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Prescription Stimulant Misuse and ADHD Symptomatology Among College Students in Iceland

Bergljot Gyda Gudmundsdottir
University of Rhode Island, gydagudmundsdottir@gmail.com

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PRESCRIPTION STIMULANT MISUSE
AND ADHD SYMPTOMATOLOGY
AMONG COLLEGE STUDENTS
IN ICELAND

BY

BERGLJOT GYDA GUDMUNDSDOTTIR

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN PSYCHOLOGY

UNIVERSITY OF RHODE ISLAND

2015

DOCTOR OF PHILOSOPHY DISSERTATION
OF
BERGLJOT GYDA GUDMUNDSDOTTIR

APPROVED:

Dissertation Committee:

Major Professor Lisa Weyandt

Lisa Harlow

Alycia Mosley Austin

Nasser H. Zawia

DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND

2015

ABSTRACT

As growing numbers of students with attention deficit hyperactivity disorder (ADHD) pursue postsecondary education, the availability of psychostimulant medications on college campuses has steadily increased. Although a large body of research has documented that misuse of prescription stimulant medication is a prevalent problem on American college campuses, few studies have been conducted beyond the United States. Iceland, closely followed by the United States, has the highest stimulant medication prescription rates in the world; however, no systematic efforts have been made to investigate to what extent these medications are being misused within the Icelandic college student population. Therefore, the purpose of the present study was to: a) examine the prevalence of prescription stimulant misuse among N=521 college students in Iceland as well as factors that are potentially predictive of stimulant misuse, including ADHD symptomatology, symptoms of depression, anxiety, and stress, self-reported grade-point average (GPA), and student sex; and b) identify the prevalence of significant ADHD symptomatology within this population.

Results revealed the prevalence of lifetime stimulant misuse behavior was approximately 13% within the overall sample, 11% among participants without a prescription for stimulant medication, and 42% among participants holding a prescription. The primary reported reason for misuse was academic enhancement, similar to findings from the United States and Europe. Findings also suggested risk factors for prescription stimulant misuse among college students in Iceland included male sex, anxiety symptoms, and a history of ADHD symptoms. Approximately 8%

of participants reported persistent, elevated ADHD symptomatology, while approximately 9% reported a previous diagnosis of ADHD.

The present findings have implications for public health policy in Iceland, particularly as it relates to the college population. Limitations of the study and suggestions for future research are discussed.

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DEDICATION

To my mother, Elín Davíðsdóttir Greason (1962 – 2014)

PREFACE

This dissertation is in manuscript format.

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Publication Status

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**Prescription Stimulant Misuse and ADHD Symptomatology among College
Students in Iceland**

Corresponding Author: Bergljot Gyda Gudmundsdottir, M.A.

Department of Psychology

University of Rhode Island

Kingston, RI 02881

Email: gydagudmundsdottir@gmail.com

Introduction

Attention deficit hyperactivity disorder (ADHD) is a chronic disorder characterized by clinically significant levels of inattention, hyperactivity, and impulsivity that causes impairment in multiple settings. The disorder is estimated to affect approximately 5% of children (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007) and 2.5% of adults (Simon, Czobor, Bálint, Mészáros, & Bitter, 2009) across cultures (American Psychiatric Association, 2013). Youth with ADHD often demonstrate various problems in the school environment, such as difficulty remaining focused and seated, disorganization, talking excessively, as well as noncompliance and aggression (Danforth, Connor, & Doerfler, 2014; Pliszka, 2014). Due to these difficulties, students with ADHD tend to perform more poorly than their peers academically (e.g., receive lower grades, repeat grades, drop out of high school at higher rates, [DuPaul & Jimerson, 2014; Faraone et al., 1993]), and are less likely to attend and graduate from college (Kuriyan et al., 2013). Despite this poor prognosis, increasing numbers of students with ADHD are successfully completing high school and pursuing higher education (DuPaul & Weyandt, 2009; Weyandt & DuPaul, 2013). While no definitive information is available regarding the prevalence of ADHD in the college population, given that the privacy of students with disabilities is protected under the Americans with Disabilities Act (1991) and that ADHD may be underdiagnosed among college students (Wolf, Simkowitz, & Carlson, 2009), studies estimate that 2-8% of college students across cultures have significant ADHD symptoms (DuPaul et al., 2001; Eagan et al., 2014; McKee, 2008; Weyandt, Linterman & Rice, 1995), and approximately 18%-50% of students who receive disability accommodations in U.S.

colleges do so primarily due to ADHD (Raue & Lewis, 2011; Wolf et al., 2009). Weyandt and DuPaul (2013), leading researchers in the field, emphasized the paucity of information available and stressed the need for studies to explore the prevalence and nature of ADHD among college students as well as their academic and social functioning. The extant literature has revealed, however, that college students with ADHD and elevated ADHD symptomatology tend to exhibit academic underachievement (Weyandt et al., 2013a), including lower GPAs (Advokat, Lane, & Luo, 2011; Gormley et al., 2015), poorer study habits and study skills (Gormley et al., 2015), greater difficulty with academic adjustment (Norwalk, Norvilitis, & MacLean, 2009; Rabiner, Anastopoulos, Costello, Hoyle, & Swartzwelder, 2008; Weyandt et al., 2013a), and are more likely to drop out of college (Barkley, Murphy, & Fischer, 2008) than their non-affected counterparts. College students with ADHD also generally report more psychosocial difficulties, including a lower self-esteem (Canu & Carlson, 2007; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005), lower life satisfaction (Gudjonsson, Sigurdsson, Eyjolfsson, Smari, & Young, 2009), higher levels of internalizing and externalizing pathology (e.g., depression, anxiety, and hostility), and greater executive dysfunction, compared to students without ADHD (Weyandt et al., 2013a). More recently, Anastopoulos and colleagues (in press) reported that college students with rigorously defined ADHD were significantly more likely than their non-affected peers to meet diagnostic criteria for one or more comorbid psychiatric disorder, particularly depression and anxiety. In fact, 55% of the ADHD participants in this study presented with at least one comorbid diagnosis, compared with only 11% of the non-ADHD sample. Taken together, this body of research clearly indicates that

students with significant ADHD symptoms face numerous challenges during the college years. These findings underscore the need for identifying college students with attention problems so that effective treatments may be implemented to help promote their academic success and well-being.

Use and Misuse of Prescription Stimulants

The main treatment options for adults with ADHD include pharmacological and psychosocial approaches with stimulant medication commonly recommended as part of an individually tailored treatment plan (Kooij et al., 2010; National Institute for Health and Clinical Excellence, 2009). Methylphenidate (MPH; e.g., Ritalin, Concerta) and amphetamine (AMP; e.g., Adderall, Dexedrine) are the two most commonly prescribed stimulants for the treatment of ADHD (Meijer et al., 2009; Wilens, 2008), and are similar, although not identical, with respect to their presumed neurochemical mode of action. Specifically, research with humans and other animals indicates that MPH increases the availability of dopamine in the extracellular space by blocking the dopamine transporter, thereby preventing dopamine reuptake (Weyandt, 2006). Additionally, MPH has been hypothesized to increase norepinephrine availability by blocking the norepinephrine transporter (Berridge & Devilbiss, 2011). AMP, however, is not only believed to prevent dopamine reuptake, but also to stimulate its efflux from the presynaptic neuron, further increasing dopamine availability. At higher doses, AMP also appears to stimulate norepinephrine efflux (Berridge & Devilbiss, 2011; Weyandt, 2006).

Although no definitive pathophysiological profile has been documented in ADHD, current neurobiological theories posit that catecholaminergic

neurotransmission plays an important role (Faraone & Biederman, 1998), particularly in the fronto-striatal pathway (Wilens, 2008). Specifically, dysregulation of neurotransmission in fronto-subcortical circuits has been associated with problems with attention, motor behavior, and executive function, all of which are associated with ADHD (although not uniquely so). Treatment with stimulant medication, in turn, is believed to enhance catecholaminergic functioning in these areas, as manifested by ADHD symptom improvement (del Campo et al., 2013; Engert & Pruessner, 2008; Faraone & Biederman, 1998). Previously, prescription stimulants were believed to primarily benefit individuals with ADHD; more recent evidence indicates, however, these medications may enhance various physiological and cognitive processes in individuals without ADHD as well (del Campo et al., 2013; Smith & Farah, 2011).

Beyond the presumed basic neurochemical actions of prescription stimulants, the precise effects of these medications on brain function remain poorly understood. Converging evidence supports, however, that when used as prescribed, stimulant medications are safe and effective at improving core ADHD symptoms of inattention, impulsivity, and hyperactivity, as well as improving psychological, cognitive, and social functioning (Adler, Spencer, McGough, Jiang, & Muniz, 2009; Adler et al., 2013; Brams, Giblin, Gasior, Gao, & Wigal, 2011; DuPaul et al., 2012; Faraone, Spencer, Aleardi, Pagano, & Biederman, 2004; Retz et al., 2012; Spencer, Adler, Weisler, & Youcha, 2008). Additionally, recent evidence indicates pharmacotherapy with stimulants may serve as a protective factor among individuals with ADHD as stimulants have been associated with decreased risk of substance abuse (Chang et al.,

2014; Wilens, Faraone, Biederman, & Gunawardene, 2003) as well as lower risk of suicidal behavior (Chen et al., 2014).

Despite major benefits for individuals with ADHD, prescription stimulants also have been associated with more negative outcomes, including a variety of side effects (e.g., sleep difficulties, reduced appetite, nausea, abdominal pain, headache, and cardiac symptoms [Craig, Davies, Schibuk, Weiss, & Hechtman, 2015; Weyandt et al., 2014]) and significant potential for misuse that can possibly lead to psychological and/or physiological dependence (Kollins, 2003), as reflected by their classification as Schedule II medications by the U.S. Food and Drug Administration (2011). As increasing numbers of individuals with ADHD pursue college, the non-medical use of prescription stimulants has become more evident on college campuses, and has been well documented in the literature (Benson, Flory, Humphreys, & Lee, 2015; Weyandt et al., 2013b). Indeed, many college students claim that stimulant medications are easily accessible on campus (McCabe, Knight, Teter & Wechsler, 2005; Rabiner et al., 2009; Sharp & Rosen, 2007; Weyandt et al., 2009), and stimulants are usually obtained from other students with a valid prescription (Benson et al., 2015; Weyandt et al., 2013b).

The non-medical use or misuse of stimulants, usually defined as taking stimulants without a valid prescription or greater use of stimulants than as prescribed (Benson et al., 2015; Weyandt et al., 2013b), has soared among university students since the beginning of the century (Babcock & Byrne, 2000; DeSantis, Noar, & Webb, 2010; DuPont, Coleman, Bucher, & Wilford, 2008; Dussault & Weyandt, 2013; Hall, Irwin, Bowman, Frankenberger, & Jewett, 2005; Janusis & Weyandt,

2010; Judson & Langdon, 2009; Low & Gendaszek, 2002; Messina et al., 2014; McCabe et al., 2005; McCabe, West, Teter, & Boyd, 2014; Rabiner et al., 2009; Sharp & Rosen, 2007; Verdi, Weyandt, & Zavras, 2014; Weyandt et al., 2009; White, Becker-Blease & Grace-Bishop, 2006). For example, Babcock and Byrne reported a lifetime prevalence rate of stimulant misuse behavior of 16.6% among college students in the year 2000 whereas in 2014 Messina and colleagues reported a lifetime prevalence rate of 25.4%. Other studies have reported a lifetime prevalence rate as high as 43% (DeSantis, Webb, & Noar, 2008). Recently, Benson and colleagues (2015) conducted a meta-analysis of 20 studies in which they estimated the prevalence rate of stimulant misuse to be at 17% among college students (95% confidence interval [CI] [13%, 23%]). Regardless of exact prevalence rates, studies consistently indicate that a large percentage of college students have misused prescription stimulants. Given the judicial and potential health risks associated with the misuse of prescription stimulants, several studies have attempted to shed light on the motivations for engaging in this behavior.

A systematic review of the literature conducted by Weyandt and colleagues (2013) revealed that several reasons for misusing prescription stimulants have been reported, chief among them being cognitive and academic enhancement. More specifically, college students who disclose engaging in stimulant misuse report doing so while studying (e.g., preparing for exams, writing papers) to increase their attention and alertness, and thus improve their academic performance. Rabiner and colleagues (2009) also found that although a number of reasons for misuse were reported in their study, the most strongly endorsed reasons pertained to the enhancement of academic

performance. Interestingly, however, stimulant misuse has been found to be negatively associated with academic functioning (Benson et al., 2015), which suggests that contrary to what students believe, prescription stimulants may not necessarily lead to improved academic performance. Weyandt et al. (2013b) as well as Benson et al. (2015) reported other less commonly endorsed reasons for the non-medical use of stimulants include “getting high”, staying awake to party, extending the effects of alcohol or other substances, losing weight, and curiosity, and up to 40% of students appear to misuse stimulants for *both* academic and non-academic reasons (Benson et al., 2015). According to Weyandt et al. (2013b), the most common method of stimulant administration among those who misuse is oral, followed by intranasal administration, but a small percentage of students report either smoking or injecting them. Finally, Benson et al. (2015) and Weyandt and colleagues (2013b) reported that most students engaging in misuse of prescription stimulants report obtaining the drugs from other students, and to a lesser extent from family members; and students have also reported stealing the medications from others and overusing their own prescriptions.

To summarize, the misuse of prescription stimulants has increased substantially in the past two decades among college students. In addition to examining the prevalence, motivations, and characteristics of stimulant misuse, researchers also have sought to identify specific predictors of this behavior, including both demographic and psychological variables.

Predictors of Prescription Stimulant Misuse

Preliminary studies have identified several demographic variables that are predictive of prescription stimulant misuse. For example, results from a number of studies have indicated males are more likely to engage in stimulant misuse than females, although findings have been inconsistent (Benson et al., 2015; Weyandt et al., 2013b). Weyandt et al. (2013b) calculated the magnitude of sex differences in studies examining the non-medical use of stimulants and found Cohen's d effect sizes ranging from .88 to 5.38, suggesting stark group differences favoring males. In terms of race/ethnicity, some studies have found students identifying as white or Caucasian are more likely to endorse stimulant misuse than students of non-white backgrounds, whereas others have reported no significant differences across racial/ethnic groups (Benson et al., 2015). As stated previously, academic performance, usually measured by self-reported grade point average (GPA), has been found to be negatively associated with misuse of prescription stimulants across several studies (Benson et al., 2015). For example, Arria, O'Grady, Caldeira, Vincent, and Wish (2008) reported that first-year college students who misused prescription stimulants had lower high school GPAs, attended classes less frequently, devoted less time to studying, and spent more time socializing compared to nonusers. Furthermore, results indicated that past-year non-medical use of stimulants predicted lower GPA by the end of the first year of college, which was mediated by skipping class.

With regard to psychological risk factors, depression (Huang et al., 2006; Teter, Falone, Cranford, Boyd & McCabe, 2010; Zullig & Divin, 2012), anxiety (Dussault & Weyandt, 2013; Verdi et al., 2014; Weyandt et al., 2009), stress (Dussault

& Weyandt, 2013; Peterkin, Crone, Sheridan, & Wise, 2011; Verdi et al., 2014), and internal restlessness (Dussault & Weyandt, 2013, Verdi et al., 2014; Weyandt et al., 2009) have all been found to be predictive of stimulant misuse. Notably, internal restlessness has been conceptualized as the adult manifestation of childhood hyperactivity; that is, symptoms of physical hyperactivity in childhood are often replaced with cognitive, mental, or internal restlessness as individuals enter adulthood (Biederman, Mick, & Faraone, 2000; Weyandt et al., 2003). Consequently, some researchers have speculated that students who misuse stimulants may be “self-medicating” to treat symptoms of ADHD. For instance, Rabiner et al. (2009) found that ADHD symptoms of inattention significantly predicted misuse of prescription stimulants, even after controlling for use of other substances. In contrast, symptoms of hyperactivity/impulsivity were associated with greater odds of engaging in other substance use. Similarly, Arria and colleagues (2011) found that untreated symptoms of inattention were associated with persistent misuse of stimulants. Finally, Benson and colleagues’ (2015) meta-analytic review suggested having a diagnosis of ADHD is significantly associated with stimulant misuse, with odds ratios ranging from 1.02 to 21.44. Collectively, these findings suggest ADHD symptoms likely constitute a risk factor for stimulant misuse.

In summary, studies clearly indicate prescription stimulant misuse is a prevalent problem on American college campuses. The primary reason students report for engaging in such misuse is enhancement of cognitive and academic performance. Research, however, presents a different picture, given that misuse of stimulants appears to be negatively associated with academic performance, and positively

associated with various psychological difficulties, including symptoms of ADHD, depression, anxiety, and stress. Preliminary evidence from other countries indicates prescription stimulant misuse is not unique to North American college life; however, information concerning stimulant misuse behavior among college students in other countries is scarce.

International Studies on Prescription Stimulant Misuse in College

Studies regarding prescription stimulant misuse beyond the United States are scant. An investigation conducted by Deline and colleagues (2014) in Switzerland concerning the use of various neuroenhancement drugs, including prescription stimulants, among males, revealed that while misuse was much lower than in the United States (i.e., 3%), prescription stimulants were the most frequently misused drugs. Furthermore, in this sample, college students reported *less* misuse of prescription stimulants than did those not enrolled in college. Surprisingly, Deline et al. (2014) did not find an association between ADHD status and misuse behavior; however, they identified participants as either ADHD or non-ADHD using a cut-off score based only on self-report ratings on a 6-item screening measure. Given the limited rigor in Deline et al.'s (2014) assessment of ADHD symptoms the validity of these findings is equivocal. Maier, Liechti, Herzig, and Schaub (2013) also investigated stimulant misuse in Switzerland among over 6,000 university students of whom 4.5% endorsed having used either MPH or AMP, primarily for academic and/or cognitive enhancement. In this study, students who reported increased levels of stress were significantly more likely to endorse misuse behavior, mirroring findings from the United States linking psychological distress with stimulant misuse (e.g., Benson et al.,

2015; Weyandt et al., 2009). A study by Mache, Eickenhorst, Vitzthum, Klapp, and Groneberg (2012) regarding substance use among German university students revealed that approximately 1-13% had used either prescription stimulants or illicit psychoactive drugs (e.g., cannabis) at least once. Similar to American students, the main reported motives for using these drugs were to improve concentration, increase alertness, and relax. In another German study, Dietz and colleagues (2013) examined the 12-month prevalence of the use of cognitive enhancement drugs among university students, including amphetamines, caffeine tablets, cocaine, methylphenidate, and mephedrone. Results suggested 20% of the students had used cognitive enhancers within the past 12 months and that males were more likely than females to have used such drugs.

The results of these studies indicate that European university students are indeed using various substances, including prescription stimulants, to ostensibly improve their attention and academic performance, much like their American counterparts. Preliminary studies suggest the prevalence of misuse behavior in these countries may be lower than in the United States; however, more detailed information regarding this issue is needed.

Use of Prescription Stimulants in Iceland

Although limited data exist regarding misuse of prescription stimulants among college students beyond the United States, research indicates that in terms of prescription rates, Iceland, closely followed by the United States, has the highest per capita overall consumption of prescription stimulants in the world among children, adolescents, and adults, or 8-12 defined daily doses for statistical purposes (S-DDD),

compared with 2-6 S-DDD in Canada, Switzerland, Sweden, and Norway, for example (Kaye & Darke, 2012). Similarly, Zoëga and colleagues' (2011) investigation of stimulant use in the Nordic countries revealed the rate of prescriptions for stimulant medications in Iceland was nearly 12 times that in Finland and almost five times that in Sweden. Moreover, using data from the complete nationwide drug prescription database in Iceland, Geirs, Pottegård, Halldórsson, and Zoëga (2014) reported the 1-year period prevalence of overall prescription stimulant use tripled between 2003 and 2012, with the largest increases in prescription rates among young adults between the ages of 19 and 24. No studies have been conducted to date, however, to specifically examine the prevalence of ADHD in the Icelandic population. Despite widespread use of ADHD medications in Iceland, only one study that examined prescription stimulant misuse in Iceland was found, and included a group of individuals with chronic substance abuse problems who used these medications mostly intravenously (Bjarnadóttir et al., 2013). Bjarnadóttir and colleagues (2013) concluded that prescription stimulant misuse is a growing problem in Iceland, at least among those with addiction issues. In addition, the International Narcotics Control Board (INCB) requested clarification from Icelandic authorities due to the high rates of stimulant prescriptions to children, adolescents, and adults (The Icelandic Medical Journal, 2011).

Given the similarities between Iceland and the United States with respect to stimulant prescription rates, the growing numbers of young adults prescribed stimulant medications in Iceland, and the prevalence of stimulant misuse on American college campuses, it is highly plausible these medications are also being misused among

Icelandic college students. To date, however, no systematic efforts have been made to evaluate the scope and nature of prescription stimulant misuse among college students in Iceland, nor how the prevalence of ADHD symptomatology in this population relates to such behavior. In light of the health and judicial risks associated with misuse of prescription stimulants, it is critical to investigate the extent to which these medications are being misused in Iceland as well as factors, such as ADHD symptomatology, that are predictive of prescription stimulant misuse.

Purpose of the Study

A voluminous body of research has assessed the prevalence, characteristics, and predictors of prescription stimulant misuse among undergraduate students in the United States. The results of these studies collectively indicate this behavior constitutes a significant problem on American college campuses (Benson et al., 2015; Weyandt et al., 2013b). Only a few studies, however, have assessed the prevalence of prescription stimulant misuse beyond the United States. Prescription rates for stimulant medications for ADHD are similar in Iceland and the United States; however, in contrast to the United States, no studies have been conducted to assess the prevalence of prescription stimulant misuse among college students in Iceland. Therefore, the purpose of the present study was to explore the prevalence rates of prescription stimulant misuse among Icelandic college students and to examine potential predictors of this behavior. Such findings will be instrumental in the development of prevention and intervention programs to help improve the outcomes of college students who misuse prescription stimulants. For the purposes of the present study, prescription stimulant misuse was defined as use of stimulant medications without a valid prescription (e.g., Dussault & Weyandt, 2013; Verdi et al., 2014). Specifically, the current study investigated: a) self-reported prevalence of prescription stimulant misuse among Icelandic college students, and b) self-reported prevalence of ADHD symptomatology as well as symptoms of depression, anxiety, and stress.

Research Hypotheses

Based on previous empirical findings, it was hypothesized that:

- 1) Male sex would be more strongly associated with prescription stimulant misuse behavior than female sex,
- 2) Self-reported GPA would be negatively associated with prescription stimulant misuse,
- 3) Symptoms of depression, anxiety, and stress would be positively associated with prescription stimulant misuse, and
- 4) ADHD symptomatology would significantly predict prescription stimulant misuse while controlling for symptoms of depression, anxiety, and stress.

Method

Procedure

The current study was approved by the National Bioethics Committee of Iceland (reference number: VSNb2014050018/03.07) as well as the Institutional Review Board (IRB) at the University of Rhode Island. University staff and faculty at four universities in Iceland were contacted via email, and asked to assist with the recruitment of undergraduate research participants. Two of the universities were located in the capital region of Iceland, whereas the other two were located in more rural areas. Specifically, contact people at each of the four universities were asked to forward an email containing a brief summary of the study and a link to a secure online survey website (SurveyMonkey) to all Icelandic undergraduate students who might be eligible and willing to participate. To further facilitate participant recruitment, the same information was posted on public Icelandic Facebook webpages. Before initiating the online survey, potential participants were presented with an electronic informed consent form (Appendix A) and instructed to confirm they had read and understood the content by checking a statement of endorsement. The consent form contained the researchers' contact information should participants have had questions or concerns and listed the requirements and responsibilities of participating in the study, including a description of the research project (e.g., time commitment, potential for harm, anonymity, etc.). Participants were made aware that the survey was completely voluntary and anonymous and that they had the opportunity to discontinue participation in the study at any time. Participants who provided consent to participate were then directed to the study questionnaires. To encourage participation, potential

participants were offered to enter a drawing at the end of the survey for a chance to win a 5,000 ISK gift card ($\approx$ 45 USD). Upon completion of the study questionnaires, participants were debriefed and provided with information regarding how to contact the researchers with any questions or concerns (see Appendix B).

Participants

A total of 931 individuals accessed the online survey; 929 agreed to participate while 2 individuals declined participation. The present sample included $N=521$ participants of undergraduate status from the four largest universities in Iceland, $n=34$ of whom (6.5%) reported having a current prescription for psychostimulant medication. The remaining 408 participants reported being of graduate student status ($n=102$), did not disclose their status, and/or did not complete the entire survey ($n=306$). Participants holding a current prescription for stimulant medication were excluded from regression analyses concerning predictors of stimulant misuse behavior, given the current study's definition of misuse as use of stimulants without a valid prescription. This subgroup of participants, however, was not excluded from other analyses (e.g., psychometric analyses, prevalence rates of stimulant misuse [although stimulant misuse prevalence rates were calculated separately for each group based on prescription status], and prevalence of significant ADHD symptomatology calculations).

The mean age of participants was 28.33 years ($SD=8.36$; range 19-57 years). A majority of participants identified as female (81.4%), and 18.6% identified as male. Based on available demographic information (Reykjavik University 2011; University of Iceland, 2013), approximately 60% of participants were expected to be female;

therefore, the gender distribution of the current sample was more unequal than anticipated. As expected, a large majority of participants identified as white (99.2%), compared with only 0.8% identifying as either non-white or other. Sixty-nine participants (13.2%) endorsed having some form of a disability and 47 participants (9%) reported a previous diagnosis of ADHD. Information concerning participant demographics can be found in Table 1 and a statement regarding diversity in research is presented in Appendix C.

Measures

Demographics Questionnaire. The demographics questionnaire included questions about participant age, gender/sex, race/ethnicity, university, degree program, cumulative grade point average (GPA), ADHD diagnostic status, and stimulant medication prescription status. As stated previously, participants who reported having a current prescription for stimulant medication were *not* excluded from participating in the study but for regression analyses concerning stimulant misuse behavior their responses were not included, given that the focus of the study was use of prescription stimulants without a valid prescription. The demographic questionnaire is presented in Appendix D.

DSM-IV Checklist of Symptoms. The DSM-IV Checklist of Symptoms comprises 18 statements regarding symptoms of ADHD based on DSM-IV criteria (APA, 1994), nine of which pertain to each symptom domain of inattention and hyperactivity/impulsivity, respectively. Each statement is rated in terms of its frequency of occurrence (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *very often*). Participants were asked to rate both current (preceding 6 months) and childhood (prior

to the age of 12) symptom frequency. Magnússon et al. (2006) reported that the Icelandic version of the DSM-IV Checklist of Symptoms demonstrated “excellent” (p. 501) reliability and validity in their sample, including strong correlations with well-defined childhood and adulthood ADHD. The DSM-IV Checklist of Symptoms is presented in Appendix E.

The Depression Anxiety Stress Scale -21 (DASS-21). The DASS-21 (Lovibond & Lovibond, 1995) comprises 21 items measuring levels of anxiety, depression and stress among adults. Responses are provided on a 4-point Likert-scale to express the extent to which each statement has applied to the respondent during the previous seven days. Response options range from 0 to 3 (i.e., “*did not apply to me at all*” to “*applied to me very much/most of the time*”; Lovibond & Lovibond, 1995). An Icelandic version of the DASS-21 was used in the current study. Gudjonsson et al. (2009) reported excellent internal consistency coefficients for the Icelandic version of the DASS-21 in a sample of college students, with Cronbach’s alpha for the three subscales and total score ranging between 0.86-0.95. Additionally, Ingimarsson (2010) reported that the DASS-21 had acceptable convergent and discriminant validity. The DASS-21 is presented in Appendix F.

Stimulant Survey Questionnaire-I (SSQ-I). The SSQ-I contains 40 items (Weyandt et al., 2009) designed to assess misuse of prescription stimulants among college students, as well as perceptions of and knowledge about prescription stimulant use. Thirty items are statements to which participants respond on a 5-point Likert scale (e.g., “*never*” to “*always*” or “*strongly disagree*” to “*strongly agree*”, as applicable). Response options are presented in dichotomous format for the final 10 items (“yes” or

“no”). For the original version of SSQ-I, a total score can be obtained by summing the items although items also have been observed to load on four distinct factors: (1) *Self-reported prescription stimulant use*, (2) *Perception of prevalence of prescription stimulant use among peers*, (3) *Knowledge of atypical stimulant use among peers*, and (4) *Perception of safety of stimulants* (Weyandt et al., 2009). For the purposes of the present study, an Icelandic translation of the SSQ was administered; given the lack of information pertaining to its reliability, validity, and dimensionality, psychometric analyses were conducted. The SSQ is presented in Appendix G.

Results

Data Analyses

Preliminary psychometric analyses were conducted, including an assessment of the internal consistency of each measure, as well as the factor structure of the newly translated Icelandic version of the SSQ. Additionally, data were examined with regard to assumptions of normality, linearity, and homoscedasticity. Prevalence rates of stimulant misuse were assessed by calculating the percentage of students who endorsed at least one form of prescription stimulant misuse behavior as having occurred at least “rarely”, as measured by the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement, and Use of Stimulants for Partying or Getting High components of the Icelandic version of the SSQ. The prevalence of significant ADHD symptomatology was assessed by calculating the percentage of students who earned total scores of at least 25 and 23 on the childhood and adulthood versions of the DSM Checklist of Symptoms, respectively. Magnússon et al. (2006) reported these cutoff scores have a sensitivity index of 0.80 and specificity of 0.90 for detecting ADHD in childhood as well as adulthood.

Hypothesis 1, that male sex (independent variable; IV) would be more strongly associated with prescription stimulant misuse than female sex, as measured by the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement and Use of Stimulants for Partying or Getting High components of the Icelandic version of the SSQ (dependent variables; DV), was tested via simple regression.

Hypothesis 2, that self-reported GPA (IV) would be negatively associated with prescription stimulant misuse, as measured by the Use of Stimulants for Academic,

Cognitive, Physical, or Social Enhancement and Use of Stimulants for Partying or Getting High components of the Icelandic version of the SSQ (DV), was tested via simple regression.

Hypothesis 3, that symptoms of depression, anxiety, and stress as measured by the three corresponding subscales of the DASS-21 (IVs), respectively, would be positively associated with prescription stimulant misuse, as measured by the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement and Use of Stimulants for Partying or Getting High components of the Icelandic version of the SSQ (DV), was tested via multiple regression.

Hypothesis 4, that symptoms of ADHD, as measured by scores on the DSM-IV Checklist of Symptoms (IVs), would significantly predict prescription stimulant misuse as measured by the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement and Use of Stimulants for Partying or Getting High components of the Icelandic version of the SSQ (DV), while controlling for symptoms of depression, anxiety, and stress (IVs), as measured by the three corresponding subscales of the DASS-21 respectively, was tested using multiple regression.

Other analyses included examining differences in prescription stimulant misuse between students with and without a prescription for stimulant medication (descriptively), group differences in scores on the DASS-21 and DSM-IV Checklist of Symptoms based on history of stimulant misuse, and group differences in scores on the DASS-21 and SSQ based on significant ADHD symptomatology status as well as self-reported disability status. Based on the results of a post hoc power analysis

conducted in G*Power 3.2.1 (Faul, Erdfelder, Buchner, & Lang, 2009), the current study had estimated power ranging between 0.72 – 0.99, depending on analysis.

Missing Data

At the individual item level, missing data ranged between 0.2% and 6%. As for missing data patterns, the percentage of missing data was generally lower for items administered earlier in the survey (e.g., the SSQ) compared to items administered later in the survey (e.g., DASS-21, DSM-IV Checklist of Symptoms, Demographic Questionnaire). Although no universal agreement exists concerning what percentage of missing data should be regarded as problematic, estimates have ranged between 5-20% (Schlomer, Bauman, & Card, 2010). Missing data were handled using listwise deletion.

Psychometric Analyses

Icelandic Translation of the SSQ. An exploratory principal components analysis (PCA) of the Icelandic translation of the SSQ with Varimax rotation was conducted. Responses from all participants, regardless of prescription status, were included to obtain as large a sample as possible. It should be noted that items 35 and 36 of the original version of the SSQ were combined into a single item as their meaning and content was virtually identical in the Icelandic translation. The Icelandic version of the SSQ therefore included a total of 39 items, as opposed to 40. Additionally, it should be noted that item 5 of the Icelandic version of the SSQ, concerning injection of prescription stimulants, was impossible to include in the PCA given that every participant endorsed this item as never having occurred (i.e., as “0”).

Velicer's MAP test and Horn's parallel analysis were used to determine the number of components (O'Connor, 2000), both of which suggested 8 components should be extracted. The PCA (see table 2) revealed items 1, 6, 9, 19, 20, 38, and 39 had complex loadings; however, items 1, 6, 9, and 38 were retained given that they fit well conceptually with at least one of the components on which they loaded. Although items 19, 20, and 39 were not eliminated from the overall scale, they were not added to any of the components identified by the PCA. Component 8 comprised three of the complex items 6, 19, and 38, all of which were either added to other components due to better conceptual fit, or excluded. Therefore, the eighth component was eliminated, resulting in a total of 7 components. Another PCA with 7 components, excluding items 5, 19, 20, and 39, was conducted (see table 3). Table 4 depicts the eigenvalues and percentage of variance explained for each component.

Items 1, 9, and 10 were complex and loaded on components 1 and 2. Despite their complexity, all three items were retained due to their importance in assessing stimulant misuse behavior; item 1 was added to component 2 and items 9 and 10 to component 1, due to higher component loadings and better conceptual fit. Similarly, items 15 and 16 were also complex; however, they were both retained and added to component 6 for optimal conceptual fit.

The overall internal consistency coefficient for all 39 items of the SSQ was Cronbach's $\alpha = 0.741$. The 7 components were conceptualized and labeled as follows:

1. Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement (Cronbach's $\alpha = .905$);

2. Use of Stimulants for Partying or Getting High (Cronbach's $\alpha = 0.896$);
3. Knowledge of Other Students' Use of Stimulants (Cronbach's $\alpha = 0.856$);
4. Perceptions of Stimulant Availability (Cronbach's $\alpha = .783$);
5. Perceptions of Stimulant Safety (Cronbach's $\alpha = 0.774$);
6. Sharing Stimulants with Other Students (Cronbach's $\alpha = 0.563$); and
7. Perceived Knowledge about Stimulants (Cronbach's $\alpha = 0.945$).

All internal consistency coefficients for the SSQ as a whole, as well as its 7 components, ranged from acceptable to excellent with the exception of component 6, Sharing Stimulants with Other Students ($\alpha = 0.563$) which may partly stem from relatively low component loadings for 2 out of the 4 items contributing to this component, as illustrated in table 3. Together, the 7 components accounted for 65.4% of the overall variance (see table 4).

Intercorrelational analyses for the 7 components of the SSQ, presented in table 5, revealed Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement and Use of Stimulants for Partying or Getting High were significantly and positively correlated ($r = 0.52, p < 0.001$). Additionally, Sharing Stimulants with Other Students was significantly correlated with Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement ($r = 0.46, p < 0.001$) and Use of Stimulants for Partying or Getting High ($r = 0.42, p < 0.001$). Perceptions of Stimulant Safety were significantly but modestly correlated with Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement ($r = 0.19, p < 0.001$) as well as Use of Stimulants for Partying or Getting High ($r = 0.13, p = 0.004$). Similarly, Perceived Knowledge about Stimulants was only modestly correlated with Use of

Stimulants for Academic, Cognitive, Physical, or Social Enhancement ($r = 0.15$, $p = 0.001$), but not Use of Stimulants for Partying or Getting High ($r = 0.07$, $p = 0.11$).

DASS-21 and DSM-IV Checklists of Symptoms. The Cronbach's alphas for the three subscales of the DASS-21 as well as the DASS-21 as a whole were excellent: Depression = 0.921, Anxiety = 0.833, Stress = 0.873, DASS-21-Total = 0.942. In a similar vein, the Cronbach's alphas for the subscales and total score of the DSM Checklist of Symptoms were excellent: Inattention Past 6 Months = 0.893, Hyperactivity/Impulsivity Past 6 Months = 0.826, ADHD Total Past 6 Months = 0.913; Inattention Childhood = 0.936, Hyperactivity/Impulsivity Childhood = 0.931, ADHD Total Childhood = 0.958.

Prevalence of Prescription Stimulant Misuse Behavior

Overall prevalence of lifetime prescription stimulant misuse, irrespective of prescription status, was 13.2% (95% CI: [10.26%, 16.14%]). Specifically, lifetime prevalence of a score of 1 or higher on Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement was 10.1% (95% CI: [7.5%, 12.7%]) while prevalence of a score of 1 or higher on Use of Stimulants for Partying or Getting High was 10.9% (95% CI: [8.21%, 13.59%]).

Among those without a current prescription for prescription stimulant medication, the overall prevalence of lifetime prescription stimulant misuse was 11.2% (95% CI: [8.34%, 14.06%]). The percentage of participants earning a score of at least 1 or higher on the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement component of the SSQ was 8.1% (95% CI: [5.64%, 10.56%]). With regard to the Use of Stimulants for Partying or Getting High component, the

percentage of participants earning a score of at least 1 or higher was 10.2% (95% CI: [7.47%, 12.93%]). Within the group of participants holding a current prescription, the overall prevalence of lifetime prescription stimulant misuse was 42.4% (95% CI: [25.79%, 59.01%]) The percentage of participants with a prescription earning a score of at least 1 or higher on the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement component of the SSQ was 42.4% (95% CI: [25.79%, 59.01%]). As for the Use of Stimulants for Partying or Getting High subscale, the percentage of participants with a prescription earning a score of at least 1 or higher was 10.2% (95% CI: [0.03%, 20.37%]).

Table 6 provides prevalence rates for each individual stimulant misuse behavior, broken down by prescription status. As table 6 illustrates, the prevalence of stimulant misuse behavior was generally higher among those currently holding a prescription for stimulants compared to those without a prescription. An important caveat, however, is the fact that the group currently holding a prescription for stimulant medication was significantly smaller (n=34) than the group without a prescription (n=487). Interestingly, 7.7% of the entire sample reported having been offered prescription stimulants by other students; within the group without a current prescription only 6.7% endorsed having been offered prescription stimulants by other students whereas 17.6% of the group currently holding a prescription had been offered such drugs by peers. Overall, the most commonly endorsed reasons for misusing stimulants were to 1) perform better in schoolwork, 2) feel more energetic, 3) perform better on tests, 4) focus better in class, and 5) to “get high”. In the group without a prescription the most commonly endorsed reasons for misuse were as follows: to 1)

perform better in schoolwork, 2) feel more energetic, 3) “get high”, 4) perform better on tests, and 5) focus better in class. Within the group currently holding a prescription the following reasons emerged as the most commonly endorsed: to 1) perform better in schoolwork, 2) perform better on tests, 3) focus better in class/feel more energetic, 4), socialize better, and 5) feel better about myself.

As can be seen in table 7, a small percentage (11-12%) of participants agreed or strongly agreed that stimulants are easily accessible, regardless of prescription status. The percentage of participants without a prescription agreeing or strongly agreeing that stimulant use on campus is a problem was 14.5% while for participants holding a prescription it was 8.8%. The group without a prescription generally felt either neutral or disagreed that occasional or daily use of stimulants is harmless (7.4% agreed or strongly agreed that occasional use is harmless; 1.9% agreed or strongly agreed that daily use is harmless). In the group currently holding a prescription for stimulant medication the percentage of participants agreeing or strongly agreeing that such use is harmless was much higher (32.4% agreed or strongly agreed that occasional use is harmless; 17.6% agreed or strongly agreed that daily use is harmless).

Also evident from data presented in table 7, a considerable percentage of students reported feeling knowledgeable about stimulants and their side effects, and within the group holding a current prescription this percentage was approximately double that of the group without a prescription (42% and 41.3% in the group without a prescription compared with 76.5% and 85.3%, in the group with a prescription).

Table 8 illustrates the percentage of participants who agreed to statements regarding prescription stimulant misuse. A large majority of students endorsed knowing about other students who use stimulants for academic, cognitive, and physical enhancement, as well as for recreational reasons (74% - 96% in the overall group). Of students holding a prescription for stimulants, 55% reported hiding their medication to prevent others from taking it.

Group Differences based on History of Stimulant Misuse

Table 9 includes the minimum and maximum values as well as the means and standard deviations for each of the components/subscales of the SSQ, DASS-21, and DSM-IV Checklist of Symptoms broken down by history of stimulant misuse among participants without a current prescription for stimulant medication. Based on descriptive data, all component/subscale means were higher in the group reporting a history of stimulant misuse (i.e., among students earning a score of at least 1 on the Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement or Use of Stimulants for Partying or Getting High components of the SSQ), except for the Knowledge of Other Students' Use of Stimulants component of the SSQ. Independent samples t-tests, also illustrated in table 9, revealed scores on the Knowledge of Other Students' Use of Stimulants were significantly higher in the group without a history of stimulant misuse with Cohen's *d* in the large range (Cohen, 1992). Perceptions of Stimulant Safety, Sharing Stimulants with Other Students, Perceived Knowledge about Stimulants, past 6-month ADHD total score, and childhood ADHD total, score, however, were all significantly higher in the group reporting a history of stimulant misuse, with Cohen's *d* effect sizes ranging from small to large (Cohen, 1992). In

contrast, no significant differences were found for any of the DASS-21 subscales of depression, anxiety, or stress. Findings should be interpreted with caution, however, due to significantly different variances across groups in some cases (see table 9). Additionally, because these analyses were simply exploratory in nature and conducted post-hoc, no multiple comparison corrections (e.g., Bonferroni) were made (see Armstrong, 2014).

Factors Predictive of Prescription Stimulant Misuse

For each of the regression models, errors were examined with regard to assumptions of linearity, normality, and homoscedasticity, as depicted in figures 1-24. Results should be interpreted cautiously given that assumptions of normality and homoscedasticity may not have been met, possibly due in part to considerable zero-inflation and hence positive skewness in the dependent variable (see figures 25 and 26). As stated previously, participants holding a current prescription for stimulant medication were excluded from the regression analyses given the present study's definition of stimulant misuse as use of stimulants without a valid prescription.

Prior to conducting regression analyses, preliminary intercorrelational analyses between all independent and dependent variables were performed. Results, delineated in table 10, revealed Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement was significantly and positively correlated with DASS-21 anxiety scores ($r = 0.195, p < 0.001$) and childhood total ADHD score ($r = 0.216, p < 0.001$). Use of Stimulants for Partying or Getting High was positively and significantly correlated with participant sex ($r = 0.147, p < 0.04$; male sex was associated with greater use), and with past 6-month total ADHD score ($r = 0.105, p < 0.043$) childhood total

ADHD score ($r = 0.200, p < 0.001$). Neither Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement nor Use of Stimulants for Partying or Getting High was associated with DASS-21 depressive symptoms, DASS-21 stress symptoms, or GPA. Also of note is that all DASS-21 subscales, depression, anxiety, and stress, were significantly intercorrelated. ADHD childhood total score was significantly correlated with ADHD past 6 month total score: $r = 0.729, p < 0.001$, and ADHD total scores in both childhood and adulthood were significantly correlated with all DASS-21 subscales (i.e., depression, anxiety, and stress).

Among participants without a current prescription for stimulant medication, the first hypothesis, that male sex would be more strongly associated with prescription stimulant misuse than female sex, was partially supported. Although sex did not significantly predict Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement (see table 11), sex significantly predicted Use of Stimulants for Partying or Getting High (see table 12), with males being more likely to report such behavior. Sex, however, only explained 1% in the variance of the dependent variable.

The second hypothesis, that self-reported GPA would be negatively associated with prescription stimulant misuse, was neither supported for Use of Stimulants for Use of Stimulants for Partying or Getting High (see table 11) nor for Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement (see table 12).

The third hypothesis, that symptoms of depression, anxiety, and stress would be positively associated with prescription stimulant misuse was partially supported. Anxiety, but not depression or stress, was significantly and positively associated with Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement (see

table 11). The model explained approximately 4% of the variance in the dependent variable; hence, the effect size was small. Symptoms of depression, anxiety, and stress, however, did not significantly predict Use of Stimulants for Partying or Getting High (see table 12).

The fourth hypothesis, that ADHD symptoms would significantly predict prescription stimulant misuse while controlling for symptoms of depression, anxiety, and stress was supported. Both childhood and past 6 months' symptoms of ADHD significantly predicted Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement. The model explained 9% of the variance in the dependent variable; thus the effect size was small. Of note, however, is that the relationship between childhood ADHD symptoms and stimulant misuse was positive whereas for past 6 months' ADHD symptoms it was *negative*. With regard to Use of Stimulants for Partying or Getting High, only childhood symptoms of ADHD emerged as a significant predictor. The latter model explained 4% of the variance in the dependent variable.

Prevalence of Significant ADHD Symptomatology

Within the entire sample, regardless of prescription status, the percentage of students reporting current (past 6-months) significant ADHD symptomatology (i.e., obtaining a total score of 23) on the DSM Checklist of Symptoms was 10.7% (95% CI: [7.95%, 13.45%]), and the percentage of students reporting significant childhood ADHD symptomatology (i.e., obtaining a total score of 25) was 15.2% (95% CI: [12.01%, 18.39%]). The percentage of participants from the entire sample reporting significant ADHD symptomatology on the DSM-IV Checklist of Symptoms, both currently (past 6 months) and in childhood was 8.0% (95% CI: [5.52%, 10.48%]),

compared with 9.1% of participants endorsing having been diagnosed previously with ADHD at some point in their lifetime (95% CI: [6.62%, 11.58%]). Of those reporting having been diagnosed previously with ADHD, 47.83% endorsed the ADHD-Inattentive subtype, 2.17% endorsed the ADHD-Hyperactive/Impulsive subtype, and 36.96% endorsed the ADHD-Combined subtype, while 13.04% reported not knowing the subtype with which they had been diagnosed. The correlation between significant ADHD symptomatology as defined in the present study, and a self-reported, previous ADHD diagnosis was statistically significant: $r = 0.42$, $p < 0.01$. Approximately 38% of participants with significant ADHD symptoms reported a previous diagnosis of ADHD, compared with about 6% of participants without significant ADHD symptoms. Among participants reporting a previous diagnosis of ADHD, only 35% were classified as having significant ADHD symptoms, based on the present study's definition.

Within the group of participants meeting criteria for significant ADHD symptomatology as defined in the present study, approximately 20% endorsed having a current prescription for stimulant medication, compared with 4.5% of those not meeting criteria for significant ADHD symptomatology. Of those participants who reported a previous ADHD diagnosis, 59.6% endorsed being prescribed stimulant medication.

Also of interest were potential group differences based on significant ADHD symptomatology group status. Participants with significant ADHD symptomatology in both childhood and adulthood, regardless of prescription status, reported greater levels of depression ($t(416) = 2.96$, $p = 0.006$; Cohen's $d = 0.84$), anxiety ($t(416) = 2.80$, $p =$

0.009; Cohen's $d = 0.85$), and stress ($t(416) = 2.45, p = 0.02$; Cohen's $d = 0.57$) relative to those without significant ADHD symptoms, as defined in the present study. Cohen's d effect sizes were in the medium to large range; however, results should be interpreted cautiously as the homogeneity of variance assumption may not have been met. Regarding Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement ($t(449) = 1.41, p = 0.16$) as well as Use of Stimulants for Partying or Getting High ($t(449) = 0.497, p = 0.62$), irrespective of prescription status, no statistically significant group differences were found. Similarly, when those with a current prescription for stimulant medication were excluded from the analyses, participants with significant ADHD symptoms did not report significantly greater Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement ($t(419) = -0.97, p = 0.34$) or Use of Stimulants for Partying or Getting High ($t(419) = -0.86, p = 0.40$) than those without significant ADHD symptoms. Importantly, given that group differences analyses based on ADHD symptomatology were exploratory in nature and conducted post hoc, no corrections were made for multiple comparisons (see Armstrong, 2014).

Additional Post Hoc Analyses

Among participants without a current prescription for stimulant medication, independent t-tests indicated those reporting a disability did not report significantly more stimulant misuse for academic, cognitive or other enhancement ($t(413) = -1.63, p = 0.11$) or for recreational reasons ($t(413) = -1.20, p = 0.24$) than participants not reporting a disability. Variances were not equal across the two groups; therefore, results should be interpreted with caution. In contrast, significant group differences

were found for all subscales of the DASS-21; participants with a disability reported significantly higher depression ($t(413) = -2.89, p = 0.005$), anxiety ($t(413) = -3.63, p = 0.001$), and stress ($t(413) = -3.48, p = 0.001$) than participants without a disability.

The same pattern of results emerged when participants holding a current prescription for stimulant medication were included in the analyses: Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement: ($t(449) = -1.71, p = 0.09$), Use of Stimulants for Partying or Getting High: ($t(449) = -1.16, p = 0.25$), DASS-21 depression ($t(449) = -3.62, p = 0.001$), DASS-21 anxiety ($t(449) = -4.10, p < 0.001$), and DASS-21 stress ($t(449) = -4.15, p < 0.001$) were not significant across the two groups.

Discussion

The present study was the first to examine prevalence rates of prescription stimulant misuse among college students in Iceland and its relation to student sex, GPA, psychological symptoms of depression, anxiety, and stress, as well as ADHD symptoms. Further, the current study sought to identify the prevalence of significant ADHD symptomatology within this population. Specifically, it was hypothesized that: 1) male sex would be more strongly associated with prescription stimulant misuse than female sex; 2) self-reported GPA would be negatively associated with prescription stimulant misuse; 3) symptoms of depression, anxiety, and stress would be positively associated with prescription stimulant misuse; and 4) ADHD symptomatology would significantly predict prescription stimulant misuse while controlling for symptoms of depression, anxiety, and stress. In addition, psychometric analyses were conducted for the newly translated Icelandic version of the SSQ.

Psychometric Findings

Results revealed the underlying component structure of the Icelandic version of the SSQ was different from that of the original four factor version (Weyandt et al., 2009); in the present sample, items were observed to load on seven distinct components, named: a) Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement; b) Use of Stimulants for Partying or Getting High; c) Knowledge of Other Students' Use of Stimulants; d) Perceptions of Stimulant Availability; e) Perceptions of Stimulant Safety; f) Sharing Stimulants with Other Students; and g) Perceived Knowledge about Stimulants. All components demonstrated acceptable internal consistency (i.e., > 0.7), except for Sharing Stimulants with Other Students

($\alpha = 0.563$), possibly due to suboptimal loadings for two items contributing to this component. Two plausible explanations regarding these discrepant findings can be offered. First, the present study used a different method (i.e., Velicer's MAP and Horn's parallel analysis, principal components analysis [O'Connor, 2000]) to determine the number of components than did Weyandt and colleagues (2009; principal-axis factor analysis). Second, psychometric non-equivalence of measures across cultures is a well-known phenomenon in cross-cultural research (Rottig, 2009). Cultural non-equivalence of measures can lead to difficulty with the interpretation of findings in different groups (Rottig, 2009); however, even though the current results suggested another set of underlying components relative to the original version of the SSQ, qualitatively, the Icelandic components appear to represent constructs similar to the original four factors, including self-reported stimulant misuse, perceptions of other students' use of stimulants, as well as perceptions of stimulant safety. Therefore, it can be concluded that the SSQ is indeed measuring prescription stimulant misuse and related beliefs and perceptions among college students in Iceland, similar to the original, English language version of the instrument.

Prescription Stimulant Misuse Findings: Prevalence and Motivations

The present study was the first to identify prescription stimulant misuse among college students in Iceland, which is surprising given the high rate of prescriptions issued each year in Iceland. Results revealed that within the overall sample, prevalence of lifetime prescription stimulant misuse was 13.2% (95% CI: [10.26%, 16.14%]), among those without a current prescription for stimulant medication, the overall prevalence of lifetime prescription stimulant misuse was 11.2% (95% CI:

[8.34%, 14.06%]), while among those holding a prescription it was 42.4% (95% CI: [25.79%, 59.01%]). Based on descriptive data, participants holding a prescription for stimulant medication generally reported higher levels of stimulant misuse across all items of the SSQ. Approximately 8% of participants without a current prescription for stimulants reported having used these medications to enhance their academic, cognitive, physical, or social performance while about 10% of participants from this same group reported having used stimulants to party or to “get high”. These findings are within the same range (i.e., 3-20%) as those reported in Germany and Switzerland (e.g., Deline et al., 2014; Dietz et al., 2013; Mache et al., 2012); it is important to note, however, that prevalence estimates reported in these three studies also encompassed other substances (e.g., cannabis, amphetamine, caffeine, etc.), which may complicate comparisons with the present results. On the other hand, Maier et al. (2013) specifically examined rates of MPH and AMP misuse among university students in Switzerland, reporting a prevalence rate of 4.5%. Taken together, these findings indicate that prevalence of misuse of prescription stimulants is comparable, or possibly higher, among college students in Iceland relative to Germany and Switzerland.

Compared to the United States, Icelandic prevalence rates are also within the range of what has been found across studies (i.e., 5.3% - 35%; Weyandt et al., 2013b), although prevalence estimates from Benson and colleagues’s (2015) meta-analysis approximate around 17%, which is higher than those of the current study. Based on these findings, it is plausible that prevalence of stimulant misuse behavior is higher in

Iceland than in Europe, but lower than in the United States. More research is needed to further examine this hypothesis.

In terms of motivations for misusing stimulant medication, the most commonly endorsed reason, regardless of prescription status, was to enhance academic performance (i.e., “to perform better in schoolwork” [53.7% among participants with a history of stimulant misuse]). This is in accordance with the literature from both the United States (e.g., Benson et al., 2015; Weyandt et al., 2013b), as well as Europe (Deline et al., 2014; Dietz et al., 2013; Mache et al., 2012; Maier et al. 2013), reporting desired improvement of academic performance as the main reason for stimulant misuse. These findings lend support to the notion that students may use prescription stimulants as a support strategy and further suggests these students perceive themselves as struggling academically. Other commonly endorsed reasons included cognitive and physical enhancement (e.g., “to perform better on tests” [43.3% among participants with a history of stimulant misuse] or “to feel more energetic” [44.8% among participants with a history of stimulant misuse]) as well as recreational motivations (e.g., “to get high” [28.4% among participants with a history of stimulant misuse]).

As a group, participants with and without a valid prescription generally felt neutral or disagreed that misuse of prescription stimulants is a problem on campus, and that stimulants are easily accessible. These results differ from findings reported by Weyandt et al. (2009), wherein 50% of participants agreed or strongly agreed that stimulants are easily obtainable. These findings are also interesting given that approximately 13% of the entire sample reported having engaged in one or more

stimulant misuse behaviors at least rarely. Therefore, it appears that although stimulant misuse is indeed occurring among college students in Iceland, students may not necessarily be aware of it and/or may not perceive this behavior as particularly problematic.

Based on descriptive data, a higher percentage (i.e., 17.6% – 32.4%) of Icelandic participants holding a prescription for stimulants agreed or strongly agreed that occasional and/or daily stimulant misuse is harmless compared to those without a prescription (i.e., 1.9% - 7.4%). Students with a prescription also reported feeling more knowledgeable about stimulant medications and their side effects than students without a prescription, as would be expected. A large majority of participants with and without a prescription reported knowing about peers who engage in stimulant misuse behavior for academic, cognitive, or recreational reasons. Finally, more than half of the students holding a prescription reported hiding their medication to prevent their peers from taking them, similar to results reported by Weyandt et al. (2009).

Findings indicated a significant, positive association between use of stimulants for academic, cognitive, and other enhancement reasons and use of stimulants for recreational reasons. Stimulant use for both reasons was also significantly correlated with sharing stimulants with peers (i.e., diversion) and increased perceptions of stimulant safety, as well as greater perceived knowledge about stimulants.

Group Differences based on Stimulant Misuse History

Group differences in psychological functioning based on stimulant misuse history status among students without a current prescription were also of interest. Findings suggested past 6-month total number of ADHD symptoms as well as

childhood total symptoms of ADHD were significantly higher in the group reporting a history of stimulant misuse than among those without such history. In contrast, depression, anxiety, and stress were not statistically different across the two groups. Overall, the results support the hypothesis that Icelandic college students who misuse stimulants are more likely to demonstrate ADHD symptomatology relative to non-users. Future studies are needed to examine this association in greater detail.

In addition, participants reporting a history of stimulant misuse scored significantly higher than those without such history with regard to perceptions of stimulant safety, sharing stimulants with peers, and perceived knowledge about stimulants. These results have critical implications for prevention and intervention targeting stimulant misuse behavior, and highlight the importance of educating college students about the risks associated with misuse of these drugs. Given that many students appear to acquire stimulants from peers with a valid prescription (see Weyandt et al., 2013b) it behooves physicians who prescribe stimulant medication to emphasize the numerous risks associated with stimulant medication diversion and misuse with their patients.

Factors Predictive of Prescription Stimulant Misuse

The present study identified several variables that are predictive of stimulant misuse behavior among college students in Iceland. Preliminary correlational analyses revealed Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement was significantly and positively correlated with anxiety and ADHD symptoms in childhood. Alternatively, Use of Stimulants for Partying or Getting High was positively and significantly correlated with participant sex, wherein being male

was associated with greater use, and with childhood and past 6-month symptoms of ADHD. No significant correlations between depressive symptoms, stress, or GPA and stimulant misuse behavior were observed.

The first hypothesis, that male sex would be more strongly associated with stimulant misuse than female sex, was supported, although the effect size was small. Participants who were male were significantly more likely to endorse having engaged in prescription stimulant misuse for partying or “getting high”, but not for academic, cognitive, or other enhancement reasons. The current results echo findings reported by Weyandt and colleagues (2013b) as well as Benson et al. (2015) regarding greater misuse among males relative to females, although neither of those studies specified the primary motives behind this behavior among males, compared to females.

Contrary to expectations, the second hypothesis, that self-reported GPA would be negatively associated with prescription stimulant misuse, was not supported. These findings can be contrasted with those reported by Benson et al. (2015) wherein a lower GPA was associated with greater odds of engaging in stimulant misuse. It is unclear why this relationship did not emerge in the current study, but one possible explanation is that grading conventions differ across the two countries and GPA may therefore differentially associate with other outcomes.

The third hypothesis, that symptoms of depression, anxiety, and stress would be positively associated with prescription stimulant misuse was partially supported. Anxiety, but not depression or stress, was significantly and positively associated with use of stimulants for academic, cognitive, and other enhancement reasons (small effect size); however no significant associations were found for use of stimulants for

recreational reasons. This provides further support to the hypothesis that students who struggle academically may use stimulant medications to help cope with educational demands.

The fourth hypothesis, that ADHD symptoms would significantly predict prescription stimulant misuse while controlling for symptoms of depression, anxiety, and stress was supported; both childhood and past 6-month total symptoms of ADHD significantly predicted stimulant use for academic, cognitive, and other enhancement reasons, with a small effect size. Interestingly, however, the relationship between childhood ADHD symptoms and stimulant misuse was positive while for past 6-month ADHD symptoms it was *negative*, indicating greater past 6 month ADHD symptomatology is associated with lower use of stimulants for academic, cognitive, and other enhancement reasons. In contrast, correlational analyses suggested ADHD symptoms in *both* childhood and adulthood were positively associated with stimulant misuse behavior. It is unclear why the relationship between ADHD symptoms and stimulant misuse behavior was different for childhood compared to adulthood when both constructs were included in the same regression model; one plausible explanation is the relatively high correlation (i.e., $r = 0.74$) between ADHD symptoms in adulthood and childhood, possibly suggesting multicollinearity (see Kraha, Turner, Nimon, Zientek, & Henson, 2012). With regard to stimulant use for recreational reasons, only childhood symptoms of ADHD emerged as a significant, positive predictor. Collectively, the findings support the notion that a history of ADHD symptoms increases the likelihood of misuse of stimulant medication. Further research is needed to examine this relationship in greater detail.

The present findings have the potential to inform public health policies concerning college student mental health and well-being as well as stimulant medication management in Iceland. Greater access to psychological and academic support services for students who struggle due to ADHD, ADHD symptomatology, or other psychological difficulties may be beneficial and provide students with safer and more appropriate strategies for coping with the challenges of the college environment. Additionally, psychoeducational interventions regarding the risks of psychostimulant medication diversion and misuse are clearly warranted, especially within the college population.

ADHD Symptomatology Findings

The prevalence of persistent (i.e., occurring both in childhood and adulthood), significant ADHD symptomatology within the sample as a whole was 8.0% (95% CI: [5.52%, 10.48%]) while 9.1% of participants reported having been previously diagnosed with ADHD. The correlation ($r = 0.42$, $p < 0.01$), or agreement, between significant ADHD symptomatology and having a previous ADHD diagnosis was statistically significant. Moreover, 38% of participants meeting study criteria for significant ADHD symptoms reported a previous diagnosis of ADHD, compared with about 6% of participants without significant ADHD symptoms. Conversely, only 35% of participants reporting a previous diagnosis of ADHD were classified as having significant ADHD symptoms.

Therefore, results indicate more than 60% of participants identified as having significant ADHD symptoms had not been formally diagnosed with ADHD. This suggests the present definition of “significant ADHD symptoms” may have lacked

specificity, leading to a number of false positives, and/or many of the participants identified truly have ADHD that has not been diagnosed. It is important to note, however, that “significant ADHD symptoms”, as defined in the current study, should *not* be conceptualized as a formal ADHD diagnosis given that this categorization is solely based on self-reported rating scale data. Instead, these numbers provide a rough estimate of the prevalence of problems associated with attention and/or hyperactivity/impulsivity that in some cases may warrant clinical attention.

These results are inconsistent with those reported by Gudjonsson and colleagues (2009) who also investigated the prevalence of ADHD among college students in Iceland. Gudjonsson et al (2009) found only 1 out of 369 participants met somewhat more stringent criteria for the disorder, while the prevalence of subthreshold ADHD, or ADHD in partial remission, was 10%, which is more comparable to the current findings. Further, in the Gudjonsson et al. (2009) study, the percentage of students reporting a prior diagnosis of ADHD was 1%, which is also lower than the current results suggested. Although both studies relied on convenience samples, a particular strength of the present study was the recruitment of participants from the four largest universities in Iceland, whereas Gudjonsson and colleagues (2009) recruited participants from one university only. Therefore, it can be argued that the current sample was somewhat more representative of the larger Icelandic college student population.

Results suggested as a group, Icelandic college students with elevated ADHD symptoms experience greater psychological distress relative to those with fewer ADHD symptoms, as these participants reported significantly higher levels of

depression, anxiety, and stress, with effect sizes in the medium to large range. In contrast, no statistically significant differences in stimulant misuse behavior based on ADHD symptomatology status were found.

Regarding treatment, approximately 20% of participants with significant ADHD symptomatology, as defined in the present study, reported holding a current prescription for stimulant medication, compared with 4.5% of those not meeting criteria for significant ADHD symptomatology. Therefore, a large majority of participants with significant ADHD symptoms, as defined in the current study, were not prescribed medication to address these symptoms. Conversely, approximately 60% of participants reporting a previous ADHD diagnosis endorsed having been prescribed stimulant medication.

The present findings suggest that a significant subgroup of Icelandic college students demonstrate elevated ADHD symptomatology. Whether or not these students would meet diagnostic criteria for the disorder is unclear; however, the current results indicate these students are at greater risk for symptoms of depression, anxiety, and stress, relative to those without significant ADHD symptoms. These findings add to a growing body of literature that attests to the relationship between ADHD symptomatology and a variety of psychosocial difficulties among college students (e.g., Anastopoulos et al., in press; Weyandt & DuPaul, 2013). The findings also highlight the importance of providing these students with effective treatment and support in the college environment. Research regarding treatment of ADHD in college students is scarce and preliminary; however, findings reported by Anastopoulos and King (2015) concerning a treatment program for college students with ADHD,

consisting of cognitive behavior therapy (CBT) and individual mentoring, were promising and included greater ADHD knowledge, enhanced organizational skills, and increased adaptive thinking. Similarly, LaCount, Hartung, Shelton, Clapp, and Clapp (2015) reported a decrease in self-reported ADHD symptoms and academic impairment as a result of individual and group CBT sessions targeting organizational and time-management skills among college students with elevated ADHD symptoms. Finally, Fleming, McMahon, Moran, Peterson, and Dreessen (2015) conducted a randomized controlled pilot trial offering group sessions of dialectical behavior therapy (DBT) to college students with ADHD. DBT training was associated with greater improvement in ADHD symptoms and quality of life than the control condition. Increased availability and access to similar support services for college students in Iceland, especially those who struggle with ADHD symptoms and other psychosocial difficulties, may be warranted.

Additional Post Hoc Findings

Group differences based on disability status were also explored. Within the group without a current prescription for stimulant medication, results revealed participants endorsing having some form of a disability were not significantly more or less likely than participants without disabilities to disclose a history of stimulant misuse. These findings are similar to those reported by Janusis and Weyandt (2010) who found that this same pattern of results emerged when students holding a current prescription for stimulant medication were included in the analyses. The current findings should be interpreted with caution, however, as results suggested significant heterogeneity of variance across groups.

In contrast, as a group, students reporting a disability endorsed significantly higher levels of depression, anxiety, and stress than students without a disability. Hence, it is important that college students with disabilities be offered and encouraged to access academic and psychosocial support services.

Limitations and Future Directions

Several limitations of the present study should be discussed. First, the current study employed a convenience sample, which may limit the generalizability of the findings. As noted previously, although the current sample included students from the four largest universities in Iceland, the extent to which it represents the larger college student population in Iceland is unclear. Second, the sample was disproportionately female, which also may serve to reduce the generalizability of the findings. Given the current results that males were more likely than females to engage in stimulant misuse for recreational reasons, it is possible that the present study underestimated the prevalence of this behavior among male college students. Third, assumptions of normality and homoscedasticity for t-test and regression analyses may not have been met, emphasizing the need for cautious interpretation of the findings. Fourth, the study was correlational in design and, as such, does not permit any causal inferences regarding the relationship between the variables of interest. Fifth, the current study did not address other substance use behavior (e.g., use of alcohol, tobacco, marijuana, etc.), which may be an important correlate of stimulant misuse behavior (Benson et al., 2015). Finally, the age range of participants in the current study was much wider (i.e., 19-57 years) than that of participants in similar studies conducted in the United States (i.e., typically 18-25 years).

Future studies regarding prescription stimulant misuse using representative samples of college students in Iceland are needed. Ideally, such studies would be longitudinal and prospective in nature, include a rigorous assessment of ADHD and related psychosocial issues, and address the potential relationship between prescription stimulant misuse and other substance use behaviors. Additionally, although the current study was not neurobiologically focused, future research is needed to elucidate the pathophysiology of ADHD symptomatology and comorbid conditions (e.g., anxiety and depression) and the effects of psychostimulants on these biological mechanisms.

Conclusion

The current study was the first to investigate misuse of prescription stimulant medication among college students in Iceland. Results revealed a prevalence rate of approximately 11% among participants without a prescription for stimulants, 42% among participants with a prescription, and 13% within the overall sample (among participants with and without a current prescription). Based on these findings, the prevalence of this behavior appears to be higher in Iceland than in other European countries, but lower than in the United States. Participants reported the primary and secondary reasons for misusing stimulants included academic, cognitive, physical, and social enhancement as well as partying and/or getting high, similar to results from studies conducted with college students in the United States and in Europe.

Preliminary evidence from the current study indicates risk factors for prescription stimulant misuse among college students in Iceland include being male, experiencing symptoms of anxiety, and having a history of ADHD symptoms. The results of the current study also revealed that approximately 8% of Icelandic college

students sampled reported persistent, elevated ADHD symptomatology, and students with a history of prescription stimulant misuse had significantly higher ADHD symptoms than those without such history.

Interestingly, correlational analyses suggested a positive relationship between ADHD symptoms and stimulant misuse, both with regard to childhood and adulthood ADHD symptoms. Multiple regression analyses, however, presented a more complicated picture, wherein childhood symptoms of ADHD were positively associated with stimulant misuse, and current ADHD symptoms negatively predicted stimulant misuse. Cautious interpretation of these results is warranted, however, given the study's limitations.

The present findings have important implications for public health policy in Iceland, particularly as it relates to the college population. Educating college students about the risks of ADHD prescription stimulant medication misuse and diversion is clearly warranted. Given that many college students who misuse prescription stimulants appear to do so to “self-medicate”, or to cope with the various challenges they face, it is critically important to provide students with safer strategies to manage academic demands in order to promote health and well-being.

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Table 1. *Participant demographics*

Category	N	Percent
Sex		
Female	424	81.4
Male	97	18.6
Race/Ethnicity		
White	517	99.2
Non-White	3	0.6
Other	1	0.2
ADHD Diagnosis	47	9.0
Disability	69	13.2

Table 2. *Initial, 8-component PCA with Varimax rotation*

Item	Component							
	1	2	3	4	5	6	7	8
1. I have used prescription stimulants for non-medical purposes.	.424	.728	.111	.007	.114	.102	.090	.141
2. I have used prescription stimulants at parties.	.194	.892	.156	.042	.083	.079	.085	.026
3. I have used prescription stimulants with alcohol.	.250	.858	.125	.034	.076	.080	.100	.023
4. I have snorted prescription stimulants.	.066	.664	.206	.021	.104	.006	.020	0.55
5. I have injected prescription stimulants.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. I have smoked prescription stimulants.	.072	.338	.099	.045	.032	.109	.015	.550
7. I have taken prescription stimulants to focus better in class.	.851	.199	.073	.003	.115	.092	.019	.027
8. I have taken prescription stimulants to perform better on tests.	.889	.133	.041	.032	.119	.003	.053	.083
9. I have taken prescription stimulants to help me socialize better.	.465	.388	.126	.027	.054	.562	.018	.194
10. I have taken prescription stimulants to help me lose weight.	.534	.347	.030	.058	.140	.153	.008	.382
11. I have taken prescription stimulants to perform better in my school work.	.874	.180	.043	.009	.120	.151	.068	.076
12. I have taken prescription stimulants to feel more energetic.	.775	.307	.030	.017	.032	.326	.049	.144
13. I have taken prescription stimulants to feel better about myself.	.706	.234	.001	.039	.069	.372	.020	.303
14. I have taken prescription stimulants to “get high”.	.109	.791	.093	.130	.035	.053	.028	.224
15. I have been offered prescription stimulants by other students.	.198	.396	.305	.198	.014	.061	.091	.156
16. I have tried someone else’s prescription stimulant medication.	.373	.546	.097	.107	.020	.256	.045	.021
17. I have purchased prescription stimulants from other students.	.155	.186	.109	.108	.069	.762	.057	.102
18. I have sold prescription stimulant medication to other students.	.273	.001	.082	.020	.139	.757	.045	.176
19. I have given prescription stimulant medication to other students.	.535	.315	.053	.051	.114	.076	.081	.406
20. I have been pressured into letting someone else have my prescription stimulant medication.	.449	.007	.136	.090	.110	.445	.143	.180
21. Prescription stimulants are easy to get on this campus.	.033	.100	.144	.846	.089	.052	.011	.113
22. Prescription stimulants are as easy to get as alcohol.	.004	.012	.047	.840	.017	.011	.055	.066

23. Prescription stimulants are as easy to get as marijuana.	.040	.077	.073	.821	.138	.056	.037	.014
24. Using prescription stimulants occasionally is harmless.	.152	.232	.056	.006	.730	.021	.023	.224
25. Using prescription stimulants daily is harmless.	.128	.054	.076	.044	.746	.060	.014	.056
26. Prescription stimulant use on campus is a problem.	.118	.166	.294	.500	.043	.001	.176	.211
27. Prescription stimulants are safer than marijuana.	.070	.058	.082	.064	.742	.125	.065	.139
28. Prescription stimulants are safer than alcohol.	.114	.068	.038	.105	.814	.101	.018	.026
29. I feel I am knowledgeable about prescription stimulants.	.067	.055	.103	.088	.072	.040	.944	.026
30. I feel I am knowledgeable about the side effects of prescription stimulants.	.114	.081	.110	.075	.031	.006	.941	.016
31. I know students who use prescription stimulants at parties.	.092	.172	.845	.083	.072	.102	.112	.019
32. I know students who use prescription stimulants with alcohol.	.096	.197	.838	.074	.063	.107	.096	.021
33. I know students who use prescription stimulants with other drugs.	.024	.273	.737	.085	.010	.048	.075	.113
34. I know students who use prescription stimulants while studying.	.216	.185	.682	.240	.010	.016	.078	.302
35. I know students who use prescription stimulants during finals week/tests.	.215	.103	.659	.246	.011	.071	.051	.291
36. I know students who snort prescription stimulants.	.120	.150	.661	.062	.030	.028	.024	.088
37. I know students who inject prescription stimulants.	.009	.167	.442	.198	.009	.027	.004	.187
38. I know students who smoke prescription stimulants.	.011	.021	.577	.073	.025	.017	.083	.405
39. I hide my prescription stimulant medication so that no one will take it.	.343	.100	.138	.058	.188	.259	.229	.287

Table 3. *Final, 7 component PCA with Varimax rotation*

Item	Component						
	1	2	3	4	5	6	7
1. I have used prescription stimulants for non-medical purposes.	.431	.662	.126	.025	.191	.162	.161
2. I have used prescription stimulants at parties.	.203	.874	.154	.056	.113	.106	.105
3. I have used prescription stimulants with alcohol.	.256	.840	.124	.048	.106	.110	.119
4. I have snorted prescription stimulants.	.081	.661	.204	.030	.123	.019	.031
6. I have smoked prescription stimulants.	.121	.448	.088	.102	.126	.247	.128
7. I have taken prescription stimulants to focus better in class.	.856	.161	.094	.017	.157	.101	.053
8. I have taken prescription stimulants to perform better on tests.	.883	.082	.072	.049	.179	.041	.108
9. I have taken prescription stimulants to help me socialize better.	.492	.406	.102	.031	.001	.500	.037
10. I have taken prescription stimulants to help me lose weight.	.562	.405	.040	.079	.167	.201	.045
11. I have taken prescription stimulants to perform better in my school work.	.876	.131	.063	.010	.167	.165	.108
12. I have taken prescription stimulants to feel more energetic.	.827	.295	.044	.018	.044	.154	.052
13. I have taken prescription stimulants to feel better about myself.	.753	.263	.003	.053	.111	.267	.068
14. I have taken prescription stimulants to “get high”.	.136	.816	.083	.115	.033	.073	.026
15. I have been offered prescription stimulants by other students.	.114	.369	.287	.144	.051	.320	.029
16. I have tried someone else’s prescription stimulant medication.	.343	.511	.089	.073	.046	.373	.006
17. I have purchased prescription stimulants from other students.	.115	.157	.062	.062	.040	.809	.040
18. I have sold prescription stimulant medication to other students.	.246	.037	.048	.003	.105	.781	.017
21. Prescription stimulants are easy to get on this campus.	.008	.080	.148	.822	.120	.147	.018
22. Prescription stimulants are as easy to get as alcohol.	.013	.030	.048	.848	.020	.020	.036
23. Prescription stimulants are as easy to get as marijuana.	.041	.081	.062	.815	.138	.079	.036
24. Using prescription stimulants occasionally is harmless.	.131	.162	.078	.021	.790	.052	.040
25. Using prescription stimulants daily is harmless.	.102	.069	.064	.045	.737	.042	.002
26. Prescription stimulant use on campus is a problem.	.088	.112	.275	.536	.006	.112	.105

27. Prescription stimulants are safer than marijuana.	-						
	.062	.079	.104	.083	.687	.074	.112
28. Prescription stimulants are safer than alcohol.							-
	.112	.062	.051	.108	.794	.095	.030
29. I feel I am knowledgeable about prescription stimulants.			-		-		
	.064	.044	.098	.096	.077	.032	.932
30. I feel I am knowledgeable about the side effects of prescription stimulants.			-		-		
	.108	.075	.101	.088	.048	.007	.927
31. I know students who use prescription stimulants at parties.	-	-		-		-	-
	.077	.166	.843	.078	.060	.132	.124
32. I know students who use prescription stimulants with alcohol.	-	-		-		-	-
	.077	.190	.836	.067	.050	.146	.108
33. I know students who use prescription stimulants with other drugs.			-			-	-
	.002	.299	.726	.090	.030	.084	.050
34. I know students who use prescription stimulants while studying.	-	-		-		-	-
	.178	.105	.696	.203	.106	.129	.174
35. I know students who use prescription stimulants during finals week/tests.	-	-		-		-	-
	.189	.025	.680	.210	.092	.058	.154
36. I know students who snort prescription stimulants.			-				-
	.119	.176	.650	.071	.047	.028	.010
37. I know students who inject prescription stimulants.	-						
	.002	.122	.434	.158	.053	.061	.069
38. I know students who smoke prescription stimulants.	-	-		-			
	.045	.111	.563	.129	.114	.116	.183

Notes. The columns in which item component loadings are bolded represent the component to which each item belongs. In cases where more than 1 component loading is bolded, the underlined loading represents the component to which the item was ultimately added.

Table 4. *SSQ Components, eigenvalues, and % of variance explained*

SSQ Component	Eigenvalues	% of Variance	Cumulative %
SSQ Component 1 - Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement	4.61	13.56%	13.56%
SSQ Component 2 - Use of Stimulants for Partying or Getting High	4.36	12.81%	26.37%
SSQ Component 3 - Knowledge of Other Students' Use of Stimulants	4.20	12.36%	38.73%
SSQ Component 4 - Perceptions of Stimulant Availability	2.61	7.67%	46.40%
SSQ Component 5 - Perceptions of Stimulant Safety	2.56	7.54%	53.93%
SSQ Component 6 - Sharing Stimulants with Other Students	1.97	5.79%	59.73%
SSQ Component 7 - Perceived Knowledge about Stimulants	1.93	5.67%	65.40%

Table 5. *Correlation matrix for the 7 components of the Icelandic translation of the SSQ among participants without a current prescription*

SSQ Component	C1	C2	C3	C4	C5	C6	C7
SSQ Component 1 - Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement	1	.554**	.231 ⁻ **	.032	.188**	.463**	.155**
SSQ Component 2 - Use of Stimulants for Partying or Getting High	.554**	1	.359 ⁻ **	.081	.179**	.512**	.148**
SSQ Component 3 - Knowledge of Other Students' Use of Stimulants	.231 ⁻ **	.359 ⁻ **	1	.305 ⁻ **	.009	.381 ⁻ **	.226 ⁻ **
SSQ Component 4 - Perceptions of Stimulant Availability	.032	.081	.305 ⁻ **	1	.121**	.153**	.151**
SSQ Component 5 - Perceptions of Stimulant Safety	.188**	.179**	.009	.121**	1	.173**	-.038
SSQ Component 6 - Sharing Stimulants with Other Students	.463**	.512**	.381 ⁻ **	.153**	.173**	1	.109*
SSQ Component 7 - Perceived Knowledge about Stimulants	.155**	.148**	.226 ⁻ **	.151**	-.038	.109*	1

Notes. * = Correlation is significant at the 0.05 level. ** = Correlation is significant at the 0.01 level

Table 6. *Prevalence of stimulant misuse behaviors*

Item	% endorsing item/behavior as having occurred at least “rarely”		
	Total N=521	n=487 without prescription	n=34 with prescription
1. I have used prescription stimulants for non-medical purposes.	9.3%	9.0%	14.7%
2. I have used prescription stimulants at parties.	6.2%	6.1%	8.8%
3. I have used prescription stimulants with alcohol.	6.5%	5.9%	14.7%
4. I have snorted prescription stimulants.	3.5%	3.3%	5.9%
5. I have injected prescription stimulants.	0.0%	0.0%	0.0%
6. I have smoked prescription stimulants.	0.8%	0.6%	2.9%
7. I have taken prescription stimulants to focus better in class.	4.4%	3.2%	23.5%
8. I have taken prescription stimulants to perform better on tests.	5.6%	4.0%	29.4%
9. I have taken prescription stimulants to help me socialize better.	3.1%	2.7%	9.1%
10. I have taken prescription stimulants to help me lose weight.	2.1%	1.7%	8.2%
11. I have taken prescription stimulants to perform better in my school work.	7.3%	5.7%	32.4%
12. I have taken prescription stimulants to feel more energetic.	6.0%	4.9%	23.5%
13. I have taken prescription stimulants to feel better about myself.	2.3%	1.9%	8.8%
14. I have taken prescription stimulants to “get high”.	4.0%	4.2%	2.9%
15. I have been offered prescription stimulants by other students.	7.7%	6.7%	17.6%
16. I have tried someone else’s prescription stimulant medication.	2.3%	2.1%	5.9%
17. I have purchased prescription stimulants from other students.	1.2%	1.1%	2.9%
18. I have sold prescription stimulant medication to other students.	0.4%	0.2%	2.9%
19. I have given prescription stimulant medication to other students.	1.9%	1.2%	11.8%
20. I have been pressured into letting someone else have my prescription stimulant medication.	2.5%	1.3%	20.6%

Table 7. *Percentage of students who responded “agree” or “strongly agree” to statements concerning prescription stimulant use and availability*

Item	% endorsing either “agree” or strongly agree”		
	Overall N=521	n=487 without prescription	n=34 with prescription
21. Prescription stimulants are easy to get on this campus.	11.2%	11.0%	11.8%
22. Prescription stimulants are as easy to get as alcohol.	7.8%	7.2%	11.8%
23. Prescription stimulants are as easy to get as marijuana.	18.6%	18.7%	20.6%
24. Using prescription stimulants occasionally is harmless.	7.9%	7.4%	32.4%
25. Using prescription stimulants daily is harmless.	2.0%	1.9%	17.6%
26. Prescription stimulant use on campus is a problem.	13.8%	14.5%	8.8%
27. Prescription stimulants are safer than marijuana.	4.6%	3.9%	14.7%
28. Prescription stimulants are safer than alcohol.	4.5%	3.4%	14.7%
29. I feel I am knowledgeable about prescription stimulants.	45.0%	42.7%	76.5%
30. I feel I am knowledgeable about the side effects of prescription stimulants.	44.0%	41.3%	85.3%

Table 8. *Percentage of participants who responded “YES” to statements concerning prescription stimulant misuse*

Item	% agreeing to statement		
	Overall N=521	n=487 without prescription	n=34 with prescription
31. I know about students who use prescription stimulants at parties.	82.1%	82.1%	85.3%
32. I know about students who use prescription stimulants with alcohol.	83.5%	83.4%	85.3%
33. I know about students who use prescription stimulants with other drugs.	91.0%	91.4%	88.2%
34. I know about students who use prescription stimulants while studying.	78.5%	78.9%	76.5%
35. I know about students who use prescription stimulants during finals week/tests.	76.4%	76.7%	76.5%
36. I know about students who snort prescription stimulants.	93.5%	93.3%	94.1%
37. I know about students who inject prescription stimulants.	99.2%	99.2%	100.0%
38. I know about students who smoke prescription stimulants.	96.5%	96.6%	93.9%
39. I hide my prescription stimulant medication so that no one will take it.	N/A	N/A	55.9%

Table 9. *Descriptive statistics and independent t-test analyses for SSQ, DASS-21, and DSM-IV Checklist scores for participants without a current prescription by stimulant misuse history status*

Variable	Min	Max	n=309 no history of stimulant misuse M (SD)	n=39 history of stimulant misuse M (SD)	t (346)	Cohen's d
SSQ – Component 1 Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement	0	21	N/A	4.23 (5.72)	N/A	N/A
SSQ – Component 2 Use of Stimulants for Partying or Getting High	0	17	N/A	3.41 (3.29)	N/A	N/A
ΨSSQ – Component 3 Knowledge of Other Students' Use of Stimulants	0	8	7.23 (1.61)	5.61 (2.22)	4.41**	0.96
SSQ – Component 4 Perceptions of Stimulant Availability	4	20	10.29 (3.00)	10.54 (3.09)	-0.48	-0.08
SSQ – Component 5 Perceptions of Stimulant Safety	4	20	6.61 (2.75)	8.31 (2.81)	-3.57**	-0.62
ΨSSQ – Component 6 Sharing Stimulants with Other Students	0	8	0.06 (0.28)	0.82 (1.64)	-2.92**	-1.26
SSQ – Component 7 Perceived Knowledge about Stimulants	2	10	5.98 (2.50)	7.18 (2.57)	-2.76**	-0.48
ΨADHD Total – past 6 months	0	46	9.37 (7.89)	12.46 (9.58)	-1.93*	-0.38
ΨADHD Total – childhood	0	54	9.41 (10.06)	16.18 (14.27)	-2.87**	-0.64
DASS-Depression	0	21	3.65 (4.33)	3.95 (4.30)	-0.41	-0.07
DASS-Anxiety	0	15	2.06 (3.04)	2.74 (3.20)	-1.27	-0.22
DASS-Stress	0	20	4.45 (4.10)	4.59 (3.84)	-0.22	-0.03

Notes. Ψ = variances were significantly different across groups, results should be interpreted with caution. * = significant at the 0.05 level. ** = significant at the 0.01 level.

Table 10. *SSQ Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement, and Use of Stimulants for Partying or Getting High Pearson correlations with DASS subscales (depression, anxiety, and stress), ADHD total scores in childhood and adulthood, participant sex, and self-reported GPA*

Variable	A	B	C	D	E	F	G	H	I
A: DASS-21 depression	1	.604**	.707**	-.036	-.016	.411**	.179**	.058	-.036
B: DASS-21 anxiety	.604**	1	.707**	-.042	-.054	.405**	.220**	.195**	.064
C: DASS21 stress	.707**	.707**	1	.025	.106*	.436**	.202**	.087	.028
D: GPA	-.036	-.042	-.025	1	-.020	-.042	-.010	-.010	-.020
E: Participant Sex	-.016	-.054	.106*	-.020	1	.060	.190**	.023	.147**
F: DSM-IV Checklist: ADHD total score past 6 months	.411**	.405**	.436**	-.042	.060	1	.729**	.089	.105*
G: DSM-IV Checklist: ADHD total score childhood	.179**	.220**	.202**	-.010	.190**	.729**	1	.216**	.200**
H: SSQ Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement	.058	.195**	.087	-.010	.023	.089	.216**	1	.657**
I: SSQ Use of Stimulants for Partying or Getting High	-.036	.064	.028	-.020	.147**	.105*	.200**	.657**	1

Notes. * = Correlation is significant at the 0.05 level. ** = Correlation is significant at the 0.01 level.

Table 11. *Regression analyses with Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement component of SSQ as the dependent variable*

Independent variable(s)	<i>t</i>	<i>p</i>	β	F	df	<i>p</i>	adj. R^2
Model 1							
				0.94	1, 468	0.33	0.00
Sex	0.97	0.33	0.05				
Model 2							
				0.07	1, 364	0.78	0.00
GPA	-0.28	0.78	-0.01				
Model 3							
				6.29	3, 417	<0.001	0.04
Depression	-0.81	0.42	-0.06				
Anxiety	3.84	<0.001	0.26				
Stress	-0.54	0.59	-0.04				
Model 4							
				8.08	5, 378	<0.001	0.09
ADHD past 6 months	-2.91	0.004	-0.24				
ADHD childhood	4.65	<0.001	0.34				
Depression	-0.51	0.61	-0.04				
Anxiety	3.69	<0.001	0.26				
Stress	-0.51	0.61	-0.04				

Table 12. *Regression analyses with Use of Stimulants for Partying or Getting High component of SSQ as the dependent variable*

Independent variable(s)	<i>t</i>	<i>p</i>	β	F	df	<i>p</i>	adj. R^2
Model 1							
						Model summary	
				4.71	1, 468	0.03	0.01
Sex	2.17	0.03	0.10				
Model 2							
						Model summary	
				0.32	1, 457	0.57	0.00
GPA	-0.56	0.57	-0.03				
Model 3							
						Model summary	
				1.78	3, 419	0.15	0.01
Depression	-1.56	0.12	-0.112				
Anxiety	1.61	0.11	0.110				
Stress	0.70	0.49	0.056				
Model 4							
						Model summary	
				3.81	5,379	0.002	0.04
ADHD past 6 months	-0.96	0.34	-0.08				
ADHD childhood	3.21	0.001	0.24				
Depression	-1.77	0.08	-0.13				
Anxiety	1.16	0.25	0.09				
Stress	0.46	0.65	0.04				

Figure 1. *Regression model with Sex as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of independence of errors assumption*

Figure 2. *Regression model with Sex as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of independence of errors assumption*

Figure 3. *Regression model with Sex as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of normal distribution assumption*

Figure 4. *Regression model with Sex as the IV and Use of Stimulants for Partyng or Getting High as the DV: Assessment of independence of errors assumption*

Figure 5. Regression model with Sex as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of homogeneity of variance and linearity assumption

Figure 6. Regression model with Sex as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of normal distribution assumption

Figure 7. Regression model with GPA as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of independence of errors assumption

Figure 8. Regression model with GPA as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of homogeneity of variance and linearity assumption

Figure 9. *Regression model with GPA as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of normal distribution assumption*

Figure 10. *Regression model with GPA as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of independence of errors assumption*

Figure 11. *Regression model with GPA as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of homogeneity of variance and linearity assumption*

Figure 12. *Regression model with GPA as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of normal distribution assumption*

Figure 13. *Regression model with DASS subscales as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of independence of errors assumption*

Figure 14. *Regression model with DASS subscales as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of homogeneity of variance and linearity assumption*

Figure 15. *Regression model with DASS subscales as the IV and Use of Stimulants for Academic, Cognitive, Physical, or Social Enhancement as the DV: Assessment of normality assumption*

Figure 16. *Regression model with DASS subscales as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of independence of errors assumption*

Figure 17. *Regression model with DASS subscales as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of homogeneity of variance and linearity assumption*

Figure 18. *Regression model with DASS subscales as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of normality assumption*

Figure 19. *Regression model with DASS subscales and ADHD symptoms as the IV and Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement as the DV: Assessment of independence of errors assumption*

Figure 20. *Regression model with DASS subscales and ADHD symptoms as the IV and Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement as the DV: Assessment of homogeneity of variance and linearity assumption*

Figure 21. *Regression model with DASS subscales and ADHD symptoms as the IV and Use of Stimulants for Academic, Cognitive, Physical, and Social Enhancement as the DV: Assessment of normality assumption*

Figure 22. *Regression model with DASS subscales and ADHD symptoms as the IVs and Use of Stimulants for Partying or Getting High as the DV: Assessment of independence of errors assumption*

Figure 23. Regression model with DASS subscales and ADHD symptoms as the IVs and Use of Stimulants for Partying or Getting High as the DV: Assessment of homogeneity of variance and linearity assumption

Figure 24. Regression model with DASS subscales and ADHD symptoms as the IV and Use of Stimulants for Partying or Getting High as the DV: Assessment of normality assumption

Figure 25. *Distribution of scores on the Use of Prescription Stimulants for Academic, Cognitive, Physical, or Social Enhancement component of the SSQ*

Figure 26. *Distribution of scores on the Use of Prescription Stimulants for Partying or Getting High component of the SSQ*

Appendix A

Informed Consent (English)
The University of Rhode Island
Department of Psychology

*Prevalence of ADHD and Prescription Stimulant Misuse among College Students in
Iceland*

PLEASE PRINT AND KEEP THIS FORM FOR YOURSELF

Dear Participant:

You have been invited to take part in a research project described below. If you have any questions, please feel free to contact the student investigator, B. Gyda Gudmundsdottir, at +1 (XXX) XXX-XXXX or XXX@my.uri.edu, or the principal investigator, Dr. Lisa Weyandt, at +1 (XXX) XXX-XXXX or XXX@uri.edu.

The purpose of this study is to examine the misuse of prescription stimulant medications among college students and how it relates to aspects of psychosocial functioning, including symptoms of ADHD, depression, anxiety, and stress. Responses to survey items are completely anonymous: there will be no identifying information linking you to your responses. Data will be encrypted and stored through the website SurveyMonkey, and only the primary student investigator will have access to the data through the use of a password.

YOU MUST BE AT LEAST 18 YEARS OLD to participate in this research project. If you are not, please discontinue the survey at this time.

If you decide to participate in this study, it will involve completing some questionnaires pertaining to your perceptions about prescription stimulant medication, symptoms of ADHD, depression, anxiety, and stress, and your demographic background.

The possible risks of the study are minimal, although you may feel some embarrassment answering questions of a personal nature. Please respond honestly, and remember that your responses are anonymous.

Although there are no direct benefits of the study, your answers will help to increase knowledge and understanding regarding the non-medical use of prescription stimulants among college students.

Your participation in this study is anonymous. This means that your answers to all questions are private. No one else can know that you participated in this study, and no one can find out what your answers were to any items. Scientific reports will be based on aggregated group data, and will not identify you or any individual in this project.

The decision to participate in this research project is up to you. You do not have to participate, and you can decline to answer the questionnaires. If you decide to take part in the study, you may quit at any time. Whatever you decide will in no way penalize you or your status as a student. Participation in this study is not expected to be harmful or injurious to you.

If you have any additional questions or concerns about this study, you may contact the student investigator, B. Gyda Gudmundsdottir, at +1 (XXX) XXX-XXXX, her faculty sponsor, Dr. Lisa Weyandt, at +1 (XXX) XXX-XXXX, or the University of Rhode Island's Vice President for Research, 70 Lower College Road, Suite 2, URI, Kingston, RI; +1 (XXX) XXX-XXXX.

By clicking this box, you are indicating that:

- You are at least 18 years old.
- You have read the consent form and your questions have been answered to your satisfaction.

Appendix A (continued)

Informed Consent (Icelandic)

UPPLÝST SAMÞYKKI

University of Rhode Island
Department of Psychology/Sálfræðideild

Algengi ADHD og misnotkunar örvandi lyfseðilsskyldra lyfja meðal háskólanema á Íslandi [Prevalence of ADHD and Prescription Stimulant Misuse among College Students in Iceland]

VINSAMLEGA GEYMIÐ EINTAK AF ÞESSU EYÐUBLAÐI TIL EIGIN AFNOTA.

Kæri þátttakandi:

Þér hefur verið boðið að taka þátt í rannsókn sem lýst er hér að neðan. Vinsamlega hafðu samband við rannsakendur, Bergljótu Gyðu Guðmundsdóttur, doktorsnema í sálfræði, í síma +1 (XXX) XXX-XXXX eða gegnum tölvupóst: XXX@my.uri.edu, eða leiðbeinanda hennar og ábyrgðarmann rannsóknarinnar, Dr. Lisu Weyandt, í síma +1 (XXX) XXX-XXXX eða gegnum tölvupóst: XXX@uri.edu.

Markmið þessarar rannsóknar er að kanna misnotkun örvandi lyfseðilsskyldra lyfja meðal háskólanema og hvernig slík hegðun tengist ýmsum sálfélagslegum breytum, til dæmis einkennum athyglisbrests með ofvirkni (AMO; ADHD), þunglyndis, kvíða og streitu. Svör við spurningum eru órekjanleg til einstakra þátttakenda og engum persónuupplýsingum verður safnað. Gögn verða dulkóðuð og geymd á vefsíðu SurveyMonkey og munu einungis rannsakendur hafa aðgang að gögnunum gegnum notendanafn og lykilorð.

ÞÚ VERÐUR AÐ HAFNA NÁÐ 18 ÁRA ALDRI til þess að taka þátt í rannsókninni. Ef þú ert ekki orðin/-nn 18 ára, vinsamlega hættu þátttöku núna.

Ef þú ákveður að taka þátt í þessari rannsókn muntu verða beðin/-nn um að svara spurningum um viðhorf þín til örvandi lyfseðilsskyldra lyfja, notkun slíkra lyfja, og einkenna ADHD, þunglyndis, kvíða og streitu, sem og spurningum um bakgrunn þinn.

Áhætta af þátttöku í þessari rannsókn er nánast engin en þér gæti hugsanlega þótt óþægilegt að svara spurningum er varða persónulega hagi þína. Vinsamlega svaraðu af hreinskilni og mundu að svör þín eru nafnlaus og órekjanleg til þín.

Þótt enginn beinn ávinningur fái af þátttöku í þessari rannsókn munu svör þín leiða til aukinnar þekkingar og skilnings á misnotkun örvandi lyfseðilsskyldra lyfja meðal háskólanema.

Þátttaka þín í þessari rannsókn er nafnlaus. Það felur í sér að svör þín við öllum spurningum eru leynileg. Enginn mun vita að þú hafir tekið þátt í þessari rannsókn og enginn mun geta komist að því hverju þú svaraðir. Skýrslur og greinar um þessa rannsókn munu byggjast á svörum þátttakenda í heild og ómögulegt verður að rekja niðurstöður til einstakra þátttakenda.

Ákvörðun um þátttöku í þessari rannsókn er alfarið þín. Þér ber ekki skylda til að taka þátt og þú mátt sleppa því að svara einstökum spurningum og/eða spurningalistum í heild. Ef þú ákveður að taka þátt í rannsókninni máttu hætta þátttöku hvenær sem er. Hver sem ákvörðun þín verður mun hún ekki hafa áhrif á stöðu þína sem háskólanemi á nokkurn hátt. Þátttaka í þessari rannsókn telst áhættulaus.

Ef þú hefur einhverjar spurningar eða athugasemdir vegna rannsóknarinnar hafðu vinsamlega samband við rannsakendur, Bergljótu Gyðu Guðmundsdóttur, doktorsnema í sálfræði, í síma +1 (XXX) XXX-XXXX, eða leiðbeinanda hennar og ábyrgðarmann rannsóknarinnar, Dr. Lisu Weyandt, í síma +1 (XXX) XXX-XXXX, eða eftirlitsskrifstofu rannsókna við University of Rhode Island (University of Rhode Island's Vice President for Research), 70 Lower College Road, Suite 2, URI, Kingston, Rhode Island, í síma +1 (XXX) XXX-XXXX.

Með því að merkja við hér að neðan staðfestir þú að:

- Þú hefur náð 18 ára aldri.
- Þú hefur lesið þetta eyðublað um upplýst samþykki og spurningum þínum hefur verið svarað á fullnægjandi hátt.

Appendix B

Debriefing (English)

The study that you just participated in examined misuse of prescription stimulant medications among college students in Iceland, and the relationship between ADHD symptoms, sex, GPA, depressive symptoms, anxiety, and stress among college students. This study, titled, “Prevalence of ADHD and Prescription Stimulant Misuse among College Students in Iceland” is being conducted in order to fulfill requirements for a doctorate of philosophy degree in psychology.

The prevalence of misuse of stimulant medications among college students in the United States has been well documented in research. This study is the first to assess prevalence rates among Icelandic college students and to further examine risk factors associated with stimulant misuse in this population. Results of this investigation may help to identify sub-populations of Icelandic college students who are at risk for misuse of stimulant medication, and to inform prevention and intervention strategies designed to address prescription stimulant misuse.

If you have any questions or concerns about this study, please contact Bergljot Gyda Gudmundsdottir at +1 XXX-XXX-XXXX or at xxx@gmail.com. Thank you for your time and participation.

Appendix B (continued)

Debriefing (Icelandic)

Rannsóknin sem þú varst að ljúka þátttöku í felst í því að kanna algengi misnotkunar örvandi lyfseðilsskyldra lyfja meðal íslenskra háskólanema og samband einkenna athyglisbrests með ofvirkni (AMO eða ADHD), kyns, meðaleinkunnar, þunglyndiseinkenna, kvíða og streitu við misnotkun örvandi lyfseðilsskyldra lyfja meðal íslenskra háskólanema. Þessi rannsókn, sem ber titilinn “Algengi ADHD einkenna og misnotkunar örvandi lyfseðilsskyldra lyfja meðal háskólanema á Íslandi” (“Prevalence of ADHD and prescription stimulant misuse among college students in Iceland”), er hluti af doktorsverkefni Bergljótar Gyða Guðmundsdóttur í sálfræði við University of Rhode Island í Bandaríkjunum.

Rannsóknir hafa ítrekað sýnt fram á að misnotkun örvandi lyfja eigi sér stað meðal háskólanema í Bandaríkjunum. Þetta er fyrsta rannsóknin sem kannar algengi misnotkunar örvandi lyfseðilsskyldra lyfja og þætti sem spá fyrir um slíka hegðun meðal íslenskra háskólanema. Niðurstöður þessarar rannsóknar geta hjálpað til við að skilgreina hvaða undirhópar íslenskra háskólanema eru líklegri til að misnota örvandi lyfseðilsskyld lyf en aðrir og geta einnig veitt mikilvægar upplýsingar fyrir forvarnir og inn grip á þessu sviði.

Ef einhverjar spurningar vakna eða ef þú sérð eitthvað athugavert við þessa rannsókn, vinsamlega hafðu samband við Bergljótu Gyðu Guðmundsdóttur í síma +1 XXX-XXX-XXXX eða gegnum tölvupóst: xxx@gmail.com. Kærar þakkir fyrir að gefa þér tíma til að taka þátt.

Appendix C

Statement on Diversity in Research

This research project aimed to recruit participants of both sexes/genders and those with and without disabilities, to increase the likelihood that findings would equally apply to all individuals within the target population, i.e., college students in Iceland, in accordance with the requirements of the Office of Research Compliance and the Institutional Review Board. Given the racial/ethnic homogeneity of the Icelandic population (Statistics Iceland, 2013), it was considered likely that a large majority of participants would identify as White/Caucasian. In addition, because approximately 4% of university students are registered as having a disability (University of Iceland, 2013), the majority of participants were likely to identify as *not* having a disability. No college student enrolled at any of the target universities was excluded from participation; however, to be eligible for participation, participants needed to be able to read and write in Icelandic.

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Appendix D

Demographic Questionnaire (English)

1. **Current age (in years):** _____

2. **Sex:**

Male

Female

Other: _____

3. **Race/Ethnicity (please circle one):**

White

Non-White

Other: _____

4. **Degree Program in which you are enrolled (please choose one):**

Not attending college/university

Bachelor's Level

Master's Level

Specialist Level

Doctoral Level

Other (please specify): _____

5. **What is your current GPA (on a scale of 0-10)?** _____

6. **Have you ever used prescription stimulant medication (e.g., Ritalin, Ritalin-Uno, Concerta, Adderall, Vyvanse, etc.) that was not prescribed to you?**

Yes

No

7. **Have you ever been diagnosed with Attention-Deficit-Hyperactivity Disorder (ADHD or ADD)?**

Yes

No

8. **If you answered "yes" to the previous question, with what subtype/presentation of ADHD are you diagnosed?**

Hyperactive/Impulsive Type

Inattentive Type

Combined Type

Do not know

9. If you answered “yes” to the previous question, at what age were you first diagnosed? _____

10. Are you currently taking stimulant medication that has been prescribed to you by a doctor, including methylphenidate (e.g. Ritalin, Concerta, Metadate) or amphetamine (Adderall, Dexedrine, Desoxyn, Vyvanse)?

Yes

No

11. If “yes” to question 10, have you ever used stimulant medication that was prescribed to you in a way other than the manner it was prescribed (e.g. higher or more frequent dosage, different method of ingestion)?

Yes

No

12. Do you currently have a disability?

Yes

No

13. If “yes” to the previous question 12, are you currently registered with the Disabilities Support Services office at your university?

Yes

No

Appendix D (continued)
Demographic Questionnaire (Icelandic)

Bakgrunnsspurningar

1. Aldur (í árum): _____

2. Kyn:

Karl

Kona

Annað: _____

3. Kynþáttur/uppruni (vinsamlega veldu eitt):

Hvítur (White)

Ekki hvítur (Non-White)

Annað (vinsamlega útskýrið): _____

4. Tegund náms sem þú ert skráð/-ur í (vinsamlega veldu eina):

Ekki skráð/-ur í háskóla

Grunnnám til bachelor gráðu

Framhaldsnám til meistara- eða annarrar sérfræðigráðu

Framhaldsnám til doktorsgráðu

Annað (vinsamlega útskýrið): _____

5. Hver er núverandi meðaleinkunn þín (á kvarðanum 0-10)? _____

6. Hefur þú einhvern tíma notað örvandi lyfseðilsskyld lyf (t.d. Ritalin, Ritalin-Uno, Concerta, Adderall o.fl.) sem var ekki ávísað til þín?

Já

Nei

7. Hefur þú einhvern tíma verið greind/-ur með athyglisbrest með (eða án) ofvirkni (AMO; attention deficit/hyperactivity disorder; ADHD, ADD)?

Já

Nei

8. Ef þú svaraðir síðustu spurningu játandi, hvaða undirtegund AMO/ADHD varst þú greind/-ur með?

Athyglisbrestur (Inattentive)

Hreyfiofþvirkni og hvatvísi (Hyperactive/Impulsive)

Blönduð (Combined)

Veit ekki

9. Ef þú svaraðir síðustu spurningu játandi, hvenær varstu greind/-ur (aldur í árum)? _____

10. Tekur þú örvandi lyf sem hefur verið ávísað til þín af lækni, til dæmis metýlfenídat (t.d. Ritalin, Ritalin-Uno, Concerta, o.fl.) eða amfetamínskyld lyf (t.d. Adderall, Dexedrine, Desoxyn, Vyvanse)?

Já Nei

11. Ef þú svaraðir síðustu spurningu játandi, hefur þú einhvern tíma notað örvandi lyf sem var ávísað til þín á annan hátt en tilgreint var á lyfseðli (t.d. í stærri eða fleiri skömmtum eða með öðrum leiðum en gegnum munn)?

Já Nei

12. Býrð þú við fötlun af einhverju tagi?

Já Nei

13. Ef þú svaraðir síðustu spurningu játandi, nýtur þú formlegrar þjónustu/aðstoðar vegna fötlunar þinnar í háskólanum sem þú ert skráð/-ur í?

Já Nei

Appendix E

DSM-IV Checklist of Symptoms – Past 6 Months (English)

Indicate the number that best describes your behavior over the past 6 months.

0 = Never or rarely 1 = Sometimes 2 = Often 3 = Very Often

1. Fail to give close attention to details or make careless mistakes in my work. ____
2. Fidget with my hands or feet or squirm in my seat. ____
3. Have difficulty sustaining my attention in tasks or fun activities. ____
4. Leave my seat in situations in which remaining seated is expected. ____
5. Don't listen when spoken to directly. ____
6. Feel restless ____
7. Don't follow through on instructions and fail to finish work. ____
8. Have difficulty engaging in leisure activities or doing fun things quietly. ____
9. Have difficulty organizing tasks and activities. ____
10. Feel "on the go" or "driven by a motor." ____
11. Avoid, dislike, or feel reluctant to engage in work that requires sustained mental effort. ____
12. Talk excessively. ____
13. Lose things necessary for tasks and activities. ____
14. Blur out answers before questions have been completed. ____
15. Easily distracted. ____
16. Have difficulty awaiting my turn. ____
17. Forgetful in daily activities. ____
18. Interrupt or intrude on others. ____

Appendix E (continued)

DSM-IV Checklist of Symptoms – Childhood (English)

Indicate the number that best describes your behavior when you were a child, prior to 12 years of age.

0 = Never or rarely 1 = Sometimes 2 = Often 3 = Very Often

1. Fail to give close attention to details or make careless mistakes in my work. ____
2. Fidget with my hands or feet or squirm in my seat. ____
3. Have difficulty sustaining my attention in tasks or fun activities. ____
4. Leave my seat in situations in which remaining seated is expected. ____
5. Don't listen when spoken to directly. ____
6. Feel restless ____
7. Don't follow through on instructions and fail to finish work. ____
8. Have difficulty engaging in leisure activities or doing fun things quietly. ____
9. Have difficulty organizing tasks and activities. ____
10. Feel "on the go" or "driven by a motor." ____
11. Avoid, dislike, or feel reluctant to engage in work that requires sustained mental effort. ____
12. Talk excessively. ____
13. Lose things necessary for tasks and activities. ____
14. Blurt out answers before questions have been completed. ____
15. Easily distracted. ____
16. Have difficulty awaiting my turn. ____
17. Forgetful in daily activities. ____
18. Interrupt or intrude on others. ____

Appendix E (continued)

DSM-IV Checklist of Symptoms – Past 6 Months (Icelandic)

Hegðunarmatskvarði fyrir fullorðna

Veldu það svar sem lýsir best hegðun þinni eins og hún var síðustu 6 mánuði.

Aldrei eða sjaldan = 0

Stundum = 1

Oft = 2

Mjög oft = 3

1. Huga illa að smáatriðum eða geri fljótfærnislegar villur í starfi eða námi. ____
2. Er mikið með hendur og fætur á hreyfingu eða á iði þegar ég sit. ____
3. Á erfitt með að halda athygli vakandi við verkefni eða tómstundaiðju. ____
4. Fer úr sæti mínu í aðstæðum þar sem ætlast er til að ég sitji kyrr. ____
5. Virðist ekki hlusta þegar talað er beint til mín. ____
6. Hreyfi mig óhóflega mikið í aðstæðum þar sem það á ekki við; ofvirk(ur); finnst ég vera eirðarlaus. ____
7. Fylgi ekki fyrirmælum til enda og tekst ekki að ljúka verkefnum. ____
8. Á erfitt með að vera hljóð(ur) þegar ég sinni tómstundaiðju. ____
9. Á erfitt með að skipuleggja verkefni og athafnir. ____
10. Er alltaf á ferðinni, eða „er eins og þeytisþjald“.
11. Forðast verkefni (t.d. í vinnu eða heima) sem krefjast mikillar beitingar hugans.

12. Tala óhóflega mikið. ____
13. Týni hlutum sem eru nauðsynlegir til verkefna eða athafna. ____
14. Gríp fram í með svari áður en spurningum er lokið. ____
15. Er auðtrufluð(-aður). ____
16. Á erfitt með að bíða eftir að röðin komi að mér. ____
17. Er gleyminn(n). ____
18. Gríp fram í eða ryðst inn í samræður eða athafnir annarra. ____

Appendix E (continued)

DSM-IV Checklist of Symptoms – Childhood (Icelandic)

Hegðunarmatskvarði fyrir fullorðna

Veldur það svar sem lýsir best hegðun þinni eins og hún var fyrir 12 ára aldur.

Aldrei eða sjaldan = 0

Stundum = 1

Oft = 2

Mjög oft = 3

1. Huga illa að smáatriðum eða geri fljótfærnislegar villur í starfi eða námi. ____
2. Er mikið með hendur og fætur á hreyfingu eða á iði þegar ég sit. ____
3. Á erfitt með að halda athygli vakandi við verkefni eða tímstundaiðju. ____
4. Fer úr sæti mínu í aðstæðum þar sem ætlast er til að ég sitji kyrr. ____
5. Virðist ekki hlusta þegar talað er beint til mín. ____
6. Hreyfi mig óhóflega mikið í aðstæðum þar sem það á ekki við; ofvirk(ur); finnst ég vera eirðarlaus. ____
7. Fylgi ekki fyrirmælum til enda og tekst ekki að ljúka verkefnum. ____
8. Á erfitt með að vera hljóð(ur) þegar ég sinni tímstundaiðju. ____
9. Á erfitt með að skipuleggja verkefni og athafnir. ____
10. Er alltaf á ferðinni, eða „er eins og þeytisþjald“.
11. Forðast verkefni (t.d. í vinnu eða heima) sem krefjast mikillar beitingar hugans.

12. Tala óhóflega mikið. ____
13. Týni hlutum sem eru nauðsynlegir til verkefna eða athafna. ____
14. Gríp fram í með svari áður en spurningum er lokið. ____
15. Er auðtrufluð(-aður). ____
16. Á erfitt með að bíða eftir að röðin komi að mér. ____
17. Er gleyminn(n). ____
18. Gríp fram í eða ryðst inn í samræður eða athafnir annarra. ____

Appendix F

Depression Anxiety Stress Scale -21 (DASS-21)

Lestu hverju fullyrðingu og veldu svar 0, 1, 2 eða 3 sem segir til um hve vel hver fullyrðing átti við í þínu tilvik í síðustu vikuna. Það eru engin rétt eða röng svör. Eyddu ekki of miklum tíma í að velta fyrir þér hverri fullyrðingu.

*[Please read each statement and circle a number 0, 1, 2, or 3 that indicates how much that statement applied to you over the **past week**. There are no right or wrong answers. Do not spend too much time on any statement].*

0 = Átti alls ekki við mig. [Did not apply to me at all].

1 = Átti við mig að einhverju leyti eða stundum. [Applied to me to some degree, or some of the time].

2 = Átti töluvert vel við mig eða drjúgan hluta vikunnar. [Applied to me to a considerable degree, or a good part of time].

3 = Átti mjög vel við mig eða mest allan tímann. [Applied to me very much, or most of the time].

1. Mér fannst erfitt að ná mér niður. [I found it hard to wind down]. ____

2. Ég fann fyrir munnþurrki. [I was aware of dryness of my mouth]. ____

3. Ég virtist alls ekki geta fundið fyrir neinum góðum tilfinningum. [I couldn't seem to experience any positive feeling at all]. ____

4. Ég átti í erfiðleikum með að anda (t.d. allt of hröð öndun, mæði án líkamlegrar áreynslu). [I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)]. ____

5. Mér fannst erfitt að hleypa í mig krafti til að gera hluti. [I found it difficult to work up the initiative to do things]. ____

6. Ég hafði tilhneigingu til að bregðast of harkalega við aðstæðum. [I tended to over-react to situations]. ____

7. Ég fann fyrir skjálfta (t.d. í höndum). [I experienced trembling (e.g. in the hands)]. ____

8. Mér fannst ég eyða mikilli andlegri orku. [I felt that I was using a lot of nervous energy]. ____

9. Ég hafði áhyggjur af aðstæðum þar sem ég fengi hræðslukast (panic) og gerði mig að fífl. [I was worried about situations in which I might panic and make a fool of myself]. ____
10. Mér fannst ég ekki geta hlakkað til neins. [I felt that I had nothing to look forward to]. ____
11. Ég var ergileg(ur). [I found myself getting agitated]. ____
12. Mér fannst erfitt að slappa af. [I found it difficult to relax]. ____
13. Ég var dapur/döpur og niðurdregin(n). [I felt down-hearted and blue]. ____
14. Ég þoldi ekki þegar eitthvað kom í veg fyrir að ég héldi áfram við það sem ég var að gera. [I was intolerant of anything that kept me from getting on with what I was doing]. ____
15. Mér fannst ég nánast gripin(n) skelfingu. [I felt I was close to panic]. ____
16. Ég gat ekki fengið brennandi áhuga á neinu. [I was unable to become enthusiastic about anything]. ____
17. Mér fannst ég ekki vera mikils virði sem manneskja. [I felt I wasn't worth much as a person]. ____
18. Mér fannst ég frekar hörundsár. [I felt that I was rather touchy]. ____
19. Ég varð vör(var) við hjartsláttinn í mér þó ég hefði ekki reynt á mig (t.d. hraðari hjartsláttur, hjartað sleppti úr slagi). [I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)]. ____
20. Ég fann fyrir ótta án nokkurrar skynsamlegrar ástæðu. [I felt scared without any good reason]. ____
21. Mér fannst lífið vera tilgangslaust. [I felt that life was meaningless]. ____

Appendix G

Stimulant Survey Questionnaire (English)

Please answer the following questions about your college experience truthfully. Stimulants refer to prescription medications including methylphenidate (Ritalin, Concerta, Metadate) and amphetamine (Adderall, Dexedrine, Desoxyn).

Please circle the number that best describes your agreement with each statement.

These questions are rated on a Likert scale:

	Never	Rarely	Occasionally	Frequently	Always
1. I have used prescription stimulants for non-medical purposes.	1	2	3	4	5
2. I have used prescription stimulants at parties.	1	2	3	4	5
3. I have used prescription stimulants with alcohol.	1	2	3	4	5
4. I have snorted prescription stimulants.	1	2	3	4	5
5. I have injected prescription stimulants.	1	2	3	4	5
6. I have smoked prescription stimulants.	1	2	3	4	5
7. I have taken prescription stimulants to focus better in class.	1	2	3	4	5
8. I have taken prescription stimulants to perform better on tests.	1	2	3	4	5
9. I have taken prescription stimulants to help me socialize better.	1	2	3	4	5
10. I have taken prescription stimulants to help me lose weight.	1	2	3	4	5
11. I have taken prescription stimulants to perform better in my school work.	1	2	3	4	5
12. I have taken prescription stimulants to feel more energetic.	1	2	3	4	5
13. I have taken prescription stimulants to feel better about myself.	1	2	3	4	5
14. I have taken prescription stimulants to “get high”.	1	2	3	4	5
15. I have been offered prescription stimulants by other students.	1	2	3	4	5
16. I have tried someone else’s prescription stimulant medication.	1	2	3	4	5
17. I have purchased prescription stimulants from other students.	1	2	3	4	5
18. I have sold prescription stimulant medication to other students.	1	2	3	4	5
19. I have given prescription stimulant medication to other students.	1	2	3	4	5
20. I have been pressured into letting someone else have my prescription stimulant medication.	1	2	3	4	5

Please answer the following questions about your college experience truthfully. Stimulants refer to prescription medications including methylphenidate (Ritalin, Concerta, Metadate) and amphetamine (Adderall, Dexedrine, Desoxyn).

Please circle the number that best describes your agreement with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
21. Prescription stimulants are easy to get on this campus.	1	2	3	4	5
22. Prescription stimulants are as easy to get as alcohol.	1	2	3	4	5
23. Prescription stimulants are as easy to get as marijuana.	1	2	3	4	5
24. Using prescription stimulants occasionally is harmless.	1	2	3	4	5
25. Using prescription stimulants daily is harmless.	1	2	3	4	5
26. Prescription stimulant use on campus is a problem.	1	2	3	4	5
27. Prescription stimulants are safer than marijuana.	1	2	3	4	5
28. Prescription stimulants are safer than alcohol.	1	2	3	4	5
29. I feel I am knowledgeable about prescription stimulants.	1	2	3	4	5
30. I feel I am knowledgeable about the side effects of prescription stimulants.	1	2	3	4	5

Please Circle Yes or No to the following questions:

31. I know students who use prescription stimulants at parties.	YES	NO
32. I know students who use prescription stimulants with alcohol.	YES	NO
33. I know students who use prescription stimulants with other drugs.	YES	NO
34. I know students who use prescription stimulants while studying.	YES	NO

35. I know students who use prescription stimulants during finals week.	YES	NO
36. I know students who use prescription stimulants during tests.	YES	NO
37. I know students who snort prescription stimulants.	YES	NO
38. I know students who inject prescription stimulants.	YES	NO
39. I know students who smoke prescription stimulants.	YES	NO
40. I hide my prescription stimulant medication so that no one will take it.	YES	NO

Appendix G (continued)

Stimulant Survey Questionnaire (Icelandic)

Vinsamlega svaraðu eftirfarandi spurningum hreinskilnislega. Miðað er við tímabilið frá því háskólanám hófst. Þegar talað er um “örvandi lyfseðilsskyld lyf” er átt við lyf sem ávísað er með lyfseðli, svo sem metýlfenídat, t.d. Ritalin, Ritalin-Uno, Concerta og skyld lyf (t.d. Adderall, Vyvanse, Focalin o.fl.).

Vinsamlega veldu það svar sem á best við hverju sinni.

	Aldrei	Sjaldan	Stundum	Oft	Alltaf
1. Ég hef notað örvandi lyfseðilsskyld lyf í öðrum tilgangi en læknisfræðilegum.	1	2	3	4	5
2. Ég hef notað örvandi lyf þegar ég fer út að skemmta mér eða “á djamminu”.	1	2	3	4	5
3. Ég hef notað örvandi lyfseðilsskyld lyf með áfengi.	1	2	3	4	5
4. Ég hef sniffað/snortað/sogið örvandi lyfseðilsskyld lyf gegnum nefið.	1	2	3	4	5
5. Ég hef sprautað mig með örvandi lyfseðilsskyldum lyfjum.	1	2	3	4	5
6. Ég hef reykt örvandi lyfseðilsskyld lyf.	1	2	3	4	5
7. Ég hef tekið örvandi lyfseðilsskyld lyf til auka einbeitingu mína í tíma.	1	2	3	4	5
8. Ég hef tekið örvandi lyfseðilsskyld lyf til að standa mig betur á prófum.	1	2	3	4	5
9. Ég hef tekið örvandi lyfseðilsskyld lyf til að eiga auðveldara með samskipti við aðra.	1	2	3	4	5
10. Ég hef tekið örvandi lyfseðilsskyld lyf til að grennast.	1	2	3	4	5
11. Ég hef tekið örvandi lyfseðilsskyld lyf til að standa mig betur í námi	1	2	3	4	5
12. Ég hef tekið örvandi lyfseðilsskyld lyf til að fá aukaorku.	1	2	3	4	5
13. Ég hef tekið örvandi lyfseðilsskyld lyf til að bæta sjálfsálit mitt.	1	2	3	4	5
14. Ég hef tekið örvandi lyfseðilsskyld lyf til þess að komast í vínu.	1	2	3	4	5
15. Aðrir nemendur hafa boðið mér örvandi lyfseðilsskyld lyf.	1	2	3	4	5
16. Ég hef prófað örvandi lyfseðilsskyld lyf af öðrum nemendum.	1	2	3	4	5
17. Ég hef keypt örvandi lyfseðilsskyld lyf af öðrum nemendum.	1	2	3	4	5
18. Ég hef selt öðrum nemendum örvandi lyfseðilsskyld lyf.	1	2	3	4	5
19. Ég hef gefið öðrum nemendum örvandi lyfseðilsskyld lyf.	1	2	3	4	5
20. Ég hef orðið fyrir þrýstingi að gefa öðrum örvandi lyf sem ávísað var til mín.	1	2	3	4	5

Vinsamlega svaraðu eftirfarandi spurningum hreinskilnislega. Þegar talað er um “örvandi lyf” er átt við lyf sem ávísað er með lyfseðli, þ.m.t. metýlfenídat, t.d. Ritalin, Ritalin-Uno, Concerta og skyld lyf (t.d. Adderall, Vyvanse, Focalin o.fl.).

Vinsamlega veldu það svar sem á best við hverju sinni.

	Mjög Ósammála	Ósammála	Hvorki/né	Sammála	Mjög Sammála
21. Það er auðvelt að verða sér úti um örvandi lyfseðilsskyld lyf í háskólasamfélaginu.	1	2	3	4	5
22. Það er jafnauðvelt að verða sér úti um örvandi lyfseðilsskyld lyf og áfengi.	1	2	3	4	5
23. Það er jafnauðvelt að verða sér úti um örvandi lyfseðilsskyld lyf og gras/marijúana	1	2	3	4	5
24. Það er óhætt að nota örvandi lyfseðilsskyld lyf af og til.	1	2	3	4	5
25. Það er óhætt að nota örvandi lyfseðilsskyld lyf daglega.	1	2	3	4	5
26. Notkun örvandi lyfseðilsskyldra lyfja er vandamál í háskólasamfélaginu.	1	2	3	4	5
27. Örvandi lyfseðilsskyld lyf eru öruggari en marijúana.	1	2	3	4	5
28. Örvandi lyfseðilsskyld lyf eru öruggari en áfengi.	1	2	3	4	5
29. Ég tel mig vel upplýsta/-n um örvandi lyfseðilsskyld lyf.	1	2	3	4	5
30. Ég tel mig vel upplýsta/-n um aukaverkanir örvandi lyfseðilsskyldra lyfja.	1	2	3	4	5

Vinsamlega veldu JÁ eða NEI eftir því sem við á:

31. Ég veit um nemendur sem nota örvandi lyfseðilsskyld lyf þegar þeir fara út að skemmta sér.	JÁ	NEI
32. Ég veit um nemendur sem nota örvandi lyfseðilsskyld lyf með áfengi.	JÁ	NEI
33. Ég veit um nemendur sem nota örvandi lyfseðilsskyld lyf með öðrum lyfjum.	JÁ	NEI
34. Ég veit um nemendur sem nota örvandi lyfseðilsskyld lyf þegar þeir læra.	JÁ	NEI
35. Ég veit um nemendur sem nota örvandi lyfseðilsskyld lyf í prófum.	JÁ	NEI
36. Ég veit um nemendur sem taka örvandi lyfseðilsskyld lyf (snorta/sniffa) í nefið.	JÁ	NEI
37. Ég veit um nemendur sem sprauta sig með örvandi lyfseðilsskyldum lyfjum.	JÁ	NEI
38. Ég veit um nemendur sem reykja örvandi lyfseðilsskyld lyf.	JÁ	NEI
39. Ég fel örvandi lyfseðilsskyld lyf sem var ávísað til mín fyrir öðrum svo enginn taki þau.	JÁ	NEI