



## Perceived academic benefit is associated with nonmedical prescription stimulant use among college students



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### HIGHLIGHTS

- 6962 students without ADHD were studied at nine colleges.
- Assessed student beliefs about nonmedical use of prescription stimulants (NPS).
- 29% agreed that NPS helps students earn higher grades, 38% were unsure.
- Higher levels of perceived academic benefit were associated with NPS.
- Frequent alcohol and marijuana use were associated with NPS.

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### ABSTRACT

**Introduction:** College students are at higher than average risk for nonmedical use of prescription stimulants (NPS). A commonly identified motive among students who engage in NPS is to improve grades. Several research studies have observed that NPS most likely does not confer an academic advantage, and is associated with excessive drinking and other drug use. This study documents the proportion of the general college student population who believe that NPS will lead to improvements in academic performance.

**Methods:** This study gathered online survey data from a large, demographically diverse sample of college students to document the prevalence of perceived academic benefit of NPS for improving grades and to examine the association between such belief and NPS.

**Results:** Overall, 28.6% agreed or strongly agreed that NPS could help students earn higher grades, and an additional 38.0% were unsure. Students with a higher level of perceived academic benefit of NPS and more frequent patterns of drinking and marijuana use were more likely to engage in NPS, even after adjustment for a wide range of covariates.

**Conclusions:** The results underscore the need for interventions that simultaneously correct misperceptions related to academic benefit and target alcohol and marijuana use to reduce NPS.

**Abbreviations:** ADHD, Attention-Deficit/Hyperactivity Disorder; GPA, grade point average; NPS, nonmedical use of prescription stimulants; SBI, screening and brief intervention

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## 1. Introduction

Nonmedical use of prescription stimulants (NPS) is defined as the use of a medication usually prescribed to treat Attention-Deficit/Hyperactivity Disorder (ADHD) without a prescription or in a way that is inconsistent with a doctor's orders (Colliver, Kroutil, Dai, & Gfroerer, 2006; DeSantis, Webb, & Noar, 2008; McCabe, West, & Wechsler, 2007; Substance Abuse and Mental Health Services Administration, 2006). In the US, 3.7% of full-time college students are estimated to have engaged in NPS during the past month (Substance Abuse and Mental Health Services Administration, 2016). Lifetime prevalence estimates of NPS vary, but studies among college students have found the range to be between 5.3% and 35% (DeSantis, Webb, & Noar, 2008; DuPont, Coleman, Bucher, & Wilford, 2008; Weyandt et al., 2013). The Monitoring the Future study reported that college students are more likely than their non-college attending peers to use Adderall® nonmedically [10.7% vs. 7.1%, respectively (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2016)]. NPS is more prevalent among college students who are white, male, members of a Greek organization, and whose parents have at least a four-year college degree (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2016; McCabe, Knight, Teter, & Wechsler, 2005). Attending a college located in the Northeast or with highly competitive admission standards is also significantly associated with NPS (McCabe, Knight, Teter, & Wechsler, 2005).

While prescription stimulants such as Adderall® and Ritalin® are beneficial for the treatment of ADHD (Chan, Fogler, & Hammerness, 2016; Wilens et al., 2006), using these drugs nonmedically is associated with risk for dependence and other substance use. McCabe et al. (2007) found that 12.6% of individuals who began engaging in NPS at age 19 became stimulant dependent, with lifetime stimulant dependence increasing with earlier initiation. Several cross-sectional studies have observed that nonmedical users of prescription stimulants also drink alcohol excessively and use illicit drugs, particularly cannabis (Arria, Caldeira, et al., 2008; DeSantis, Noar, & Webb, 2009; McCabe et al., 2005; Teter, McCabe, Boyd, & Guthrie, 2003). McCabe et al. (2005) found that students who engaged in NPS were more than ten times more likely to use cannabis during the past year than non-users.

The cognitive benefit of NPS has been called into question. Experimental studies have demonstrated that among individuals without an ADHD diagnosis, taking prescription stimulants does not result in marked cognitive improvement compared with controls (Advokat, 2010; Chamberlain et al., 2011; Ilieva, Boland, & Farah, 2013; Volkow et al., 2008). For example, Ilieva, Boland, and Farah (2013) conducted a double-blind placebo-controlled trial and found that Adderall® was not associated with enhancement of any of the thirteen cognitive measures assessed. One experimental study using a balanced placebo design reported a deterioration in performance associated with methylphenidate administration among individuals without ADHD (Volkow et al., 2008). The authors concluded that NPS might slow metabolic activation in an already optimally focused brain when performing cognitive tasks, thereby actually weakening cognitive performance.

One naturalistic longitudinal study of college students linked NPS with a pattern of increasing marijuana and alcohol use accompanied by increases in skipping class and decreases in grade point average [GPA (Arria et al., 2013)]. Other cross-sectional research has also shown that college students who engage in NPS have lower GPAs and skip more classes (Clegg-Kraynok, McBean, & Montgomery-Downs, 2011; McCabe et al., 2005; McCabe, Teter, & Boyd, 2006; Rabiner et al., 2009). Non-medical users of prescription stimulants also spend less time studying and more time socializing with their counterparts, patterns of behavior that would appear to impede academic performance (Arria, O'Grady, Caldeira, Vincent, & Wish, 2008). A more recent study observed that students who initiate NPS show no statistically significant improvement in their GPA and gain no detectable advantages over their peers academically (Arria et al., 2017).

Although research studies have cast substantial doubt regarding the academic benefit of NPS, the belief that these drugs, when taken non-medically, can improve academic performance appears to be widespread among college students who engage in NPS. Teter, McCabe, LaGrange, Cranford, and Boyd (2006) examined student's motivations for NPS and found students believe that the drugs will enhance their concentration (65%), help with studying (60%), and increase alertness (48%). Consistently, academic motives are commonly reported among students who engage in NPS (Clegg-Kraynok, McBean, & Montgomery-Downs, 2011; DeSantis, Noar, & Webb, 2009; DeSantis et al., 2008; DuPont, Coleman, Bucher, & Wilford, 2008; Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012; Low & Gendaszek, 2002; McCabe et al., 2005; Rabiner et al., 2009; Teter, McCabe, Cranford, Boyd, & Guthrie, 2005; Teter et al., 2006; White, Becker-Blease, & Grace-Bishop, 2006). However, the literature does not provide information about the range of beliefs that exist among the general college student population regarding the putative academic benefit of NPS. Studies examining motives for NPS can only be conducted among individuals who engage in use. Therefore, there is limited information about the perceived academic benefit of NPS among college students in general. The present study makes an important distinction by measuring how widespread the perceived academic benefit of NPS really is among a large college student sample.

Perceived benefits of using a substance influence the desire to initiate and maintain use of that substance (Cox & Klinger, 1988; Goldman, Brown, & Christiansen, 1987; Leigh, 1989). Positive or negative expectancies can mediate behavior and might have reinforcing effects on behavior over time (Jones, Corbin, & Fromme, 2001). Researchers have found the expected positive and negative consequences of NPS can be measured and classified (Labbe & Maisto, 2010; Looby & Earleywine, 2010), similar to other substances. Nonusers, recreational users, and medical users can be discriminated on the basis of expectancies (Looby & Earleywine, 2010). An exploratory factor analysis performed on the Prescription Stimulant Expectancy Questionnaire II revealed that nonusers of prescription stimulants held significantly weaker expectancies for cognitive enhancement and stronger expectancies for guilt and dependence compared with user groups. Combining positive items together and negative items together to create composite scales confirmed that nonusers of prescription stimulants held the strongest negative expectancies and recreational/medical users held the strongest positive expectancies. If predictive of use, the expectancy that NPS will confer academic advantages might be a valuable prevention target, both to avert initiation and to discourage continued use after initiation.

This study of a large, demographically diverse sample of college students sought to: a) describe the prevalence of perceived academic benefit of NPS as a viable means of improving grades, and b) examine the explanatory power of such belief for predicting NPS. We hypothesized that three constructs would be associated with NPS—namely, higher levels of perceived academic benefit, alcohol use, and marijuana use patterns after holding constant demographic variables.

## 2. Methods

### 2.1. Multi-site design

This multi-site study uses data collected from 8039 full-time undergraduate students at nine colleges and universities in the US during the 2015–2016 academic year (see Table 1). The sites were selected based on variability by size, type, and geographic location. Students were randomly selected at every site, and eligibility was restricted to individuals between the ages of 18 and 25. A categorical variable for school was used to account for regional differences in prevalence of NPS.

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