not prescribed to you? (circle all that apply)
1. Orally
 2. Snorting
 3. Smoking
 4. Injecting
 5. Other _____
16. How many of your friends use prescription stimulants for academic purposes, which were not prescribed to them?
1. None of them
 2. A few of them
 3. Most of them
 4. All of them
17. It is acceptable for college students to use prescription stimulants for academic purposes, which were not prescribed to them?
1. Strongly Disagree
 2. Disagree
 3. Neutral
 4. Agree

						5. Strongly Agree
18. How much of a risk do you think college students face (physically or in other ways) if they use prescription stimulants, which were not prescribed to them?						1. No Risk 2. Slight Risk 3. Moderate Risk 4. Great Risk
19. Using prescription stimulants, which have not been prescribed, can be an effective study aid.						1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
20. How difficult would it be for you to get prescriptions stimulants that are not prescribed to you?						1. Very Difficult 2. Difficult 3. Easy 4. Very Easy
In the past 4 weeks, 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	
21. tired out for no good reason?	1	2	3	4	5	
22. nervous?	1	2	3	4	5	
23. so nervous that nothing could calm you down?	1	2	3	4	5	
24. hopeless?	1	2	3	4	5	
25. restless or fidgety?	1	2	3	4	5	
26. so restless you could not sit still?	1	2	3	4	5	

- | | | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 27. depressed? | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 28. that everything was an effort? | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 29. so sad that nothing could cheer you up? | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 30. worthless? | | | | | |

The final set of questions is about substance use:

31. **(Only females answer)** Over the past 2 weeks have you had 4 or more alcoholic drinks in a row? 1. Yes 2. No
32. **(Only males answer)** Over the past 2 weeks have you had 5 or more alcoholic drinks in a row? 1. Yes 2. No
33. In the past 12 months have you used energy drinks that contain alcohol? 1. Yes 2. No
34. In the past 12 months have you used marijuana? 1. Yes 2. No
35. In the past 12 month have you used any synthetic cannabis (herbal incense) products, such as Spice, K2? 1. Yes 2. No
36. In the past 12 months have you used other illicit drugs: cocaine, crack, heroin, LSD, PCP, hallucinogens, inhalants, ecstasy, and/or methamphetamines? 1. Yes 2. No
37. In the past 12 months have you used any prescription drugs **(not including stimulants)** that were not prescribed to you? 1. Yes 2. No

THANK YOU

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