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Study Drugs and Academic Integrity: The Role of Beliefs About an Academic Honor Code in the Prediction of Nonmedical Prescription Drug Use for Academic Enhancement

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The role of beliefs about academic integrity in college students' decisions to use nonmedical prescription drugs (NMPDs) in academic settings was examined. In Spring 2012 the authors obtained survey data from 645 participants at a small, undergraduate, private liberal arts institution in the Northeastern United States. A broadcast e-mail message was sent to 1,982 students, and data were collected via an anonymous online survey. Of the participants, 19% reported using medication prescribed for ADHD for academic enhancement: Adderall® was the primary medication used. Academic use of NMPDs was higher among participants who had lower levels of belief that such use violated standards of an academic honor code. Furthermore, NMPD use was higher among students for whom the perception of peer use was higher. There is potential to reduce NMPD use on college campuses through implementation of honor codes and campus-wide campaigns related to academic integrity.

In recent years, both news media and academic literature have reported widespread and increased prevalence of nonmedical prescription drug (NMPD) use (use without a prescription) for purposes of improved academic performance, cognitive improvement, and/or neuroenhancement (Aikins, 2011; Brauser, 2009; Larriviere, Williams, Rizzo, & Bonnie, 2009; Setlik, Bond, & Ho, 2009). The

purported increase, however, is not without controversy, as some claim that media attention has exaggerated the prevalence of academic NMPD use (Partridge, Bell, Lucke, Yeates, & Hall, 2011). Stimulants traditionally prescribed for attention-deficit hyperactivity disorder (ADHD) such as mixed-salts amphetamines (e.g., Adderall®) and methylphenidates (e.g., Ritalin®, Concerta®, and Methylin®) have been the primary drugs used in academic settings (Benham, Huerta, & Salazar, 2006; Olfson, Gameroff, Marcus, & Jensen, 2003) and these drugs have been at the forefront of neuroethical discussions on college campuses nationwide (Bavarian, Flay, Ketcham, & Smit, 2013; Franke, Lieb, & Hildt, 2012; Holloway & Bennett, 2012; Partridge et al., 2011; Racine & Forlini, 2008). Because of this focus on the use of stimulant medications in academic situations, we investigated the nonmedical use of stimulants (e.g., Adderall, Ritalin, Concerta, Methylin, etc.) specifically; the nonmedical use of other drugs such as opiates, sedatives, analgesics, or anxiolytics was not assessed.

Considerable attention has been given to college students as investigations have indicated that this cohort is at high risk for academic NMPD use. College students function in an environment that simultaneously demands high-quality academic performance and serves as an arena for experimentation, thus creating a primary market for those who seek

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out these stimulant drugs for their perceived cognitive-enhancing qualities and potential ability to improve academic achievement (Advokat, Gudry, & Martino, 2008; Aikins, 2011; Babcock & Byrne, 2000; DeSantis, Webb, & Noar, 2008; S. E. McCabe, Knight, Teter, & Wechsler, 2005; Varga 2012). In a large study of 10,904 participants at 119 four-year colleges, S. E. McCabe and colleagues (2005) found that the proportion of college students who had used prescription stimulants nonmedically ranged from 0% to 25%, with the majority of schools having a prevalence between 1% and 9% and 12 schools having a prevalence rate of 10% or higher. A more recent study reported a prevalence of 43% among college students (higher than most studies), notably, 84% of those students reported using NMPDs to study (Advokat et al., 2008).

The increase in nonmedical use of ADHD medications by healthy individuals is problematic due to the potential risk of addiction, malnutrition, paranoia, suicidal ideations, induced psychosis, cardiovascular complications, stroke, and very rarely death (Adderall, 2007; Adderall XR, 2011; Aikins, 2011; Concerta, 2010; Methylin, 2010; Ragan, Bard, & Singh, 2013; Ritalin, 2010; Setlik et al., 2009). More common side effects include insomnia, nausea, loss of appetite, headaches, dry mouth, dizziness, irritability, mood changes, and exacerbation of tics if already present (Adderall, 2007; Adderall XR, 2011; Concerta, 2010; Methylin, 2010; Ritalin, 2010).

There is a consistent pattern among studies regarding demographic predictors of NMPD use. Involvement in a Greek-letter organization has been found to predict increased NMPD use (Dussault & Weyandt, 2013; Franke et al., 2012; S. E. McCabe et al., 2005; Rabiner, Anastopoulos, Costello, Hoyle, & Swartzwelder, 2010), and students with grade point averages of a *B* or lower are

twice as likely to use NMPDs as students whose grades are a *B+* or higher (Bavarian et al., 2013; DeSantis et al., 2008; Johnston, O'Malley & Bachman, 2003; S. E. McCabe et al., 2005; Rabiner et al., 2010). Results of studies have been varied in determining whether the sex of the user significantly predicts NMPD use (Advokat et al., 2008; Low & Gendaszek, 2002; Malone, 2011; S. E. McCabe et al., 2005; Rabiner et al., 2010). Although less consistently, depression (Zullig & Divin, 2012), alcohol, and other illicit drug use (Lanier & Farley, 2011) have also been reported as predictors of NMPD use. Interestingly, to date, we are unaware of any American study which has assessed factors such as tracks of study (e., pre-med, pre-law) and future graduate/professional school plans when comparing grade point averages and NMPD use. Franke et al. (2012) reported slightly higher NMPD use among German undergraduate pharmacy students compared to students studying medicine or economics. Better understanding of demographic and academic variables associated with NMPD use is important as strategies for the development of prevention and intervention programs can be implemented on college campuses when risk factors become increasingly understood. This is especially important for college campuses given the adverse health effects and risk for addiction that have been documented with NMPD use.

Prevention, as opposed to intervention, is likely the preferred approach to combat academic NMPD use on college campuses (Greydanus, 2007; Murray, 1998). To deter use, DeSantis et al. (2008) recommended that increased emphasis should be placed on the legal ramifications of NMPD use, because there is a lack of knowledge on many campuses that possession without a prescription, use, and distribution of Schedule II drugs (which include Adderall, Ritalin, Concerta, and Methylin) are federal offenses. Consideration

should be given for campus-wide campaigns that educate the student population on health and legal risks associated with use of ADHD medications. As we discuss below, one novel approach to the prevention of academic NMPD use could be to focus on the perceived cognitive benefits of such use as an issue of academic integrity.

ACADEMIC INTEGRITY AND ACADEMIC NMPD USE

Ritalin, Concerta, Methylin, and Adderall have been referred to as “smart pills” and “steroids for the brain” and also as “nootropics” by news media and even in numerous studies because of their purported ability to enhance cognition (i.e., actually make someone smarter; Aikins, 2011; DeSantis & Hane, 2010; DeSantis et al., 2008; Low & Gendaszek, 2002; Trudeau, 2009). These reports have been criticized, however, as researchers seek to clarify whether cognitive enhancement actually occurs in healthy individuals who use ADHD stimulants. Further, Partridge and colleagues (2011) argue that news media consistently exaggerate NMPD use prevalence, downplay potential side effects of use, and emphasize possible benefits.

Data regarding whether or not cognitive enhancement occurs during NMPD use reveals that the complexities of individual differences (genes, personality, body weight, and ability level), the amount of the drug consumed, and emotional reactions to use all contribute to enhancement or nonenhancement. It has been concluded that if NMPDs are used in an academic setting, they could bridge finite differences between being “near the top” and being “at the top,” depending on individual responses to the drug (Smith & Farah, 2011; Vrecko, 2013).

In addition to the potential for cognitive enhancement, users often claim that NMPD

use has allowed them to stay awake and alert for longer durations of time, and confers an advantage over their peers for completing assignments or studying for exams (DeSantis et al., 2008). Teter, McCabe, LaGrange, Cranford, & Boyd’s (2006) study of NMPD use by college students showed that students self-reported improvement in concentration, productivity, and memory as well as assistance with motivation to study when using NMPDs. In the literature reviewed by Smith and Farah (2011), a consistent finding across studies was that use of mixed salts amphetamines (e.g., Adderall) and methylphenidates (e.g., Ritalin, Concerta, and Methylin) was associated with enhanced consolidation of long-term declarative memory. They concluded that students cramming for exams need to retain information for longer than just an hour or two, and therefore these drugs have real world benefits by enhancing memory retention (regardless of whether or not they actually enhance cognition). With these benefits in mind, it is important to consider student beliefs about academic integrity and academic NMPD use.

Many argue that NMPD use for academic enhancement is not unethical and minimize issues associated with use by comparing it to consuming a strong cup of coffee or hiring a private tutor, as well as declaring that NMPDs cannot compensate for the inequality created by natural talent and luck (Aikins, 2011; Forlini & Racine, 2009; Franke et al., 2012; Racine & Forlini, 2010). DeSantis and colleagues (2008) observed that students had a general lack of guilt about academic NMPD use. Specifically, the students in this study reported that “not getting high off of it” and “doing better in school” were morally acceptable reasons for using NMPDs academically. More than half of the participants in one study reported that there was no moral difference between NMPD use

and the use of caffeine (Franke et al., 2012).

On the other hand, in the study by Aikins (2011) some participants suggested that using NMPDs in academic situations was more an issue of fairness than an issue of legality. Reported anecdotes deemed academic NMPD use as “cheating” and a form of “chemical academic dishonesty” by “accomplishing incredible academic feats through stimulant use,” as well as creating an “unfair playing field” where unequal access prohibits some from attaining the drug (Aikins, 2011; Forlini & Racine, 2009). Thus, an appeal to academic integrity may be a potential issue on which to focus during prevention efforts; that is, NMPD use may be reduced to the extent to which students view its academic use as unfair, dishonest, and a form of cheating. A potential, albeit largely unexplored, mechanism to encourage students to display academic integrity is through an academic honor code.

An academic honor code sets a standard of acceptable behaviors and principals (social norms) that a campus community has agreed to abide by (Vandehey, Diekhoff, & LaBeff, 2007). The validity of an honor code depends on the idea that those who have agreed to it can be trusted to uphold its standards. Honor codes are used in academic settings to deter academic dishonesty because they clearly establish definitions of cheating as well as the repercussions of committing the act (D. L. McCabe & Bowers, 1994). In addition, when the student body favors an honor code, it creates an atmosphere in which cheating is found offensive (Vandehey et al., 2007). An honor code that considers academic NMPD use to be a form of cheating may deter students from using NMPDs in an academic setting, especially if use is considered to be a violation of the honor code and thus a violation of socially normative behavior on campus. For example, D. L. McCabe, Trevino, and Butterfield (2001) found that

cheating rates at small colleges with honor codes were reduced because of negative peer perceptions of cheating and overall disapproval of cheaters. Therefore, it is important to consider the possibility that an honor code stipulation could decrease academic NMPD use by making it a structured issue of academic integrity and a violation of the social norm.

THEORETICAL CONSIDERATIONS IN ACADEMIC USE OF NMPDS

To better conceptualize the relationship between academic integrity, social norms, and NMPD use we considered three theories: the theory of planned behavior, the theory of reasoned action, and the theory of cognitive dissonance. The theory of planned behavior (Ajzen, 1991), as well as the theory of reasoned action (O’Callaghan, Chant, Callan, & Baglioni, 1997; Fishbein, 1980) on which it is based, predict that people’s attitudes influence their behavior. In accordance with these theories, one would expect that positive attitudes toward the academic use of NMPDs (e.g., the attitude that such use is acceptable and even desirable) would lead students to use NMPDs in academic situations and that negative attitudes (e.g., the attitude that use violates academic integrity norms) would lead students to not use NMPDs in academic situations. This theory has been employed in prior research of academic NMPD use (Judson & Langdon, 2009). The theory of cognitive dissonance (Festinger, 1957), on the other hand, posits that attitudes and behaviors are associated not because behaviors are determined by attitudes, but because attitudes are determined by behaviors. In accordance with this theory, one would expect that students who use NMPDs in academic settings would come to hold positive attitudes towards such use and that students who do not use them would come to hold negative

attitudes towards use. All three theories predict that there would be an association between attitudes toward academic NMPD use and actual use of NMPDs in academic situations. Thus, students who hold the attitude that academic NMPD use constitutes a violation of academic integrity would be less likely to use NMPDs in academic situations than students who did not hold this attitude.

THIS STUDY

We aimed to investigate the role of college students' academic integrity attitudes in their academic NMPD use. Students at a college with a long-held, and student-driven academic honor code* were asked to indicate the extent to which they believed that NMPD use during three different academic activities (completing a graded assignment, studying for an examination, taking an examination) should constitute a violation of the honor code. A composite variable based on their responses to these items was used to predict use, while controlling for sex, GPA, Greek-letter organization membership, graduate school plans, and perceived social norms for academic NMPD use. Sex, GPA, Greek-letter organization membership, and graduate school plans were included as control variables based on prior research, and the social norm variable was included due to its importance in the theory of planned behavior (Ajzen, 1991) and the theory of reasoned action (Baglioni et al., 1997; Fishbein, 1979).

It was hypothesized that there would be a negative association between the academic

integrity of NMPD use composite variable and the likelihood of academic NMPD use; that is, students would be increasingly less likely to engage in use as their belief that such use represents academic dishonesty increased. Finding such a relationship would suggest that an academic honor code may constitute an effective method of reducing academic use of NMPDs, particularly among students who regard such use as a violation of that honor code.

METHOD

Participants

Participants were recruited in February 2012 via a broadcast e-mail message sent to 1,982 undergraduate students at a highly selective, residential liberal arts college located in a small town in the Northeastern United States† which had an academic honor code. There were 751 students who responded to the broadcast e-mail by logging onto the survey (37.9% of those recruited); however, 36 of these students failed to respond to most of the survey questions. For the 715 responding to the survey questions, the data of 52 participants were excluded because they reported that they had prescriptions for the drugs of interest, the data of 12 participants were excluded because they reported NMPD use which was not related specifically to academic use‡, and the data of 6 participants were excluded because of missing data or out-of-range data for one of the major study variables. The final sample, therefore, consisted of 645 participants (66.5% female) representing 32.5% of those to whom

* The honor code at the study college does not include any statements regarding NMPD use and academic integrity. A copy of the academic honor code for the study college is available from the contact author.

† The Office of Institutional Research at the college reports that the student body was 53.4% female and 84.0% White, non-Hispanic, with a mean age of 20.44 years ($SD = 1.77$) on the census date for the semester when the data were collected.

‡ All analyses were repeated with the data obtained from these 12 participants included with the findings virtually unchanged.

the broadcast e-mail was sent, 85.9% of those who responded to the e-mail, and 90.1% of those who responded to the survey questions.

Procedure

Data were collected via an anonymous online survey, which consisted of items written specifically for this study and required approximately 5 minutes to complete. Participants were not compensated for their participation. All measures and procedures were approved by the college Institutional Review Board.

Measures

Academic Use of NMPDs. Participants were informed that they were going to be asked a series of questions about drugs used to treat ADHD, such as Ritalin, Adderall, Concerta, and Methylin. Participants first were asked if they have a prescription for any of these drugs. As noted above, 52 participants responded in the affirmative and their data were excluded from this study since the focus of the study was on nonmedical use of these drugs. Participants also were asked, "Have you ever used any of these drugs (Ritalin, Adderall, Concerta, Methylin, etc.) nonmedically (without a prescription)?" The response options were yes and no. To assess academic use of NMPDs, participants were asked questions about their use of these drugs in three different academic situations: Have you ever used any of these drugs nonmedically to aid in completing a graded assignment? Have you ever used any of these drugs nonmedically to aid in studying for an exam? and Have you ever used any of these drugs nonmedically during an exam? The response options for all three of these questions were 0 (*never*), 1 (*once or twice*), 2 (*sometimes*), and 3 (*frequently*).

Four questions were asked regarding the frequency of use, one question each for Ritalin, Adderall, Concerta, and Methylin. The specific wording of these four questions

was: How often, if ever, have you used [name of drug]? The response options were: 0 (*never used*), 1 (*used, but not in the past 12 months*), 2 (*used, but not in the past 30 days*), and 3 (*used in the past 30 days*).

Academic Integrity and Academic NMPD Use. To assess beliefs about the academic integrity of academic NMPD use, participants were asked questions about their beliefs regarding the use of these drugs in three different academic situations: Do you think using these drugs nonmedically to aid in completing a graded assignment should be a violation of [this institution's] honor code? Do you think using these drugs nonmedically to aid in studying for an exam should be a violation of [this institution's] honor code? and Do you think using these drugs nonmedically during an exam should be a violation of [this institution's] honor code? The response options for all four academic honor code questions ranged from 0 (*definitely no*) to 4 (*definitely yes*). For the purposes of the present logistic regression, a composite variable was created by summing the responses to these three items. This honor code violation composite could take values from 0 (i.e., the participant responded "definitely no" to all three items) to 12 (i.e., the participant responded "definitely yes" to all three items).

Control Variables. Participants were asked to indicate their sex (female, male), Greek-letter organization membership status (nonmember, member), grade point average (GPA), and graduate/professional school plans (no plan to attend graduate or professional school, plan to attend graduate or professional school). In addition to indicating whether or not they planned to attend graduate or professional school, participants indicated the type of degree program(s) they planned to complete from a list comprised of the following program types: Masters (MA, MS, MFA, MBS, etc.), Doctorate (PhD, EdD, etc.), Medical Degree

(MD, DO, DDS, DVM, etc.), Law Degree (JD), and Other Professional Degree (PA, RN, LPN, PT, etc.). Participants' responses to these items were coded as 0 (no) or 1 (yes).

Lastly, participants were asked three questions which assessed their perceived social norms for academic NMPD use: Do you know anyone else who attends [this institution] who has used any of these drugs nonmedically to aid in completing a graded assignment? Do you know anyone else who attends [this institution] who has used any of these drugs nonmedically to aid in studying for an exam? and Do you know anyone else who attends [this institution] who used any of these drugs nonmedically during an exam? The response options for all three questions were 0 (*no one*), 1 (*yes, one or two people*), 2 (*yes, a few people*), and 3 (*yes, many people*). For the purposes of the data analysis, a composite variable was created by summing the responses to these three items with resulting composite values from 0 (i.e., the participant responded "no one" to all three items) to 9 (i.e., the participant responded "yes, many people" to all three items).

RESULTS

Overall, 19.1% ($n = 123$) of participants reported some sort of NMPD use for academic purposes, with 16.1% ($n = 104$) reporting use when completing a graded assignment, 15.5% ($n = 100$) reporting use when studying for an examination, and 8.4% ($n = 54$) reporting use during an examination. The primary drug used by these 123 students was Adderall (used by 91.9%), followed by Ritalin (46.3%), and Concerta (27.6%).[§] Descriptive statistics for the full sample, as well as for users and nonusers are presented in Table 1. Figure 1 provides additional information about participants' beliefs that academic NMPD use should be a violation of the academic honor code.

As may be seen in Table 2, a number of the study variables correlated significantly with academic NMPD use. Notably, use tended to be higher among students with lower levels of the belief that academic NMPD use should constitute an honor code violation. Use also was higher in men, for Greek-letter organization members, and among students for whom the social norms variable was higher.

[§] Use of Methylin was reported by 1.6% and use of other NMPDs was reported by 14.6%. These percentages total to more than 100.0% because participants reported using more than one NMPD.

TABLE 1.
Descriptive Statistics

	Total ($N = 645$) % or $M (SD)$	Academic NMPD Users ($n = 123$) % or $M (SD)$	Nonusers ($n = 522$) % or $M (SD)$
Honor Code Violation Composite (0–12)	6.42 (4.20)	2.44 (3.24)	7.36 (3.83)
Female	66.5	46.3	71.3
GPA (4-Point Scale)	3.26 (0.44)	3.11 (0.40)	3.29 (0.44)
Greek-Letter Organization Member	30.2	43.9	27.0
Graduate School Plans	83.7	83.7	83.7
Social Norms Composite (0–9)	4.02 (3.17)	6.62 (2.45)	3.41 (3.01)

TABLE 2.
Intercorrelations Among Study Variables ($N = 645$)

	2		3		4		5		6		7	
	<i>r</i>	<i>p</i>										
1. Academic NMPD Use (0 = No Use; 1 = Use)	-.46	.000	.21	.000	-.17	.000	.14	.000	.00	.995	.40	.000
2. Honor Code Violation Composite (0–12)	—		-.16	.000	.17	.000	.01	.848	.09	.025	-.21	.000
3. Sex (0 = Female; 1 = Male)			—		-.13	.001	-.07	.091	-.01	.850	.21	.000
4. GPA (4-Point Scale)					—		.03	.437	.15	.000	-.14	.000
5. Greek-Letter Organization Member (0 = No; 1 = Yes)							—		.05	.183	.24	.000
6. Graduate School Plans (0 = No; 1 = Yes)								—			.03	.418
7. Social Norms Composite (0–9)											—	

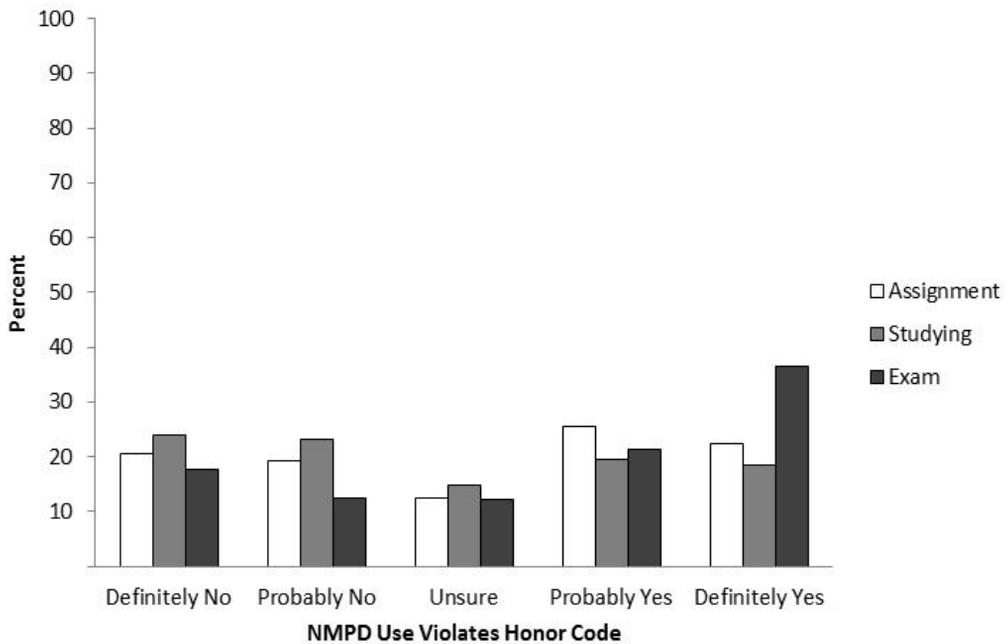


FIGURE 1. Belief That NMPD Violates the Academic Honor Code by Academic Activity While completing a graded assignment, while studying for an exam, and during an exam.

PREDICTION OF ACADEMIC USE OF NMPDS

A multivariate logistic regression in which academic NMPD use was the criterion variable was conducted, and the results of this analysis are presented in Table 3. This analysis revealed that in a model in which all five control variables were included the honor code violation composite was a statistically significant negative predictor of academic NMPD use, which aligned with our hypothesis. More specifically, the statistically significant control variables were: sex (male students had approximately twice the likelihood of engaging in use relative to female students), Greek-letter organization membership (members had almost twice the likelihood of engaging in use relative to nonmembers), GPA (a greater likelihood of use was related to lower GPA), and social norms (a greater likelihood of use was related to higher levels of the social norms composite). The graduate/professional school plans variable was not a significant predictor of use.

DISCUSSION

This investigation is among the first to address beliefs about ethical aspects of academic use of NMPDs as a predictor of self-reported use, and it is the first to explore the relationship between such use and beliefs about academic integrity as expressed in an honor code. An important finding is that the use of stimulant drugs in academic situations was predicted by beliefs about whether academic NMPD use should constitute a violation of the honor code in place at the institution. This finding is unique in the extant literature on NMPD use in academic settings. Another important finding is that academic NMPD use was higher among students for whom the perception of peer use was higher. In addition, consistent with other studies, males, members of Greek-letter organizations, and those with lower GPAs were more likely to use NMPDs in academic situations (Advokat et al., 2008; DeSantis et al., 2008; Dussault & Weyandt, 2013; Johnston et al. 2003; Malone, 2011; S. E. McCabe et al., 2005;

TABLE 3.
Multivariate Prediction of Academic NMPD Use (*N* = 645)

Predictor Variable	Odds Ratio	95% CI	<i>p</i>
<i>Primary Predictor Variable</i>			
Honor Code Violation Composite (0–12)	0.73	0.68, 0.78	.000
<i>Control Variables</i>			
Sex (0 = Female; 1 = Male)	2.04	1.21, 3.44	.007
GPA (4-Point Scale)	0.52	0.04, 0.96	.044
Greek-Letter Organization Member (0 = Nonmember; 1 = Member)	1.91	1.10, 3.34	.022
Graduate School Plans (0 = No; 1 = Yes)	1.16	0.59, 2.32	.677
Social Norms Composite (0–9)	1.40	1.27, 1.55	.000

Rabiner et al., 2010); however, planning to attend graduate/professional school was not significant in predicting use.

Academic Integrity and Academic NMPD Use

Given the apparent ubiquity of NMPD use in an academic setting and the hazards associated with it, it is important to understand why students use NMPDs academically and to develop efficacious methods for preventing use. Our finding of an association between use and the belief that this use should be considered a violation of an extant honor code highlights the importance of the role of attitudes about the academic integrity of using NMPDs. The finding that academic NMPD use was associated with attitudes regarding the academic integrity of use suggests that such attitudes may play a role in the decision to use or not use NMPDs academically. This finding is consistent with the theory of planned behavior (Ajzen, 1991) and the theory of reasoned action (O'Callaghan et al., 1980) in which a person's attitude toward a given behavior is hypothesized to influence the probability of that behavior occurring. These theories provide a plausible explanation of why participants in this study who believed that academic NMPD use should be considered an honor code violation were less likely to engage in use than those who did not believe use should be an honor code violation. It is important to acknowledge, however, that our findings also are consistent with the theory of cognitive dissonance (Festinger, 1957) which predicts that attitudes about academic NMPD use may be associated with use because the act of using NMPDs in academic situations impacted participant attitudes.

Our finding that academic NMPD use and the attitude that such use should be an honor code violation suggests that a potential intervention aimed at reducing NMPD use

in academic situations could be the implementation on an academic honor code, particularly one which includes language highlighting the issue of academic integrity surrounding the use of NMPDs in academic settings. At the study institution, although the academic honor code does not specifically state that such use is a violation, the presence of the honor code appeared to have the effect of suppressing the academic use of NMPDs among those who held the attitude that that such use should be a violation of the honor code. It is possible that the inclusion of specific language in the honor code stating that academic NMPD use constitutes an honor code violation might further reduce use by making the academic integrity issue explicit. Although most, if not all, colleges and universities have policies prohibiting the use of illegal substances (which, of course, include NMPDs), highlighting the issue of academic integrity surrounding NMPD use could provide additional control over such use. Clearly, institutions that have academic honor codes could specifically include language in these honor codes addressing academic NMPD use. Institutions that do not have honor codes could consider explicitly banning academic NMPD use in their student conduct code. Future research should examine the effects on NMPD use in academic settings of including specific, targeted language in honor and conduct codes.

SOCIAL NORMS AND ACADEMIC NMPD USE

Another important finding in this study is that misperceptions about normative behavior may also play a role in academic NMPD use. Nearly 75% of participants reported knowing at least one person who used NMPDs to complete a graded assignment or study for an exam; however, fewer than 20% of the participants

self-identified as NMPD users for academic enhancement. This suggests the possibility that actual use may in fact be lower than perceived use, a discrepancy which may lead to increased use and has been demonstrated in research on the effects of social norms on alcohol use in college (e.g., Perkins, 2002). Further research on social norms and NMPD use in academic settings is needed to determine if this is the case. This research should address both descriptive norms for academic NMPD use (what students think other students do) but also injunctive norms for academic NMPD use (how acceptable students believe such use is).

If it is found that college students overestimate the academic use of NMPDs by other students and/or the extent to which other students find such use acceptable, this would mean that social norms campaigns aimed at descriptive and/or injunctive norms might reduce the use of NMPDs in academic situations (Atkin & Freimuth, 2001; Rozenbroek & Rothstein, 2011). Such social norms campaigns have proven to be effective in reducing other substance use problems, particularly alcohol use, on college campuses (DeJong, 2010; Perkins & Craig, 2006). It is important to note, however, that the data on the efficacy of social norms campaigns is mixed (Toomey, Lenk, & Wagenaar, 2007; Wechsler & Nelson, 2008).

LIMITATIONS

This study has a number of limitations which warrant cautious interpretation of the findings. First, the data were gathered at a small, highly selective liberal arts college located in a small town in the Northeastern United States, and therefore, the findings may not generalize to students at other types of colleges in other types of locations. It has been found that nonmedical prescription drug use is highest at colleges in the Northeastern United States

and also at colleges with higher admission standards (S. E. McCabe et al., 2005). Second, the present data were obtained from 32.5% of the student body, which may differ in some way from the larger student body. In particular, these findings may have been biased by the overrepresentation of women in the sample; however, when the analyses were repeated separately for men and women, the findings were very similar to those reported above, indicating that the sex makeup of the sample was not a significant factor influencing the outcome. In addition, the response rate was similar to that of other online surveys (Cook, Heath, & Thompson, 2000; Kaplowitz, Hadlock, & Levine, 2004), nevertheless, the possibility of nonresponse bias in this study must be acknowledged. Third, we relied solely on participants' responses to survey items, and therefore the findings are subject to self-report bias. Fourth, because this study was cross-sectional, the precise nature of the relationships between the predictors and academic use of NMPDs cannot be fully explicated. In particular, although it is possible that students' beliefs about the academic integrity of NMPD use may have led them to either use or not use these substances academically, it also is possible that the reverse is the case. As noted above, the theory of cognitive dissonance (Festinger, 1957), would predict that students' patterns of NMPD use would result in their having particular attitudes toward use, as opposed to their attitudes influencing their use. Aikins's (2011) finding that academic NMPD users minimized the effects of use (by choosing to use, then equating it with drinking a strong cup of coffee and by viewing its benefits as similar to those that would arise by hiring a private tutor) is consistent with the cognitive dissonance interpretation of our findings. Prospective research is needed to determine the extent to which attitudes toward academic NMPD use influence NMPD use in academic

situations as well as the extent to which the use of NMPDs in academic situations influences attitudes toward academic NMPD use.

CONCLUSIONS

There are many challenges associated with discouraging academic NMPD use in a student population that is looking for an academic advantage and views NMPDs as cognitive enhancers that can provide that advantage. Given the risks associated with NMPD use, university administrators and other university officials should be encouraged to increase efforts to reduce academic NMPD use. This study suggests that a viable step toward reducing NMPD use would be to implement an academic honor code or to strengthen an existing honor code to create an environment in which academic NMPD use is considered to be a violation of the principle of academic integrity. Prohibiting NMPD use in college honor codes may be an effective environmental

policy for reducing the use of these substances by college students in much the same way that environmental policies are effective in reducing college alcohol use (Toomey et al., 2007).

In addition, the potential benefits of discouraging NMPD use in an honor code could be enhanced by educational efforts aimed at informing students about the health and legal risks associated with NMPD use. In addition, it may be the case that social norms campaigns targeting illicit NMPD use could reduce such use. Our findings underscore the potential value of policy-based interventions, and future research on reducing NMPD use should further explore the efficacy of interventions based on academic honor codes and social norms.

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