

5-3-2019

## Racial and Gender Differences in Perceptions of Illicit Use of Prescription Stimulants

Kara Lynn Nayfa

Follow this and additional works at: <https://scholarsjunction.msstate.edu/td>

---

### Recommended Citation

Nayfa, Kara Lynn, "Racial and Gender Differences in Perceptions of Illicit Use of Prescription Stimulants" (2019). *Theses and Dissertations*. 3710.  
<https://scholarsjunction.msstate.edu/td/3710>

This Graduate Thesis - Open Access is brought to you for free and open access by the Theses and Dissertations at Scholars Junction. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Scholars Junction. For more information, please contact [scholcomm@msstate.libanswers.com](mailto:scholcomm@msstate.libanswers.com).

Racial and gender differences in perceptions of illicit use of prescription stimulants

By

Kara L. Nayfa

A Thesis  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Master of Science  
in Psychology  
in the Department of Psychology.

Mississippi State, Mississippi

May 2019

Copyright by  
Kara L. Nayfa  
2019

Racial and gender differences in perceptions of illicit use of prescription stimulants

By

Kara L. Nayfa

Approved:

---

Kevin J. Armstrong  
(Major Professor/Graduate Coordinator)

---

Torri M. Jones  
(Committee Member)

---

Michael R. Nadorff  
(Committee Member)

---

Rick Travis  
Dean  
College of Arts & Sciences

Name: Kara L. Nayfa

Date of Degree: May 3, 2019

Institution: Mississippi State University

Major Field: Psychology

Major Professor: Kevin J. Armstrong

Title of Study: Racial and gender differences in perceptions of illicit use of prescription stimulants

Pages in Study 88

Candidate for Degree of Master of Science

Racial/ethnic differences underlying the illicit use of prescription stimulants (IUPS) were examined. A 2 X 2 (African American/Caucasian and male/female) design with  $n = 120$  per group (mean age of 19.23,  $SD = 1.30$ ) was used to evaluate survey responses regarding IUPS and their ADHD symptoms (using the Adult ADHD Self-Report Scale; ASRS). First, African Americans endorsed IUPS less frequently ( $p < .001$ ) and reported lower levels of ADHD symptoms ( $p < .01$ ). Second, participants rated three domains of risk for IUPS. African Americans perceived higher social risk ( $p < .001$ ). No significant differences were found for legal or health risks. Third, African Americans perceived lower benefits for IUPS for concentration ( $p < .001$ ), alertness ( $p < .001$ ), and help with studying ( $p < .001$ ). Minor gender differences are discussed and implications for targeting risk/benefit beliefs in IUPS prevention and treatment programs are discussed.

## DEDICATION

This thesis is dedicated to my parents who have supported me during every step of my graduate career. In addition, this thesis is dedicated to my mentor, Dr. Kevin Armstrong, for his unwavering support and guidance through the many ups and downs this life has thrown at me.

## TABLE OF CONTENTS

DEDICATION .....	ii
LIST OF TABLES .....	v
CHAPTER.....	1
I.    INTRODUCTION.....	1
Illicit Use of Prescription Stimulants .....	1
Gender and Racial Differences .....	2
Illicit Use of Prescription Stimulants .....	2
Illicit use of prescription stimulants.....	2
Special Focus on African American Females .....	3
Attention Deficit Hyperactivity Disorder diagnosis .....	3
Explanations for Differences.....	5
Mental Healthcare Access – Disparity Concerns.....	5
Theoretical Explanations.....	6
Issues Related to Prescription Stimulants .....	7
Mental Healthcare Provider Biases.....	7
Attitudes Towards Legal/Illicit Use of Prescription Stimulants .....	7
Familial/Parental Perceptions.....	8
Attitudes Towards Care From Health Professionals.....	8
Other .....	9
Health Belief Model.....	9
Hypotheses .....	9
Research Questions .....	10
II.    METHOD .....	11
Participants.....	11
Materials.....	12
Procedure.....	12
III.   RESULTS.....	14
Hypothesis 1 .....	14
Hypothesis 2.....	14
Hypothesis 3.....	15
Hypothesis 3a .....	15
Risk Perception Discriminant Analysis .....	16

Hypothesis 3b.....	17
Benefit Perception Discriminant Analysis .....	18
Hypothesis 4.....	19
Additional Research Questions .....	19
IV.  DISCUSSION.....	22
Hypothesis 1.....	22
Hypothesis 2.....	24
Hypothesis 3.....	25
Hypothesis 4.....	26
Additional Research Questions .....	27
Strengths and Limitations .....	27
Strengths.....	27
Limitations .....	28
Future Directions.....	29
REFERENCES .....	31
APPENDIX .....	40
A.  IRB APPROVAL .....	40
B.  QUESTIONNAIRE AND ASRS .....	42
C.  TABLE 3 – REDUCED SAMPLE OF AFRICAN AMERICAN FEMALES VS OVERALL SAMPLE OF AFRICAN AMERICAN FEMALES.....	87



## LIST OF TABLES

Table 1	MANOVA of Risk Perceptions.....	16
Table 2	MANOVA of Benefit Perceptions .....	18
Table 3	Reduced Sample of African American Females vs. Overall Sample of African American Females .....	88

## CHAPTER I

### INTRODUCTION

#### **Illicit Use of Prescription Stimulants**

Illicit use of prescription stimulants (IUPS) has increased dramatically over the last decade, particularly for adolescents. Currently some of the most commonly abused prescription drugs on college campuses are stimulants, such as Ritalin, Adderall, and Vyvanse (Maahs, Weidner, & Smith, 2016). One study found that 6.9% of undergraduate students in America had used prescription stimulants illicitly, whereas lifetime use estimates range from 3% to 7% (Maahs, Weidner, & Smith, 2016; McCabe et al., 2005). One possible explanation is that many adolescents find stimulants appealing because of the increased alertness and energy they may experience (Herman-Stahl, Krebs, Kroutil, & Heller, 2006; Judson & Langdon, 2009; Teter, McCabe, Cranford, Boyd, & Guthrie, 2005). Increased pressure on students to maintain high academic achievement by parents and professors in college environments may be exacerbating IUPS in the college population (Kinman, Armstrong, & Hood, 2017; Rabiner et. al., 2009). Students who are already succeeding may illicitly use prescription stimulants to remain competitive with other students and maintain their GPA, whereas student athletes may illicitly use to maintain their GPA without having to try hard so they can continue to compete in their respective sports (Maahs, Weidner, & Smith, 2016). Several other studies suggest that college students may be misusing prescription stimulants to party longer, suppress their appetites, or for an “exercise aid” (Graff Low & Gendaszek, 2002; Maahs, Weidner, &

Smith, 2016; White, Becker-Blease, & Grace-Bishop, 2006). Another possible explanation for this increase may be that among students the stigma of illicitly using prescription stimulants is decreasing (Kerley, Copes, & Griffin, 2015). Additionally, McCabe and Cranford (2012) indicated individuals who misuse prescription stimulants typically have many motives to use rather than just one motive. Although in college students, many studies have found that the primary motive for misuse of prescription stimulants is academic motivation (Benson et al., 2018; Benson, Flory, Humphreys, & Lee 2015; Cruz, Sumstine, Mendez, & Bavarian, 2017; Rabiner et al., 2009). Despite the overall high rates of lifetime IUPS, illicit use is not equivalent across gender and race.

### **Gender and Racial Differences**

#### **Illicit Use of Prescription Stimulants**

**Illicit use of prescription stimulants.** Mixed results have been found concerning IUPS across gender in the literature. Thus, many other factors should be considered when assessing IUPS and gender, such as Greek affiliation, polysubstance use, and family income (Pilkinton & Cannatella, 2012). Benson et al. (2018) found that overall males are more likely to misuse prescription stimulants than females. Males are more likely to endorse engaging in IUPS for “getting a high,” whereas females are more likely to endorse using them for academic reasons (Pilkinton & Cannatella, 2012). In addition to gender gaps concerning illicit use of prescription stimulants, racial disparities are concerning for researchers. Caucasian students tend to be more likely to report illicit use of prescription stimulants than any other race, including African Americans (Maahs, Weidner, & Smith, 2016; McCabe, Knight, Teter, & Wechsler, 2005). Although gender differences are a concern for illicit use of prescription stimulants, the biggest discrepancy is among race.

### **Special Focus on African American Females**

Pilkinton and Cannatella (2012) investigated the difference among Caucasian, African American, and Hispanic males and females and illicit use of prescription stimulants. Overall, they found that Caucasian males were more likely to engage in illicit use of prescription stimulants than any other group and that African American females were least likely to use than any other group. In a separate study investigating illicit use of prescription stimulants among girls ages 10-18 years, Striley, Kelso-Chichetto, and Cottler (2017) found that use was significantly higher as age increases and was significantly higher for Caucasian girls. One explanation for the gender differences is that many girls could potentially misuse prescription stimulants as a form of weight control (Cruz, Sumstine, Mendez, & Bavarian, 2017; Striley, Kelso-Chichetto, & Cottler 2017). Considering research has shown African Americans are less likely to be dissatisfied with their bodies (Dye, 2016), it is reasonable to consider this as a possible explanation for African American females misusing prescription stimulants less than Caucasian females. Gender and racial disparities are not only common throughout IUPS literature, but also throughout ADHD literature.

### **Attention Deficit Hyperactivity Disorder diagnosis**

ADHD manifests in 4.4% of adults and 7.8% of young people ages 4 to 17 years (Pilkinton & Cannatella, 2012). Researchers have found that 4.3% of young people ages 4 to 17 years old in the U.S. are prescribed stimulant medication (Centers for Disease Control and Prevention, 2003; McCabe, Boyd, & Young, 2007). In Mississippi in 2011 it was reported that 10.9% of children between the ages of 4 to 17 years old had a current ADHD diagnosis (Staneva et al., 2018). In 2018 56.3% of all stimulant prescriptions were prescribed for males compared to 43.7% being received by females in Mississippi.

Although males were more likely to receive prescriptions for ADHD medication than females, increase in consumption of these medications was higher for females from 2011-2014 compared to males.

Studies have found 5% of full-time freshmen attending college for the first time reported having a previous diagnosis of ADHD (Green & Rabiner, 2012; Pryor, Hurtado, DeAngelo, Palucki Blake, and Tran, 2010); however, McKee (2008) found that 7.5% of college students self-reported symptoms of ADHD that met diagnostic criteria. Concern about ADHD and ADHD symptoms is common. ADHD is diagnosed in 25% of college students who are receiving disability services (Green & Rabiner, 2012). This is not surprising given that one half to two thirds of children diagnosed with ADHD continue to have symptoms throughout adolescence and adulthood. Thus, students diagnosed with ADHD are less likely to graduate from high school and attend college (Dupaul, Weyandt, O'Dell, & Varejo, 2009; Green & Rabiner, 2012).

Miller, Nigg, and Miller (2009) conducted a review of the ADHD literature in African Americans and found that parents and teachers are more likely to rate African American youth as having more ADHD symptoms than Caucasian youth. Despite these findings, the diagnosis rate of African Americans is two-thirds the rate of Caucasians (Miller, Nigg, & Miller, 2009). In a study comparing race and ADHD diagnosis, researchers found that Caucasian children were more likely to be diagnosed with ADHD and more likely to take ADHD medication. From 2011-2012 it was found that boys were more likely to be on ADHD medication than girls and non-Hispanic white children were more likely to use ADHD medication than Hispanic children or African American children (Georgetown University Health Policy Institute, 2017). Researchers concluded this is likely due to African American children being underdiagnosed with ADHD rather

than Caucasian children being overdiagnosed with ADHD (Coker et al., 2016, Cruz, Sumstine, Mendez, & Bavarian, 2017; LeFever, Dawson, & Morrow, 1999; McCabe, Teter, & Boyd, 2004; Safer and Malever, 2000). Researchers investigated racial/ethnic disparities in ADHD diagnoses among race for children from kindergarten through eighth grade. They found that minority children were 69%, 50%, and 46% less likely to be diagnosed with ADHD (Morgan, Staff, Hillemeier, Farkas, & Maczuga, 2013). Many researchers have attempted to assuage these gender and racial gaps concerning ADHD by applying theoretical explanations. Specifically concerning ADHD, it may take African American parents longer to seek help for their children with ADHD symptoms than Caucasian parents, which may lead to more severe symptoms of ADHD (Miller, Nigg, & Miller, 2009).

### **Explanations for Differences**

#### **Mental Healthcare Access – Disparity Concerns**

Researchers indicated 21% of African Americans lack health insurance coverage, whereas only 15.8% of Caucasians lack health insurance coverage. African Americans are more likely to be categorized as poor (27.1%) requiring Medicaid coverage compared to Caucasians (10.7%) being classified as poor and requiring Medicaid coverage (Snowden, 2012). It may be reasonable to consider fewer African Americans have coverage due to high healthcare costs and lack of financial resources. Lack of financial and healthcare resources is a potential explanation for lower rates of diagnosis of ADHD in African Americans.

## **Theoretical Explanations**

In one study researchers suggest the generalized female vulnerability theory may account for the gender differences in illicit use of prescription stimulants. This theory takes into account that Western cultures typically think of women as nurturing and caring, which contributes to gender differences in appropriate social norms. These social norms deem illicit substance use more inappropriate for women than for men; therefore, women who use prescription stimulants recreationally are perceived more negatively and “experience more interpersonal consequences (guilt, remorse)” than men (Lookatch, Moore, & Katz, 2014). These social norms also lead to women being more concerned about their body image. Thus, it may be reasonable to conclude if women were taking prescription stimulants as a form of weight control society might deem it more acceptable. The results of this study indicated females were not viewed more negatively than males concerning prescription stimulant misuse, regardless of their motivation for use. There was also no significant difference in acceptance whether use was to get high or to lose weight (Lookatch, Moore, & Katz, 2014). One explanation could be that the gender differences associated with norms of using prescription stimulants illicitly is slowly diminishing.

Another possible theoretical explanation for prescription stimulant misuse that researchers suggest is the theory of planned behavior (TPB). This theory suggests three constructs account for an individual’s intention to exhibit a behavior. The constructs are attitude towards the behavior, subjective norms about the behavior, and the amount of perceived behavioral control over performing the behavior. Based on the TPB, individuals with the three characteristics of lower perceptions of health and ethical risks, higher perceptions related to “positive subjective norms,” and lower perceptions of their

behavior control in regards to prescription stimulants, were more likely to illicitly use prescription stimulants (Gallucci, Martin, Beaujean, & Usdan, 2015). In addition to theoretical explanations of prescription stimulant misuse, biases associated with mental healthcare providers may play a significant role in the underdiagnosis of ADHD in African Americans and lack of medical and mental health help-seeking behaviors for African Americans.

### **Issues Related to Prescription Stimulants**

#### **Mental Healthcare Provider Biases**

Researchers suggest middle-class Caucasians seeking mental health services are significantly more likely to receive an appointment than middle-class African Americans, working-class African Americans, or working-class Caucasians (Kugelmass, 2016). Research indicates that doctors are less likely to prescribe stimulants to African American adolescents than to Caucasian adolescents (Herman-Stahl, Krebs, Kroutil, & Heller, 2006).

#### **Attitudes Towards Legal/Illicit Use of Prescription Stimulants**

Researchers found that individuals who engaged in IUPS perceived lower health and legal risks and perceived higher cognitive benefits. Thus, those individuals engaging in IUPS are perceiving some risks; however, they may not have an accurate understanding of the negative consequences associated with taking these risks (Kinman, Armstrong, & Hood, 2017). One possible explanation for this could be that individuals who are actively involved in consuming these nonprescription stimulants do not perceive their behavior as unlawful or dishonorable. College students may also be mentally applying a cost benefit analysis and deciding the cognitive benefits exceed the legal and



health risks (Kinman et al., 2017; Sattler, Sauer, Mehlkop, & Graeff, 2013). From a cultural perspective, Herman-Stahl, Krebs, Kroutil, and Heller (2006) found that religious beliefs did not play a role in whether an individual misused prescription stimulants.

### **Familial/Parental Perceptions**

#### **Attitudes Towards Care From Health Professionals**

Previous research has demonstrated racial and ethnic differences in the field of mental health in areas such as rates of help-seeking and perceptions of pathology. Researchers suggest that racial disparities can result from stigmatization as well as misperceptions of the ratio between the risks and benefits of seeking mental health help (Yeh et. al., 2005). Researchers asked Dutch young adults about their beliefs about mental health problems and help seeking behaviors. They reported being less likely to seek help if they believed treatment would not help, or if they believed their mental health disorders did not have negative consequences. Young adults who perceived their mental illness as chronic were more likely to seek professional help (Vanheusden et al., 2009). Researchers investigated race/ethnicity and the perceived experience of mental health care. They found African Americans were more likely than Caucasians to have negative perceptions of mental health care, particularly regarding cost of mental health care and location of services (Cai & Robst, 2016). Research suggests even when African Americans and Caucasians are diagnosed with the same mental illness, African Americans are less likely to utilize prescription drugs and less likely to spend money on prescription drugs for mental illness than Caucasians (Han & Liu, 2005). Beliefs about the utility of medication for helping with academic achievement are expected to affect college student decisions about taking stimulant medication. Similarly, low levels of worry about the side effects of medication remove potential barriers to

using medication to help address academic worries. Indeed, in one university student sample IUPS was most commonly associated with motivations to improve academic performance and low levels of concern that IUPS may have negative consequences (Kinman, Armstrong, & Hood, 2017).

## **Other**

### **Health Belief Model**

The Health Belief Model (HBM) theorizes that individuals will engage in health behaviors if they believe they could or are likely to develop an illness, they believe the problem is severe and will have consequences, they believe seeking professional help will effectively reduce symptoms, and they believe there are no or few barriers to receiving services (Henshaw & Freedman-Doan, 2009). Therefore, if an individual endorses each of these beliefs, they will be more likely to seek mental health services. Additionally, HBM suggests that other beliefs about risks can hinder service-seeking behavior. For example, seeking services may be less likely to happen with the presence of negative expectations for effectiveness, risk, or cultural acceptability. Culturally perceived barriers to seek services may be different for some individuals. For example, the stigma that is associated with mental health changes across cultures and mistrust of healthcare providers changes across cultures as well (Henshaw & Freedman-Doan, 2009).

## **Hypotheses**

1. A smaller proportion of African American participants will report lifetime IUPS rates compared to Caucasian participants.
2. African American participants will report lower self-reported levels of ADHD symptoms (ASRS) than Caucasian participants.

3. As compared to Caucasian participants, African American participants will report
  - Higher risk perceptions (legal, health, social domains), and
  - Lower benefit perceptions (concentration, alertness, and help with studying).
4. African American females will provide lower perceived benefits ratings for appetite suppression/weight control effects from IUPS versus Caucasian females.

### **Research Questions**

1. Do African American females have the lowest use rates of the four gender X race groups?
2. Do African American females report the lowest levels of ADHD symptoms of the four gender X race groups?
3. Do African American females have the highest risk and lowest benefit perceptions for IUPS of the four gender X race groups?

## CHAPTER II

### METHOD

This study was approved by the university Human Subjects Institutional Review Board (see Appendix A).

#### **Participants**

The sample was obtained during two semesters from college students enrolled at a large, public Southeastern university. Participants identifying as any race other than Caucasian or African American were excluded from these analyses. The initial sample consisted of 1,589 participants, with 233 African American females, 120 African American males, 816 Caucasian females, and 420 Caucasian males. The mean age was 19.14 ( $SD = 1.32$ ), and over half (57.7%) of the participants were freshmen. Participants were recruited through the Psychology Research Pool (PRP) at the university.

Planned analyses included sets of analyses based on two levels of gender and two levels of race. To get an equal number of participants in each of these four cells, all 120 African American males were kept and 120 cases were randomly sampled within the other three cells. For these 480 remaining participants, the mean age was 19.23 ( $SD = 1.30$ ) and 53.1% were freshmen.

## Materials

The questionnaire (see Appendix B) assessed basic demographics, history of ADHD and prescription treatments with NPS medications, illicit consumption of NPS medications, and risk/benefit perceptions of consuming NPS medications.

Separate risk perception questions used a Likert scale to assess for perceptions of legal, health, and social risks. The ratings ranged from 1 = “Very Dangerous” to 4 = “Not Dangerous at all.” E.g., *“How much of a [legal, health, or social] risk is posed by using stimulant medication without a prescription?”*

Separate benefit perception questions used a Likert scale to assess for perceptions of helpfulness of NPS medications for concentration, alertness, and help with studying. The ratings ranged from 1 = “Always Useful” to 5 = “Never Useful.” E.g., *“How useful is stimulant medication in helping you [concentrate, stay alert, study for exams]?”*

An additional benefit question was *“How useful is stimulant medication for helping suppress appetite?”* (Q28) 1=“Always Useful” 5 = “Never Useful.”

The Adult ADHD Self-Report Scale (ASRS) v1.1 (see Appendix B – items 126-143) assessed ADHD related symptoms based on participant’s responses to eighteen items created to reflect DSM-IV-TR criteria (Kessler et al., 2005). The ASRS has demonstrated high levels of specificity and sensitivity (Kessler, 2005), adequate test-retest reliability (Matza et al., 2011), and both high internal consistency and convergent validity (Adler et al., 2006). Higher scores indicate more significant symptomology.

## Procedure

Participants accessed the study through the undergraduate Psychology Research Program website. They completed the informed consent and the questionnaire was

administered via Qualtrics. Participants received research credit upon completion of the study.

## CHAPTER III

### RESULTS

The four primary hypotheses to this study required testing for the presence of main effects. Additional research questions explored the presence of interactions, specifically that the African American female group would appear different based on prevalence, ADHD symptoms, history of ADHD diagnoses/medication treatment, and IUPS risk/benefit perceptions.

#### **Hypothesis 1**

Hypothesis 1 was that African American participants would report lower lifetime IUPS rates. A chi-square analysis showed African American participants endorsed IUPS use less frequently compared to Caucasian participants (9.2% vs. 21.3%;  $\chi^2(1) = 13.59, p < .001$ ).

#### **Hypothesis 2**

Hypothesis 2 was that African American participants would self-report lower levels of ADHD symptoms (ASRS) than Caucasian participants. An ANOVA was conducted using race and gender as independent variables and total number of significant symptoms on the ASRS as the dependent variable. A two-way ANOVA yielded a significant main effect for race, indicating that African Americans ( $M = 4.65, SD = 4.17$ ) are significantly less likely to self-report higher levels of ADHD symptoms compared to

Caucasians ( $M = 5.84$ ,  $SD = 4.22$ ),  $F(1,473) = 9.83$ ,  $p < .01$ . There was no observed main effect for gender,  $F(1,473) = 2.61$ , *ns*.

### **Hypothesis 3**

#### **Hypothesis 3a**

Hypothesis 3a was that African American participants would report higher risk perceptions (legal, health, social domains). A MANOVA was conducted using race and gender as independent variables and three dependent variables (ratings for legal, health, and social risks). The initial MANOVA was run on the entire sample; however, Box's  $M$  of 46.23 for risk perceptions was associated with a  $p$ -value of  $<.001$  violating the assumption of equal covariance matrices. Field (2013) recommended randomly sampling each of the groups to generate equal group sizes when the assumption of equal covariance matrices is violated. Thus, three of the four groups were randomly sampled to reach a group size equal to the fourth, and smallest group of 120 participants. Field (2013) states when the group sizes are equal, the Box test can be ignored.

The MANOVA assessing risk perceptions was run on the remaining 480 participants. Using Pillai's trace, there was a significant effect of race on risk perception,  $V = .04$ ,  $F(3,474) = 6.13$ ,  $p < .001$ . A separate univariate ANOVA revealed a significant effect of race on social risk perception, specifically African American participants perceive higher social risk ( $M = 2.63$ ,  $SD = 1.11$ ) related to IUPS compared to Caucasian participants ( $M = 3.03$ ,  $SD = 0.91$ ,  $F(1,476) = 18.44$ ,  $p < .001$ ). Separate univariate ANOVAs revealed a non-significant effect of race on legal risk perception related to IUPS,  $F(1,476) = 1.05$ , *ns* and health risk perception related to IUPS,  $F(1,476) = 1.49$ , *ns*. See Table 1.



Table 1

*MANOVA of Risk Perceptions*

	<u>Legal</u>		<u>Health</u>		<u>Social</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
African American (total)	1.83	0.94	1.90	0.94	2.63*	1.11
Female	1.71	0.92	1.77	0.91	2.50	1.10
Male	1.95	0.95	2.03	0.96	2.76	1.11
Caucasian	1.91	0.85	2.00	0.88	3.03*	0.91
Female	1.82	0.88	1.83	0.83	2.98	0.94
Male	2.01	0.80	2.17	0.89	3.07	0.88

*Note.* \* $p < .001$ .

**Risk Perception Discriminant Analysis**

The MANOVA was followed up with a discriminant analysis for risk perceptions, which revealed three discriminant functions. The first explained 71.2% of the variance, canonical  $R^2 = .05$ , whereas the second explained 28.3% of the variance, canonical  $R^2 = .02$ , and the third explained 1.4 % of the variance, canonical  $R^2 = .001$ . In combination, these discriminant functions significantly differentiated race/gender,  $\Lambda = 0.93$ ,  $\chi^2(9) = 34.08$ ,  $p < .001$ . Removing the first function indicated the second and third function could significantly differentiate race/gender,  $\Lambda = 0.98$ ,  $\chi^2(4) = 10.26$ ,  $p < .05$ ; however, when the first and second function were removed, the third function did not significantly differentiate race/gender,  $\Lambda = 1.00$ ,  $\chi^2(1) = 0.50$ ,  $p = .479$ .

### **Hypothesis 3b**

Hypothesis 3b was that African American participants would report lower benefit perceptions. Specifically, a MANOVA was conducted using race and gender as independent variables and three dependent variables (ratings for concentration, alertness, and studying). In the initial MANOVA, the obtained Box's M of 169.77 for benefit

perceptions also violated the assumption of equal covariance matrices. Thus, this MANOVA was also conducted on the remaining 480 participants after equal group sizes were randomly sampled as stated previously for the risk perception MANOVA.

Using Pillai's trace, there was a significant effect of race on benefit perceptions,  $V = .07$ ,  $F(3,471) = 11.92$ ,  $p < .001$ . A separate univariate ANOVA revealed a significant effect of race on the benefit of increasing concentration related to IUPS, specifically African American participants ( $M = 2.29$ ,  $SD = 1.22$ ) are less likely to perceive an increase in concentration benefit from IUPS compared to Caucasian participants ( $M = 1.79$ ,  $SD = 1.04$ ),  $F(1,473) = 23.57$ ,  $p < .001$ . A separate univariate ANOVA revealed a significant effect of race on the benefit of increasing alertness related to IUPS, specifically African American participants ( $M = 2.29$ ,  $SD = 1.24$ ) are less likely to perceive an increase in alertness benefit from IUPS compared to Caucasian participants ( $M = 1.92$ ,  $SD = .93$ ),  $F(1,473) = 18.04$ ,  $p < .001$ . A separate univariate ANOVA revealed a significant effect of race on the benefit of helping with studying related to IUPS, specifically African American participants ( $M = 2.53$ ,  $SD = 1.25$ ) are less likely to perceive a benefit of helping with studying from IUPS compared to Caucasian participants ( $M = 1.90$ ,  $SD = 1.05$ ),  $F(1,473) = 35.69$ ,  $p < .001$ . See Table 2.

Table 2

*MANOVA of Benefit Perceptions*

	<u>Concentration</u>		<u>Alertness</u>		<u>Studying</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
African American (total)	2.29*	1.22	2.29*	1.24	2.53*	1.25
Female	2.28	1.22	2.16	1.23	2.43	1.21
Male	2.31	1.22	2.41	1.25	2.63	1.28
Caucasian	1.79*	1.04	1.85*	0.97	1.90*	1.05
Female	1.70	0.98	1.79	1.00	1.88	1.05
Male	1.88	1.09	1.92	0.93	1.93	1.05

Note. \* $p < .001$

**Benefit Perception Discriminant Analysis**

The MANOVA was followed up with a discriminant analysis for benefit perceptions, which revealed three discriminant functions. The first explained 82.2% of the variance, canonical  $R^2 = .07$ , whereas the second explained 14% of the variance, canonical  $R^2 = .01$ , and the third explained 3.7 % of the variance, canonical  $R^2 = .004$ . In combination these discriminant functions significantly differentiated race/gender,  $\Lambda = 0.91$ ,  $\chi^2(9) = 44.52$ ,  $p < .001$ , but removing the first function indicated the second ( $\Lambda = 0.98$ ,  $\chi^2(4) = 8.12$ ,  $p = .087$ ) and third function ( $\Lambda = 1.00$ ,  $\chi^2(1) = 1.71$ ,  $p = .191$ ) did not significantly differentiate race/gender.

#### **Hypothesis 4**

Hypothesis 4 was that African American females, compared to Caucasian females, would provide lower ratings for perceived benefits related to appetite suppression/weight control effects from IUPS. A one-way ANOVA indicated African American females ( $M = 3.44, SD = 1.33$ ) were significantly less likely to perceive that IUPS would have an appetite suppression benefit compared to Caucasian females ( $M = 2.82, SD = 1.36$ ),  $F(1, 238) = 12.68, p < .001$ .

#### **Additional Research Questions**

Three additional research questions were explored to better understand the gender and racial differences associated with IUPS. The first research question was explored to determine whether African American females have the lowest use rates of the four gender X race groups. A chi-square analysis showed African American female participants endorsed significantly lower use rates compared to Caucasian male and female participants and African American male participants,  $\chi^2(3) = 25.38, p < .001$ .

The second research question was explored to determine whether African American females report the lowest levels of ADHD symptoms of the four gender X race groups. A two-way ANOVA indicated there was no race by gender interaction,  $F(1,473) = 0.05, ns$ . Thus, these results show that African American females ( $M = 4.92, SD = 4.33$ ) do not report the lowest levels of ADHD symptoms compared to African American males ( $M = 4.39, SD = 3.76$ ), Caucasian females ( $M = 6.18, SD = 4.40$ ), and Caucasian males ( $M = 5.49, SD = 4.01$ ).

As a follow up to this research question, additional analyses were conducted to assess the histories of ADHD diagnoses and exposure to stimulant medication treatments

between the groups. A chi-square analysis for gender by race was significant,  $\chi^2(3) = 8.26, p < .05$ , showing African American females (3.4%) were diagnosed with ADHD at the lowest rate followed by African American males (5.8%), Caucasian males (10%), and Caucasian females (12.5%). A chi-square analysis for gender by race also was significant,  $\chi^2(6) = 20.22, p < .01$ , and revealed that prescription rates were not equal among the four groups. African American females (1.7%) and males (1.7%) had fewer prescriptions for stimulant medication followed by Caucasian males (9.2%) and Caucasian females (12.5%).

The final research question was whether African American females had the highest risk and lowest benefit perceptions for IUPS of the four gender X race groups. A MANOVA was conducted to assess risk and benefit perceptions for IUPS among the four gender X race groups. Using Pillai's trace, there was a significant effect of gender on risk perception,  $V = .03, F(3,474) = 4.77, p < .01$ . A separate univariate ANOVA revealed a significant effect of gender on legal risk perception, specifically females ( $M = 1.76, SD = 0.90$ ) are more likely to perceive legal risk related to IUPS compared to males ( $M = 1.98, SD = 0.88$ ),  $F(1,476) = 7.10, p < .01$ . A separate univariate ANOVA revealed a significant effect of gender on health risk perception, specifically females ( $M = 1.80, SD = 0.87$ ) are more likely to perceive health risk related to IUPS compared to males ( $M = 2.10, SD = 0.93$ ),  $F(1,476) = 13.44, p < .001$ . A separate univariate ANOVA revealed a non-significant effect of gender on social risk perception related to IUPS,  $F(1,476) = 3.43, ns$ . Using Pillai's trace, there was not a significant effect of gender on benefit perceptions,  $V = .008, F(3,471) = 1.23, ns$ . Using Pillai's trace, there was a non-significant gender by race interaction on risk perception,  $V = .004, F(3,474) = 0.66, ns$ , or

a significant gender by race interaction on benefit perceptions,  $V = .01$ ,  $F(3,471) = 2.11$ ,

*ns.*

## CHAPTER IV

### DISCUSSION

This study proposed four hypotheses and three sets of research questions. The hypothesized main effects showed the sample performed in a way consistent with other studies in the literature and are reviewed first.

#### **Hypothesis 1**

Previous research indicates that African Americans have lower IUPS rates than Caucasians. For example, McCabe et al. (2007) showed that African Americans were less likely to have drug use problems compared to Caucasians. Another study found that African Americans were three times less likely to have illicitly used prescription stimulants in the past year than Caucasians (Teter, McCabe, LaGrange, Cranford, & Boyd, 2006). As predicted, African American participants reported lower IUPS lifetime rates than Caucasian participants. Reasons for this finding are unclear from this data set. This could potentially be explained by financial constraints or reduced access to mental healthcare. For example, a higher percentage of African Americans lack health insurance coverage compared to Caucasians (Snowden, 2012), which would give reduced access to prescription stimulants within African American communities and social circles. Researchers have also shown that African American parents had less knowledge about ADHD than Caucasian parents (Bussing, Schoenburg, & Perwien, 1998). They also indicated that African American children were twice as likely to need ADHD treatment

but not receive services. The Centers for Disease Control and Prevention (2006) found that Non-Hispanic white children (15%) were only slightly more likely to be on regular medication than Non-Hispanic black children (13%). One reason for this may be that more African American children are receiving Medicaid health insurance coverage. Those receiving Medicaid (16%) have an increased likelihood of being on regular medication compared to children who have private health insurance (13%) or no health insurance (7%). Anderson, Chen, Perrin, and Van Cleave (2015) found that children who had no insurance were less likely to be medicated for any mental health condition and ADHD specifically compared to children with private insurance.

Additionally, a higher proportion of African Americans who have mental healthcare access may still be less able to afford or choose to take prescribed medications even if diagnosed with ADHD. Utilization of prescriptions for mental healthcare may also play a role in racial disparity issues concerning IUPS. African American individuals are less likely to utilize prescription drugs for mental healthcare even when they have a diagnosis (Han & Liu, 2005). African Americans have been shown to be less trusting of mental health professionals indicating the disparity may result from unwillingness to seek mental healthcare due to lack of trust or other negative perceptions of the mental healthcare field (Cai & Robst, 2016). Considering the perceived barriers to receiving mental healthcare by African Americans (e.g., lack of health insurance, financial constraints, lack of trust) the HBM indicates that African Americans would be less likely to engage in health behaviors. There are still other reasons for the lower use and one has to do with whether individuals think of their “symptoms” as something that could respond to stimulant medication.



## Hypothesis 2

As predicted, African American participants were less likely to self-report higher levels of ADHD symptoms than Caucasian participants. One potential explanation for this could be that African Americans have less access to healthcare, thus they are reporting less and at lower levels than Caucasians. Considering past research has shown African Americans are more likely to have negative perceptions of mental healthcare than Caucasians (Cai & Robst, 2016), this may be another potential explanation for African Americans to be reporting less and at lower levels than Caucasians. There was no difference in reporting ADHD symptoms for gender and there was no gender by race interaction observed. Researchers have shown that fewer women have reported high levels of impulsivity but both men and women have reported high levels of inattention (McKee, 2008). In this sample, inattention versus hyperactive symptoms were not analyzed separately, which could help assess one explanation for not having seen gender differences in ADHD symptom endorsement. If a separation had been made between types of symptoms during the analyses, there may have been gender differences for ADHD symptom endorsement based on types of symptoms experienced.

The post hoc analyses indicated that African American females were diagnosed with ADHD at the lowest rate followed by African American males, Caucasian males, and Caucasian females. This is consistent with previous research showing the diagnosis rate of African Americans is two-thirds the rate of Caucasians (Miller, Nigg, & Miller, 2009). The post hoc analyses also showed that African American females and males were less likely to have a prescription for stimulant medication followed by Caucasian males and Caucasian females. This is also consistent with research conducted by Georgetown University Health Policy Institute (2017), which found that Caucasian

children were more likely to be diagnosed with ADHD and more likely to take ADHD medication.

### **Hypothesis 3**

Hypothesis 3 assessed risk perceptions. Analyses showed that African Americans were more likely to perceive higher levels of social risks compared to Caucasians. Higher risk perceptions may help explain the significantly lower IUPS rate of African Americans. The TPB states that attitude towards a particular behavior influences whether that behavior will be present. Indeed, other researchers have found that African American attitudes towards IUPS, including perceiving higher risks associated with such use, indicate they will be less likely to engage in IUPS (Gallucci, Martin, Beaujean, & Usdan, 2015). Caucasians perceived lower social risks, which may be low enough to have no significant deterrent value on decisions regarding IUPS. Whether there are substantial social risks to IUPS is unclear but another possibility is that African Americans may perceive the risks and have a more accurate understanding of the negative consequences associated with taking these risks compared to Caucasians (Kinman, Armstrong, & Hood, 2017).

Regarding benefit perceptions, African Americans were less likely to perceive benefits associated with increasing concentration, increasing alertness, and helping with studying compared to Caucasians. The HBM states that an individual will be more likely to seek services or help if they believe they could or are likely to develop an illness and if they believe seeking help will effectively reduce symptoms (Henshaw & Freedman-Doan, 2009). If African Americans are not perceiving that they have symptoms or an illness in general, they will likely report a lack of benefits associated with using a

medication for an illness they do not believe they are experiencing. In the TPB, African American perceptions of lower levels of benefits may also contribute to lower rates of IUPS compared to Caucasians.

#### **Hypothesis 4**

As predicted, African American females were less likely than Caucasian females to perceive a benefit of appetite suppression via IUPS. Several studies have explored racial and ethnic differences concerning body image and body satisfaction in females. Gluck and Geliebter (2002) found that before controlling for body mass index, African Americans were more likely to endorse a larger ideal body size; however, after controlling for body mass index the difference was not significant. African Americans may not desire the idea of being thin as much as Caucasians because they do not have as much pressure to be thin. Past research indicates African American men may be more willing to have relationships with women who have a larger body size than Caucasian men (Gluck & Geliebter, 2002; Powell & Kahn, 1995). Several studies have indicated that even though African American women have larger body sizes and higher weight on average than Caucasian women, African American women are more likely to be satisfied with their body size and weight (Lovejoy, 2001; Akan & Grilo, 1995; Parker, Nichter, Nichter, Vuckovic, & Ritenbaugh, 1995, Story, French, Resnick, & Blum, 1995). This lends support to the notion that African American females may be more satisfied with their bodies leading them to believe IUPS would not benefit them as an appetite suppressant. Further, African American females may not seek out or even consider using prescription medication for appetite suppression purposes because they have a more positive self-image.

### **Additional Research Questions**

Each of the three research questions explored whether there was an interaction of race and gender for the primary dependent variables. Specifically, the analysis assessed whether African American females showed lower diagnostic prevalence rates, lower ADHD symptom endorsement, lower rates of IUPS, and both lower benefit and higher risk perceptions for IUPS.

Results indicated that there were no gender by race interactions for prevalence rates, ADHD symptom endorsement, rates of IUPS, or benefit and risk perceptions for IUPS. Thus, these outcomes were not affected by race and gender simultaneously, indicating that African American females do not have significantly lower diagnostic prevalence rates, lower ADHD symptom endorsement, lower rates of IUPS, or lower benefit and higher risk perceptions for IUPS compared to the other three gender by race groups.

### **Strengths and Limitations**

#### **Strengths**

The ADHD literature has largely ignored African American females (Kirk et al., 2012). African Americans and, specifically, African American females are an important and ignored population that might have significantly different sociocultural factors influencing identification, referrals, diagnoses, treatment, and untreated prognosis. This study helps address the literature gap concerning African American females by discussing differences in self-report of ADHD symptoms, IUPS levels, and underlying risk/benefit perceptions regarding stimulant medications. Research that targets better understanding African American females' perceptions of ADHD symptomology and the higher risks and lower benefits associated with IUPS, could help inform education efforts

with physicians, mental health providers, and the general population to improve the services provided to the African American population.

Methodological strengths include that the sample size provided adequate statistical power for the analyses. The selected measures included the ASRS, which has shown high levels of sensitivity and specificity and has been adopted broadly to screen for significant levels of ADHD symptomology. The ASRS has also demonstrated good internal consistency, test-retest reliability, and convergent validity.

### **Limitations**

There are at least a couple factors limiting the generalizability of obtained results to broader populations. First, while the total number of African American participants is higher than often seen in the literature, this study used students from a single state university in a state that has an unusually high proportion of African Americans in the population (> 30%) and university population (> 20%). Students in this sample and the university may not be representative of African Americans from other states and universities with different proportions of races present on campus. Additionally, not all of the participants' data could be used because of statistical anomalies observed when conducting the analysis. For example, the original plan for analysis used a MANOVA but initial results showed a violation of the assumption of equal covariance matrices. This anomaly required a solution involving reducing the sample size to create an equal number of participants in each cell (Field, 2013). Unfortunately, the reduction in sample size also decreased statistical power and reduced the chances of detecting small effects in the sample. A related concern was whether the randomly sampled subset of obtained African American female participants ( $n = 120$ ) was representative of or somehow different from

the overall group of African American females ( $n = 233$ ). In an effort to evaluate this concern, we conducted analyses on a variety of demographic variables (e.g., age, history of ADHD diagnosis, prescription history, risk/benefit perceptions). Fortunately, no obvious differences were found between the subsample and the overall sample (see Appendix C).

Additionally, there were other methodological limitations. The ASRS was a self-report symptom measure and not a clinician-evaluated symptom count. Thus, current ADHD status of participants is unknown, and this study is limited to considering the self-report of severity of ADHD symptoms rather than the presence/absence of the disorder.

One final significant limitation of this study is that the current literature base remains sparse. This makes it difficult to pose hypotheses from an empirically based perspective and to place the findings in context of a broader literature. Current research has not demonstrated a clear understanding of the differences between African American's beliefs about IUPS. Before this research project, the literature shows little on African American beliefs concerning IUPS in general.

### **Future Directions**

Future research should further investigate racial and gender differences regarding ADHD and IUPS. By continuing to explore these differences researchers can begin to learn and understand the predictors and protective factors associated with these differences and IUPS. Researchers should continue to explore perceptions of African Americans vs. perceptions of Caucasians to help explain this racial disparity. Even more, further exploration of risk and benefit perceptions may give a clearer understanding of motivations or lack of motivation for IUPS.

Future research should also explore racial and gender differences among other populations. This study was restricted to African Americans and Caucasian subgroups. There may be other racial and cultural groupings that could be studied in productive ways. This study focused on a college population, which could potentially limit the generalizability to other populations. Researchers should examine the gender and racial differences concerning ADHD, IUPS, and risk/benefit perceptions to determine whether these differences are consistent in other populations. Additionally, motivations for IUPS should be explored to examine differences between race and gender. This study specifically examined alertness, concentration, help with studying, and appetite suppression as motivation for IUPS; however, other motivations, such as ability to produce a high, stay up all night, and party longer, should also be further explored.

Considering in the current sample there were significant differences in history of diagnosis and prescription stimulant use, researchers should explore whether perceptions among college students are related to help-seeking behaviors for ADHD related problems. Specifically, researchers would benefit from investigating whether risk and benefit perceptions of prescription stimulant use affect help-seeking behaviors in college students and across race. Finally, future research should explore whether parenting beliefs about the risk and benefits of prescription stimulants affect help-seeking behaviors and pursuing professional services for their younger children exhibiting ADHD symptoms. Differences in parenting beliefs across race and culture should be explored as well. Ultimately, this kind of information should better inform the development of more effective and better targeted psychoeducational materials regarding illicit use of prescription stimulants by different populations.

## REFERENCES

- Adler, L. A., Spencer, T., Faraone, S. V., Kessler, R. C., Howes, M. J., Biederman, J., & Secnik, K. (2006). Validity of pilot Adult ADHD Self-Report Scale (ASRS) to rate adult ADHD symptoms. *Annals of Clinical Psychiatry, 18*(3), 145-148.
- Akan, G. E. & Grilo, C. M. (1995). Sociocultural influences on eating attitudes and behaviors, body image, and psychological functioning: A comparison of African American, Asian American, and Caucasian college women. *International Journal of Eating Disorders, 18*, 181-187.
- Anderson, L. E., Chen, M. L., Perrin, J. M. , & Van Cleave, J. (2015). Outpatient visits and medication prescribing for US children with mental health conditions. *Pediatrics, 136*(5), 1178-1185.
- Benson, K., Woodlief, D. T., Flory, K., Sicheloff, E. R., Coleman, K., & Lamont, A. (2018). Is ADHD, independent of ODD, associated with whether and why college students misuse stimulant medication? *Experimental and Clinical Psychopharmacology*. Advance online publication. <http://dx.doi.org/10.1037/pha0000202>
- Benson, K., Flory, K., Humphreys, K. L., & Lee, S. S. (2015). Misuse of stimulant medication among college students: A comprehensive review and meta-analysis. *Clinical Child and Family Psychology Review, 18*, 50-76. doi: 10.1007/s10567-014-0177-z.



- Bussing, R., Schoenburg, N. E., & Perwien, A. R. (1998). Knowledge and information about ADHD: Evidence of cultural differences among African-American and white parents. *Social Science and Medicine*, *46*(7), 919-928.
- Cai, A., & Robst, J. (2016). The relationship between race/ethnicity and the perceived experience of mental health care. *American Journal of Orthopsychiatry*, *86*(5), 508-518. doi:10.1037/ort0000119
- Centers for Disease Control and Prevention. (2003). *Attention Deficit/Hyperactivity Disorder (ADHD)*. Available at <https://www.cdc.gov/ncbddd/adhd/data.html>. Accessed September 3, 2017.
- Centers for Disease Control and Prevention. (2006). *Summary health statistics for U.S. children: National health interview survey*. Available at <https://stacks.cdc.gov/view/cdc/6789>. Accessed September 5, 2018.
- Coker, T. R., Elliot, M. N., Toomey, S. L., Schwebel, D. C., Cuccaro, P., Emery, S. T., Davies, S. L., Visser, S. N., & Schuster, M. A. (2016). Racial and ethnic disparities in ADHD diagnosis and treatment. *Pediatrics*, *138*(3), 1-9.
- Cruz, S., Sumstine, S., Mendez, J., & Bavarian, N. (2017). Health-compromising practices of undergraduate college students: Examining racial/ethnic and gender differences in characteristics of prescription stimulant misuse. *Addictive Behaviors*, *68*59-65. doi:10.1016/j.addbeh.2017.01.016
- Dupaul, G. J., Weyandt, L. L., O'Dell, S. M., & Varejo, M. (2009). College students with ADHD: Current status and future directions. *Journal of Attention Disorders*, *13*(3), 234-250. doi: 10.1177/1087054709340650

- Dye, H. (2016). Are there differences in gender, race, and age regarding body dissatisfaction? *Journal of Human Behavior in the Social Environment*, 26(6), 499-508. doi:10.1080/10911359.2015.1091240
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics*. London: Sage Publications.
- Gallucci, A., Martin, R., Beaujean, A., & Usdan, S. (2015). An examination of the misuse of prescription stimulants among college students using the theory of planned behavior. *Psychology, Health & Medicine*, 20(2), 217-226. doi:10.1080/13548506.2014.913800
- Georgetown University Health Policy Institute. (2017, July). *How Medicaid and CHIP shield children from the rising costs of prescription drugs* (Issue Brief No. 3). Washington DC: Hoadley, J. & Alker, J.
- Gluck, M. E., & Geliebter, A. (2002). Racial/ethnic differences in body image and eating behaviors. *Eating Behaviors*, 3, 143-151.
- Green, A. L., & Rabiner, D. L. (2012). What do we really know about ADHD in college students? *Neurotherapeutics*, 9, 559-568. doi:10.1007/s13311.012.0127.8
- Han, E., & Liu, G. G. (2005). Racial disparities in prescription drug use for mental illness among population in US. *Journal of Mental Health Policy and Economics*, 8(3), 131-143.
- Henshaw, E. J., & Freedman-Doan, C. R. (2009). Conceptualizing mental health care utilization using the health belief model. *Clinical Psychology: Science and Practice*, 16(4), 420-439. doi:10.1111/j.1468-2850.2009.01181.x

- Herman-Stahl, M. A., Krebs, C. P., Kroutil, L. A., & Heller, D. C. (2006). Risk and protective factors for nonmedical use of prescription stimulants and methamphetamine among adolescents. *Journal of Adolescent Health, 39*(3), 374-380. doi:10.1016/j.jadohealth.2006.01.006
- Judson, R., & Langdon, S. W. (2009). Illicit use of prescription stimulants among college students: Prescription status, motives, theory of planned behaviour, knowledge and self-diagnostic tendencies. *Psychology, Health & Medicine, 14*(1), 97-104. doi:10.1080/13548500802126723
- Kerley, K. R., Copes, H., & Griffin, O. I. (2015). Middle-class motives for non-medical prescription stimulant use among college students. *Deviant Behavior, 36*(7), 589-603. doi:10.1080/01639625.2014.951573
- Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E. V. A., & Ustun, T. B. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. *Psychological Medicine, 35*(02), 245-256.
- Kinman, B.A., Armstrong, K.J., & Hood, K.B. (2017). Perceptions of risks and benefits among nonprescription stimulant consumers, diverters, and non-users. *Substance Use & Misuse, 52*(10), 1256-1265.
- Kirk, C., Hurdish, E., Roussin, L., Peterson, D., Ballard, E., Finnegan, A., Mauldin, E., Smith, M., & Armstrong, K. J. (2012). *ADHD girls in high impact journal samples: Areas of improving and inadequate representation*. Poster session presented at the annual meeting of the Association for Behavior and Cognitive Therapies, National Harbor, MD.

- Kugelmass, H. (2016). 'Sorry, I'm not accepting new patients': An audit study of access to mental health care. *Journal of Health and Social Behavior*, 57(2), 168-183. doi:10.1177/0022146516647098
- LeFever, G. B., Dawson, K. V., & Morrow, A. L. (1999). The extent of drug therapy for attention deficit-hyperactivity disorder among children in public schools. *American Journal of Public Health*, 89(9), 1359-1364. doi: 10.2105/AJPH.89.9.1359
- Lookatch, S. J., Moore, T. M., & Katz, E. C. (2014). Effects of gender and motivations on perceptions of nonmedical use of prescription stimulants. *Journal of American College Health*, 62(4), 255-262. doi:10.1080/07448481.2014.891593
- Lovejoy, M. (2001). Disturbances in the social body: Differences in body image and eating problems among African American and white women. *Gender & Society*, 15(2), 239-261.
- Graff Low, K., & Gendaszek, A. E. (2002). Illicit use of psychostimulants among students: A preliminary study. *Psychology, Health, & Medicine*, 7, 283-287.
- Maahs, J. R., Weidner, R. R., & Smith, R. (2016). Prescribing some criminological theory: An examination of the illicit use of prescription stimulants among college students. *International Journal of Offender Therapy and Comparative Criminology*, 60(2), 146-164. doi:10.1177/0306624X14548530
- Matza, L. S., Van Brunt, D. L., Cates, C., & Murray, L. T. (2010). Test-retest reliability of two patient-report measures for use in adults with ADHD. *Journal of Attention Disorders*, 15(7), 557-563.

- McCabe, S. E., & Cranford, J. A. (2012). Motivational subtypes of nonmedical use of prescription medications: Results from a national study. *Journal of Adolescent Health, 51*(5), 445-452. doi:10.1016/j.jadohealth.2012.02.004
- McCabe, S. E., Boyd, C. J., & Young, A. (2007). Medical and Nonmedical Use of Prescription Drugs among Secondary School Students. *Journal of Adolescent Health, 40*(1), 76-83. doi:10.1016/j.jadohealth.2006.07.016
- McCabe, S. E., Morales, M., Cranford, J. A., Delva, J., McPherson, M. D., Boyd, C.J. (2007). Race/ethnicity and gender differences in drug use and abuse among college students. *Journal of Ethnicity in Substance Abuse, 6*(2), 75-95. doi: 10.1300/J233v06n0206
- McCabe, S. E., Knight, J. R., Teter, C. J., & Wechsler, H. (2005). Non-medical use of prescription stimulants among US college students: Prevalence and correlates from a national survey. *Addiction, 100*(1), 96-106.
- McCabe, S. E., Teter, C. J., & Boyd, C. J. (2004). The use, misuse and diversion of prescription stimulants among middle and high school students. *Substance Use & Misuse, 39*(7), 1095-1116. doi:10.1081/JA-120038031
- McKee, T. E. (2008). Comparison of a norm-based versus criterion-based approach to measuring ADHD symptomatology in college students. *Journal of Attention Disorders, 11*, 677– 688. <http://dx.doi.org/10.1177/1087054707308501>
- Miller, T. W., Nigg, J. T., & Miller, R. L. (2009). Attention deficit hyperactivity disorder in African American children: What can be concluded from the past ten years? *Clinical Psychology Review, 29*, 77-86. doi: 10.1016/j.cpr.2008.10.001

- Morgan, P. L., Staff, J., Hillemeier, M. M., Farkas, G., & Maczuga, S. (2013). Racial and ethnic disparities in ADHD diagnosis from kindergarten to eighth grade. *Pediatrics*, *132*(1), 85-93. doi: 10.1542/peds.2012-2390
- Parker, S., Nichter, M., Nichter, M., Vuckovic, C. S., & Ritenbaugh, C. (1995). Body image and weight concerns among African American and white adolescent females: Differences that make a difference. *Human Organization*, *54*, 103-114.
- Pilkinton, M., & Cannatella, A. (2012). Nonmedical use of prescription stimulants: Age, race, gender, and educational attainment patterns. *Journal of Human Behavior in the Social Environment*, *22*(4), 409-420. doi:10.1080/10911359.2012.664968
- Powell, A. D., & Kahn, A. S. (1995). Racial differences in women's desires to be thin. *International Journal of Eating Disorders*, *17*, 191-195.
- Pryor, J. H., Hurtado, S., DeAngelo, L., Palucki Blake, L., & Tran, S. (2010). *The American freshman: National norms fall 2010*. Los Angeles, CA: Higher Education Research Institute at UCLA
- Rabiner, D., Anastopoulos, A., Costello, E., Hoyle, R., McCabe, S., Swartwelder, H. (2009). Motives and perceived consequences of nonmedical ADHD medication use by college students: Are students treating themselves for attention problems? *Journal of Attention Disorders*, *13*, 259-270.
- Safer, D. J., & Malever, M. (2000). Stimulant treatment in Maryland public schools. *Pediatrics*, *106*(3), 533-539. doi: 10.1542/peds.106.3.533
- Sattler, S., Sauer, C., Mehlkop, G., & Graeff, P. (2013). The rationale for consuming cognitive enhancement drugs in university students and teachers. *PLoS One*, *8*, 1-10. doi: 10.1371/journal.pone.0068821

- Snowden, L. R. (2012). Health and mental health policies' role in better understanding and closing African American–White American disparities in treatment access and quality of care. *American Psychologist, 67*(7), 524-531.  
doi:10.1037/a0030054
- Staneva, M., Pearson, M., Dobbs, T., Cannon-Smith, G., Preacely, N., Byers, P. (2018). *Emerging trends in prescription stimulants indicated for treatment of Attention-Deficit/Hyperactivity Disorder: Mississippi 2011 and 2014*. Mississippi State Department of Health. Retrieved from <https://msdh.ms.gov/msdhsite/index.cfm/31,7620,382,740,pdf/ADHDPrescriptions2012.pdf>
- Story, M., French, S. A., Resnick, M. D., & Blum, R. W. (1995). Ethnic/racial and socioeconomic differences in dieting behaviors and body image perceptions in adolescents. *International Journal of the Eating Disorders, 18*, 173-179.
- Striley, C. W., Kelso-Chichetto, N. E., & Cottler, L. B. (2017). Nonmedical prescription stimulant use among girls 10–18 years of age: Associations with other risky behavior. *Journal of Adolescent Health, 60*(3), 328-332.  
doi:10.1016/j.jadohealth.2016.10.013
- Teter, C. J., McCabe, S. E., Cranford, J. A., Boyd, C. J., & Guthrie, S. K. (2005). Prevalence and motives for illicit use of prescription stimulants in an undergraduate student sample. *Journal of American College Health, 53*(6), 253-262. doi:10.3200/JACH.53.6.253-262

- Teter, C. J., McCabe, S. E., LaGrange, K., Cranford, J. A., Boyd, C. J. (2006). Illicit use of specific prescription stimulants among college students: Prevalence, motives, and routes of administration. *Pharmacotherapy*, 26(10), 1501-1510. doi: 10.1592/phco.26.10.1501
- Vanheusden, K., van der Ende, J., Mulder, C. L., van Lenthe, F. J., Verhulst, F. C., & Mackenbach, J. P. (2009). Beliefs about mental health problems and help-seeking behavior in Dutch young adults. *Social Psychiatry and Psychiatric Epidemiology*, 44(3), 239-246. doi: 10.1007/s00127-008-0428-8
- White, B. P., Becker-Blease, K. A., & Grace-Bishop, K. (2006). Stimulant medication use, misuse, and abuse in an undergraduate and graduate student sample. *Journal of American College Health*, 54(5), 261-268.
- Yeh, M., McCabe, K., Hough, R. L., Lau, A., Fakhry, F., & Garland, A. (2005). Why bother with beliefs? Examining relationships between race/ethnicity, parental beliefs about causes of child problems, and mental health service use. *Journal of Consulting and Clinical Psychology*, 73(5), 800-807. doi: 10.1037/0022-006X.73.5.800



APPENDIX A  
IRB APPROVAL

**From:** [jbr6@msstate.edu](mailto:jbr6@msstate.edu)  
**To:** [Armstrong, Kevin; jh2833@msstate.edu; kln83@msstate.edu; Dorr, Morgan; mhd94@msstate.edu; mrb693@msstate.edu](mailto:Armstrong, Kevin; jh2833@msstate.edu; kln83@msstate.edu; Dorr, Morgan; mhd94@msstate.edu; mrb693@msstate.edu)  
**Subject:** Approval Notice for Study # IRB-17-392, Protective and Risk Factors for Nonprescription Use of Stimulant Medication  
**Date:** Friday, August 25, 2017 7:42:57 AM

---

Protocol ID: IRB-17-392  
Principal Investigator: Kevin Armstrong  
Protocol Title: Protective and Risk Factors for Nonprescription Use of Stimulant Medication  
Review Type: EXPEDITED  
Approval Date: August 25, 2017  
Expiration Date: July 15, 2018

The above referenced study has been approved. To access your approval documents, log into myProtocol and click on the protocol number to open the approved study. Your official approval letter can be found under the Event History section. For non-exempt approved studies, all stamped documents (e.g., consent, recruitment) can be found in the Attachment section and are labeled accordingly.

If you have any questions that the HRPP can assist you in answering, please do not hesitate to contact us at [irb@research.msstate.edu](mailto:irb@research.msstate.edu) or 662.325.3994.

APPENDIX B  
QUESTIONNAIRE AND ASRS

## Questionnaire

Q1 [Consent form was presented – a “yes” continues to Q2, while a “no” leads to discontinuation of participation.]

Q2 Have you ever been diagnosed with ADHD (Attention Deficit Hyperactivity Disorder)?

Yes (1)

No (2)

Q3 Do you CURRENTLY have a prescription for ADHD medication?

Yes, a stimulant medication like Adderall, Concerta, Ritalin, Focalin, Vyvanse, Daytrana patch, Dexedrine, Metadate (1)

Yes, a non-stimulant medication like Catapres, Clonidine, Intuniv, Desipramine, Norpramin, Strattera, Atomoxetine, Tenex, Effexor, Venlafaxine. (2)

Yes, not sure what it is (3)

No (4)

Answer If Do you CURRENTLY have a prescription for ADHD medication? Yes Is Selected

Q4 Have you ever been approached to divert (sell or share) your stimulant medication?

Yes (1)

No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medication? Yes Is Selected

Q5 Where do you get your prescription for the stimulant medication?

- MSU Student Health Center (1)
- Other (2)

Answer If Do you CURRENTLY have a prescription for ADHD medication? Yes Is Selected

Q6 Where do you usually get your prescription for the stimulant medication filled?

- MSU's Student Health Center (1)
- Starkville area pharmacy (2)
- Other (3)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q7 Which stimulant medication are you prescribed?

- Concerta (1)
- Vyvanse (2)
- Adderall (3)
- Ritalin (4)
- Other (5) \_\_\_\_\_

Answer If Do you CURRENTLY have a prescription for ADHD medication? Yes, a stimulant medication like Adderall, Concerta, Ritalin, Focalin, Vyvanse, Daytrana patch, Dexedrine, Metadate Is Selected

Q8 When was the last time you shared any of your prescription stimulant medication with someone else (e.g., Adderall, Vyvanse, Concerta)?

- Past month (1)
- Past year (2)
- More than a year ago (3)
- Never (4)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q9 How helpful is this medication?

\_\_\_\_\_ Slide the bar to indicate how helpful you believe this medication to be. (1)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q10 Have you ever taken a larger dose than prescribed (e.g., 2 pills at one time instead of 1, 3 pills instead of 2) in your life?

- Yes (1)
- No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q11 Have you taken a larger dose than prescribed (e.g., 2 pills at one time instead of 1, 3 pills instead of 2) in the past month?

Yes (1)

No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q12 Have you taken a larger dose than prescribed (e.g., 2 pills at one time instead of 1, 3 pills instead of 2) in the past year?

Yes (1)

No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q13 Did you ever take a larger dose than prescribed (e.g., 2 pills at one time instead of 1, 3 pills instead of 2) before college?

Yes (1)

No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q14 Have you taken the medication more frequently (e.g., 2x/day instead of once, 3x/day instead of 2x) than prescribed in the past month?

Yes (1)

No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q15 Have you taken the medication more frequently (e.g., 2x/day instead of once, 3x/day instead of 2x) than prescribed in the past year?

- Yes (1)
- No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medica... Yes Is Selected

Q16 Have you taken the medication more frequently (e.g., 2x/day instead of once, 3x/day instead of 2x) than prescribed in your life?

- Yes (1)
- No (2)

Answer If Do you CURRENTLY have a prescription for ADHD medication? Yes, a stimulant medication like Adderall, Concerta, Ritalin, Focalin, Vyvanse, Daytrana patch, Dexedrine, Metadate Is Selected

Q17 If you have a prescription for a stimulant medication, what BEST describes how you USUALLY take your medication?"

- Never (1)
- Weekdays only (2)
- Weekends only (3)
- Weekdays plus weekends (4)
- I only use it for special events (5)



Q18 Have you PREVIOUSLY had a prescription for a stimulant medication but DON'T currently?

- Yes (1)
- No (2)

Answer If Have you PREVIOUSLY had a prescription for a stimulant me... Yes Is Selected

Q19 Were you ever approached to divert (sell or share) your stimulant medication?

- Yes (1)
- No (2)

Answer If Have you PREVIOUSLY had a prescription for a stimulant me... Yes Is Selected

Q20 Which stimulant medication were you prescribed?

- Concerta (1)
- Vyvanse (2)
- Adderall (3)
- Ritalin (4)
- Other (5) \_\_\_\_\_

Answer If Have you PREVIOUSLY had a prescription for a stimulant me... Yes Is Selected

Q21 When was the last time (when you were taking the prescribed stimulant medication) that you shared any with someone else (e.g., Adderall, Vyvanse, Concerta)?

- High school (10-12th grades) (1)
- Junior high school (7th-9th) (2)
- Elementary school (6th grade or earlier) (3)
- Never (4)

Answer If Have you PREVIOUSLY had a prescription for a stimulant me... Yes Is Selected

Q22 How helpful was this stimulant medication when you were taking it?

\_\_\_\_\_ Slide the bar to indicate how helpful you believe this medication to be. (1)

Q23 If you have NEVER been diagnosed with ADHD, how likely is it that you have undiagnosed ADHD problems that might benefit from medication?

\_\_\_\_\_ Slide the bar to best answer the question. (1)

Q24 Have you ever taken stimulant medication (Adderall, Concerta, Vyvanse, etc.) without a prescription?

- Yes (1)
- No (2)

Q25 Please rate how difficult you think your current major is compared to other majors.

- Very difficult (1)
- Difficult (2)
- Somewhat Difficult (3)
- Neutral (4)
- Somewhat Easy (5)
- Easy (6)
- Very Easy (7)

Q26 Have any of your immediate family members (i.e., parents/siblings) ever been diagnosed with ADHD?

- None (1)
- 1 family member (2)
- 2 family members (3)
- > 2 family members (4)

Q27 How difficult is your current class load this semester?

- Very Difficult (1)
- Difficult (2)
- Somewhat Difficult (3)
- Neutral (4)
- Somewhat Easy (5)
- Easy (6)
- Very Easy (7)

Q28 The following questions will ask you to rate how useful stimulant medication is for helping with different tasks. (If you do not or have not taken this medication how well do you think it would help with these tasks.)

	Always useful (1)	Often useful (2)	Sometimes useful (3)	Rarely useful (4)	Never useful (5)
Studying for exams (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing papers (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking exams (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staying awake in class (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Giving class presentations (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting to class on time (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earning a higher GPA (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pulling an "all nighter" to study or write a paper (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancing eligibility for scholarship/financial support (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance other substances (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancing athletic performance (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Building muscle (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suppress appetite (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduce fatigue (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q42 Other?

Q43 Do you feel the medication helps you (or would help you if you were taking it):

	Yes (1)	No (2)
To avoid getting a worse grade? (1)	<input type="radio"/>	<input type="radio"/>
To avoid academic suspension/probation? (2)	<input type="radio"/>	<input type="radio"/>
To avoid losing scholarship money? (3)	<input type="radio"/>	<input type="radio"/>
To increase concentration? (4)	<input type="radio"/>	<input type="radio"/>
To increase alertness? (5)	<input type="radio"/>	<input type="radio"/>

Q48 Other?

Q49 How competitive are you about your grades?

\_\_\_\_\_ Slide bar to best answer the question. (1)

Q50 What do you think is the percentage of college students, whether they have a prescription or not, that have EVER used a stimulant medication in a non-prescribed manner (e.g., taking a higher dose, taking more frequently, or combining with other medications or substances)?

\_\_\_\_\_ Slide bar to best answer the question. (1)

Q51 When stimulant medication is obtained without a prescription, which is more common - that the medication was sold or shared?

\_\_\_\_\_ Slide bar to best answer the question (1)

Q52 When was the last time someone shared any of their prescription stimulant medication with you (e.g., Adderall, Vyvanse, Concerta)?

- Past month (1)
- Past year (2)
- More than a year ago (3)
- Never (4)

Q53 When was the last time you sold any of your prescription stimulant medication to someone else (e.g., Adderall, Vyvanse, Concerta)?

- Past month (1)
- Past year (2)
- More than a year ago (3)
- Never (4)

Q54 When was the last time someone sold stimulant medication to you (e.g., Adderall, Vyvanse, Concerta)?

- Past month (1)
- Past year (2)
- More than a year ago (3)
- Never (4)

Q55 Please rank these possible motivations for why YOU would share or sell stimulant medication. (Multiple selections are allowed, but rank only motivations you think are relevant, click and drag options.)

Why YOU would share or sell stimulant medication? (Drag items here & rank)	Not relevant
_____ To be liked/ accepted (1)	_____ To be liked/ accepted (1)
_____ To avoid being disliked/ rejected (2)	_____ To avoid being disliked/ rejected (2)
_____ Financial gain (3)	_____ Financial gain (3)
_____ To help someone (4)	_____ To help someone (4)
_____ Recreational benefits (5)	_____ Recreational benefits (5)

Q56 What do you believe are OTHERS' motivations to sharing or selling medication? (Multiple selections are allowed, but rank only motivations you think are relevant, click and drag options)

Why would OTHERS share or sell medication? (Drag items here & rank)	Not relevant
_____ To be liked/ accepted (1)	_____ To be liked/ accepted (1)
_____ To avoid being disliked/ rejected (2)	_____ To avoid being disliked/ rejected (2)
_____ Financial gain (3)	_____ Financial gain (3)



\_\_\_\_\_ To help someone (4)  
\_\_\_\_\_ Recreational benefits (5)

\_\_\_\_\_ To help someone (4)  
\_\_\_\_\_ Recreational benefits (5)

Q57 Would YOU share or sell medication more for financial gain or for social reasons?

- Financial gain (1)
- Social (2)
- Other/ NA (3) \_\_\_\_\_

Q58 Would OTHERS share or sell medication more for financial gain or for social reasons?

- Financial gain (1)
- Social (2)
- Other/ NA (3) \_\_\_\_\_

Q59 Select agree

- Strongly disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Q60 Have your family members ever shared prescribed medications with family members or friends who have a similar need but no prescription? (e.g., pain killers, anti-anxiety agents, ADHD medication)

- Yes (1)
- No (2)

Q61 Have your roommates/floor mates ever shared prescribed medications with others who have a similar need but no prescription? (e.g., pain killers, anti-anxiety agents, ADHD medication)

- Yes (1)
- No (2)

Q62 Have YOU ever shared prescribed medications with others who have a similar need but no prescription? (e.g., pain killers, anti-anxiety agents, ADHD medication)

- Yes (1)
- No (2)

Q63 What desired effects do you think YOU would get from using stimulant medication?

(multiple selections allowed)

- Increased concentration (1)
- Increased alertness (2)
- Help with studying (3)
- Produce a "high" (4)
- None (5)
- Other (6) \_\_\_\_\_

Q64 What desired effects do you think OTHERS would get from using stimulant medication?

(multiple selections allowed)

- Increased concentration (1)
- Increased alertness (2)
- Help with studying (3)
- Produce a "high" (4)
- None (5)
- Other (6) \_\_\_\_\_

Q65 How capable is stimulant medication of producing a "high" for the user?

- Very capable (1)
- Moderately capable (2)
- Somewhat Capable (3)
- Incapable (4)

Q66 How capable is stimulant medication in helping increase concentration?

- Very capable (1)
- Moderately capable (2)
- Capable (3)
- Incapable (4)
- Very incapable (5)

Q67 How capable is stimulant medication in helping increase alertness?

- Very capable (1)
- Moderately capable (2)
- Capable (3)
- Incapable (4)
- Very incapable (5)

Q68 How capable is stimulant medication in helping with studying?

- Very capable (1)
- Moderately capable (2)
- Capable (3)
- Incapable (4)
- Very incapable (5)

Q69 How strongly do you believe that someone has ever given you a stimulant medication without your permission or awareness?

- Strongly believe (1)
- Suspect (2)
- Do not believe (3)

Q70 Have YOU, whether you've had a prescription or not, ever had a side effect from an ADHD-related medication that required a trip to your doctor (non-emergency)?

Yes (1)

No (2)

Q71 Have YOU, whether you've had a prescription or not, ever had a side effect from an ADHD-related medication that required a trip to an emergency room?

Yes (1)

No (2)

Q72 Do you know of ANYONE, whether they had a prescription or not, who had a side effect from using an ADHD-medication that required a trip to an emergency room?

Yes (1)

No (2)

Q73 Do you know of ANYONE, whether they had a prescription or not, who had a side effect from using an ADHD-medication that required a trip to their doctor (non-emergency)?

yes (1)

No (2)

Q74 How often do you think people have a side effect from an ADHD-related medication that requires a trip to a doctor (non-emergency)?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

Q75 How often do you think that people ever have a side effect from an ADHD-related medication that requires a trip to the emergency room?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

Q76 When using ADHD stimulant medication what types of side effects have YOU experienced?

	Never had that effect (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	Never Used (6)
Headaches (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stomach aches (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritability (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced appetite (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulty (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dizziness (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty getting along with friends (e.g., irritability, mood swings) (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q84 What color is an orange?

- Pink (1)
- Orange (2)
- Blue (3)
- Black (4)
- Red (5)

Q85 Have YOU ever combined stimulant medication with energy drinks?

- Yes, I have combined stimulant medication and energy drinks. (1)
- No, I have only used stimulant medications. (2)
- No, I have only used energy drink. (3)
- No, I have never used either. (4)

Q86 Do you know someone that has combined stimulant medication with energy drinks?

- Yes (1)
- No (2)



Q87 If you have EVER used stimulant medication in a non-prescribed fashion (i.e., higher frequency or higher dose level), when did that typically happen?"

- Never (1)
- Weekdays only (2)
- Weekends only (3)
- Weekdays plus weekends (4)
- Only for special events (5)

Q88 For what events do you take stimulant medication? (check all that apply)

- exams (1)
- papers (2)
- partying (3)
- school/work days (4)
- athletic events (5)
- other (6)

Q89 Have you ever been charged with DUI (driving under the influence)?

- Yes (1)
- No (2)

Q90 If you have a current prescription for ADHD, how difficult was it to get your prescription renewed the last time you renewed it?

- Not at all (1)
- Some difficulties (2)
- Very easy (3)
- N/A (4)

Q91 If you have a current prescription for ADHD, how difficult was it to get your prescription filled?

- Not at all (1)
- Some difficulties (2)
- Very easy (3)
- NA (4)

Q92 How much of a LEGAL risk is posed by using stimulant medication with a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q93 How much of a LEGAL risk is posed by using stimulant medication without a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q94 How much of a HEALTH risk is posed by using stimulant medication with a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q95 How much of a HEALTH risk is posed by using stimulant medication without a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q96 How much of a SOCIAL risk (e.g., rejection by or criticism from others) is posed by using stimulant medication with a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q97 How much of a SOCIAL risk (e.g., rejection by or criticism from others) is posed by using stimulant medication without a prescription?

- Very Dangerous (1)
- Dangerous (2)
- Slightly Dangerous (3)
- Not Dangerous at all (4)

Q98 Rate yourself on each of the following items using the rating system below. Only rate actual behavior be it verbal and/or physical. Do not include in your ratings thoughts not followed by any action or fantasies. For these questions it is important to rate any events that have occurred over your lifetime (including your years as a teenager and a young adult). How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? "Throw" a temper tantrum (for example: screaming, slamming doors, throwing things when frustrated to the "breaking point")

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q99 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Get into physical fights with other people

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q100 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Get into verbal fights or arguments with other people

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q101 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Deliberately hit another person (or an animal) in anger

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q102 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Deliberately struck or deliberately broke objects, (for example: windows, dishes, etc.) in anger

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q103 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Deliberately tried to physically hurt yourself in anger or desperation

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q104 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Deliberately tried to end your life or kill yourself in anger or desperation

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q105 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Had discipline problems in school which resulted in a reprimand by the school principal, or in a suspension, or expulsion from school

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)



Q106 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Had difficulties with bosses or supervisors which resulted in a physical or verbal fight and led to a reprimand, a demotion, or a firing from your job

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q107 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Had difficulties with other people due to lying, stealing, sexual promiscuity, involvement in activities that were questionably legal, disregard for the rights of others

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q108 How Many Times Would You Say You Did the Following Things Over the Course of Your Life to Date? Had difficulties with the law or police which resulted in a warning, arrest, or conviction for a misdemeanor or felony offense

- 0 = never happened (1)
- 1 = only happened "once" (e.g., one time) (2)
- 2 = happened "a couple" or "a few" (e.g., 2-3) times (3)
- 3 = happened "several" (e.g., 4-9) times (4)
- 4 = happened "many" (e.g., 10+) times (5)
- 5 = happened "so many" times that I couldn't give a number (6)

Q109 Pull slider as close to 50% as you can.

\_\_\_\_\_ Select 50%. (1)

Q110 Have you ever thought about or attempted to kill yourself?

- 0= No (2)
- 1 (3)
- 2 (4)
- 3 (5)
- 4 (6)
- 5 (7)
- 6= I have attempted to kill myself and I think I really hoped to die (8)

Q111 How often have you thought about killing yourself in the past year?

- 0= Never (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4= Very often (5)

Q112 Have you ever told someone that you were going to commit suicide, or that you might do it?

- 0= No (1)
- 1 (2)
- 2= Yes, during more than one period of time (3)

Q113 How likely is it that you will commit suicide one day?

- 0= No chance at all (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4= Very likely (5)

Q114 How safe do you think it would be to take a double dose (e.g., 2 pills vs. 1) than a typical stimulant prescription calls for?

\_\_\_\_\_ Slide bar to best answer the question. (1)

Q115 If you have ever taken stimulants from a friend who had a prescription, how did the amount YOU typically used compare to THEIR usual prescription dose?

- Less than their dose (e.g., 1 when 2 is normal) (1)
- Equal to their dose (2)
- Double their dose (e.g., double normal dose or more) (3)
- More than double their dose (4)
- Never taken medication (5)

Q116 How satisfied are you with your body?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neutral (3)
- Satisfied (4)
- Very Satisfied (5)

Q117 If someone you know reports they have ADHD (attention deficit hyperactivity disorder) your view of them is likely to:

- Become more positive (1)
- No change (2)
- Become more negative (3)

Q118 Do you disapprove of people WITH a prescription trying stimulant medications once or twice?

- Yes (1)
- No (2)

Q119 Do you disapprove of people WITH a prescription trying stimulant medications regularly?

- Yes (1)
- No (2)

Q120 Do you disapprove of people WITHOUT a prescription trying stimulant medications once or twice as a study aid?

- Yes (1)
- No (2)

Q121 Do you disapprove of people WITHOUT a prescription trying stimulant medications regularly as a study aid?

- Yes (1)
- No (2)

Q122 Do you disapprove of people WITHOUT a prescription trying stimulant medications once or twice for recreational purposes?

- Yes (1)
- No (2)

Q123 Do you disapprove of people WITHOUT a prescription trying stimulant medications regularly for recreational purposes?

- Yes (1)
- No (2)

Q124 Do you disapprove of people WITHOUT a prescription trying stimulant medications once or twice for diet/ appetite control purposes?

- Yes (1)
- No (2)

Q125 Do you disapprove of people WITHOUT a prescription trying stimulant medications regularly for diet/ appetite control purposes?

- Yes (1)
- No (2)

Q126 How often do you have trouble wrapping up the final details of a project once the challenging parts have been done?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q127 How often do you have difficulty getting things in order when you have to do a task that requires organization?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q128 How often do you have problems remembering appointments or obligations?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q129 When you have a task that requires a lot of thought, how often do you avoid or delay getting started?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q130 How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q131 How often do you feel overly active and compelled to do things, like you were driven by a motor?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q132 How often do you make careless mistakes when you have to work on a boring or difficult project?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)



Q133 How often do you have difficulty keeping your attention when you are doing boring or repetitive work?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q134 How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q135 How often do you misplace or have difficulty finding things at home or at work?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q136 How often are you distracted by activity or noise around you?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q137 How often do you leave your seat in meetings or other situations in which you are expected to remain seated?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q138 How often do you feel restless or fidgety?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q139 How often do you have difficulty unwinding and relaxing when you have time to yourself?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q140 How often do you find yourself talking too much when you are in social situations?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q141 When you're in conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish themselves?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q142 How often do you have difficulty waiting your turn in situations when turn taking is required?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q143 How often do you interrupt others when they are busy?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Very often (5)

Q144 How old are you (years)?

Q145 Please select your gender.

- Male (1)
- Female (2)

Q146 Please select your ethnicity.

- Caucasian (1)
- African American (2)
- Asian (3)
- Pacific Islander (4)
- Hispanic (5)
- Other (6)

Q147 What is your current living arrangement?

- Single sex resident hall (1)
- Co-ed hall (2)
- Other university housing (3)
- At home (4)
- Fraternity/ Sorority house (5)
- Off campus (6)

Q148 Please select what class mostly closely matches your current credit hour total.

- Freshman (first semester) (1)
- Freshman (other) (2)
- Sophomore (3)
- Junior (4)
- Senior (5)
- Unclassified or graduate (6)

Q149 What is your current Greek life affiliation?

- Member (1)
- Non- Member (2)
- Past member (3)

Q150 What is your current GPA (actual, if available; estimated if first semester college student)?

\_\_\_\_\_ GPA (1)

Q151 What is your current major?

Q152 How many credit hours are you enrolled in this semester?

Q153 Are you or have you ever been a member of the Honors College?

- Yes (1)
- No (2)

Q154 How challenging is your major for you?

\_\_\_\_\_ Slide bar to best answer the question. (1)

Q155 Have you ever combined stimulant medication with alcohol?

- Yes (1)
- No (2)

Q156 Have you ever combined stimulant medication with other drugs?

- Yes (1)
- No (2)

Q157 FATHER'S highest level of education

- Doctoral degree (1)
- Masters degree (2)
- Bachelor degree (3)
- Associates degree (4)
- High school diploma/ GED (5)
- Less than high school diploma (6)

Q158 MOTHER'S highest level of education

- Doctoral degree (1)
- Masters degree (2)
- Bachelor degree (3)
- Associates degree (4)
- High school diploma/ GED (5)
- Less than high school diploma (6)

Q159 Were you truthful with the responses you provided?

- Yes (1)
- No (2)

APPENDIX C

TABLE 3 – REDUCED SAMPLE OF AFRICAN AMERICAN FEMALES VS OVERALL  
SAMPLE OF AFRICAN AMERICAN FEMALES



Table 3

*Reduced Sample of African American Females vs. Overall Sample of African American Females*

	Overall AA females (n = 233)	Selected Sample for Study AA females (n = 120)
IUPS % (Consumer)	12/233 = <u>5.2%</u>	4/120 = 3.3%
IPUS % (Misuser)	1/233 = 0.4%	1/120 = 0.8%
<b>Risk perceptions</b>		
Legal	1.64 <u>(.88)</u>	1.71 <u>(.92)</u>
Health	1.67 <u>(.90)</u>	1.77 <u>(.91)</u>
Social	2.59 (1.13)	2.50 (1.10)
<b>Benefit perceptions</b>		
Concentration	<u>2.18</u> (1.16)	<u>2.28</u> (1.22)
Alertness	<u>2.14</u> (1.17)	<u>2.16</u> (1.23)
Studying	<u>2.39</u> (1.17)	<u>2.43</u> (1.21)
Appetite suppression helpfulness	<u>3.38</u> (1.36)	<u>3.44</u> (1.33)
First semester freshmen	76/233 = 32.6%	37/120 = 30.8%
Greek affiliated	11/233 = 4.7%	7/120 = 5.8%
Has current script	2/233 = 0.9%	2/120 = 1.7%
Ever diagnosed	6/233 = 2.6%	4/120 = 3.3%
Likelihood of undiagnosed ADHD	<u>11.67</u> (22.31)	<u>10.52</u> (21.32)
Current script	2/233 = 0.9%	2/120 = 1.7%
Been slipped stimulant medication without permission	14/231 = 6.1% strongly 26/231 = 11.3% suspect	6/118 = 5.1% strongly 12/118 = 10.2% suspect
Age	<u>19.20</u> (1.38)	<u>19.16</u> (1.17)
ADHD significant symptom count	4.59 <u>(4.10)</u>	4.92 <u>(4.33)</u>