Nonprescribed stimulant use (NPSU), defined as using stimulant medications such as Adderall, Vyvanse, and Ritalin that have not been prescribed, is becoming a norm—especially on college campuses. This study evaluated possible predictive factors of academic NPSU in college students. We hypothesized that students would be more likely to misuse stimulants if they (a) perceived NPSU to be safe, (b) perceived NPSU to be ethical, (c) were academically extrinsically motivated, (d) perceived their college environments to be competitive, and (e) perceived NPSU to be common. Participants (N = 270; 59% women, 41% men) were undergraduate students at a small, Christian, liberal arts university in Southern California, recruited from an online research participation management system. Spearman Rho correlations were calculated, and significant relationships were found between NPSU and perceptions of NPSU commonality (r = .18, p = .006) as well as NPSU ethicality (r = .20, p < .001). These relationships remained significant even when controlling for the covariate of age: NPSU commonality, r(226) = .15, p = .03; NPSU ethicality, r(226) = -.14, p = .04. The implications of these findings are discussed.
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al., 2012). Garnier-Dykstra et al. (2012) also found that approximately 46% of students used stimulants within the year of their first offer.

Research has uncovered several motivations for NPSU in college students. First, students may simply be unaware of the consequences of NPSU. For example, students may not be aware of health and academic risks associated with NPSU. In one study comparing Greek life members to non-Greek life members, the former were more likely to report having misused stimulants. However, they were also more likely to view them as safer than alcohol, marijuana, and other illegal substances (Dussault & Weyandt, 2013). There is also evidence that NPSU may negatively impact academic achievement. On average, students who misuse stimulants are generally less academically successful than their nonusing counterparts (Weyandt et al., 2014). Students might also be unaware of the legal consequences of NPSU. Although state laws regarding the misuse of these controlled substances vary, some of the stricter states have fines ranging from $10,000 to $500,000, with a possibility of a lifetime in prison for NPSU (Weyandt et al., 2016). In general, students who find NPSU riskier are more likely to report that they have never misused stimulants (Benson et al., 2015).

A second reason for NPSU among college students could be that students are willing to look beyond the high stakes of misuse to meet certain goals. Research has shown that 54% of NPSU is for academic purposes such as to improve concentration, improve study skills, and stay awake in order to study longer (Benson et al., 2015). Another study found that approximately 66% of participants misused stimulants in order to enhance alertness and nearly 57% misused these prescriptions in order to improve their academic performances (Bossaer et al., 2013).

Further evidence of NPSU for academic purposes is illustrated by patterns of use and misusers’ intentions. Stimulant consumption peaks around midterms and final exams in order to enable students to stay awake all night and study for these exams right before they happen (Garnier-Dykstra et al., 2012). Hartung and colleagues (2013) compared use of stimulants among those with a prescription, those with a prescription who took more than their doctor prescribed (medical misusers), those without a prescription who misused (nonmedical misusers), and those who did not use stimulants. They found that the nonmedical users were more likely to misuse stimulants to study more effectively, and the medical misusers were the group most likely to misuse stimulants in order to improve academic performance. The most effective way to succeed academically and for long-term learning, however, is through more consistent and sustained effort of studying instead of a short, condensed burst of effort (Dodge, Williams, Marzell, & Turrisi, 2012). Most first-time users, usually during the beginning of their college experience, actually try drugs such as Adderall or Ritalin because of motives driven by curiosity. However, later on during their college experience, students are driven by academic motives such as staying awake to study and increasing concentration (Garnier-Dykstra et al., 2012).

There appear to be many reasons surrounding NPSU in college students including a desire for academic success as well as misperceptions of the consequences of NPSU. However, little research has examined more complex motivations contributing to NPSU. The purpose of the current study was to examine various factors that could be related to the growing prevalence of NPSU. Understanding why so many students misuse stimulants and correcting any misperceptions could be important in combatting the growing norm of NPSU on college campuses.

Perceptions of NPSU as Academic Dishonesty
If the primary intention behind NPSU is academic improvement, then an additional factor that could lead to NPSU is a failure to consider it to be academic dishonesty. NPSU as a means to enhance academic performance could arguably be a form of cheating. One study found that many students who misused stimulants claimed that using the drug itself was not actually wrong because they were able to test their own responsible behaviors by choosing the situations in which it was appropriate and inappropriate to misuse (Petersen, Nørgaard, & Traulsen, 2015). However, students’ acknowledgement that some situations are inappropriate for NPSU indicates that there is some recognition that NPSU might be unethical. This admission raises the questions of when NPSU becomes an ethical issue, and whether NPSU is a form of academic dishonesty when used in an academic setting. The perception that NPSU is not academic dishonesty could contribute to the increasing use of NPSU on college campuses.

To test the perceived ethics of academic NPSU, one study examined students’ perceptions of a hypothetical situation in which a student took an
A student used anabolic steroids to do better in a race, resulting in both students performing better on their given tasks than they had anticipated. When considering both situations, the majority of the 1,200 male participants not only considered the hypothetical student who took Adderall to be less of a cheater, but many also believed that he was taking a more necessary step in order to succeed in comparison with the anabolic steroid user (Dodge et al., 2012). These results show that not only do many college students not view misusing stimulants as cheating, but they also believe it to be necessary at times. Although many of these participants did not report misusing stimulants themselves, some of them still believed that NPSU in order to achieve greater academic success is not cheating. These attitudes toward academic NPSU could be related to personal usage of stimulants for academic purposes.

Not all studies have found perceptions of NPSU to be as ethically ambiguous. Other research has suggested that some students view NPSU as a form of academic dishonesty. In a study that reported on a hypothetical situation of a girl taking Ritalin in order to stay awake to study during finals because of high grade pressure put on her by her parents, approximately 56% of student respondents considered this act of NPSU to be academic dishonesty (Bossaer et al., 2013). Although not all students view NPSU as cheating (Dodge et al., 2012), almost 69% of college students believe NPSU gives its consumers an unfair advantage in an academic setting (Bossaer et al., 2013). NPSU, therefore, could be an academic shortcut some students use to obtain success, whether motivated by personal desire or social pressure. Further research is needed to clarify the relationship between actual NPSU and perceptions of the ethicality of academic NPSU.

Extrinsic Motivation Affecting Cheating and NPSU

Because NPSU might be considered a form of cheating, some of the factors associated with academic dishonesty may also be associated with NPSU. Many of these factors appear to be related to extrinsic motivation, which is finding motivating factors for a particular action from external resources. There is a direct relationship between extrinsic motivation and a student’s tendency to cheat (Alt & Geiger, 2012), which could mean that there is a direct relationship between extrinsic motivation and NPSU, when NPSU is considered a form of academic dishonesty.

Family and situational pressures, both extrinsic motivators, might be related to cheating, and by extension, NPSU. In a study of third- and fourth-year college women, the greatest predictor of academic cheating was the combination of the goals of achieving high grades alongside the pressure of desiring to please one’s parents—both extrinsically motivated goals (Alt & Geiger, 2012). Furthermore, in a study comparing misusers to nonusers, those who misused stimulants reported higher levels of perceived parental pressures in comparison to those who did not use (Hartung et al., 2013). Students who admitted to cheating generally described themselves as more performance-oriented and less mastery-oriented than their noncheating peers (Anderman, Griesinger, & Westerfield, 1998). This result shows that students are more likely to cheat if they have an external goal that they are trying to reach instead of trying to achieve for the sake of what they are learning, illustrating their extrinsic motivation for success. A student who is performance-oriented may strive for a good grade in a class because it is what the student’s parents want, but a student who is mastery-oriented may strive for a good grade because the student wants to fully understand the topic, and the grade itself is just an unintentional beneficial outcome. If cheating and academic NPSU are both extrinsically motivated, it follows that some students reported that, because of large external pressures for academic success, their NPSU was permissible as well as defensible (Kerley, Copes, & Griffin, 2015). Staying awake to study or to increase concentration and the spike of NPSU around midterms and finals are both actions driven by desiring good grades, which is derived from external goals and rewards (Garnier-Dykstra et al., 2012). If college students were more intrinsically motivated, or eager to do well because they want to fully understand and master the class material, it is possible that students’ chances of misusing stimulants would decrease.

Environmental Factors Affecting Cheating and NPSU

A student’s academic and peer environments also play a large part in cheating prevalence, and, in turn, possibly play a role in academic NPSU. When students perceive their classes or schools to put a greater emphasis on extrinsic goals such as good grades, and try to foster competitive environments, they believe cheating to be more acceptable (Anderman et al., 1998). When students perceive a course as putting a larger emphasis on
mastering the material, or understanding it for the sake of its importance instead of for the sake of getting a good grade, they view cheating as less acceptable (Anderman et al., 1998). This research implies that, when students are in an academic environment that they believe highly values grades over understanding and places an emphasis on academic competition, the students will be more likely to cheat in order to be successful in the midst of what they may perceive as a competitive and extrinsic goal-oriented environment. Thus, it is possible that NPSU is more common on college campuses perceived to be more competitive.

Peer attitudes toward and peer participation in cheating may also play a part in the prevalence of NPSU. When students believe that they will gain more peer support and experience social gain by greater involvement in learning, not solely achieving, academic cheating may be reduced (Alt & Geiger, 2012). If this is true, the reverse may also be true, meaning that, if a greater number of students believe that cheating is not unethical, a more cheating-prone environment may be created. Just as cheating is more common in cheating-prone environments, when students reported a higher perceived approval and higher perceived use by other students in regard to NPSU, they were more likely to misuse stimulants (Silvestri & Correia, 2016). This finding suggests that, if students believe that NPSU is commonplace, or that NPSU is not viewed negatively by others, they will be significantly more likely to misuse stimulants. NPSU is more common with students involved in Greek life, but those students also perceive a higher rate of nonmedical stimulant use among their peers compared to those not in Greek life (Dussault & Weyandt, 2013). This finding could mean that being around a group of people who one perceives to misuse stimulants may increase one’s likelihood of misusing stimulants. The prevalence of NPSU in the Greek community may be caused more by the misperception of NPSU popularity instead of the actual dominance of its usage. So, in reality, the perceived commonality of NPSU may be a more accurate predictive factor of academic NPSU than actual commonality.

**Purpose of the Current Study**
If NPSU for academic purposes is a type of cheating, extrinsic motivation, perceived environmental competitiveness, and perceived commonality could lead to NPSU. In the literature on academic cheating, students with extrinsically oriented goals were more likely to cheat, just like students who were more extrinsically motivated were more likely to misuse stimulants (Anderman et al., 1998; Garnier-Dykstra et al., 2012; Hartung et al., 2013). External pressures were higher in students who reported cheating and NPSU (Alt & Geiger, 2012; Hartung et al., 2013). Peer commonality of cheating and NPSU influenced students’ likelihood of partaking in it (Alt & Geiger, 2012; Silvestri & Correia, 2016), but potentially because of the perception of commonality itself. Furthermore, considering that competitive environments lead students to cheat (Anderman et al., 1998), they may also lead students to misuse stimulants.

Although a variety of research has been conducted on the prevalence of NPSU in college students, there is still a large gap in the research on identifying factors that lead some students and not others to misuse stimulants during their academic journeys. The purpose of the current study was to further understand and explore the extrinsic motivations behind college students’ misuse of stimulants in an academic setting. In addition, the current study attempted to examine how extrinsic motivation in particular, and various specific extrinsic motivators, are related to NPSU. We hypothesized that NPSU would be positively associated with (a) perceiving NPSU to be safe, (b) perceiving NPSU to be ethical, (c) possessing extrinsic motivation in an academic setting, (d) perceiving the academic environment to be competitive, and, finally, (e) perceiving NPSU to be common.

**Method**

**Participants**
Participants included 314 undergraduate students at a small, Christian, liberal arts university in Southern California. Participants were recruited from an online research participation management system that included students enrolled in a foundational psychology course. Participants were excluded from the data analyses if they had a stimulant prescription for ADHD or did not respond whether or not they had a prescription (n = 19), if they did not respond affirmatively to a data validity question included in the survey (n = 14), if they were younger than 18 years of age (n = 3), if they did not respond to two or more measures within the survey (n = 7), or if they did not respond to any of the questions from the Stimulant Use Questionnaire (n = 1). The final sample therefore included 270 participants.

Of these participants, 111 reported being
men (41.1%), and 159 reported being women (58.9%). The average age of participants was 18.88 years (SD = 1.09), with ages ranging from 18 to 24 years. The sample included primarily first-year students (65.9%) who predominantly represented Euro-American or White race/ethnicity (51.1%). Other participants self-identified as Asian American or Asian (18.5%); Mixed Race (11.1%); Latino/a or Hispanic (9.3%); African American, Africa, or Black (3.7%); Middle Eastern or North African (2.6%); Hawaiian or Pacific Islander (0.4%); Native American (0.4%); and Other (2.6%); missing (0.4%). Most participants reported living in on-campus housing (86.3%).

With regard to NPSU, 31 participants reported having misused stimulants at least once in their lives (11.5%), 21 reported NPSU in the past year (7.8%), 15 reported NPSU in the previous semester (5.6%), and seven participants reported NPSU in the past month (2.6%). For the students who reported use during the previous semester, responses ranged from one time to 10 times, with a mean usage of 3.01 (SD = 3.21). For the seven students who reported NPSU within the past month, four participants reported having misused stimulants once, two participants reported having misused stimulants twice, and one did not respond. Each of the participants who reported NPSU more recently also reported NPSU for the time frame prior, meaning if a participant reported past semester NPSU, they also reported past year NPSU.

Measures

Demographic form. Participants completed the demographic form to assess various demographic characteristics of the sample including sex, ethnicity, year in school, parents’ annual income, state of employment, on- or off-campus housing status, religious affiliation, GPA, age, and involvement in a fraternity or sorority. Most items required categorical responses with the exception of age and GPA, which were free responses.

Academic Extrinsic Motivation score. The Academic Motivation Scale is a 28-item questionnaire that measures both extrinsic motivation and intrinsic motivation, which are defined as finding motivation from an external source and finding motivation from an internal source, respectively (Vallerand et al., 1992). For the purpose of the current study, only the 12 items measuring extrinsic motivation were utilized. Items were measured on a 7-point Likert-type scale, with responses ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Participants rated each item in terms of how well they felt each item answered the question, “Why do you go to college?” A sample item is: “In order to obtain a more prestigious job later on.” Three subscales measure extrinsic motivation identified, introjected, and external regulation. For the purpose of the current study, the three extrinsic motivation subscale scores were summed to create an overall extrinsic motivation score. A high score for each subscale marked a high identification with extrinsic motivation. Previous research found strong internal consistency, with Cronbach’s α ranging from .70 to .86 for the various subscales (Cokley, Bernard, Cunningham, & Motoike, 2001). The Academic Extrinsic Motivation (AEM) score showed strong reliability for the present study’s data (Cronbach’s α = .91).

Perceived Campus Competitiveness score. We used 10 items from the Twenty Items Value Inventory (Sandy, Gosling, Schwartz, & Koelkebeck, 2014) to assess participants’ perceptions of the typical student’s competitiveness on campus. For the purpose of the current study, we used two of these items to measure perceived campus competitiveness. The items were, “Getting ahead in life is important to them. They strive to do better than others,” and “Being very successful is important to them. They like to impress other people.” The other eight items were included in the survey so participants would not be able to gauge what was being measured, but responses to these items were not used in any analyses. The items were rated using a 7-point Likert-type scale ranging from 1 (No one at Pepperdine University fits this description) to 7 (Everyone at Pepperdine University fits this description). The scores for these two items were combined, with higher scores indicating perceptions of a highly competitive campus. In previous research, these two items had a Cronbach’s α coefficient of .79, showing strong internal consistency (Sandy et al., 2016). For the current study, the Perceived Campus Competitiveness (PCC) score had an α = .72.

Stimulant Use Questionnaire. The Stimulant Use Questionnaire was developed by the authors for the current study (see Appendix A). This questionnaire was used to evaluate frequency of stimulant use. The first question required a dichotomous response regarding whether or not the students were prescribed an ADHD stimulant prescription. The next three questions also required a dichotomous response and asked if the participants had ever used stimulants, if they had used them in the past year, or if they had used them in the past semester. The next four questions also required a dichotomous response and asked what stimulants the participants had used.
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them in the past month. Positive responses identified past Nonprescribed stimulant users. The final question required a ratio response and asked about the frequency of the participants’ stimulant use in the past month. Higher numbered ratio responses identified more frequent NPSU. Responses to each item were considered independently in the data analysis.

**Perception of Nonprescribed Stimulant Use Commonality score.** The perceived frequency of NPSU on participants’ college campus was measured using a modified version of the Perception of Prevalence of Prescription Use Among Peers subscale from Weyandt et al.’s (2009) Stimulant Survey Questionnaire. We modified the scale from its original 10 items measured with yes or no responses, to a three item 7-point Likert-type scale with responses ranging from 1 (No one at Pepperdine University does this) to 7 (Everyone at Pepperdine University does this). Participants responded to the items, “use prescription stimulants while studying,” “use prescription stimulants during midterms,” and “use prescription stimulants during tests.” The responses to each question were summed, with higher scores indicating greater perceived NPSU among peers. The Perception of Nonprescribed Stimulant Use Commonality (PSUC) score had strong reliability (Cronbach’s α = .93).

**Perception of Nonprescribed Stimulant Use Safety score.** The perceived safety of NPSU was measured using the Perception of Safety of Stimulants scale from Weyandt et al.’s (2009) Stimulant Survey Questionnaire. Three items were excluded from the original 7-item scale because they measured participants’ own perceptions of how much they knew about stimulants, not how safe they viewed stimulants to be. Following this modification, the scale included four items measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measure included items such as “Prescription stimulants are safer than marijuana” and “Using prescriptions stimulants daily is harmless.” The responses to each question were summed, with higher scores indicating perceptions of greater safety in using. In previous research, the unedited scale had a Cronbach’s α coefficient of .61 (Dussault & Weyandt, 2013). For the current sample, the Perception of Non-Prescribed Stimulant Use Safety (PSUS) score had a moderately high level of reliability (Cronbach’s α = .73).

**Perceptions of Nonprescribed Stimulant Use Ethicality scale.** Perceptions of whether the participant viewed NPSU to be ethical was measured by a single item response to a hypothetical situation about a student named Jeff taking Adderall to increase performance for a midterm (Dodge et al., 2012; see Appendix B). Participants were asked to respond to a revised Likert-type response scale ranging from 1 (strongly disagree) to 7 (strongly agree) with the statement, “Jeff is a cheater for using Adderall.” Higher scores on the Perception of Nonprescribed Stimulant Use Ethicality (PSUE) scale indicated greater perception of NPSU as unethical, and lower scores indicated less perception of NPSU as unethical.

**Validity Question.** At the end of the study, participants answered the question, “Are your responses true and accurate, and if so, should they be included in the data being collected for this survey?” Their responses were measured using a yes or no categorical response. Only participants who affirmed their responses should be used were included in the following analyses.

**Procedure**

Pepperdine University’s institutional review board approved the study (IRB Approval Code: 17-04-548), and students completed an online informed consent form prior to participating. Participants volunteered to participate in the study using an online research participation management system. The survey questionnaires were administered online in the following order: the demographic form, the AEM scale, the PCC scale, the Stimulant Use Questionnaire, the PSUC scale, the PSUS scale, the PSUE scale, and the Validity Question. The survey was anonymous and took approximately 15 minutes to complete. Participants received one credit toward their psychology course research participation requirement as an incentive to participate.

**Results**

**Descriptive Statistics**

Scores on the PSUS scale ranged from 4 to 20, with the average score indicating that people generally feel NPSU is not safe ($M = 9.71, SD = 3.16$). Scores on the PSUE scale ranged from 1 to 7, with the average score depicting a general neutrality toward perceptions of NPSU as cheating ($M = 3.60, SD = 1.86$). Scores on the AEM scale ranged from 13 to 84, with the average score depicting high academic extrinsic motivation ($M = 60.97, SD = 13.65$). Scores on the PCC scale ranged from 3 to 14, with the average score indicating that participants perceived the campus to be generally
competitive \( (M = 10.20, \ SD = 1.95) \). Scores on the PSUC scale ranged from 3 to 20, with the average score indicating that students perceived approximately half of the university’s students as participating in NPSU behaviors \( (M = 8.87, \ SD = 3.18) \). This information can also be found in Table 1.

**Demographic Differences for Independent and Dependent Measures**

We conducted preliminary analyses to determine relationships between each of the demographic variables and the independent variable of lifetime NPSU as well as the dependent variables. Chi-square tests were conducted to examine the relationship between categorical demographic variables and lifetime NPSU. Lifetime NPSU was related to whether the participant lived on- or off-campus \( (\chi^2 = 18.31, \ df = 1, \ phi = .262, \ p < .001) \), with those living off-campus being significantly more likely to report NPSU. Lifetime NPSU was also related to being in one’s first or second year of college versus being in one’s third or fourth year of college \( (\chi^2 = 7.81, \ df = 1, \ phi = .171, \ p = .005) \), with those in the second half of their college experience being significantly more likely to report lifetime NPSU. An independent-samples t test was conducted to examine the relationship between age and lifetime NPSU. The average age of those who reported lifetime NPSU \( (M = 19.57, \ SD = 1.50) \) was significantly higher than those who did not \( (M = 18.78, \ SD = 0.97; \ t = -3.90; \ df = 262; \ d = 0.63, \ p < .001) \). The difference between the mean scores of those who did not report lifetime NPSU and those who did report lifetime NPSU was -0.79 with a 95% confidence interval of -1.19 to -0.39. No significant differences were found between sorority/fraternity involvement, religious affiliation, sex, ethnicity, parents’ annual income, or state of employment. Because many of the participants were in their first semester of college, we were unable to evaluate the relationship between college GPA and NPSU. Lastly, we conducted t tests between sex and the dependent measures, and significant differences were only found for sex and academic extrinsic motivation \( (t = -2.95, \ df = 266; \ d = 0.36, \ p = .02) \), with women \( (M = 63.01, \ SD = 12.21) \) scoring higher on it than men \( (M = 58.05, \ SD = 15.01) \).

**Perceptions of Safety, Ethicality, and Commonality**

The frequency distributions of PSUS, PSUE, and PSUC were examined. These findings are displayed in Figures 1, 2, and 3, respectively.

In regard to PSUS, 45.2% of participants viewed occasional NPSU as harmful, and 74.8% of participants viewed daily NPSU as harmful. When comparing stimulants with marijuana and alcohol, 54.4% of students viewed marijuana as safer, and 46.7% of students viewed alcohol as safer than stimulants. Overall, students had a split view of NPSU safety except for their opinions on daily use of it, which a majority considered unsafe.

When evaluating PSUE, 49.9% of participants did not consider Jeff as cheating for taking Adderall to improve his performance on his midterm. Furthermore, 10.4% of participants felt neutral to the scenario. Finally, only 38.9% of participants actually considered Jeff to be a cheater for misusing...
stimulants to enhance his academic performance. Based on these findings, about half of participants did not consider NPSU for academic purposes as a form of cheating.

Lastly, students’ PSUC was much higher than actual reported NPSU. Although only 11.5% of participants reported lifetime NPSU, 29.9% of participants thought that at least half the students on campus misused stimulants during finals. Contrarily, 23.3% of participants thought that no one or almost no one misused stimulants during finals. Even though only 11.5% of students reported lifetime NPSU, 33% reported that at least half of the campus misused stimulants in contrast with a small proportion of respondents who perceived that no students or almost no students misused stimulants.

**Correlates of NPSU**

Spearman Rho correlation analyses were conducted to analyze the relationships between the dependent variables and lifetime NPSU as well as past year NPSU (see Table 1). No analyses were conducted to analyze past semester NPSU or past month NPSU because of the low number of participants who reported any of these behaviors.

No significant correlations were observed between lifetime NPSU and AEM, PCC, and PSUS. However, significant correlations were observed between lifetime NPSU and PSUE, \( r(267) = -0.198, \ p = .001 \), as well as PSUC, \( r(238) = 0.177, \ p = .006 \). Significant correlations were also observed between past year NPSU and PSUE, \( r(268) = -0.216, \ p < .001 \), and PSUC, \( r(239) = 0.147, \ p = .02 \). Participants were more likely to report NPSU if they did not view it as cheating or if they viewed it to be common. Although age was not significantly related to PSUE, \( r(263) = -0.073, \ p = .24 \), it was the one demographic variable significantly related to both lifetime NPSU, \( r(264) = 0.181, \ p = .003 \), and PSUC, \( r(264) = 0.234, \ p < .001 \). To determine the extent to which age was confounding these significant relations, we conducted partial correlations controlling for age between the independent and dependent variables. When controlling for age, lifetime NPSU was still significantly associated with both PSUE, \( r(226) = 0.14, \ p = .04 \), and PSUC, \( r(226) = 0.15, \ p = .03 \).

**Discussion**

The current study examined potential factors related to NPSU in order to increase understanding surrounding academic NPSU in college settings. It is important to identify and understand the various elements associated with NPSU in college students.
because of the serious consequences associated with NPSU such as state fines (Weyandt et al., 2016), potential jail time (Weyandt et al., 2016), and negative impact on academic performance (Weyandt et al., 2014). Furthermore, because 54% of NPSU is related to improving academic performance (Benson et al., 2015), it is important to look more specifically at the contributors to academic NPSU among college students. The findings from the present study were difficult to interpret given the small number of nonprescribed stimulant users in the current sample but do provide some important preliminary information about the relationship between lifetime NPSU and various extrinsic factors that affect it.

Because there are peaks in NPSU surrounding midterm and finals season (Garnier-Dykstra et al., 2012), perceptions of occasional NPSU as harmless would appear to be more common than everyday NPSU. Our findings support this idea because 24.8% of participants considered occasional use to be harmless, and 10% considered daily use to be harmless. Furthermore, only 45.2% of participants considered occasional use to be harmful, and 74.8% of participants considered daily use to be harmful. These findings illustrate that attitudes toward temporal safety may have some relevance to NPSU. Because past findings point to perceptions of safety as a possible predictor for NPSU, future research needs to evaluate the various degrees of safety to see how that relates to actual behaviors.

Similarly, the perceptions of the ethicality of taking Adderall to perform better on midterms were not consistent. Of participants in the current study, 49.9% reported that they disagreed to some extent that Jeff’s actions were cheating, but only 38.9% of the sample agreed to some extent that his actions were cheating, and 10.4% did not have an opinion. A large portion of students did not consider this behavior as a form of academic dishonesty, which could be a contributor to campus usage of stimulants.

An important element to review in regard to perceived commonality is the discrepancy between the amount of people who reported NPSU and how common participants perceived academic NPSU on campus. Of all of the participants, 47.4% stated that less than half or about half of their student peers took stimulants to study, and 51.1% stated that less than half or about half took them during finals week. If our sample is truly representative of the university itself, and only 11.5% of students have ever misused stimulants, the unique disparity between how many people misuse stimulants and how many how many people that participants believed misuse stimulants needs to be more fully understood and addressed.

We hypothesized that NPSU would be positively associated with (a) perceptions of NPSU as safe, (b) perceptions of NPSU as ethical, (c) extrinsic motivation in an academic setting, (d) perceptions of academic environment competitiveness, and, finally, if (e) perceptions of NPSU are seen as common. Of our five hypotheses, lifetime NPSU and past year NPSU were both found to be related to perceptions of NPSU ethicality and NPSU commonality, with people more likely to misuse stimulants if they did not perceive it to be cheating or if they viewed it as common.

Our first hypothesis stated that there would be a relationship between lifetime NPSU and perception of NPSU safety. This hypothesis was not supported, but past research has found that people who view NPSU as safe are more likely to report misuse (Dussault & Weyandt, 2013). Furthermore, the PSMS scale had some items that elicited vastly different responses such as the harmlessness of occasional NPSU and daily NPSU. If the scale were to measure more specific attitudes about NPSU, we might have been able to support previous research findings demonstrating a relationship between perceptions of safety and NPSU.

One significant relationship found in this study was between perceptions of NPSU ethicality and lifetime NPSU as well as past year NPSU. In the previous research conducted to evaluate ethicality of academic Adderall misuse using the same vignette as the current study, Dodge et al. (2012) found that most participants did not view the student’s NPSU behavior as cheating, even though they believed the Adderall to be giving the student an unfair advantage. In our study, people were more likely to report lifetime and past year NPSU if they did not perceive the vignette character’s Adderall use to be cheating. People perceiving NPSU as unethical may be a factor that could prevent their engagement in NPSU for academic purposes. Another interesting but almost contrary finding is the general opinion participants had on Adderall use as cheating. Although nonprescribed stimulant users were less likely to interpret NPSU as cheating, about half of all participants did not consider it to be cheating either.

Some of the nonsignificant relationships observed in the current study could be based on the framework utilized from previous cheating...
research. Using this cheating framework, we developed certain hypotheses such as NPSU’s potential relationship with academic extrinsic motivation and perceived campus competitiveness. Less than 40% of participants perceived NPSU for academic purposes as cheating. Because previous research on cheating has illustrated the influence of extrinsic motivation on cheating (Alt & Geiger, 2012; Anderman et al., 1998), we hypothesized that there may also be a relationship between academic NPSU and academic extrinsic motivation. However, because a large portion of participants did not actually see NPSU as a form of academic dishonesty, it is understandable that the relationship between extrinsic motivation and lifetime NPSU was not significant.

Furthermore, because so many participants did not consider NPSU as cheating in the current study, our findings would naturally be inconsistent with past research finding that competitive environments influence non-NPSU forms of cheating. Cheating was more likely to occur in environments where students felt pressure to compete (Alt & Geiger, 2012; Anderman et al., 1998). However, because most of the participants did not consider NPSU to be cheating, it makes sense that the influence of competitiveness on cheating behaviors would not follow the same patterns for NPSU. Also, if people are not competitive, but they still perceive the environment to be, they may be less likely to partake in NPSU than someone who is individually competitive and perceives the environment to be competitive as well. Future research should include a measure that evaluates the competitiveness of the individual as well. If one perceives an environment to be competitive, but the person is not personally competitive, then the temptation to misuse stimulants to advance academically is much less likely.

Finally, the relationships between perceived commonality of NPSU and both lifetime NPSU and past year NPSU were significant. These results support previous research that has found that people who report NPSU are also more likely to report that their peers misuse stimulants as well (Dussault & Weyandt, 2013). These PSMC results might not have been impacted by the general perception that NPSU is not cheating because of the exposure or accessibility of NPSU within one’s peer group.

Limitations
This study had multiple limitations that should be addressed in future research. First, the population of participants who misused stimulants was a smaller proportion of our sample than we predicted it would be based on previous research. Previous researchers have found that 31% of undergraduate students have used stimulants at some point during their college experience (Garnier-Dykstra et al., 2012), although only 2% to 8% of undergraduate college students report having ADHD (Benson et al., 2015). Because of our reduced analytical power, we were unable to analyze the quantitative differences in NPSU (using frequencies of once last semester versus 10 times) or conduct binary logistic regressions that would have more fully explained the relationship between our independent variables and NPSU.

Furthermore, because our population of reported nonprescribed stimulant users was so small, we were only able to analyze lifetime NPSU, which means that most of our analyses were based on individuals who have tried stimulants at one point throughout their lives. Because this leaves a lot of room for variability such as someone trying once in high school or someone trying several years ago, we recommend that NPSU questionnaires focus specifically on the college student years by asking “Have you used stimulants at any point during college?” to represent a more precise measure of college use rather than lifetime use. Participants’ responses to the measure used in the current study might have reflected their current state compared to the state in which they misused stimulants, causing potential confounding. If we had a larger population of people reporting past semester or past month use in the current study, we would have been able to focus on recent NPSU, thereby reducing this confounding factor.

Finally, the characteristics of participants in the current study could have potentially been limiting. Lifetime NPSU and older age were significantly related, which might have affected our analyses because the majority of respondents were first-year students, and previous research as well as our own findings show that older students are more likely to report NPSU (Garnier-Dykstra et al., 2012). Furthermore, the time of the semester in which the majority of participants were completing the survey was prior to midterm season and Greek life recruitment had begun. Past research has found significant relationships between NPSU and midterms as well as being involved in Greek life (Dussault & Weyandt, 2013; Garnier-Dykstra et al., 2012), so some of the potential NPSU influences had yet to occur. Because participants attended a
Christian university, some students might have been deterred from accurately reporting NPSU for fear of potential repercussions, and the population itself might be less likely to misuse stimulants compared to a secular campus.

Future Research
With these limitations in mind, future research should include a larger sample size in order to test variations in NPSU frequency such as the difference in perceptions of safety for occasional NPSU or daily NPSU and those associations with actual NPSU. Also, with a larger sample size, the relationship between reasons behind one’s major choice (i.e., for one’s one academic desire versus one’s parents’ desire) could be examined and analyzed, which would provide information about more specific aspects of extrinsic motivation (Alt & Grieger, 2012). Because this study was the first to examine the relationship between extrinsic academic motivation and NPSU, through the eyes of NPSU as academic dishonesty, a longitudinal study could be conducted in order to evaluate if the perception of NPSU as cheating may mediate the relationship between academic extrinsic motivation and NPSU. Furthermore, because the majority of the sample did not perceive NPSU to be a form of cheating, future research should further gauge attitudes behind the conceptualization of academic dishonesty in relation to NPSU. Although some may not view NPSU as ethical, students may have an internal hierarchy of cheating behaviors, with NPSU ranking lower because it does not involve mimicking someone else’s work or inappropriately collaborating with others.

Future research should also more thoroughly examine perceptions of NPSU commonality. The current sample perceived NPSU to be more common than it actually was, and the relationship between perception of commonality and lifetime NPSU was not significant. Previous research has found that Greek life members were more prone to misuse stimulants than non-Greek life members (Dussault & Weyandt, 2013). Although we originally predicted that this finding was because of the perceived commonality within the environment, this study did not evaluate this situation exactly. Instead of testing perceived commonality within the participants’ social circle, we evaluated perceived commonality across the university campus as a whole. The perception of campus-wide commonality may matter to a certain degree, but commonality within one’s social circle could be much more predictive. Future research should examine perceptions of NPSU campus-wide as well as within participants’ social circles in order to evaluate the possible differences between these influences and participants’ NPSU.

Implications
Even though only two of the five relationships we predicted in our hypotheses were significant, three main issues emerged from our findings that universities should work to address: (a) most participants did not view NPSU as unsafe, (b) most participants did not view NPSU for academic purposes as unethical, and (c) most participants perceived NPSU to be much more common than was reported.

Universities should educate their college students to combat NPSU. First, universities should counter the inconsistent opinions of NPSU safety, especially in regard to occasional use. Although many of the participants recognized that everyday NPSU would be harmful, a majority did not consider occasional NPSU to be harmful. Universities could implement programs or educational seminars to alter inaccurate student perceptions of safety. Furthermore, because NPSU was correlated with perceptions of NPSU as cheating, it is possible that the gray area surrounding the academic dishonesty of abusing medications could contribute to the growing popularity of academic NPSU at colleges. With greater clarity about the ethicality of NPSU, more college students might avoid taking these illegal academic shortcuts. Instead of ignoring the issue, it is important for universities to acknowledge that misusing stimulants is actually a form of academic dishonesty and will not be permitted nor tolerated. Beyond expressing the expectations of their students’ behaviors, universities should also address students with accurate information. They should highlight how NPSU is not actually associated with academic improvements (Weyandt et al., 2014), and according to our findings, that NPSU is much less common than they think. Such interventions might reduce the prevalence of NPSU.

Although the information we have on academic NPSU is still lacking, the understanding surrounding it is slowly becoming more complete. Through the continuous attempts of research to evaluate factors associated with academic NPSU, researchers might then be able to more comprehensively and empirically combat it.
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### APPENDIX A

**Stimulant Use Questionnaire**

Stimulants in the following questions refer to legal, prescription stimulants often used to treat ADHD, such as Ritalin, Adderall, Vyvanse.

1. Do you have a doctor’s prescription for stimulants?
   - Yes
   - No

2. Have you used stimulants before?
   - Yes
   - No

3. Have you used stimulants in the past year?
   - Yes
   - No

4. Did you use stimulants last semester?
   - Yes
   - No

5. About how many times did you use stimulants last semester?
   
   __________ (fill in with number)

6. Have you used stimulants in the past month?
   - Yes
   - No

7. About how many times have you used stimulants in the last month?
   
   __________ (fill in with number)

8. If you have used stimulants, please list which kinds:

### APPENDIX B

**Using Adderall for Midterms Scenario**

It is midterm exam time… Jeff wants to do well on his exams but is concerned that his grades may be low. He does not have much time and is worried that he will have trouble focusing on his work when studying. Last night Jeff went to the library and had trouble focusing. Jeff’s friend Paul has a prescription for Adderall pills. Jeff decides to ask Paul for a few of the Adderall pills because Jeff has heard the pills help people focus. Jeff takes the pills and several days later, receives his midterm grades. They are higher than expected.

Indicate how strongly you agree or disagree that Jeff is a cheater for using Adderall.

1. Strongly disagree
2. Disagree
3. Slightly disagree
4. Neutral
5. Slightly agree
6. Agree
7. Strongly agree
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