

# Academic Stress and Study Habits: A Preliminary Study of “Study Drug” Use at UIUC

## *Abstract*

The object of this study is to gain a better understanding of how undergraduate students handle academic, social, and professional pressure attached to their role as a student. Specifically, it will examine the relationship between students’ amount of perceived academic stress and their study methods: a habit, routine, or aid which a student believes assists them in fulfilling their responsibilities as a student. The study methods pertinent to this project include drinking coffee, exercising, relaxation techniques (e.g. yoga, deep-breathing, and meditation), smoking cigarettes, “cramming”, pulling “all-nighters”, and “study drugs”. Participants were sampled from among undergraduate students at the University of Illinois at Urbana-Champaign. This research topic is important for understanding one aspect of students’ health and well-being on college campuses. Understanding how students make sense of and cope with the stresses and pressures intrinsic to their role as a student is an integral part of our knowledge about college students and their experiences.

## *Intro*

This study is interested in the extent to which UIUC students experiment with nonconventional, deviant study methods in response to academic strain. Of interest to this study is uncovering the motivations belying the non-medical use of prescription stimulants, and how students rationalize such use. Under a seemingly constant deluge of assignments, impending deadlines, and pressure to excel, undergraduate students are presented with plenty of reasons to

seek out and experiment with study drugs. Additionally, one of the biggest challenges students face in college is learning the best way to study given your individual learning style, academic strengths, and weaknesses. Many students find it difficult to juggle the entirety of their coursework, especially during midterms and finals.

Rates of non-medical prescription drug use in general is empirically higher among college students than the rest of the population (SAMHSA). According to the National Survey on Drug Use and Health (NSDUH), 2.3% of the U.S. population aged 12 and older reported misusing psychotherapeutic drugs in the past month (SAMHSA 2016:22). Comparatively, 4.6% of survey respondents aged 18-25 reported misusing a psychotherapeutic drug (SAMHSA 2016:23). In the 18-25 age group, 2.2% reported misusing prescription stimulants in the past month (SAMSHA 2016:25). These numbers replicate data findings from other studies which show that rates of prescription stimulant misuse is higher among those 18-25 than the general population aged 12 or older.

Prescription stimulants are the most widely misused psychotherapeutic drug in this age group, followed closely by pain relievers (SAMHSA 2016:25). In 2015, 13% of respondents 18-25 reported using an amphetamine or methylphenidate product for a medical purpose as authorized by a doctor; that number increased by 0.6% in 2016 and is statistically significant (SAMSHA 2016). Furthermore, rates of non-medical prescription stimulant use in this age group also rose in 2016 (SAMSHA 2016).

Unfortunately, due to methodological changes, the NSDUH survey does not include estimates of prescription stimulant misuse across a span of more than two years. However, diagnoses of Attention Deficit Hyperactivity Disorder (ADHD) and Attention Deficit Disorder (ADD) have been increasing steadily, leading to a steady stream of prescription stimulants into

the general population. Every year, there are more and more prescription stimulants counted as “missing” by federal and state governments. Some lawmakers worry that these drugs are being redirected to illegal markets on college campuses for non-medical use. These drugs have become increasingly accessible to students, even without a prescription, and that in and of itself increases the likelihood of experimentation. Given these trends, continuing research efforts are paramount to furthering our understanding of how and why undergraduate students use prescription stimulants for non-medical purposes.

## ***Literature Review***

### *Prevalence of Use on College Campuses*

Although the existing data on non-medical prescription stimulant use is only speculative, much quantitative research has been done to measure approximate rates of non-medical use on college campuses. Estimates of non-medical prescription stimulant use rates are varied. McCabe et al (2006) surveyed students at over 100 colleges with nationally representative student bodies. In this study, 4.1% of respondents reported using prescription stimulants illegally in the past year.

However, other studies have yielded higher estimates. Maahs et al (2016) surveyed undergraduate students at the University of Maryland and found that 28% of respondents had used prescription stimulants in the past year. In one preliminary study, Low and Gendaszek (2002) measured prevalence of prescription stimulant use versus “street” stimulant use among undergraduate students at a small, Eastern college. Specifically, this study focused on *illicit* use of prescription stimulants, defined as use without a prescription. 35% of those surveyed reported

non-medical prescription stimulant use in the past year. A small percentage of respondents reported weekly or monthly use. In comparison, 34% of respondents reported using cocaine or MDMA in the past year. Students who used prescription stimulants were more likely to have used illegal stimulants in the past year with or without a prescription. These findings may speak directly to the ubiquity of prescription stimulant use on college campuses.

### *Contributing Factors and Motivations*

As study drugs constitute controlled substances, a lot of research has been done in the disciplines of medicine, public health, and addictive disease that attempts to understand the motivations underlying non-medical use. Many studies in the existing literature base attribute non-medical use to two primary motivations, academic enhancement and recreational use. This literature is not so much interested in the subjective meanings users attach to their non-medical use. Rather, users are portrayed as misguided, misinformed drug abusers. Such beliefs about those who use prescription stimulants for non-medical purposes no doubt stem from the illegality of their use.

For instance, the piece “Nonmedical Prescription Stimulant Use Among College Students: Why We Need to Do Something and What We Need to Do” by Arria and DuPont (2010) appears in the *Journal of Addictive Diseases*. Through synthesizing current discussions present in the literature base on non-medical prescription stimulant use, they contend that the “nonmedical use of prescription stimulants is a complex behavior and should be viewed in the larger context of alcohol and drug involvement among young adults” (Arria and DuPont 2010:417). Non-medical use is trivialized or seen as benign by physicians and students alike. In addition to posing a higher risk of negative health consequences in users without a medical need for the drug, there is no conclusive evidence to suggest that prescription stimulants confer them

any academic or cognitive enhancement. Studies have found that non-medical users tend to have lower GPAs than non-users (McCabe et al 2005; Arria et al 2008). Another study found that non-medical users skip class more frequently and spend less time studying (Arria et al 2008).

Arria and Dupont (2010) correctly point out that non-medical stimulant use, similarly to alcohol and other drugs, poses health concerns to college students; however, defining the issue as *solely* one of addiction and drug abuse hinders our understanding of why college students *in particular* use substances at higher rate than the rest of the population. It is not a coincidence that multitudes of studies have found an association between non-medical prescription stimulant use, other drug use, and dependency or addiction. In particular, there is ample evidence linking non-medical use to binge drinking among college students. McCabe et al (2004) found that 69% of non-medical users frequently practiced binge-drinking compared to 21% of non-users. These results have been replicated (McCabe et al 2006). Moreover, non-medical users are more likely to have used marijuana, cocaine, ecstasy, hallucinogens, and prescription opiates in the past year (McCabe et al 2004, 2006. Even among non-medical users of methylphenidate – a prescription stimulant less frequently prescribed for ADD/ADHD than amphetamine salts (cite?) – binge drinking was more 40% more prevalent than among non-users (Teter et al 2003).

While it is true for many students that college is a site of experimentation, non-medical prescription stimulant use is substantially less prevalent across college campuses than recreational use of illicit substances, namely alcohol and marijuana. Thus, although they may experiment with other drugs, the majority of college students do not experiment with prescription stimulants. A plethora of research currently exists that identifies generalizable factors which contribute to non-medical use among students, less is known about students' underlying

motivations for using which are based upon their unique, subjective experience as a college student.

Of the literature which attempts to discover the more subjective factors contributing to non-medical prescription stimulant use, there are four factors to which college students are uniquely exposed: the pressure to succeed, sociocultural expectations, collegiate lifestyle, and accessibility (Varga 2012). Sociocultural factors include higher social acceptance of non-medical prescription stimulant use among students on campus relative to other types of substance use, namely, “street drugs” (Quintero et al 2006). Unlike users of illegal stimulants like crack-cocaine and methamphetamine, students who use prescription stimulants for non-medical purposes are not thought of as “drug users” by their classmates. Prescription stimulant use is also seen as less serious than other types of substance use. Studies show that college students rationalize their use by minimizing the potential risks of prescription stimulants. Additionally, peers are seen as credible sources of information about the risks and benefits of prescription stimulants. Given the low social stigma surrounding non-medical use and subcultural information about prescription stimulants, college students may perceive little immediate risk from experimentation.

College students may also be motivated to experiment with study drugs because of the stress and pressure inherent in the collegiate lifestyle. Studies show that college students frequently exhibit signs of moderate to severe exhaustion (Babcock and Byrne 2000; Law 2007). In addition to the external pressure of academic workload, students also subject themselves to a substantial amount of pressure. This behavior manifests early on in one’s college career. Studies show that college students perceive getting “poor” grades as a threat to their identity of a “successful student”, especially among those who tended to receive “good” grades in high school (Varga 2012). One’s role as a student is extremely salient in campus communities: it is not the

objective stress of failing a grade or earning a B; instead, it is the subjective stress of over-generalizing the life consequences of a lesser grade” (Varga 2012; 301). If one’s performance is not up to their personal standards of success, they may pressure themselves to such an extent that they are predisposed to experimenting with prescription stimulants.

While the subjective meaning of “success” eludes researchers, external pressures which predispose college students to experimentation have been studied. External pressures can come from a a singular source or a confluence of multiple sources. These include parental pressure, the pressure of college admissions, the pressure of coping with collegiate lifestyle, and the pressures put one oneself (Varga 2012). A central part of the collegiate lifestyle is the intensity of workload. Several studies have documented students’ mindset to ‘just get the assignments done’ (Babcock and Byrne 2000). Given this reality, students are more likely to turn to study drugs in a time of academic need, not necessarily to learn, but to complete their assigned work.

Additionally, external pressure from academic sources tends to compound with students’ other responsibilities, which include but are not limited to extracurricular activities and employment. The confluence of internal and external pressures have been described by students as a never-ending cycle because of which they neglect or entirely abandon other parts of their life besides school work (Varga 2012). One study found that undergraduate students were more likely to experiment with prescription stimulants if they exhibited “perfectionist” attitudes towards their school work. In other words, students who hold themselves to exceptionally high standards of academic performance tend to experiment more than those who are not “perfectionists” (Wogan 1974; Frost 1990). Low and Gendaszek (2002) replicated these results. Further, they found three primary motivations for non-medical prescription stimulant use: intellectual performance, efficiency in completing their work, and for use in combination with

alcohol (Low and Gendaszek 2002). In one study, aiding concentration, facilitating studying, and increasing alertness were the primary motivations students cited for experimentation (Teter et al 2005).

### *Sociological and Criminological Explanations for Study Drug Use*

Much of the existing research on prescription stimulant use is focused on identifying generalizable, demographic characteristics of users; these factors are currently well-established. There is a lack of research devoted to examining *theoretical* predictors of prescription stimulant use, particularly from sociological and criminological disciplines. Contemporary criminological theory is particularly unexplored.

Ford and Shroeder's (2009) seminal study tries to fill this research gap through testing the explanatory power of Agnew's General Strain Theory (1992) for studying non-medical prescription stimulant use, which they conceptualize as "the use of prescription medication without a prescription or use solely for the feeling or experience caused by the drug" (Ford and Shroeder 2009:27). Their study attempts to answer the research question: *is there an association between non-med use of prescription stims and academic strain?* Using data from, Harvard School of Public Health's College Alcohol Study 1999 (Wechsler 2003), the authors sampled 14,000 students from 119 nationally-representative four-year universities from 39 states.

They hypothesized that academic strain would statistically correlate with non-medical prescription stimulant use indirectly through a negative affective state, depression. Respondents were asked to report any non-medical prescription stimulant use in the past year and the past 30 days. Academic strain was operationalized as a disconnect between how much importance a student attached to their academic work and their GPA. "Determined achievers" reported that



they viewed their academic work as important and their GPA was above 3.0. “Apathetic achievers” similarly reported a GPA above 3.0, but did not indicate that their academic work was important to them. “Apathetic underachievers” did not report a GPA above 3.0 nor did they report viewing their academic work as important. These three groups of respondents would not be considered as experiencing academic strain. “Determined underachievers” would theoretically be classified as experiencing academic strain; their reported GPA was under 3.0 and they valued their academic work.

Ford and Shroeder’s study confirmed GST’s theoretical explanation of what contributes to students’ non-medical prescription stimulant use. Academic strain significantly correlated with students’ self-reported levels of depression. Further, depression was significantly correlated with non-medical prescription stimulant use. No association was found between academic strain and illicit drug use (e.g. cocaine). These findings suggest that the relationship between academic strain and drug use is contingent upon the *type* of drug resorted to by the individual under strain as well as the *context* and *origin* of that strain.

Previous studies have confirmed the predictive power of Social Control theory and Social Learning theory for studying non-medical prescription drug use (Peralta and Steele 2010; Maahs et al 2016). Maahs et al (2016) use a broader theoretical framework to examine non-medical prescription stimulant use. Specifically, their study tests the relative explanatory strength of Sutherland’s Differential Association theory (1947), Hirschi’s Social Bond theory (1969), and Merton’s Classic Strain theory (1938). Additionally, each theory is used to predict an association between non-medical use and general deviance. Questionnaires were administered to 10,000 undergraduate students at the University of Maryland. The theoretical hypothesis based on Social Learning theory was confirmed, as students were more likely to have used prescription

stimulants non-medically if they reported regular interaction with “delinquent” friends. The theoretical hypothesis based on Social Control theory was also confirmed, as students who held supportive attitudes of recreational drug use and students who did not perceive social and nonsocial consequences of illegal use were more likely to have used prescription stimulants non-medically. However, although non-medical use positively correlated with reported school importance, academic strain was not a statistically significant predictor of use. Academic strain was both conceptualized and operationalized in accordance with Ford and Shroeder’s (2009) study.

## ***Theoretical Framework***

### *Robert Merton (1938) – Classic Strain Theory*

Analyzing the non-medical use through the lens of his Robert Merton’s classic Strain Theory directly answers the literature bases in psychology, addiction, and public health which primarily view one’s predisposition to experiment with prescription stimulants solely through a biological lens. In the piece, “title here”, Merton (1938) explicates his theoretical contribution to classical criminology. On a fundamental level, Strain Theory posits that social structures and arrangements create societal conditions which may elicit nonconformity in individual behavior. While biologically-centered theories in other disciplinary fields view such behavior as “abnormal”, Merton argues that, given particular societal arrangements, individual responses to stressful conditions are indeed “normal”. In this way, Merton provides us a way to study deviant behaviors that arise based on social and cultural circumstances rather than from individual

abnormalities or quirks. Strain Theory attempts to provide an avenue through which to measure the definite pressure that social structures place on individual members of a given society.

The elements of social structure which contribute to Strain are culturally defined goals, purposes, and interests; these aspects of social structure constitute one's "frame of aspirational reference" through which they assess themselves (Merton 1938:672). Achieving culturally defined goals confers one a certain amount of prestige, depending on the specific goal achieved. In addition to defining one's "frame of aspirational reference", societal arrangements and structures also define, regulate, and control "permissible" and "required" modes of achieving those aspirations. This is done through the establishment and enforcement of regulatory norms; moreover, it is also done through making the moral imperative of achieving a goal through accepted avenues culturally salient. Thus, success is societally defined both in terms of the *outcome* and *process* of trying to achieve one's frame of aspirational reference.

Societies vary in the degree to which the emphasis on achieving culturally-valued goals correlates with the emphasis on providing legitimate, institutional means of attaining them. Merton argues that Strain occurs when an individual is unable to actualize their frame of aspirational reference through legitimate, institutional means. Thus, deviant behavior is a "symptom of dissociation between culturally defined aspirations and socially structured means" of attaining them (Merton 1938:674). For individuals experiencing strain, the question then becomes, "*which available means is most efficient for attaining the socially approved value of my goal?*"

Given that societies *also* vary in the degree to which institutional norms are integrated within the broader societal culture, Merton explains five different adaptations to Strain. *Conformity* is the most common response, as the entire societal order depends on individuals

conforming to conventional expectations attached to their role as a member. *Innovation* is an adaptation in which individuals attempt to mitigate Strain by relinquishing their attachment to legitimate, institutional means of achieving a particular goal, but simultaneously retain their aspirations for success according to group values. *Ritualism* is an extreme assimilation of institutional norms which tends to be chosen by individuals who believe that attaining a culturally-valued goal is out of reach for them, but do not wish to deviate from group values; thus, *ritualism* is a type of *conformist* adaptation as Merton defines them. *Rebellion* is when individuals jettison both outcome and process, creating a new social order for themselves and possibly society writ large. More common than the *rebellion* adaptation, but the least common of all adaptations, is *Retreatism*. This adaptation occurs when an individual recognizes the value of both the outcome and process, but cannot access those institutionalized means. In order to resolve the mental conflict between one's moral obligation to adopt legitimate means versus the pressure to resort to illegitimate means, individuals essentially exit the social order. Merton calls these people "true aliens".

*Robert Agnew (1992, 2002) – General Strain Theory*

In addition to Merton, other classic strain theories focus on negative relationships between individuals and societal structure that result in *goal blockage*, particularly for the lower class (Merton 1938; Cohen 1955; Cloward and Ohlin 1960). Merton's theory in particular is specific to the U.S. working class. Newer strain theories argue that individuals care not just about achieving culturally-valued long-term goals like monetary success. Rather, individuals also attach significant value to achieving *short-term* goals that are culturally-valued (Agnew 1984; Elliot and Voss 1974; Elliot et al. 1985; Empey 1982; Greenberg 1977; Quicker 1974). These approaches are largely ignored or rejected by criminology. Criminological literature typically

focuses on one type of Strain: the failure to achieve aspirations, especially money or middle-class status.

In response to Merton's Classic Strain Theory, Robert Agnew (1992) developed an alternative theory to explain why Strain leads to deviant behavior in some individuals and not others; Merton's theory does not do this. Instead of theorizing a *direct* relationship between Strain and deviant behavior, Agnew's General Strain Theory establishes an *indirect* relationship between the two. He also develops an explanation of three different types of strain, each one founded upon a different type of negative relationship between the individual and societal structures. The type of Strain of interest to this study is the disjunction between *aspirations* and *expectations* (or *achievements*). However, Agnew argues that to adequately measure Strain, three variables must be tested for: 1) the failure to achieve positively valued goals, 2) the loss of positive stimuli, and 3) the presentation of negative stimuli. These types of Strain are theoretically distinct, but may overlap in practice.

As a consequence of failing to achieve one's expectations, Agnew contends an individual will experience *negative affective states*, or negative emotions. An individual can experience one or more types of Strain at a time. Each type of Strain increases the likelihood that an individual will experience negative emotions. The most well-researched negative affective states are disappointment, depression, fear, and anger. Strain can also be chronic, which even further predisposes an individual towards deviant behavior (Linsky and Straus 1986;17; Thoits 1983:69). One may have already exhausted all other non-deviant coping mechanisms as a result of chronic strain. Their threshold for adversity is lowered and they are more likely to be experiencing negative affective states at any given time. One of his earlier studies found that negative affect shares a casual relationship with delinquency in adolescents and deviant behavior

such as drug use in young adults (Agnew 1985a; Agnew 1989). Deviant behavior is thus an attempt to escape, avoid, terminate, alleviate, seek revenge against, or manage negative affective states or stimuli.

## ***Survey Methodology***

### *Research Questions*

This study explores the hypothetical association between academic stress and students' likelihood to use prescription stimulants for non-medical purposes. To this end, it attempts to answer the following research questions: 1) *How do undergraduate students cope with academic stress?*; 2) *What is the relationship between perceived academic stress and preferred study method?*; and 3) *What is the relationship between perceived academic stress and deviant behavior?*.

### *Context and Survey Design*

One hundred undergraduate students (n = 100) the University of Illinois at Urbana-Champaign, a public midwestern university. As of Fall 2016, 33,467 undergraduate students were enrolled full-time at UIUC. Participants were either administered a written survey at a university building, café, or library (n = 10) or completed an online survey through Qualtrics at their own convenience at a time and place of their choosing (n = 90). Participants who completed a survey through Qualtrics did so of their own volition after finding and clicking on an anonymous link which the researcher had posted to several Facebook groups (UIUC Class of 2021, 2020, 2019, and 2018).

The survey consisted of 4 sections totaling 51 questions. Section 1, “Workload” contained six questions asking students about their academic responsibilities. Three of the questions asked respondents how many credits they were taking and approximately how many hours during an average day or week they spend completing class-related work. The remaining three questions asked respondents to indicate how often they felt prepared for class, how often they felt prepared for exams, and how stressed they feel on an average day.

Section 2 contained a 19-item scale designed to measure students’ level of Perceived Academic Stress (PAS Scale). Adopted from Bedewy and Gabriel (year), the PAS scale contains three subsections: 1) Academic Expectations, 2) Workload and Examinations, and 3) Students’ Academic Self-Perceptions. The authors found evidence for the validity and reliability of the PAS Scale (Bedewy and Gabriel year;page). Each subscale attempts to measure a distinct source of negative affect that may contribute to students’ overall level of perceived academic stress. Respondents were instructed to indicate whether they strongly agreed, agreed, disagreed, or strongly disagreed with particular statements. A “neutral” option was included to account for students who felt indifferent to certain statements, as this response could also be an indication of academic stress. One additional question was added to the original PAS Scale by the researcher to measure negative affect resulting from having to juggle academic and social responsibilities: *“I struggle to balance my school-work and social life”*.

Section 3, *Study Methods and Habits*, contained 7 questions asking students about their use of conventional and deviant (non-conventional) study tools. A study tool includes any habit, routine, or aid which a student believes assists them in fulfilling their responsibilities as a student (drinking coffee, exercising, relaxation techniques (e.g. yoga, deep-breathing, and meditation), smoking cigarettes, cramming, pulling “all-nighters”). These behaviors constitute “conventional”

study habits for college students. Respondents were instructed to indicate which of the conventional study tools they have tried as well which one they believe works best for them. The former item contained an open-ended “other” option. The latter item was an open-ended question with no closed-response options. The remaining five questions centered on non-medical prescription stimulant use, conceptualized in this study as a “non-conventional” study tool. Consequently, non-medical use constitutes “deviant” behavior. Respondents were asked if they knew someone who has experimented with prescription stimulants and how many students they thought have experimented with prescription stimulants for academic purposes. In addition, respondents were asked to indicate whether or not they personally have experimented with prescription stimulants for such purposes. Finally, respondents were asked to approximate how much benefit they perceive from using prescription stimulants.

Section 4 contained mostly demographic questions, which are detailed below. The rest of this section asked students if they were involved in any extracurricular activities, employed, or a member of Greek Life on campus.

### *Sample Characteristics*

Most of this sample of students consisted of freshman (35%). 15% were sophomores, 27% were juniors, and 23% were seniors. Students’ ages ranged from 18-26, however, approximately 90% of students were between the ages of 18 and 21 (n = 92). Females were overrepresented and males were underrepresented, comprising 71% and 26% of the sample, respectively. Additionally, 68% identified as women and 26% identified as men (n = 92). Most of the sample were *not* a part of Greek Life (79%). Most of the sample also reported being unemployed (54%). The vast majority of students were domestic students (93%). Finally, a slight



majority of students were white (52%). Asian/Pacific Islanders (26%) and Hispanic/Latinx (7%) were the next highest represented racial/ethnic groups.

### ***Interview Methodology***

Interviews attempt to answer the following research questions: 1) *How do undergraduate students cope with academic stress?*; 2) *What is the relationship between perceived academic stress and preferred study method?*; and 3) *What is the relationship between perceived academic stress and deviant behavior?*. Given the small sample size that reported non-medical prescription stimulant use, and given that this study did not screen respondents for medical need, interviews are geared towards discovering how students perceive, describe, and make sense of academic stress. Interviewees were asked questions about how they perceived their workload, how they manage that workload, and how they cope with the stress of collegiate life. Three undergraduate students were interviewed, two women and one man. Open codes were created from each individual interview, then axial coding was used to find and categorize thematic similarities across the interviews.

### ***Data and Variables***

Independent Variables:

#### ***Academic Strain***

Strain is conceptualized two ways: one that is consistent with Merton's (1938) Classic Strain Theory (CST) and one that is consistent with Agnew's (1992) General Strain Theory (GST). As per Merton's theory, Strain is conceptualized as the tension resulting from the socio-cultural importance of completing a bachelor's degree and students' perceived inability to live up

to such an expectation. As per Agnew's theory, Strain is conceptualized as the disjunction between academic aspirations and outcomes.

*Academic aspirations* are measured by items 1-5 on the PAS Scale. *Academic outcomes* are measured by operationalizing how often a respondent feels prepared for class, feels prepared for exams, and their reported grade point average (GPA).

#### *Negative Affective State*

Negative Affective State is a variable unique to General Strain Theory. When students' academic aspirations do not match with academic outcomes, that individual is categorized as being under Strain. Consequently, according to GST, that individual will experience Negative Affective States including but not limited to anger, frustration, hopelessness, inadequateness, and academic stress.

#### *Dependent Variable: Prescription Stimulant Use*

Although Merton (1938) and Agnew (1992) theorize a different causal relationship between strain and deviant behavior, both theories hypothesize that individuals under Strain are more likely to resort to deviant behavior as they attempt to ameliorate their condition or achieve a more desirable outcome. Survey question #35 estimates how many respondents have experimented with prescription stimulants for academic purposes. Respondents were asked to indicate "yes" if they had experimented and "no" if they had not.

#### *Operationalizing Academic Strain*

In this study, Strain is conceptualized in two theoretically distinct ways; however, Strain is operationalized using only one aggregation technique. The Strain variable is operationalized as

the disjunction between academic *inputs* and *outputs* so as to categorize respondents into two groups: those who are under strain and those who are not under strain.

Academic *inputs* were measured by two survey questions: “*On an average day, how much time do you spend doing class-related work? (Homework, studying, etc.)*”; “*During an average week, how much time do you spend doing class-related work? (Homework, studying, etc.)*” Response categories for the first measurement were coded 1-3 (1 = *less than an hour*, 2 = *1-3 hours*, 3 = *3+ hours*). Response categories for the second measurement were coded 1-4 (1 = *1-6 hours*, 2 = *6-12 hours*, 3 = *12-18 hours*, 4 = *18+ hours*). The sum of the two *input* measurements was used to stratify respondents into two groups: *high input* or *low input*.

Academic *outputs* were measured by three survey items: self-reported GPA; “*How often do you feel prepared for class?*”; “*How often do you feel prepared for exams?*” Response categories for self-reported GPA were coded 1-4 (0 = *prefer not to say*, 1 = *2.0 – 2.5*, 2 = *2.5 – 3.0*, 3 = *3.0 – 3.5*, 4 = *3.5 – 4.0*). Response categories for class preparation were coded 1-4 (1 = *never*, 2 = *some of the time*, 3 = *most of the time*, 4 = *always*). Response categories for exam preparation were coded 1-4 (1 = *never*, 2 = *some of the time*, 3 = *most of the time*, 4 = *always*). The sum of the three *output* measurements was used to stratify respondents into two groups: *high output* or *low output*.

A *low input* score was recoded to have a value of 0 while a *high input* score was recoded to have a value of 1. Likewise, a *low output* score was given a value of 0 and a *high output* score was given a value of 1. Respondents were then stratified into four groups based on the disjunction between a respondents’ academic input and output. The recoded output score was subtracted from the recoded input score. If the difference between a respondents’ scores equaled -1, their academic outputs exceeded academic inputs. If the difference between a respondents’

scores equaled 0, they were labeled as *under no strain*, as academic inputs match academic outputs. If the difference between a respondents' scores equaled 1, they were labeled as *under strain*, as academic inputs exceeded academic outputs.

### *Operationalizing Negative Affect*

In previous studies that have tested general strain theory, negative affect tends to be conceptualized as anger and/or depression, negative affects which some scholars contend to be most closely associated with crime and deviance (Agnew 1992). However, other definitions negative affect have not been thoroughly explored. Given the centrality of hard-work and stress to university living, it is surprising that Negative Affective State has not been conceptualized as stress in order to test the relationship between academic strain and non-medical prescription stimulant use.

In an effort to add to the literature base a new model of GST, negative affect is conceptualized in this study as *perceived academic stress* (PAS). Respondents' levels of PAS are measured by items 6-19 on the PAS Scale. Each item on the score followed likert-scale structure and were coded 1-5, with higher scores indicating increasing levels of perceived academic stress (*1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree*). Perceived academic stress is also measured by an item external to the PAS scale: "*How much school-related stress do you experience on an average day?*". Response categories were coded 1-4 with higher scores indicating greater levels of perceived academic stress (*1 = none, 2 = low, 3 = moderate, 4 = high*).

### *Operationalizing Non-Medical Prescription Stimulant Use*

Non-medical use was measured through one survey item: “*Have you ever tried a study drug? (e.g. Ritalin, Concerta, Adderall, Vyvanse)*” No measure of use frequency was collected. Non-medical use was operationalized as a dichotomous variable (*0 = has not used, 1 = has used*).

### *Control Variables*

Six dummy variables are present in the data analysis, measured as dichotomous dummy variables, in order to control for spurious relationships between respondents’ demographic characteristics and non-medical prescription stimulant use: sex (male = 1), gender (man = 1), race (white = 1), Greek life (member = 1), GPA (under 3.0 = 1).

### ***Quantitative Analysis Strategy***

A structural equation model (SEM) is created in Stata and used in order to examine the relationship between academic strain and non-medical prescription stimulant use. Specifically, the SEM is designed to test the hypothesis that academic strain and non-medical use are significantly associated indirectly via perceived academic stress (PAS). In the model, academic strain and perceived academic stress are both latent variables.

One-factor confirmatory factor analyses (CFA) are used to assess both measurement portions of the model, which are latent measures of academic strain and perceived academic stress. The CFA test determines acceptability of factor loading as well as model goodness-of-fit. For structural equation models, acceptability and goodness-of-fit are determined by a chi-square test. A non-significant chi-square indicates that the model adequately fits the theoretical relationship it is designed to test. A significant chi-square value suggests that there may be other

paths or associations between the variables unspecified in the model. These additional associations may be confounding or spurious. Although the sample size yielded by the survey is smaller ( $n = 100$ ), decreasing the likelihood of a significant chi-square value, it is still important to examine additional measures of model goodness-of-fit. These additional measures include: Bentler's Comparative Fit Index (CFI) and the Residual Mean Squared Error Approximation (RMSEA). A CFI score of 0.90 indicates adequate goodness-of-fit, while a score of 0.95 or higher indicates good model fit (Newcomb 1994). A RMSEA value of 0.05 or lower indicates good model fit (Browne and Cudek 1993). If the model is theoretically plausible given Agnew's GST, and the goodness-of-fit statistics indicate good model fit, we can have confidence that the data fit the structural equation model.

A two-factor confirmatory factor analysis (CFA) is performed to assess model fit between the two latent variables. After performing CFAs and determining goodness-of-fit for both latent and manifest variables in isolation, the entire structural equation model is run to test the hypothesis that academic strain and non-medical prescription stimulant use share a significant, albeit indirect, association via perceived academic stress.

In addition, Spearman's rank correlation is used to test the hypothesized relationships between the academic strain and perceived academic stress and also between perceived academic stress and non-medical use. It is also used to examine correlations between non-medical use and demographic characteristics of respondents.

## ***Quantitative Analysis Results***

### *Workload and Academic Strain*

Sample characteristics are displayed in Table 1.1. Academic input scores indicate that the sample overall exhibited high levels of academic input. Nearly half (49%) of respondents spend more than three hours per day studying or doing homework. Estimated hours per week spent studying or doing homework are split somewhat evenly between the highest categories: 30% spend 6-12 hours per week, 31% spend 12-16 hours per week, and 31% spend more than 18 hours per week studying or doing homework. Most of the sample (68%) scored in the “high input” range.

Very few respondents reported that they “always” feel prepared for class (5%). Likewise, only 4% of respondents reported that they “always” feel prepared for exams. 57% of respondents indicated that they feel prepared for class “most of the time”. Roughly one-third of respondents said that they feel prepared for class “some of the time”. Roughly equal portions of the sample reported that they feel prepared for exams “some of the time” or “most of the time”. Over half of respondents (59%) scored in the “high output” range.

Most of the sample was coded as being under no strain (61%). Some variability was lost in the aggregation technique; however, it can be assumed that, for these respondents, academic inputs equaled academic outputs. For 15% of the sample, academic outputs exceed academic inputs. These individuals would not be experiencing academic strain because, while there is a disjunction between input and output level, the difference is positive instead of negative. Approximately one quarter of respondents (24%) were coded as being under academic strain, as the level of their academic input exceeded the level of their academic output.

A respondent could be coded as not experiencing any academic strain and still be experiencing academic stress on an average day. Only 12% of respondents said that they experience “none” or “little” academic stress on an average day. Half of respondents (52%)

reported experiencing a “moderate” amount of academic stress on an average day. Over one-third (36%) of respondents reported experiencing a “high” amount of academic stress on an average day.

### *Perceived Academic Stress Scale*

Section 2 of the survey contained a scale designed to measure respondents’ level of *perceived academic stress* (PAS). Items contained in this scale corresponded to an external source of stress identified in the current literature base surrounding stress and university life. These subsections were: 1) stresses related to academic expectations, 2) stresses related to faculty, work, and exams, and 3) stresses related to academic self-perception.

The first subsection measures stresses related to academic expectations. Table 2.2 displays the frequency of answers in each response category. Table 2.3 lists the median values for each item, a more accurate representation of response frequencies than calculating the mean value given that PAS was measured along a Likert scale. Roughly one-third of the sample “agree” that competition with their peers for good grades is quite intense; one-quarter of the sample “strongly agree”. In sum, 58% of respondents either agree or strongly agree with that statement. 36% of respondents agreed that teachers are critical of their academic performance; however, the median value of this item is 3, meaning that “neutral” is the most likely response category. Frequencies of response categories for items 9 and items 13 stand in juxtaposition to the previous two items. Roughly 40% of respondents indicated that they disagreed that teachers had unrealistic expectations of them. Roughly one-third (34%) of respondents disagreed that the unrealistic expectations of their parents cause them stress.



The second subsection measures stressed related to the amount of work professors assign, workload, balancing employment with school, and exams. A little over one-third (37%) of respondents “disagree” that the amount of time they allocate to class and academic work is “enough”; another 6% of respondents “strongly disagree”. However, the median value of this item (item 4) is 3, indicating that “neutral” constitutes the average response to this particular question. Similarly, there is a mismatch between the median value of item 10 and the most frequent response categories. The median for this item is also 3, indicating that the average response is “neutral”. However, almost half of respondents (49%) either “agree” or “strongly agree” that the size of the curriculum and workload is “excessive”. Nearly the same percentage of respondents “disagree” and “agree” that the amount of work they are assigned is “too much” – 29% and 30% respectively. 47% of respondents either “agree” or “strongly agree” that they are unable to catch up if they fall behind on their school work. Item number 5 pertains to respondents’ perceived ability to balance their academic and professional responsibilities. 57% of respondents either “disagree” or “strongly disagree” that they have enough time to relax after work; the median value 2 corresponds with the frequency of these response categories. Items 15, 16, and 17 pertain to stresses surrounding examination questions and times. Based on the median value of item 15, the average respondent “agrees” that exam questions are “usually difficult”. Roughly equal proportions of respondents are either “neutral” or disagree that exam times are too short for them to complete all of the questions. The majority of respondents (66%) either “agree” or “strongly agree” that examination times are “very stressful” for them.

The last subsection contains items pertaining to stresses originating from students’ academic self-perceptions – that is, how they view themselves as students. The majority of respondents (77%) either “agree” or “strongly agree” that they are confident that they will be a

“successful” student. Relatedly, the majority of respondents (65%) either “agree” or “strongly agree” that they are confident that they will be successful in their future career. Based on the median value of item number 3, most respondents are “neutral” that they can make academic decisions easily; however, respondents more frequently answered “disagree” or “agree” to this particular item. Based on both the median value and the most frequent response category of item 7, it appears that the average respondents “disagree” that they fear failing courses this year. A little over half of respondents (51%) either “disagree” or “strongly disagree” that they believe their worry about exams is a “weakness of character”. 66% of respondents either “agree” or “strongly agree” that, even if they perform well on exams, they are worried about finding employment. 60% of respondents “agree” or “strongly agree” that they struggle to balance their school-work and social-life.

### *Study Drug Use*

This study found a use-rate for non-medical prescription stimulant use that falls on the moderate to high end of those documented in the current literature base. 20% of respondents indicated that they had experimented with a study drug at least once. Almost one-third (27%) had been asked by a peer if they knew how or where to find a study drug. 66% of respondents knew someone that had used a study drug for academic purposes. One-third of respondents (31%) estimated that “less than half” of UIUC students have experimented with a study drug. Almost half of respondents (47%) estimated that “about half” of UIUC students have experimented with a study drug. Roughly 14% of respondents estimated that “almost everyone” who is a UIUC student has experimented with a study drug. Almost half of respondents that have experimented with a study drug (47%) reported that they perceived a “moderate” benefit from the prescription

stimulant. Roughly 32% of respondents reported that they perceived “a lot” of benefit from the prescription stimulant.

### *Structural Equation Model (SEM)*

In order to determine if the individual observed variables which were coded to construct an operationalized measure of *academic strain* load onto a single construct and are represented adequately by the model, a one-factor confirmatory analysis is performed. Table 6.1 displays the results of the CFA. With the exception of the variable *hours per week*, which is constrained at 1, all factors are allowed to vary freely. The chi-square value is not significant, and the other two goodness-of-fit statistics indicate good model fit (RMSEA = 0.000, C.F.I. = 1.000). Thus, we can be confident that the measurement model is an accurate model of academic strain.

A one-factor confirmatory factor analysis (CFA) is conducted in order to determine if the items intended to measure *perceived academic stress* load on a single construct, or the subsection to which they belong. Three CFA tests are done, one for each subsection on the scale. The first CFA done is for the subsection pertaining to stresses related to academic expectations. For this subsection, all responses are coded 1-5, with a higher score indicating higher levels of perceived academic stress. The results of this CFA are shown in table 7.1. All standardized factor loadings are statistically significant and in the expected direction. The chi-square value is not statistically significant. The other two goodness-of-fit statistics indicate good model fit (RMSEA = 0.05, C.F.I. = 0.984). Thus, we can be confident that this subsection of the PAS scale is an accurate measure of perceived academic stress related to academic expectations.

A one-factor confirmatory factor analysis done to determine whether items contained in the subsection pertaining to stress related to faculty, work, or exams load onto a single construct.

The results of this CFA are shown in table 7.2. For this subsection, all responses are coded 1-5. For items number 10, 11, 12, 15, 16, and 17, a higher score indicates higher levels of perceived academic stress. For item number 5, a higher score indicates lower levels of academic stress. With the exception of item number 4, which is constrained at 1, all factors are allowed to vary freely. All factor loadings are statistically significant with the exception of item number 17. The chi-square value is not statistically significant, indicating good model fit. Additionally, the two other goodness-of-fit statistics indicate good model fit (RMSEA = 0.000, C.F.I. = 1.000). Thus, we can be confident that this subsection of the PAS scale is an accurate measure of perceived academic stress related to faculty, work, and exams.

A one-factor confirmatory factor analysis is done to determine whether items contained in the subsection pertaining to stress related to academic self-perceptions load onto a single construct. The results of this CFA are shown in table 7.3. For items number 1, 2, and 3, a higher score indicates lower levels of perceived academic stress. Conversely, for items number 7, 8, 18, and 19, a higher score indicates higher levels of perceived academic stress. With the exception of item number 1, which is constrained at 1, all factors are allowed to vary freely. All factor loadings are statistically significant and in the expected directions. The chi-square value is not statistically significant. The two other goodness-of-fit statistics indicate good model fit (RMSEA = 0.000, C.F.I. = 1.000). Thus, we can be confident that this subsection of the PAS scale is an accurate measure of perceived academic stress related to academic self-perceptions.

When the entire structural equation model was run, fifteen iterations were ran but no convergence was found. Thus, while the specific subsections of the PAS scale fit well within the model, it did not prove useful for testing the entire hypothesis that academic strain is significantly correlated with drug use indirectly via perceived academic stress. Consequently,

Spearman's rank correlation was run to examine the relationship between academic strain and perceived academic stress and also between perceived academic stress and drug use. Spearman's rank correlation determined the strength and direction of the monotonic relationship between two variables. A relationship is monotonic when a) as the value of one variable increases, the value of the other variable also increases, or b) as the value of one variable increases, the value of the other variable decreases.

Results for the Spearman's rank correlation test between *academic strain* and *perceived academic stress* are shown in table 8.1. No strong statistical associations were found between being under academic strain and any of the items measuring perceived academic stress. However, the rho value of items number 1, 7, 9, 14, 15, and 16 are statistically significant. Academic strain and item number 1 share a weak negative association. Academic strain and item number 7 share a weak positive association. Academic strain and item number 9 share a weak positive association. Academic strain and item number 14 share a weak positive association. Academic strain and item number 15 share a weak positive association. Academic strain and item number 16 share a weak positive association.

Results for the Spearman's rank correlation test between *perceived academic stress* are shown in table 8.2. No strong statistical associations in either direction were found between any of the items measuring perceived academic stress and study drug use. However, the rho value of items number 3, 9, and 15 are statistically significant. Item number 3 and study drug use share a weak negative association. Item number 9 and study drug use share a weak positive association. Item number 15 and study drug use also share a weak positive association. A spearman's rank correlation test was run between academic strain and study drug use, but the test did not yield significant results. These are shown in table 8.3.

## *Qualitative Analysis Results*

### *Interviewee #1*

Andra, a freshman majoring in Electrical and Computer Engineering, reports that her workload is, for the most part, manageable. She reports having mostly online homework for the majority of her classes, which are due regularly. She appears to describe these online assignments as low stakes: “So you have questions and you have unlimited attempts to answer the questions, so you can understand what’s going on and take them at your own pace.” While Andra recognizes that her online homework assignments are designed in order to facilitate learning the material, she attributes some of her stress surrounding school to the regularity of her online homework: “But it also kind of contributes to the stress because sometimes...there’s so much work to do all together that you don’t get time for anything else, really.” Andra describes her usual level of academic stress to be “there all the time... with peaks in between.”

Although manageable throughout most of the academic year, Andra says that her workload is contingent on what part of the semester it is. It fluctuates, becoming significantly more strenuous by the end of the semester: “...when it’s closer to midterms, my workload definitely increases by a lot because there’s homework and there’s midterms and there’s all of it going on together.” The confluence of her academic responsibilities makes certain portions of the academic year particularly stressful. Her level of academic stress concurrently peaks during these portions of the academic year. Despite having online homework due regularly, examinations cause her more stress than completing homework assignments because they occur simultaneously with other due dates and academic responsibilities. She contends that the majority of her peers that share her major also share in her perception of the curriculum and

workload: “I think in general people in my major... are stressed at all times, no matter which year they’re in... I just feel like it’s a general thing.”

During those portions of the academic year where all of her work compounds, Andra reports being so stressed such that she believes her body functions differently:

*“Well, I think when I’m stressed out I kind of... limit the amount of sleep that I take. Like, the amount of sleep that I need reduces by a lot because I just won’t feel sleepy. I won’t feel hungry. I just kind of, stop feeling.”*

When asked if she thought that having multiple due dates converging is a stress-inducer which is unique to university life, Andra says that she “pretty much like[s] the system,” and works “well” under a “little bit” of stress. She argues that, when she is moderately stressed, she tends to be more “efficient” than when she is not experiencing some level of academic stress. Her belief in her ability to thrive under stress is illustrated by the multiple extracurricular activities she is a part of, including being a cafeteria employee at ISR. While she enjoys being under a little bit of stress, Andra reports that loving what she is studying and loving her major overall means that she doesn’t necessarily mind her substantial workload.

Andra describes herself as “anti-substance,” and has never experimented with study drugs, tried energy drinks, or drank coffee. In addition to loving her studies, Andra reports using relaxing, un-winding study methods to sustain her endurance during long study sessions: “...when I feel like I’m too worked up and I’ve done a lot of work, I just go outside, and I take a walk, and a take a picture of myself and I feel better.” She also reports that keeping in touch with her family helps to keep her grounded and alleviates some of her stress, especially during those times in the academic year which are particularly stressful. In addition to having a built-in

support network back home, Andra is co-leader of a peer group for women in the Electrical and Computer Engineering department. She organizes “lean-in” sessions, which are organized every two weeks and function as a supplementary social support network while she is away at school. Rather than exacerbating her stress, Andra reports that having a network of women in her department to talk to about her stress, discuss her problems, and meet new people makes her “feel better” about her substantial workload. These lean-in sessions allow her to see that others are “suffering” more than she is, or at least “going through the same things,” which alleviate some of her academic stress.

Although Andra enjoys interacting with other women in her department, she says that participating in study sessions with her peers does not help her at all, and in fact, causes her a significant amount of stress:

*“I have a lot of acquaintances and... when the exams come together and everyone wants to get in touch and they want to know what’s coming up and they want solutions to the answers... answers to their I think the peer pressure builds up... that is what stresses me out the most, when I have 25 people asking me what this is and that is before a midterm when I don’t know what they are.”*

During crucial times in the academic year, Andra receives a significant number of requests for academic assistance. She argues that this “peer pressure” is a primary contributing factor to her levels of academic stress and has had to learn how to say “no” to her peers when their requests become excessive. Another reason that she does not study in groups with her peers has to do with her preferential study time. Andra reports staying up all night to study and sleeping during the day. She believes that her study schedule does not jive well with her peers’.



*Interviewee #2*

Christina, an undeclared sophomore with the intention to declare a major in Cinema Studies in Sports with a minor in Journalism, says that she was not prepared whatsoever for the robust workloads and substantial stress that come packaged with collegiate life. According to her, her high school treated students like they were “babies” instead of “people”, causing her to be ill-equipped to handle her workload completely on her own. Consequently, she reports feeling more stressed about completing her regularly-scheduled homework assignments than examinations:

*“I’m adamant on getting really good grades on my assignments. Just because, like, they’re a lot of little points that add up in the end. Whereas my exams, like, I’ve been relatively lucky with having professors that drop the lowest score... But if I don’t really focus on the homework assignments, I have no prior knowledge going into the exam so I expect to get a bad grade.”*

Her assignments, while not numerous, are still significant enough in the grand-scheme of her grade to cause academic stress; however, Christina reports prioritizing certain assignments above others. For two of the classes in her major, she is assigned reading that corresponds to the class lecture; she is not assessed for completion or comprehension. While she recognizes the utility of completing those readings on time for understanding the class lecture and completing future assignments, she reports having to prioritize her other assignments:

*“... if I’m being totally honest with you, I don’t do the readings because I have so much other stuff to get done. I just don’t bother doing them even though I know that I should. Not even that they would stress me out if I did so. I’m taking world religions right now to cover one of my*

*gen-eds, and it's a lot of reading. Like, I could totally do them if I put the time into that. But if I put that time into doing the reading, I would lose time for my other assignments."*

The combination of regularly-assigned reading, weekly assignments, and longer-term monthly assignments leaves Christina feeling like her academic responsibilities are zero-sum. For Christina, it is not completing the assignment or reading itself which causes her to perceive academic stress. Rather, she perceives a direct trade-off between completing an assignment or doing a reading and her ability to fulfill her other academic responsibilities. Consequently, she habitually forgoes her reading assignments, although they are due more frequently than the weekly and monthly assignments which she prioritizes above them. Christina argues that prioritization is her way of balancing the workload of courses in her major with general education courses. However, Christina also reports that her habit of prioritizing certain assignments above others causes her a fair bit of academic stress because she is uncertain as to what exactly she ought to be prioritizing: "...it is definitely stressful having to prioritize because I don't know what to do over one." Sometimes, she will skip her 10 AM lecture in order to get more sleep because she is confident with her standing in the class.

Christina describes her current academic stress level as a 6 out of 10, which appears to be a relatively low amount of academic stress for her:

*"...right now I'd say about a 6, I guess. Just because I have... a lot of my assignments done and... at least started if they're not due yet... I touch base with each of them so I know what I have assigned and what type of assignment I have to do. But they're not due yet, so it doesn't really hit."*

Christina attributes a lot of her academic stress to due dates and having to juggle competing deadlines. Moreover, Christina repeatedly reiterates her belief that the onus is on her to complete her work on time and fulfill her academic responsibilities. Her go-getter attitude is exemplified by her laundry list of extracurricular activities and responsibilities. She is on the executive board for Illini Pride, a chair of the Orange Crush organization, and a sports journalist chair. While she believes in her ability to handle these extra responsibilities, she does report experiencing additional stress due to the combination of academic and extracurricular responsibilities:

*“...it’s not my position yet because we haven’t had the transition meeting, so once we do, then I’ll be taking on their responsibilities... so that’ll definitely add on a good amount of responsibility. Which, obviously, I can handle, but like, you know, it’s something else that I have to worry about along with my classes.”*

Christina exhibits significant confidence in her ability to handle simultaneously her academic and leadership responsibilities. Part of her confidence stems from her belief that the internal pressure she places on herself to succeed is larger than other external pressures to succeed, including pressure from her professors. She also believes that her professors understand her need to prioritize certain assignments and courses above others, meaning that she does not experience significant academic stress due to her professors’ perceptions of her.

Christina’s preferred study methods include stimulating agents like coffee and red bull, as well as certain organizational methods which she uses throughout the academic year. For instance, she has one five-subject notebook where she takes notes during her classes, and other single-subject notebooks. She transposes her notes from class into these individual notebooks and color-codes them for easy accessibility and comprehension later on while she is studying.

She reports that using these organizational techniques alleviates some of her academic stress:

“It’s *incredible*...I love it, I *love* it. It’s something I really enjoy.” These particular study methods are proactive. Christina also proactively seeks out friends in her classes to form future study groups with, and reports that studying in groups with her peers helps her a lot. While she is studying for an exam, doing a longer homework assignment, or completing her work during particularly stressful portions of the academic year, Christina reports cramming, forgoing sleep, and drinking “copious” amounts of coffee and Red Bull. She recalls three specific nights last semester in which she did not sleep at all:

*“Like within the week, I had one, skip a day, one, skip a day, one, skip a day. It wasn’t that bad, no. I drank copious amounts of red bull. Copious amounts of coffee. I was all caffeine, no food.*

*Literally. I was eating, but like, I wasn’t like, going home cooking for myself.”*

For Christina, it seems as though academic stress takes priority during these times in the semester such that she ignores her responsibilities to her body. She describes cramming, not sleeping, and drinking “copious” amounts of coffee as her, “in a nutshell.” She prefers stimulating study methods not because they help her focus on her school work, but because they help her stay awake for longer periods of time. Such rhetoric suggests that, for Christina, these types of study methods are normal and expected during strenuous times in the academic year.

Although well-acquainted with certain stimulants like caffeine, Christina has not experimented with study drugs in college; however, she did use Adderall non-medically in high school in order to take the ACT. She said that taking a study drug did not yield better results. Despite having peers who regularly use study drugs for academic purposes, Christina has not heard of anyone experiencing negative side-effects from using prescription stimulants non-medically: “I do know a couple girls that have. They’ve always said that they just focus for

hours. I've never really heard anything other than that." Christina is familiar with students' motivations to experiment with study drugs for the purpose of focusing on their academic work. Not only is Christina sympathetic to this particular motivation, she believes in the ability of study drugs to enhance one's ability to focus. For this reason, she thinks of study drugs as categorically different than other types of drugs:

*"I think that Adderall is in a different category. I've never heard of anybody taking Adderall at like a music festival or like, just to do as a drug on the side, like how people smoke weed all the time. Like, I've never heard anyone say, let's go pop some Adderall, guys! Like, no one really does that. I feel like it's more towards the educational, not educational, like the school aspect considering that it does help people focus in class and pay attention to what they're doing. So I consider it in a different category."*

In addition to recognizing and being familiar with students' non-medical motivations to use prescription stimulants, Christina reports that she does not view students' who experiment with study drugs as "drug users." Although she does not take an opposing stance to study drugs, she reports that she has "never gone out of [her] way to find somebody who has Adderall."

### *Interviewee #3*

Johnny, a junior currently majoring in Kinesiology but planning to switch his major to Economics, reports that he is "trying to keep [his] sanity" while juggling a substantial academic workload, playing hockey, and keeping up to date on his assignments. He reports that "just keeping track of everything and maintaining the schedule" is "kind of tough because the workload's a lot." Johnny also reports experiencing significantly more stress due to exams than completing regularly-scheduled assignments because, in the classes he is currently taking,

examinations are weighted very heavily. In order to cope with this stress, Johnny says that he prioritizes studying for exams over his other assignments:

*“Because there’s so many other things on your plate. Let’s say you have an exam. Like tomorrow I have an exam for calc. And that’s like the main thing I’m worried about right now because I got to get a good grade on it... So, I think, yeah, having other priorities coming up in your schedule can really influence a change of behavior in what I’m really focusing on.”*

Although Johnny prioritizes his exams because he is more worried about receiving a good grade than he is with other assignments, it appears that prioritization causes him as much stress as it supposedly relieves. To some extent, Johnny views this trade-off as an inevitable aspect of being a college student: having to prioritize one thing at the direct expense of another: “I try to prioritize exams and then, I don’t know, I’ll just forget to do something and I’ll be like, (sigh), that’s not good. And then I’ll get stressed out.” For Johnny, forgetting about an assignment is due even in the wake of having to take a heavily-weighted exam causes him significant academic stress. In fact, forgetting an assignment compounds on and exacerbates whatever stress he is currently under: “I think it does add a little bit every so often if I forget to do an assignment. It will just add a little bit more stress to me already stressing out about, like, an exam. It kind of just builds up.”

Johnny describes his overall levels of academic stress as a constant build-up which alleviates only briefly after an examination date passes. His constant academic stress, especially surrounding exams, is in part due to the substantial value he attaches to his grades. He reports viewing his grades as a reflection of his abilities as a student which have significant implications for his future success in his new major and in life after college:

*“Because then I would be stressing out about...going into econ, like am I gonna do well in econ because I’m struggling a little bit in calc? And then that can carry over into other classes that might require calc. And I’ll just think like, oh man, is this gonna be my future? Because I want to do this. But if I can’t succeed in calc, then where am I gonna end up?”*

As a member of the hockey team, Johnny worries about the trade-off between his athletic responsibilities and his academic responsibilities, although overall he “can’t imagine not playing.” He also reports that, sometimes, playing hockey relieves his stress: “...sometimes it relieves my stress and I can just forget about school.” Having hockey as a part of his daily routine helps him decompress from the constant academic stress and focus on something other than his school-work. However, during practice he sometimes worries that he is spending several hours playing sports as opposed to studying or doing class-related activities.

Johnny’s preferred study methods include drinking coffee, listening to music, and using organizational techniques throughout the academic year. He has a particularly interesting relationship to his planner. He reports that he stopped using his planner because he “had a tendency not to look at it” and keep track of his schedule off the top of his head. He ceased using his planner because, although he would fill it out regularly, he would not check it regularly and consequently forget to do assignments. Quitting his planner both relieved and created academic stress for Johnny: “it kind of relieved the stress, not having it, but it probably created new stress because I was worrying about something else.” That “something else” Johnny is referring to is the possibility that he will inevitably forget an important part of his school work because he has a plethora of academic responsibilities on his plate at one time. With or without his planner he experiences academic stress for this reason; however, he still feels guilty for quitting his planner.

Instead of his planner, Johnny uses sticky notes to remind him of important assignments as they come up in his course schedule.

In addition to using sticky notes proactively, Johnny reports using both stimulating and relaxing study methods, including drinking coffee, listening to music, and having a “study beer”. He enjoys finding new genres and artists to listen to while studying: “I think I like cancelling out the noise around me and just listening to whatever I feel.” He also reports drinking coffee “most days of the week.” He says that the primary reasons he drinks coffee is to get through classes on days where he does not get adequate sleep due to academic stress: “...I usually have coffee most days of the week. And it helps me get through class and stuff, but I don’t think I’m that productive.” However, when the caffeine wears off and he is “fed up” with school, Johnny will have a “study beer”, which helps him relax and focus on his school work: “Whereas maybe later in the day once all my classes are done I can have a study beer or just like focus on – I don’t know – just not be as upbeat I guess – mentally upbeat.” It is interesting that, although Johnny’s coffee intake increased in college commensurate with his workload, it does not confer him many benefits. Conversely, having a “study beer” allows him to relax and create a “different environment” for him to focus on his school-work.

Despite using caffeine regularly and alcohol sparingly to focus on his academic responsibilities, Johnny has not experimented with study drugs. He is familiar with the term and the practice, as he reports having peers who use prescription stimulants non-medically on a regular basis to complete their work. He has also been asked where to procure them. Although he drinks coffee almost every day, he does not want to experiment with study drugs because he has heard stories of students becoming dependent on prescription stimulants: “I don’t know, I’ve heard people can be dependent on them, I feel like. And I don’t want that. Even though I drink



coffee all the time, it's not the same. I'd rather drink more coffee than do a drug like that, I don't know."

## ***Discussion***

This study offers preliminary findings as to the prevalence of study drug use, conceptualized as a deviant behavior, among undergraduate students at UIUC. One-fifth of the sample reported experimenting with a study drug at least once, a number which is consistent with what previous studies have found and is also on the high end of the spectrum. Most of the sample reported knowing someone that had used prescription stimulants for academic purposes. Nearly half of the sample estimated that about half of the undergraduate population at UIUC have experimented. These two findings point to the ubiquity of prescription stimulant use on college campuses, as the majority of the student body are aware that non-medical use exists and knows someone who partakes. This reality in and of itself increases the likelihood of experimentation notwithstanding whether or not students consider study drug use to be a "deviant" behavior. However, because this study did not filter respondents based on their prescription status, measurements of non-medical prescription stimulant use cannot be considered valid or reliable and do not substantially contribute to the existing literature base.

However, this study did produce substantial, significant findings about students' levels of academic stress and how students navigate university life, including the stress that comes along with it. While it is unsurprising that the majority of undergraduates reported high levels of academic stress due to the competitive nature of admissions standards at UIUC, it is interesting that, without being given a metric for evaluating themselves, one-third of the sample reported that they spent the highest amount of hours provided by the response categories on school-related

activities per day and per week. This finding suggests that UIUC students view themselves to be extremely hard workers even when providing an estimate of these numbers. Moreover, the majority of students reported experiencing at least a moderate level of academic stress on a daily basis. In conjunction, the amount of hours students spend on class-related activities and the seemingly constant stress students report heighten the likelihood that they will experience negative emotions related to school.

Despite the prevalence of high output scores and moderate to high levels of academic stress among students, most of the sample did not meet criteria for being under academic strain as conceptualized in this study. This finding suggests that Merton's strain theory may not be the best metric through which to understand how students understand and attach meaning to the stresses of university life. Furthermore, the results of the PAS scale indicate that most of students' perceived academic stress stems from internal pressures rather than external pressures. The subsection measuring stresses related to academic expectations found that students believe competition with their peers for grades is intense and that their professors are critical of their academic performance; however, the majority of students do not believe that their professors set unrealistic expectations of them. This finding is interesting because it creates an alternate condition for academic strain. Specifically, it creates a disjunction between what students believe they are capable of and what their professors believe they are capable of. It seems that students believe that they are not living up to the expectations of their professors, although the expectations they set for them are not unrealistic.

Additionally, the subsection measuring stresses related to faculty, work, and exams found that students feel that they do not allocate enough time to class and academic work; they also feel that the size of their curricula and workloads are excessive. These findings suggest that students

are generally overburdened with their school-work such that they experience palpable negative affect most every day. If students are already predisposed to believing that their academic responsibilities are insurmountable, it is highly likely that these individuals will experience substantial negative emotions surrounding school.

The additional in-depth interviews shed light on the coping mechanisms which students employ to manage their workloads and academic stress. It is interesting that all interviewees reported experiencing simultaneous relief and stress when using certain study methods which most students would find “conventional.” Andra, Christina, and Johnny all report experiencing some academic stress because of their need to prioritize certain assignments and classes above others. Further, Johnny reports experiencing academic stress from using his planner.

Although none of the interviewees reported non-medical prescription stimulant use during college, two out of the three report preferring stimulating study methods including drinking coffee and energy drinks. Andra, on the other hand, prefers relaxing study methods like going for walks and keeping in touch with her family. Yet, both interviewees who report preferring stimulating study methods do not use them to maintain focus, but rather to stay awake for longer periods of time. This particular finding is interesting given that non-medical use of prescription stimulants is rampant on college campuses. From the results of this study, it appears that similar stimulants are not used in order to focus. Conversely, one interviewee reports using “study beer” in order to relax, rather than speed up. In conjunction, the findings of the quantitative and qualitative analyses suggest that students at UIUC are not turning to prescription stimulants in order to fulfill their academic responsibilities, perhaps because they desire a relaxing, non-stressful experience while studying or doing class-related activities.

### ***Limitations***

The most significant limitation to this study is its small sample size and that the sample is not representative of students at UIUC nor college students generally. Thus, the results of this study are not generalizable to the larger population at UIUC nor the larger population of college students in the U.S. Secondly, a major limitation of this study is that respondents were not filtered by prescription status; their prescription status was never asked. Without knowing the number of participants who are prescribed stimulants for medical purposes, any rate of use found is merely speculative. For this reason, it is also unclear if this study provides reliable or valid evidence against Classic Strain Theory or General Strain Theory.

Further research should examine the association between academic stress and study drug use according to Agnew's General Strain Theory, perhaps using a fewer number of items to measure perceived academic stress. Studies may examine the relationship between specific items on the PAS scale and study drug use in isolation. A longitudinal study may be conducted to see when and how students are introduced to study drugs on campus. Since one-third of this sample was freshman, non-users may have been underrepresented. This study also did not thoroughly examine the association between demographic characteristics and study drug use. Future research should work to determine these connections and control for them when testing theoretical hypotheses.

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