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Substance Use Among College Students

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B.A., Psychology, University of Puget Sound, 2014

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The Role of Descriptive Social Norms in Opioid and Other Substance Use

Among College Students

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Abstract

Recreational opioid use among college students has increased steadily over the past decade, and has been shown to be influenced by social pressures. Social norm informed interventions have been used to help correct student misperceptions of peer substance use and curb personal substance use, however most of this research has been centered on alcohol use. This study examined the role of descriptive social norms of two peer reference groups (close friend and acquaintance) at two time periods (30 days and 12 months) in a number of different substances, including opioids, alcohol, marijuana, stimulants, sedatives, and psychedelics in a diverse sample of undergraduate college students at the University of New Mexico. In addition, differences in perceptions of peer opioid use was examined between recreational opioid users and non-users. Results indicated that descriptive close friend norms predicted personal substance use across all substances at both time points, and descriptive acquaintance norms predicted personal substance use for all substances, except opioids, at both time points. In addition, those who used opioids recreationally perceived their close friends and acquaintances to use more opioids in the past 30 days, however no differences emerged within the past 12 months. This study provides preliminary support for the effectiveness of social norm informed interventions to help curb growing recreational opioid use among college students.

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Introduction

Prescription drug use has steadily increased for the past two decades, with opioids accounting for most of that escalation (Compton & Volkow, 2006). Estimates of problematic opioid use in the past year in young adults are twice as high as they are in the general population, 8% vs 4%, with use also correlated with a diagnosis of Major Depressive Disorder, increased suicidal ideation, and problematic use of other substances (Hughes et al., 2015). Given that young adults are already at greater risk for substance use and mental health difficulties (Hamza & Willoughby, 2016; Zullig & Divin, 2012), problematic use of opioids may serve to compound the risk (McCabe, Teter, Boyd, Knight, & Wechsler, 2005). Yet, there is an absence of research examining typical patterns or predictors of opioid use in this age group.

The alcohol use literature provides one potential key variable in the prediction of opioid use, and that is perceptions of peer use (Glider, Midyett, Mills-Novoa, Johannessen, & Collins, 2001; Lee, Blayney, Rhew, Lewis, & Kaysen, 2016). Findings indicate that perceived peer use, also known as a social norm, is associated with higher rates of personal substance use (McCabe & Boyd, 2005; Neighbors et al., 2006; Perkins, 2002; Meisel & Goodie, 2015). However, much of this research is focused on problematic alcohol use, with little research investigating the role of social norms among other substances, including opioid use. The absence of information in this area is important, given that half of opioids are obtained from peer sources in young adults (McCabe & Boyd, 2005). Therefore, the current study aimed to investigate the role of social norms across a number of substances, including opioids, to determine if peer influences may also be an important factor in opioid use among college students.

Recreational Opioid Use Among College Students

Prescription opioid use has increased across U.S. college campuses over the past two decades (Hughes et al., 2015). Approximately one in four campuses report an annual opioid prevalence rate of 10% or higher and opioids are the second most common illicit drug used among college students, just behind marijuana (McCabe et al., 2005). These rates pertain to recreational use of opioids, defined as use regardless of prescription and for the primary purpose of obtaining psychotropic or euphoric effects (Smith et al., 2013).

Among college students, recreational opioid use, as opposed to opioid use to relieve pain, is a risk factor for a number of problems. Recreational opioid users experience more reported alcohol-related problems and higher frequency of binge drinking (McCabe et al., 2007). In addition, recreational users were seven times more likely to have used illicit drugs and fifteen times more likely to have experienced three drug-related problems in the past year (Meisel & Goodie, 2015; Rozenbroek & Rothstein, 2011). In addition, recreational opioid users are more likely to develop marijuana or alcohol dependence (Meisel & Goodie, 2015). Overall, these findings suggest that there are important differences between those taking opioids for pain and those taking opioids for recreational purposes, and these differences have important relations with use of other substances and the experience of substance-related problems.

Further, recreational opioid users perceive opioids to be less harmful than other illicit drugs, such as cocaine or heroin, due to the fact that they may be prescribed by a doctor (Lord et al., 2011). This is concerning, as one study found that 72% of high school seniors who reported lifetime heroin use had also used opioids recreationally in the past year. Further, more frequent recreational opioid use was associated with greater odds of reporting lifetime heroin use (Palamar et al.,2016).

Demographically, differences in opioid use have also been observed within gender and age among college students. Women are more likely to use non-prescribed opioids to relieve pain or self-treat symptoms, while men were much more likely to use for recreational purposes (McCabe et al., 2009). Women were also found to be less likely to use concurrent substances while taking opioids, contrary to men, who were much more likely to use other substances (McCabe et al., 2009). In addition, older college students report higher rates of recreational opioid use (Rozenbroek & Rothstein, 2011). Further, within the general population between the years of 2002 and 2014, rates of recreational opioid use were found to peak between ages 18-21 and decrease thereafter (Hu, Griesler, Wall, & Kandel, 2017). Taken together, age and gender may be important factors to examine when investigating patterns of recreational opioid use.

Peer Influences on Recreational Opioid Use and Substance Use

Among college students, over half (58%) of all prescription pain medications are obtained from peer sources, with about 12% obtained from family members, and the remaining 30% obtained from 'other' sources, such as a drug dealer or a personal prescription (Hughes et al., 2015; McCabe & Boyd, 2005). About 71% of recreational opioid users' report taking them as a social activity (Brandt, Taverna, & Hallock, 2014). In addition, those who report obtaining opioids from peer sources were much more likely to report other illicit drug use (McCabe & Boyd, 2005), higher social pressure to take substances, and greater fear of social consequences (i.e. loss of friends, confrontation; Champion, Lewis, & Myers, 2015). Growing social media outlets are also fostering peer influences on individual substance use and perceptions of peer use (Groth, Longo, & Martin, 2016). A review examining the impact of alcohol use on social media content found that 60-85% of Facebook posts contained alcohol related content, and that 72% of those posts displayed alcohol in a positive light (Groth et al., 2016). Further, individuals who

posted photos of alcohol on their social media pages were 2.34 times more likely to report engaging in excessive alcohol use, and students who viewed a profile with alcohol content reported higher perceived social norms than those who viewed a profile without alcohol related content.

Social Norms and Substance Use

Social norms are generally defined as rules for behavior that are considered acceptable in a group (Berkowitz, 2004). The first social norm intervention was suggested by Berkowitz & Perkins (1986) when analyzing student alcohol patterns, where they examined descriptive social norms (i.e. perception of what others are actually using). Their results indicated that students tended to overestimate their peers' drinking, and that overestimation predicted how much the individual drank. Based on these results, a social norm intervention was developed to correct student's perceptions of peer alcohol use in the hopes of curbing individual alcohol use. Previously, traditional interventions focused on providing information about possible negative consequences of alcohol use without addressing peer norms for fear of increasing use. However, evidence suggested that providing descriptive peer norms may decrease problematic drinking by providing students clearer and more realistic guidelines (Berkowitz & Perkins, 1986). The first longitudinal descriptive social norms approach in college students targeted alcohol use and drinking behaviors, and it was found that corrections in drinking misperceptions were associated with an increase in safe drinking and abstinence (Haines, 1996). Following this study, many others were carried out nationally targeting alcohol use among college students, which achieved significant reductions in risky drinking (Glider, et. al, 2001; Johannessen & Glider, 2003; Johannessen et. al, 1999; Perkins & Craig, 2002; 2003; Foss et al, 2003; 2004). Current research examining the temporal precedence of changes between drinking perceptions and drinking

behavior have supported social norm interventions, with mediation analyses indicating changes in perceived peer drinking behavior leading to changes in individual drinking behavior, which in turn promoted a more accurate social norm of peer drinking behavior (Lewis et al., 2015; Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006).

In addition, social norm research has explored the salience of particular reference groups when measuring perceptions of normative alcohol use and administering normative feedback to students. Previous research has found that students can distinguish among different reference groups when assessing for descriptive normative drinking behavior, and that misperceptions occur regardless of reference group proximity to the individual, ranging from more generic (i.e. a typical student) to more specific reference groups (i.e. same gender and race/ethnicity; Larimer et al., 2009). Furthermore, reference groups that are more proximal in nature to the individual (i.e. close friend) were more highly correlated with risky drinking behaviors than reference groups that were more distal in nature (i.e. typical college student; Collins & Spelman, 2013; Larimer et al., 2009). Previous work has also found that proximal referent group norms mediate the relationship between distal referent group norms and personal alcohol use, indicating that an individual's perception of alcohol use among their proximal social group may be a more salient predictor of personal use than of their distal social context (Maddock & Glanz, 2001). Lastly, gender-matched normative drinking feedback was found to be more effective in decreasing alcohol consumption for women, but not for men, indicating the importance of also administering specific normative feedback for some demographic groups (Lewis & Neighbors, 2007).

Social norms approaches have also been studied in relation to other problematic substances that are commonly used among college students. While there have been very few

interventions studies, individual use and perceptions of peer use have been examined with substances such as marijuana, stimulant medications, and codeine cough syrup (Kilmer et al., 2006; Sanders et al., 2013; Meisel & Goodie, 2015; Peters et al., 2003). Findings across these substances have been consistent with patterns found in alcohol use, with perceptions of peer use grossly exceeding reported personal use (Kilmer et al., 2006; Buckner, 2013; Sanders et al., 2013). To date, one social norm intervention aimed at decreasing marijuana use has been carried out, and findings indicated that this intervention did reduce perceptions of peer use and feelings of disapproval from peers towards abstaining. However, reduced personal use was not observed, thought to be due to the short follow up time (Elliott et al., 2014; Elliott & Carey, 2012). Therefore, it is unclear as to the effectiveness of social norm interventions with substances other than alcohol, however it is clear that individuals often misperceive peer use of multiple substances.

Social Norms and Recreational Opioid Use

There have been two studies carried out that examine social norms of opioids among college students. The first was done by McCabe (2008), which assessed personal use and perceived peer use of prescription opioids, prescription stimulants and marijuana. This study asked 3,639 college students via web-based survey about their personal and perceived peer use within the past 12 months. The survey included questions such as, "On how many occasions in the past 12 months have you used the following drugs, not prescribed to you?" To evaluate perceived social norms the students were asked, "Please estimate the percentage of students who, in the past 12 months, used pain medication that was not prescribed to them". These same questions were asked regarding marijuana and prescription stimulant use. Findings from this study indicated that students peer perceptions exceeded reported individual use for both

prescription medication and marijuana use, however the discrepancy was larger with prescription medications than marijuana (McCabe, 2008). It was also found that women, fraternity/sorority members and Black students tended to have larger discrepancies pertaining to prescription drug use more so than other students (McCabe, 2008).

Building from McCabe (2008), a second study was done by Sanders, Stogner, Seibert & Miller (2014). This study examined personal use and perceived social norms of prescription opioids, stimulants, sedatives, anabolic steroids/HGH, tobacco, alcohol, binge drinking, and marijuana. They recruited 2,349 college students to complete a web-based survey that asked about both personal use and perceived peer use of substances within the past 30 days. To assess personal use the survey asked, "Please check the appropriate box for the number of days that you have used each of the following substances recreationally *in the last 30 days*", and students were given six response options that ranged from 1-2 days, to 20 or more days. To assess perceived peer use, the survey asked, "How often do you think the average student has recreationally used the following in the last 30 days?", and students were given the same six response options for each substance. Consistent with previous literature, students peer perceptions exceeded reported individual use of all substances. However, contrary to McCabe's (2008) findings, tobacco, alcohol, marijuana, and binge drinking exhibited larger discrepancies than prescription drug use.

Following these two studies, there remains a need to investigate social norms of opioids and other substances further. First, neither study examined perceived social norms in relation to peer proximity to the individual, such as a close friend versus an acquaintance, as well as matched demographic factors, such as gender and age. Second, neither study assessed prescription opioid users and how their personal use and perceptions of opioid use may vary in comparison to non-prescribed opioid users. Third, these studies also did not assess for heroin use

or perceived use of heroin, which may be important to investigate given that opioids and heroin are often used together (Hughes et al., 2015; Palamar et al., 2016). Fourth, these studies examine different time windows, with one assessing the past 12 months and the other the past 30 days, which may speak to the conflicting findings of each study. Lastly, both studies use discrete rather than continuous variables when assessing personal use and perceived peer use, which could have reduced the power of their statistical outcomes.

Current Study

The current study aimed to assess personal use, and perceived close friend use, and perceived acquaintance use of opioids in relation to other substances such as alcohol and binge drinking, marijuana, heroin, stimulants, sedatives, and psychedelics within the past 30 days and 12 months among college students. First, peer norms were compared to reported personal substance use to determine among which substances the discrepancy between peer norms and reported personal use was largest. It was hypothesized that both peer norms (close friend and acquaintance) among all substance categories at both time points would exceed reported personal substance use. Second, differences in opioid use and perceptions of peer use among those who endorsed having a prescription were examined. It was hypothesized that individuals who have a prescription for opioids would report lower rates of personal recreational opioid use and exhibit smaller discrepancies between perceived peer use of opioids and reported personal opioid use. While recreational opioid users would report higher rates of personal recreational opioid use, and exhibit larger discrepancies between perceived peer use of opioids and reported personal opioid use. Third, differences between peer reference group in predicting personal substance use were examined. Specifically, it was hypothesized that higher perceptions of both close friend and acquaintance substance use would be associated with more personal substance use at both 30

days and 12 months, however perceived close friend use would be more strongly associated with personal substance use than perceived acquaintance use at both time points. In addition, it is hypothesized that this pattern will carry across all eight substance categories.

Method

Participants

Eligibility criteria required that participants were 18 years or older, enrolled as an undergraduate at the University of New Mexico (UNM), and able to read and write English. All participants were recruited via large undergraduate psychology courses through an online research system. Individuals interested in completing the survey for class extra credit were provided with a URL link to the informed consent hosted on UNM's Opinio platform. To enroll, participants were required to read the informed consent and confirm that they met the stated eligibility criteria prior to accessing the study questionnaires. Data were collected from a total of 1,014 participants. Data from 25 participants were excluded due to a high proportion (i.e., $\geq$ 75%) of missing responses. Data from an additional 97 participants were also excluded due to performing below 80% accuracy on the validity check questions. Therefore, the total sample size available for analysis was 892.

Procedures

After consenting through the online form, participants were asked to complete a survey assessing personal and peer perceptions of substance use, and demographic characteristics. Five validity check questions were randomly placed throughout the survey and participants were required to accurately complete at least four of these questions. Responses for the current study were submitted between June 2017 and December 2017. All study procedures were reviewed and approved by the Human Subjects Division at the University of New Mexico.

Measures

      Demographic Information. Demographics collected included reported gender, age, race/ethnicity, class standing, family income, grade point average (GPA), living on or off campus, and current employment status. In addition, participants reported if they currently had a valid prescription for opioids. See Appendix for survey questions.

      Personal Substance Use. Alcohol use was assessed both for total number of days of use and days of binge drinking. Days of use for six additional substances were also assessed. These included days of use for marijuana, opioids (any prescription opioid), stimulants (any prescription stimulant, cocaine, methamphetamine, MDMA/Ecstasy), sedatives (any prescription sedative), heroin, and psychedelics (mushrooms, LSD/Acid, peyote, salvia). Use in the past 30 days and 12 months was assessed for each item. These questions were adapted from previous studies examining social norms of substance use among college students, as well as guidelines from the National Institute of Alcohol Abuse and Alcoholism (NIAAA; McCabe, 2008; Neighbors et al., 2006; NIAAA, 2003; Sanders, Stogner, Seibert, & Miller, 2014). Responses could range from 0-30 days and 0-365 days depending on the time period being assessed. For substances that may be prescribed, questions referred specifically to recreational use defined as use without a prescription or more than prescribed (Smith et al., 2013).

      Perceptions of Peer Use. Perceptions of peer substance use were measured separately for two groups: (1) close friends of the same sex and age attending UNM and (2) acquaintances of the same sex and age attending UNM. The peer substance use questions were identical to the personal substance use questions detailed in the section above (i.e., 30 and 12-month frequencies for seven substances and binge drinking were assessed).

Data Analysis Plan

Means and standard deviations of personal use, perception of close friend use, and perception of acquaintance use were computed and compared for each of the eight substance categories. T-test mean comparisons of perceived close friend use and acquaintance use at both time points were done to determine if they may be analyzed as separate reference groups. Next, differences in opioid use and perceptions of peer use among those who endorsed having an opioid prescription and non-prescribed users were examined using two MANOVA analyses at 30 days and 12 months. Bonferroni corrections were applied to correct for multiple comparisons (Field, 2005).

Lastly, differences between peer reference groups in predicting personal substance use across the eight substance categories were examined at both 30 days and 12 months using 32 separate negative binomial regressions (one for each substance use category). Negative binomial models are primarily used when outcome variables represent highly skewed count data, in which there is a high preponderance of zero counts and the variance is expected to exceed the mean. In this type of regression, the linear predictor is connected to the outcome via a natural logarithm link function to account for overdispersed data. Therefore, raw regression coefficients are converted to a log scale and interpreted as incidence rate ratios (IRRs) (Atkins, Baldwin, Zheng, Gallop, & Neighbors, 2013). IRRs describe the proportional change in the count associated with a one unit increase of the predictor. The first set of negative binomial regressions examined perceptions of close friend use predicting personal substance use across all eight substance categories (alcohol, binge drinking, marijuana, opioids, stimulants, sedatives, heroin, psychedelics) at 30 days and 12 months, while controlling for participant age and gender. The second set of negative binomial regressions examined perceptions of acquaintance use predicting

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personal substance use across all eight substance categories at 30 days and 12 months, also

controlling for participant age and gender.

Results

Participant Characteristics

The sample was primarily female (72%), Non-Hispanic White (37%) and

Hispanic/Chicano (48%), freshman (45%), and currently living off campus (73%). Full

demographic characteristics of the sample can be found in Table 1. Of note, our sample exhibited

a wide age range, however the median age fell within typical college age range (*Mdn*: 19, *Range*:

18 – 54). Personal alcohol use was the most frequently reported substance category at 30 days

and 12 months within the sample, followed by binge drinking, and marijuana (See Table 2). Due

to the low number of individuals that reported heroin, psychedelic, and sedative (HPS) use, these

substances were collapsed together to create one substance group and referred to as one

substance category for the remainder of the analyses.

Comparison of Peer Perceptions and Reported Substance Use

The sample size for each substance category and mean number of days of reported

personal substance use, perceived close friend use, and perceived acquaintance use at 30 days

and 12 months are in Table 2. First, independent sample t-tests revealed that the mean number of

days of perceived close friend use was significantly different from the mean number of days of

perceived acquaintance use across all six substances at both time points [all *ts* (892) ≥ 10.85, all

ps < .001], warranting separate analysis of the peer reference groups. Findings indicated students

reported more peer use than personal use for both reference groups across all six substances

categories and across both time periods. In addition, the more proximal reference group (close

friend) better approximated reported personal substance use than the distal reference group

(acquaintance) across all six substance categories at both time points. The mean discrepancy between perceptions of close friend use and reported personal use aggregated across all six substances at 30 days was $M=2.95$ $SD=3.68$, and $M=24.00$ $SD=38.10$ at 12 months. The mean discrepancy between perceptions of acquaintance use and reported personal use aggregated across all six substances at 30 days was $M=4.44$ $SD=4.45$, and $M=37.04$ $SD=47.29$ at 12 months.

Perceptions of Recreational Opioid Use Among Users and Non-Users

Originally, analyses were to examine reported recreational use of opioids as well as perceptions of peer opioid use among prescription opioid users and non-prescribed users, however, due to the small sample of those who endorsed having prescription opioids ($N=13$), the present analyses examined the differences in peer perceptions of opioid use among those who endorsed using opioids recreationally and those who did not use opioids in the past 30 days and 12 months. Within the past 30 days, 27 (3%) endorsed using opioids at least once, while 860 did not use any opioids. The multivariate test was significant, indicating differences in perceived close friend and acquaintance opioid use between opioid users and non-users [Wilks' Lambda λ $= .979$, $F(2, 884) = 9.373$, $p < .001$]. Specifically, those who reported any opioid use perceived their close friends to be using opioids on more days ($M = 6.96$, $SD = 9.03$) than those who did not report any opioid use ($M = 2.35$, $SD = 5.31$, $p < 0.001$), and perceived an acquaintance to be using opioids on more days ($M = 7.93$, $SD = 7.68$) than those who did not report any opioid use ($M = 4.73$, $SD = 7.11$, $p < 0.05$) in the past 30 days. Within the past 12 months, 225 (25%) students endorsed using opioids at least once, while 667 did not use any opioids. The multivariate test was not significant, indicating no differences in perceived close friend and

acquaintance opioid use between opioid users and non-users in the past 12 months [Wilks'

Lambda $\lambda = .996$, $F(2, 885) = 1.80$, $p = .116$].

Examining the Role of Peer Substance Use Norms in Personal Substance Use

Negative binomial regression models were used to analyze the role of peer perceptions of

substance use in predicting personal substance use, while controlling for age and gender. All of

these analyses were done in MPlus V.8 (Muthén & Muthén, 2017). Of note, negative binomial

hurdle models were also examined, however the negative binomial models fit the data better as

indicated by lower Bayesian Information Criterion (BIC) fit indices across all analyses. Gender

was dummy coded prior to being entered into the models (0 = men, 1 = women). Due to the

multicollinearity between perception of close friend use and acquaintance use, separate

regression models were carried out, using IRRs to compare across reference groups. The IRRs

and 95% confidence intervals for each peer reference group at each time point, for each of the six

substance categories can be found in Table 3.

When examining peer norms between substances, perception of close friend and

acquaintance substance use was significantly associated with personal substance use for every

substance at both time points, with the exception of opioids, which was only significant for

perception of close friend use. Specifically, the models examining opioid use found that

perception of close friend use was significantly related to personal use for both 30 days and 12

months, with results indicating that a one-day increase in close friend use yielded a 12.5%

increase in number of days of personal opioid use in the past 30 days, and a 1% increase in the

past 12 months. The relation between perceived opioid use of acquaintances and personal use

was non-significant for both times periods.

When examining peer norms between time periods, perception of close friend use was more strongly associated with personal use of substances at both 30 days and 12 months than perceptions of acquaintance use, with the exception of stimulants at 12 months. The models examining stimulant use found that perception of close friend use and acquaintance use were both significantly associated to personal use, however yielded a similar rate increase in personal use. Specifically, a one-day increase in close friend use and acquaintance use yielded a 1.2% rate increase in reported number of days of personal stimulant use in the past 12 months. Lastly, when examining patterns between the 30 days and 12-month time periods, peer norms at 30 days were associated with larger rates of personal substance use at 30 days, than peer norms at 12 months with personal substance use at 12 months.

These analyses also revealed that within the 30-day time period and among the close friend models, stimulant use yielded that largest IRR, with a one-day increase in perception of close friend use yielding a 24.9% increase in number of days of personal stimulant use. HPS use closely followed, with a one-day increase in perception of close friend use yielding a 17.5% increase in number of days of personal HPS use. Among the acquaintance models, stimulant use also yielded the largest IRR, with a one-day increase in perception of acquaintance use yielding a 14.8% increase in number of days of personal stimulant use. Again, HPS use followed, with a one-day increase in perception of acquaintance use yielding a 7.3% increase in number of days of personal HPS use. Among the covariates, older age was associated with more days of personal alcohol and stimulant use, and younger age was associated with more days of binge drinking and HPS use in both peer norm models.

Within the 12-month time period and among the close friend models, binge drinking yielded the largest IRR, with a one-day increase in perception of close friend use yielding a 1.5%

increase in number of days of personal binge drinking. Stimulant and HPS use followed, with one day increase in perception of close friend use yielding a 1.2% rate increase in personal stimulant and HPS use. Among the acquaintance models, stimulant use yielded the largest IRR, with a one-day increase in perception of acquaintance use yielding a 1.2% increase in number of days of personal stimulant use. Binge drinking and HPS use followed, with a one-day increase in perception of acquaintance use yielding a 1% increase in number of days of personal binge drinking and HPS use. Among covariates, older age was also associated with more days of personal alcohol and stimulant use in both peer norm models.

Discussion

The key findings from this study are as follows. From the first set of analyses examining accuracy of peer perceptions, this study found (1) student perceptions of close friend and acquaintance substance use exceeded reported personal substance use across all six substance categories within the past 30 days as well as 12 months, and (2) perception of close friend substance use better approximated reported personal substance use across all six substance categories at both time points. From the second set of analyses examining differences in perceptions of opioid use among opioid users and non-users, this study found those who use opioids recreationally perceived their close friends and acquaintances to use opioids on more days in the past 30 days, but not past 12 months. From the third and final set of analyses examining the role of gender, age, and peer substance use norms in personal substance use, this study found (1) close friend and acquaintance norms were strongly associated with personal substance use, with the exception of opioids at both time points, (2) close friend norms were more strongly associated with personal substance use than acquaintance norms across all substances at both time points, with the exception of stimulant use in the past 12 months, (3)

older age was associated with more days of personal alcohol and stimulant use at both time periods, and (4) stronger associations were found between 30-day peer norms than the 12-month peer norms and personal substance use.

Comparison of Peer Perceptions and Reported Substance Use

In support of the study hypotheses and in line with previous findings, perceptions of peer substance use exceeded reported personal substance use at both time periods (Champion et al., 2015; Fabiano, 2003; McCabe, 2008; Sanders et al., 2014; Silvestri & Correia, 2016). These findings provide the foundational groundwork needed to implement social norm informed interventions across all eight substance categories. In addition, the proximal reference group (close friend) better approximated reported personal substance use than the distal reference group (acquaintance; Collins & Spelman, 2013), providing support for the continued assessment of peer reference groups to better understand personal substance use among college students.

Perceptions of Recreational Opioid Use Among Users and Non-Users

The original study hypotheses were aimed at the differences in perceptions of opioid use among those prescribed opioids and those using opioids recreationally. However, due to the small number of students endorsing a prescription of opioids, analyses examined any recreational opioid use among opioid users and non-users, which is still understudied in the literature. First, about 25% of the sample reported using opioids recreationally at least once in the past year, and about 3% reported using at least once in the past 30 days. The 12-month prevalence rate in this sample exceeds previous estimates of opioid use among the general population and previous college student populations, estimated to be about 8-10% (Hughes et al., 2015; McCabe et al., 2005). Although few studies have examined estimates of opioid use in the past 30-days, one reported use to be about 5% of college students, similar to the current sample (Sanders et al.,

2014). These findings indicate that the yearly prevalence of opioid use among college campuses may be continuing to steadily increase. Second, this set of analyses also found those who used opioids recreationally perceived their close friends and acquaintances to use opioids more frequently in the past 30 days, but not in the past 12 months. These findings, although cross-sectional in nature, are in line with previous social norm research, which indicate that users of a particular substance perceive their social network to use more of that substance (Meisel & Goodie, 2015; Perkins, 2002). However, this pattern may only be observed among opioid users when assessing more recent time periods.

Examining the Role of Peer Substance Use Norms in Personal Substance Use

In partial support of the study hypotheses, higher perceptions of both close friend and acquaintance substance use was associated with more personal substance use at both 30 days and 12 months, however this was not observed among opioids at either time point. Particularly, at both 30 days and 12 months, only perception of close friend opioid use was significantly associated with personal opioid use, while perception of acquaintance opioid use was not. These findings suggest that, first, among alcohol, binge drinking, marijuana, stimulants, heroin, psychedelics, and sedatives, both proximal and distal peer norms are important to assess and influence personal substance use. However, among opioid use, distal peer norms may not be important to assess nor play a role in personal opioid use. It is posited that this may be related to the increased national attention to problematic opioid use, with media and public health campaigns nationwide discussing the high rates of problematic opioid use, which may be distorting college student's perceptions of distal peer norms (McCabe, West, Teter, & Boyd, 2014; NIDA, 2017). Also, in partial support of the hypotheses, close friend norms were more strongly associated with personal substance use than acquaintance norms at both time points,

with the exception of stimulant use in the past 12 months, which exhibited an equal association between the two peer norms and personal use. In addition, stimulant use exhibited the largest rate between both peer norm groups and personal use within the past 30 days and 12 months. This suggests that stimulant users may benefit more so than other substance users from social norm interventions targeting both peer norms. Lastly, the study findings indicate that 30-day peer norms better approximate reported personal substance use within the past 30 days than the 12-month time period. This may be due to the fact that recall of substance use among a more recent and narrower window may be more accurately reported as well as that more recent perceptions of substance use may be more influential on reported personal substance (Hoeppner, Stout, Jackson, & Barnett, 2010). Therefore, social norm interventions may be more effective if corrective feedback on peer use can be given within a more recent time frame, such as 30 days rather than 12 months.

Study Limitations

The findings from this study have multiple limitations. First, this survey is cross-sectional in nature, therefore inferences regarding predictive validity cannot be made. Particularly, temporal precedence of social norms and personal substance use cannot be established. Although previous research has examined temporal precedence of social norms and personal alcohol use in a limited fashion, there is evidence that social norms do inform personal alcohol use, however, this should also be studied among other substances (Lewis et al., 2015; Neighbors et al., 2006). Second, data was gathered via retrospective self-report, which may not provide accurate reporting, particularly with perceptions of peer and personal substance use at the 12-month time period. Previous research indicates that discrepancies in frequency of alcohol use does increase as the recall window becomes larger (Hoeppner et al., 2010). Third, this survey may have

significant selection bias in a few ways. Specifically, this survey was only administered to students enrolled in psychology courses at one University, therefore, these findings may not generalize to the broader college student population. In addition, students were compensated with class credit for completing this survey, which may not provide enough incentive for some students engaged in higher rates of substance use to participate, given evidence of low engagement in academic settings (Arria et al., 2013).

Conclusions

Previously, very little social norm research had expanded past the use of alcohol in college students. This study provides preliminary evidence that the literature base of social norm informed interventions may translate to other substances, such as marijuana, opioid, stimulant, heroin, psychedelic, and sedative use. Most importantly, this study found that student peer perceptions of substance use tend to exceed reported personal substance use (regardless of substance or peer reference group), and that peer norms of more proximal reference groups tend to better approximate personal substance use. Furthermore, more recent social norms may be better indicators of actual substance use, and patterns of opioid use may function differently than other substances among college students. Given these findings, future social norm research should not only refine normative feedback based on peer reference group and time period, but should also be studied and applied across multiple substances. Future research should also pay particular attention to opioid use, as this study indicates that opioid use and perceptions of opioid use among college students may exhibit different social norm patterns than other substances. Perception of peer substance use is a particularly salient and modifiable factor among college students currently engaging in problematic substance use and targeting peer norms among

varying substance categories may provide a safe and effective way to curb substance use, and

potential negative consequences of such use, among this population.

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Tables

Table 1. Sample Demographic Information.

Measure	N	Mean (SD) or Percent
Age	892	20.56 (4.92)
Gender[*]		
Men	251	28%
Women	632	72%
GPA[*]	856	3.38 (0.51)
Class Year[*]		
Freshman	401	45%
Sophomore	169	19%
Junior	174	20%
Senior	143	16%
Employment[*]		
Working Full-time	96	11%
Working Part-time	450	50%
Not Working	348	39%
Ethnicity/Race[*]		
Black/African American	24	2%
Asian	52	6%
White/Caucasian	327	37%
Hispanic/Chicano	422	48%
Native American/Alaska Native	34	4%
Native Hawaiian/Pacific Islander	3	1%
Other/Unknown	19	2%
Family Income[*]		
≤ $25,000	174	20%
$26,000 -- $50,000	204	23%
$51,000 -- $75,000	207	23%
$76,000 -- $99,000	122	14%
≥ $100,000	184	20%

Notes. [*]Does not add to 892 due to missing data/no response.

Table 2. Sample size of reported use, and means and standard deviations of the number of days of personal, perceived close friend, and perceived acquaintance substance use in the past 30 days and 12 months.

Substance	N[a]	Personal Use Mean (SD)	Perceived Close Friend Use Mean (SD)	Perceived Acquaintance Use Mean (SD)
30 days				
Alcohol	539	3.18 (4.73)	8.51 (7.36)	9.40 (7.86)
Binge Drinking[b]	337	1.31 (3.12)	4.79 (5.83)	5.95 (6.51)
Marijuana	256	3.30 (7.64)	11.39 (11.28)	13.29 (10.61)
Opioids	27	.22 (2.02)	2.49 (5.51)	4.83 (7.15)
Stimulants	57	.36 (2.35)	2.27 (5.25)	4.05 (6.78)
Sedatives, Heroin, Psychedelics	39	.20 (1.73)	2.72 (6.23)	5.88 (8.57)
12 months				
Alcohol	674	28.50 (50.54)	70.02 (79.18)	79.61 (85.84)
Binge Drinking[b]	456	9.21 (26.37)	33.63 (54.64)	40.53 (61.35)
Marijuana	385	33.26 (80.83)	107.68 (127.78)	130.06 (128.04)
Opioids	225	2.03 (19.26)	18.33 (49.12)	33.90 (66.23)
Stimulants	129	4.12 (26.14)	18.50 (50.83)	35.12 (68.12)
Sedatives, Heroin, Psychedelics	183	2.4 (19.56)	22.62 (61.64)	52.20 (89.79)

Notes. [a] Reported at least one day of use. [b] Binge drinking defined by NIAAA guidelines; NIAAA (2003).

Table 3. Negative binomial regressions examining perceived number of days of close friend use and acquaintance use predicting number of days of personal use, controlling for age and gender, in the past 30 days and 12 months among six substance categories.

Time Point	Predictor	Alcohol		Binge Drinking [a]		Marijuana		Opioids		Stimulants		Heroin, Psychedelics & Sedatives (HPS)	
		IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
30 days	Intercept	0.699	.443 - 1.105	1.774	.838 - 3.758	1.062	.377 - 2.532	0.017**	.001 - .398	0.007***	.001 - .075	0.624	.059 - 6.653
	Gender[b]	0.915	.748 - 1.121	0.907	.676 - 1.217	0.959	.630 - 1.461	0.969	.288 - 3.258	0.849	.286 - 2.117	2.63*	1.107 - 6.253
	Age	1.044***	1.025 - 1.059	0.95**	.920 - .982	0.981	.938 - 1.025	1.096	.946 - 1.271	1.164**	1.042 - 1.279	0.875*	.777 - .986
	Perceived Close Friend Use	1.069***	1.054 - 1.082	1.130***	1.094 - 1.165	1.097***	1.078 - 1.117	1.125**	1.039 - 1.220	1.249***	1.089 - 1.401	1.175***	1.083 - 1.274
	Intercept	1.032	.647 - 1.644	3.248***	1.600 - 6.613	2.387	.893 - 6.379	0.022*	.001 - .619	0.008***	.001 - .084	0.784***	.070 - 8.776
	Gender[b]	0.871	.708 - 1.071	0.862	0.628 - 1.181	0.99	.685 - 1.432	1.322	.378 - 4.623	0.514	.165 - 1.603	1.455	.586 - 3.615
	Age	1.045***	1.025 - 1.064	0.549***	0.914 - 1.030	0.97	.928 - 1.015	1.073	.932 - 1.234	1.174**	1.053 - 1.307	0.892*	.797 - .998
	Perceived Acquaintance Use	1.031***	1.016 - 1.044	1.059***	1.031 - 1.087	1.059***	1.041 - 1.077	1.119	.984 - 1.270	1.148***	1.094 - 1.206	1.073**	1.020 - 1.129
12 months	Intercept	5.033***	2.881 - 8.785	4.914***	2.006 - 12.025	12.531***	4.527 - 40.447	0.555	.032 - 9.631	0.08*	.007 - .979	2.487	.113 - 54.652
	Gender[b]	0.849	.679 - 1.060	0.946	.650 - 1.374	.662	.414 - 1.061	0.860	.315 - 1.996	1.404	.420 - 4.688	2.073	.846 - 5.078
	Age	1.052***	1.027 - 1.079	0.992	.954 - 1.031	.981	.934 - 1.030	1.057	.919 - 1.188	1.164**	1.040 - 1.305	0.952	.820 - 1.105
	Perceived Close Friend Use	1.008***	1.007 - 1.009	1.015***	1.012 - 1.019	1.009***	1.007 - 1.011	1.008*	1.001 - 1.013	1.012**	1.003 - 1.021	1.012***	1.005 - 1.020
	Intercept	5.865***	3.340 - 10.299	5.43***	1.902 - 15.487	26.682***	8.611 - 82.765	2.563	.143 - 45.833	0.028***	.003 - 249	5.202	.723 - 37.412
	Gender[b]	0.794*	.629 - 1.002	0.636*	.427 - .949	0.804	.527 - 1.228	0.605	.181 - 2.022	0.718	.224 - 2.293	1.079	.437 - 2.662
	Age	1.060***	1.033 - 1.088	1.018	.969 - 1.070	0.969	.919 - 1.021	0.999	.877 - 1.139	1.235***	1.119 - 1.363	0.919	.841 - 1.002
	Perceived Acquaintance Use	1.005***	1.004 - 1.006	1.009***	1.006 - 1.012	1.006***	1.004 - 1.007	1.003	.995 - 1.011	1.012***	1.006 - 1.018	1.009***	1.005 - 1.013

Notes. IRR = Incidence Rate Ratio. CI = Confidence Interval. [a] Binge drinking defined by NIAAA guidelines; NIAAA (2003). [b] Dummy coded (0 = men, 1 = women).
*p ≤ .05. **p ≤ .01. ***p ≤ .001.

Appendix

<u>Demographics:</u>

1) What is your gender identity?
>   Man
>   Woman
>   Transgender
>   Non-binary/gender fluid
>   Another gender, please specify: _____
>   Prefer not to respond

2) What is your age? _____ [0-100]

3) What is your racial/ethnic identification?
>   White
>   Black or African American
>   Hispanic or Latino(a)
>   Asian
>   American Indian or Alaska Native
>   Native Hawaiian or Other Pacific Islander
>   Other, please specify:
>   Prefer not to respond

4) What is your current class standing?
>   Freshman (32 or less credit hours)
>   Sophomore (33-64 credit hours)
>   Junior (65-96 credit hours)
>   Senior (97-128 credit hours or more)

5) What is your current average GPA? _____ [0-4.0]

6) Are you in a fraternity or sorority?
>   Yes
>   No

7) Do you currently live on campus?
>   Yes
>   No

8) Are you currently a varsity athlete?
>   Yes
>   No

9) Do you currently have health insurance?
>   Yes
>   No

10) What is your current employment status?
>   Working full time
>   Working part time
>   Not working

11) What is your family's annual income?
> $25,000 or less
> $26,000 - $50,000
> $51,000 - $75,000
> $76,000 - $99,000
> $100,000 or more

12) Do you currently have a chronic physical health condition?
>   Yes, please specify: _____
>   No

Chronic Pain Questions:

13) Do you have chronic pain (pain every day or almost every day for at least the past three months)?
>   Yes
>   No, **skip to question 18**

14) What is the intensity of your pain right <u>NOW</u>?
>   0----1----2----3----4----5----6----7----8----9----10
>   No Pain   Worst Pain Possible

15) What was the <u>USUAL</u> intensity of your pain in the <u>PAST</u> <u>WEEK</u>?
>   0----1----2----3----4----5----6----7----8----9----10
>   No Pain   Worst Pain Possible

16) What was the <u>LOWEST</u> intensity of your pain during the <u>PAST</u> <u>WEEK</u>?
(If you have days without pain then mark '0').
>   0----1----2----3----4----5----6----7----8----9----10
>   No Pain   Worst Pain Possible

17) What was the <u>HIGHEST</u> intensity of your pain during the <u>PAST</u> <u>WEEK</u>?
>   0----1----2----3----4----5----6----7----8----9----10
>   No Pain   Worst Pain Possible

Prescription Opioid Questions:

18) Do you currently have a prescription for opioids? (Examples: oxycodone, morphine, methadone, meperidine, hydromorphone, hydrocodone, fentanyl, codeine, Percocet, Darvocet)
>   Yes, please specify type of opioid, prescribed dosage, times per day: _____
>   No, **skip to question 25**

19) At what age were you first prescribed opioids?

        Age: _____ [0-100]

20) For what reason are you currently prescribed opioids?

        Chronic Illness/Chronic Condition
        Physical Disability
        Chronic Pain (No associated chronic illness or condition)
        Medical/Dental Procedure
        Other

21) Do you feel that the opioids you take help with your **chronic pain** when taken *as prescribed*?

        Never
        Rarely
        Sometimes
        Most times
        All the time
        N/A- Do not have chronic pain

22) Do you feel that the opioids you take help with your **chronic pain** when taken *more than prescribed*?

        Never
        Rarely
        Sometimes
        Most times
        All the time
        N/A- Do not have chronic pain

23) Do you feel that the opioids you take help with your **activities of daily living** (e.g. routine tasks, such as getting dressed, bathing) when taken *as prescribed*?

        Never
        Rarely
        Sometimes
        Most times
        All the time

24) Do you feel that the opioids you take help with your **activities of daily living** (e.g. routine tasks, such as getting dressed, bathing) when taken *more than prescribed*?

        Never
        Rarely
        Sometimes
        Most times
        All the time

Opioid Use/Social Norms:
Opioids (Oxycodone, Morphine, Methadone, Meperidine, Hydromorphone, Hydrocodone, Fentanyl, Codeine, Percocet, Darvocet):

25) How do you think opioids compare to illicit drugs in regards to harm? (i.e. cocaine, heroin, psychedelics)

> Much more harmful
> Slightly more harmful
> Equally harmful
> Slightly less harmful
> Much less harmful

26) Have you used opioids in the past year?

> Yes
> No

27) Have you ever felt you have lost control over your use of opioids?

> Yes
> No

28) Have you ever had any negative consequences as a result of your opioid use?

> Yes
> No

29) Whom do you usually obtain your opioids from?

> Family member
> Close friend
> Acquaintance
> Drug dealer
> Doctor
> Other, please specify: _____

Personal Use:

30) During the last 30 days, how often did you use opioids recreationally (i.e. without a prescription OR taken more than prescribed)? _____ days [0-30]

31) During the last 12 months, how often did you use opioids recreationally? _____ days [0-365]

32) During the last 30 days, how many doses of opioids did you have on a typical day? _____ doses [0-100]

33) During the last 12 months, how many doses of opioids did you have on a typical day? _____ doses [0-100]

Peer Use, Close friend:

34) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used opioids recreationally? _____ days [0-30]

35) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used opioids recreationally? _____ days [0-365]

36) During the last 30 days, how many doses of opioids do you think a close friend of the same age and sex at the University of New Mexico have on a typical day? _____ doses [0-100]

37) During the last 12 months, how many doses of opioids do think a close friend of the same age and sex at the University of New Mexico have on a typical day? _____ doses [0-100]

Peer Use, Acquaintance:

38) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used opioids recreationally? _____ days [0-30]

39) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used opioids recreationally? _____ days [0-365]

40) During the last 30 days, how many doses of opioids do you think an acquaintance of the same age and sex at the University of New Mexico have on a typical day? _____ doses [0-100]

41) During the last 12 months, how many doses of opioids do think an acquaintance of the same age and sex at the University of New Mexico have on a typical day? _____ doses [0-100]

Substance Use/Social Norms:

Alcohol:

42) Have you used alcohol in the past year?
> Yes
> No

43) Have you ever felt you have lost control over your use of alcohol?
> Yes
> No

44) Have you ever had any negative consequences as a result of your alcohol use?
> Yes
> No

By a drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of domestic beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

Personal Use:

45) During the last 30 days, how often did you usually have any kind of drink containing alcohol? _____ days [0-30]

46) During the last 12 months, how often did you usually have any kind of drink containing alcohol? _____ days [0-365]

47) During the last 30 days, how many alcoholic drinks did you have on a typical day when you drank alcohol? ____ drinks [0-100]

48) During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol? ____ drinks [0-100]

49) During the last 30 days, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ___ days [0-30]

50) During the last 12 months, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ____ days [0-365]

Peer Use, Close friend:

51) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico usually has any kind of drink containing alcohol? _____ days [0-30]

52) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico usually has any kind of drink containing alcohol? _____ days [0-365]

53) During the last 30 days, how many alcoholic drinks do you think a close friend of the same age and sex at the University of New Mexico has on a typical day when they drank alcohol? _____ drinks [0-100]

54) During the last 12 months, how many alcoholic drinks do you think a close friend of the same age and sex at the University of New Mexico has on a typical day when they drank alcohol? _____ drinks [0-100]

55) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has had 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ___ days [0-30]

56) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has had 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ___ days [0-30]

Peer Use, Acquaintance:

57) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has any kind of drink containing alcohol? _____ days [0-30]

58) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has any kind of drink containing alcohol? _____ days [0-365]

59) During the last 30 days, how many alcoholic drinks do you think an acquaintance of the same age and sex at the University of New Mexico has on a typical day when they drank alcohol? _____ drinks [0-100]

60) During the last 12 months, how many alcoholic drinks do you think an acquaintance of the same age and sex at the University of New Mexico has on a typical day when they drank alcohol? _____ drinks [0-100]

61) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico has had 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ___ days [0-30]

62) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has had 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? ___ days [0-30]

<u>Marijuana:</u>

63) Have you used marijuana in the past year?
> Yes
> No

64) Have you ever felt you have lost control over your use of marijuana?
> Yes
> No

65) Have you ever had any negative consequences as a result of your marijuana use?
> Yes
> No

66) Do you have a prescription for marijuana?
> Yes
> No

Personal Use:

67) During the last 30 days, how often did you use marijuana recreationally (i.e. without a prescription)? _____ days [0-30]

68) During the last 12 months, how often did you use marijuana recreationally? _____ days [0-365]

Peer Use, Close friend:

69) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used marijuana recreationally? _____ days [0-30]

70) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used marijuana recreationally? _____ days [0-365]

Peer Use, Acquaintance:

71) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used marijuana recreationally? _____ days [0-30]

72) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used marijuana recreationally? _____ days [0-365]

<u>Heroin:</u>

73) Have you used heroin in the past year?
        Yes
        No

74) Have you ever felt you have lost control over your use of heroin?
        Yes
        No

75) Have you ever had any negative consequences as a result of your heroin use?
        Yes
        No

Personal Use:

76) During the last 30 days, how often did you use heroin? _____ days [0-30]

77) During the last 12 months, how often did you use heroin? _____ days [0-365]

Peer Use, Close friend:

78) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used heroin? _____ days [0-30]

79) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used heroin? _____ days [0-365]

Peer Use, Acquaintance:

80) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used heroin? _____ days [0-30]

81) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used heroin? _____ days [0-365]

Sedatives (Benzodiazepines, Xanax, Klonopin, Valium, Ativan, Ambien, Lunesta, Restoril):

82) Have you used sedatives in the past year?

       Yes

       No

83) Have you ever felt you have lost control over your use of sedatives?

       Yes

       No

84) Have you ever had any negative consequences as a result of your sedative use?

       Yes

       No

85) Do you have a prescription for a sedative medication?

       Yes

       No

Personal Use:

86) During the last 30 days, how often did you use sedatives recreationally (i.e. without a prescription OR more than prescribed)? _____ days [0-30]

87) During the last 12 months, how often did you use sedatives recreationally? _____ days [0-365]

Peer Use, Close friend:

88) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used sedatives recreationally? _____ days [0-30]

89) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used sedatives recreationally? _____ days [0-365]

Peer Use, Acquaintance:

90) During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used sedatives recreationally? _____ days [0-30]

91) During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used sedatives recreationally? _____ days [0-365]

Stimulants (Ritalin, Concerta, Adderall, Cocaine, MDMA/Ecstasy, Meth):

92) Have you used stimulants in the past year?
> Yes
> No

93) Have you ever felt you have lost control over your use of stimulants?
> Yes
> No

94) Have you ever had any negative consequences as a result of your stimulant use?
> Yes
> No

95) Do you have a prescription for a stimulant medication?
> Yes
> No

Personal Use:

96) During the last 30 days, how often did you use stimulants recreationally (i.e. without a prescription OR more than prescribed)? _____ days [0-30]

97) During the last 12 months, how often did you use stimulants recreationally? _____ days [0-365]

Peer Use, Close friend:

98) During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used stimulants recreationally? _____ days [0-30]

99) During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used stimulants recreationally? _____ days [0-365]

Peer Use, Acquaintance:

100)   During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used stimulants recreationally? _____ days [0-30]

101)   During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used stimulants recreationally? _____ days [0-365]

Psychedelics: (Mushrooms, LSD/Acid, DMT, Peyote, Salvia)

102)   Have you used psychedelics in the past year?
            Yes
            No

103)   Have you ever felt you have lost control over your use of psychedelics?
            Yes
            No

104)   Have you ever had any negative consequences as a result of your psychedelic use?
            Yes
            No

Personal Use:

105)   During the last 30 days, how often did you use psychedelics? _____ days [0-30]

106)   During the last 12 months, how often did you use psychedelics? _____ days [0-365]

Peer Use, Close friend:

107)   During the last 30 days, how often do you think a close friend of the same age and sex at the University of New Mexico has used psychedelics? _____ days [0-30]

108)   During the last 12 months, how often do you think a close friend of the same age and sex at the University of New Mexico has used psychedelics? _____ days [0-365]

Peer Use, Acquaintance:

109)   During the last 30 days, how often do you think an acquaintance of the same age and sex at the University of New Mexico usually has used psychedelics? _____ days [0-30]

110)   During the last 12 months, how often do you think an acquaintance of the same age and sex at the University of New Mexico has used psychedelics? _____ days [0-365]

DASS 21   NAME _____   DATE _____

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

The rating scale is as follows:

0   Did not apply to me at all - NEVER
1   Applied to me to some degree, or some of the time – SOMETIMES
2   Applied to me to a considerable degree, or a good part of time – OFTEN
3   Applied to me very much, or most of the time - ALMOST ALWAYS

		Select 0 1 2 3	D	A	S
1.	I found it hard to wind down		■		■
2.	I was aware of dryness of my mouth		■		■
3.	I couldn't seem to experience any positive feeling at all			■	■
4.	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)		■		■
5.	I found it difficult to work up the initiative to do things		■	■	
6.	I tended to over-react to situations		■	■	
7.	I experienced trembling (eg, in the hands)		■		■
8.	I felt that I was using a lot of nervous energy		■		■
9.	I was worried about situations in which I might panic and make a fool of myself			■	■
10.	I felt that I had nothing to look forward to			■	■
11.	I found myself getting agitated		■		■
12.	I found it difficult to relax		■		■
13.	I felt down-hearted and blue			■	■
14.	I was intolerant of anything that kept me from getting on with what I was doing		■	■	
15.	I felt I was close to panic		■		■
16.	I was unable to become enthusiastic about anything			■	■
17.	I felt I wasn't worth much as a person			■	■
18.	I felt that I was rather touchy		■		■
19.	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)		■		■
20.	I felt scared without any good reason		■		■
21.	I felt that life was meaningless			■	■
TOTALS			0	0	0

AAQ-2

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. Its OK if I remember something unpleasant.	1 2 3 4 5 6 7
2. My painful experiences and memories make it difficult for me to live a life that I would value.	1 2 3 4 5 6 7
3. I'm afraid of my feelings.	1 2 3 4 5 6 7
4. I worry about not being able to control my worries and feelings.	1 2 3 4 5 6 7
5. My painful memories prevent me from having a fulfilling life.	1 2 3 4 5 6 7
6. I am in control of my life.	1 2 3 4 5 6 7
7. Emotions cause problems in my life.	1 2 3 4 5 6 7
8. It seems like most people are handling their lives better than I am.	1 2 3 4 5 6 7
9. Worries get in the way of my success.	1 2 3 4 5 6 7
10. My thoughts and feelings do not get in the way of how I want to live my life.	1 2 3 4 5 6 7

Mindful Attention Awareness Scale (MAAS)

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

Self-Compassion Scale (SCS)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself.

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____ 14. When something painful happens I try to take a balanced view of the situation.

_____ 15. I try to see my failings as part of the human condition.

_____ 16. When I see aspects of myself that I don't like, I get down on myself.

_____ 17. When I fail at something important to me I try to keep things in perspective.

_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.

_____ 19. I'm kind to myself when I'm experiencing suffering.

_____ 20. When something upsets me I get carried away with my feelings.

_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.

_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.

_____ 23. I'm tolerant of my own flaws and inadequacies.

_____ 24. When something painful happens I tend to blow the incident out of proportion.

_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

SF-36 Questionnaire

Please answer the 36 questions of the **Health Survey** completely, honestly, and without interruptions.

GENERAL HEALTH:
In general, would you say your health is:
○ Excellent ○ Very Good ○ Good ○ Fair ○ Poor

Compared to one year ago, how would you rate your health in general now?
○ Much better now than one year ago
○ Somewhat better now than one year ago
○ About the same
○ Somewhat worse now than one year ago
○ Much worse than one year ago

LIMITATIONS OF ACTIVITIES:
The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
○ Yes, Limited a lot ○ Yes, Limited a Little ○ No, Not Limited at all

Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Lifting or carrying groceries
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Climbing several flights of stairs
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Climbing one flight of stairs
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Bending, kneeling, or stooping
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Walking more than a mile
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Walking several blocks
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Walking one block
○ Yes, Limited a Lot ○ Yes, Limited a Little ○ No, Not Limited at all

Bathing or dressing yourself
○ Yes, Limited a Lot   ○ Yes, Limited a Little   ○ No, Not Limited at all

PHYSICAL HEALTH PROBLEMS:
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

Cut down the amount of time you spent on work or other activities
○ Yes   ○ No

Accomplished less than you would like
○ Yes   ○ No

Were limited in the kind of work or other activities
○ Yes   ○ No

Had difficulty performing the work or other activities (for example, it took extra effort)
○ Yes   ○ No

EMOTIONAL HEALTH PROBLEMS:
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

Cut down the amount of time you spent on work or other activities
○ Yes   ○ No

Accomplished less than you would like
○ Yes   ○ No

Didn't do work or other activities as carefully as usual
○ Yes   ○ No

SOCIAL ACTIVITIES:
Emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

○ Not at all   ○ Slightly   ○ Moderately   ○ Severe   ○ Very Severe

PAIN:
How much bodily pain have you had during the past 4 weeks?

○ None   ○ Very Mild   ○ Mild   ○ Moderate   ○ Severe   ○ Very Severe

During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

○ Not at all   ○ A little bit   ○ Moderately   ○ Quite a bit   ○ Extremely

ENERGY AND EMOTIONS:
These questions are about how you feel and how things have been with you during the last 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling.

Did you feel full of pep?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Have you been a very nervous person?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Have you felt so down in the dumps that nothing could cheer you up?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Have you felt calm and peaceful?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Did you have a lot of energy?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Have you felt downhearted and blue?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Did you feel worn out?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Have you been a happy person?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

Did you feel tired?
○ All of the time
○ Most of the time
○ A good Bit of the Time
○ Some of the time
○ A little bit of the time
○ None of the Time

SOCIAL ACTIVITIES:
During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

○ All of the time
○ Most of the time
○ Some of the time
○ A little bit of the time
○ None of the Time

GENERAL HEALTH:
How true or false is each of the following statements for you?

I seem to get sick a little easier than other people
○ Definitely true   ○ Mostly true   ○ Don't know   ○ Mostly false   ○ Definitely false

I am as healthy as anybody I know
○ Definitely true   ○ Mostly true   ○ Don't know   ○ Mostly false   ○ Definitely false

I expect my health to get worse
○ Definitely true   ○ Mostly true   ○ Don't know   ○ Mostly false   ○ Definitely false

My health is excellent
○ Definitely true   ○ Mostly true   ○ Don't know   ○ Mostly false   ○ Definitely false

Upon completion of the survey, the participants will be asked to provide their email address and/or Student ID so that they may be awarded research credit.

Student ID:_____
Email Address: _____