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ABSTRACT OF DISSERTATION

Ursula Louise Bailey

The Graduate School
University of Kentucky

2011

EXAMINING THE ROLE OF PERSONALITY, PEERS, AND THE TRANSITION TO
COLLEGE ON SUBSTANCE USE

ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in the College of Arts and Sciences
at the University of Kentucky

By
Ursula Louise Bailey

Lexington, KY

Director: Dr. Elizabeth P. Lorch, Professor of Psychology
Co-Director: Dr. Richard Milich, Professor of Psychology

Lexington, Kentucky

2011

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ABSTRACT OF DISSERTATION

EXAMINING THE ROLE OF PERSONALITY, PEERS, AND THE TRANSITION TO COLLEGE ON SUBSTANCE USE

It is well established that there is an increase in substance use among college students. In the literature, this increase in use has been attributed to different personality factors, such as sensation seeking. However, what has not received sufficient attention is the possibility that the new peer groups, afforded by the transition to college, introduce unique influence on the relationship between personality and substance use. The purposes of the current study were to explore whether personality predicted substance use across the transition to college whether peer substance use moderated that relationship.

The current study examined developmentally the relations among personality, peers, and substance use as students transitioned to college. It built upon previous work by disentangling how the multifaceted trait of impulsivity may interact with the aspects unique to the transition to college, such as dynamic peer groups and substance use behavior in different contexts. This study added to the literature as it was the first to examine negative urgency and its relation to peer influence. The results of the current study aid in understanding the development of substance use among college students and the environmental contexts likely to influence use across time.

Participants (N= 229) were assessed longitudinally in order to examine changes in substance use. The participants completed an array of measures that included personality measures (i.e. sensation seeking and negative urgency), a life history calendar of substance use, a measure of problematic alcohol use, and a questionnaire examining the substance use of peers.

The current study suggests differences in the way that sensation seeking and negative urgency predict alcohol use and problematic drinking across the transition to college and demonstrated that peers' drinking had a moderating effect on the relationship between personality and drinking during particular times during the transition to college.

KEYWORDS: Sensation seeking, negative urgency, peers, substance use, transition to college,

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DISSERTATION

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Finally, in my own words, made infamous at my Master's thesis defense:

THANK YOU JESUS!

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Chapter One: Introduction

Substance use among college students is of great concern to parents, administrators, and public health officials (Sher & Rutledge, 2007). It is of particular concern due to the many negative outcomes associated with college substance use, such as academic, legal, and emotional problems (Mallett, Bachrach, & Turrisi, 2008) as well as the increased potential of risky sex (Grekin & Sher, 2006). The extant literature suggests that personality is predictive of substance use, as is the influence of peers. As the transition to college is a particularly vulnerable time for students because their environments change and it becomes necessary to seek out and adjust to new situations, this time frame provides a rich period within which to gain an understanding of the influence of personality and peers on changes in substance use. The goal of the current study is to use a person by situation approach to the question of how personality and peers influence changes in substance use during the transition to college.

When one encounters novel situations and experiences new environments, personality emerges as an important factor that influences behavior (Caspi & Moffitt, 1993). Specifically, people tend to rely on their personality dispositions as they approach and interact with unfamiliar contexts (Caspi & Roberts, 2001). The transition to college is a time when one would expect personality to be an especially important influencing factor in the selection of new contexts, environments, and peer groups. With the typical changes in living arrangements and peer social groups, there is an increased access to a number of new activities and opportunities, some of which may include substances. Therefore, the transition to college appears to be a period that provides a prime opportunity to examine the person by situation influence on substance use.

Substance use, especially in the college context, is not generally a phenomenon that occurs in isolation. It can best be conceptualized as an interaction of individual factors and

environmental factors (Guo, Hill, Hawkins, et al., 2002). Individual factors, such as impulsivity or disinhibition, which may put one at increased risk of substance use, may only have behavioral outcomes in certain environments (Bates & Labouvie, 1995). In an intriguing example of the person by situation paradigm, Jones & Lynam (2009) examined the transaction of impulsivity and perceived social control on offending. The findings of the study suggest that when perceived social control in a neighborhood is high, the effect of impulsivity is minimal (i.e. in neighborhoods with high levels of perceived supervision, both the low and high impulsive groups were relatively unlikely to offend). However, when perceived social control is low, those who are low in impulsivity still are unlikely to offend, while the risk of offending is increased significantly for those who are high in impulsivity. The results of this study highlight the importance of considering individual traits in an environmental context whereby potential moderators can be identified.

An examination of the person by situation transaction related to personality, the college social environment, and changes in substance use would provide fruitful information for the identification of potential interventions. One such study was conducted by Park, Sher, & Krull (2009). Their study assessed risky drinking in the social context of peer norms and the Greek environment as well as pre-college individual differences such as personality. In this study, the interaction of Greek membership status and extraversion was a key determinant of the trajectories of substance use in college. Specifically, students self-selected into the “high-risk” Greek environment based on their personalities and pre-college drinking levels and were subsequently socialized by the alcohol-conducive environment that the Greek system provides. However, for those students who voluntarily disaffiliated their membership in the Greek system, drinking concurrently decreased. In addition, Greek affiliation was related to high levels of peer

norms and peer norms were associated with alcohol use. Together, the findings provide some insight into where interventions may be most successful. For example, a Greek system with strong efforts geared toward changing heavy drinking norms could help deter high levels of use. Although the study provides a good framework for examining college substance use, it may be informative to include a measure of environmental risk beyond Greek affiliation. The authors note that the Greek effect on drinking does not persist when affiliation ends. Therefore, an environmental risk measurement, such as peer use, may be an influence that has lasting effects on substance use.

Personality and Substance Use

Personality is one of the most commonly studied factors in the prediction of substance use among college students (Baer, 2002). In particular, it is well established that sensation seeking and impulsivity are among the strongest predictors of substance use in general (Lynam & Miller, 2004; Whiteside & Lynam, 2003), and in college students specifically (Johnson & Cropsey, 2000; Hutchinson, Patock-Peckham, Cheong, & Nagoshi, 1998). However, over the years, there have been a variety of ways of operationalizing impulsivity.

Until recently, impulsivity has been investigated as a relatively broad construct. A study by Whiteside & Lynam (2001) investigated the facets of impulsivity in order to tease apart distinctions. The authors validated a 4 factor scale of impulsivity (UPPS) with each having differential links to a variety of outcomes. As defined by Whiteside & Lynam (2001), negative urgency (U) is defined as the tendency to act rashly when experiencing negative affect, lack of premeditation (P) is the tendency to act without forethought, lack of perseverance (P) is the tendency not to persist on tasks, and sensation seeking (S) is the tendency to seek out novel and thrilling experiences. Each of these constructs represents individual components and has

separate pathways to risk (Cyders, Flory, Rainer, & Smith, 2009). Two of these factors, lack of premeditation and lack of perseverance involve low conscientiousness and when studied along with the other UPPS factors (i.e. sensation seeking and negative urgency) do not provide any unique variance for drinking (Cyders, et al, 2009). Because they may not be directly related to drinking behavior, they are not the focus for the current study.

However, the other two factors of the UPPS are of particular interest to the current study. Negative urgency is emotion-based rash action involving neuroticism and may be related to problematic drinking behavior. Sensation seeking involves extraversion and may be related to frequency of drinking episodes.

The UPPS Impulsive Behavioral Scale subsequently has been validated in college samples (Magid & Colder, 2007), yielding results similar to Whiteside & Lynam (2001). Two of the factors, sensation seeking and negative urgency, are of particular relevance to the study of substance use during the transition to college. Although both facets fall under the umbrella of impulsivity, sensation seeking appears to capture reward seeking processes of impulsive behavior and negative urgency appears to capture processes of dysregulation under conditions of negative affect. The two traits also appear to predict different pathways (i.e. approach and positive reinforcement, respectively) related to substance use and are of particular interest.

An example that illustrates how sensation seeking and negative urgency appear to have different pathways to a common outcome is a study by Derefinko, DeWall, Metze, Walsh, & Lynam (in press). Derefinko et al. (in press) used the UPPS to examine different forms of aggression. Notably, sensation seeking was predictive of generalized aggression but not intimate partner violence. Conversely, negative urgency was predictive of intimate partner violence, but not generalized aggression. Perhaps those high in sensation seeking find themselves in

precarious situations resulting from the thrilling and exciting experiences they tend to seek out. It may also be the case that the high emotion experienced in intimate relationships makes it likely that those high in urgency would aggress against a partner rather than strangers. Though the authors note the importance of considering the multifaceted model of impulsivity when examining aggressive behavior, it is conceivable that this multifaceted model of impulsivity would shed light on substance used during the transition to college.

According to Zuckerman (1979), those who are high in sensation seeking are under-aroused and in effort to reach an optimal-level of arousal, may choose activities that are exciting and thrilling. One who is high in sensation seeking might endorse phrases such as “I’ll try anything once” or “I generally seek new and exciting experiences and sensations.” This tendency to seek out novel and adventuresome experiences has been predictive of both substance use and variety of substances used. These associations may be reasonable considering that under-arousal may lead one to frequently experiment with a variety of substances for the sake of generating arousal.

Negative urgency, though it is only recently gaining more attention in the literature, also has been found to be predictive of substance use problems (Cyders et al, 2009). Negative urgency, dysregulation under conditions of negative affect, is highly related to neuroticism, the tendency to experience distress. Although the neuroticism and negative urgency domains are related, they do not completely overlap. It is conceivable that one can be prone to experiencing distress and not be impulsively dysregulated by it. An example of this is a study by Fischer et al., (2007) investigating alcohol use among women with eating disorders. Among women who were high in neuroticism, only those who were also high in negative urgency reported alcohol problems. The authors concluded that it was not the tendency to experience distress of

neuroticism alone that caused the significant alcohol problems, but the tendency to act rashly while experiencing distress of negative urgency that led to the problems. Negative urgency appears to be an emotion based dysregulation that may lead one to experience problems associated with risky behavior.

Considering that sensation seeking and negative urgency together have not been widely studied in the substance use literature and that they have predictive power for substance use and problematic use, investigating these two facets will provide a clear measurement of each construct and advance the literature of personality and substance use by avoiding arbitrary composites of impulsivity. Specifically, including both sensation seeking and negative urgency in a study of college substance use will provide a more complete picture of the ways impulsivity may operate to influence substance use. Clarifying impulsivity as a multi-faceted construct allows an in-depth examination of personality's influence on substance use. As previously noted, the role of personality in substance use is not a sole determinant. Substance use occurs in context and for college students especially, a social context. Peers may be one such influence on substance use that moderates the relation between personality and substance use.

Peers and Substance Use

Consideration of peer influence on substance use may be particularly important among students transitioning to college. First, this time marks a shift from parental influence to peer influence (Bosari & Carey, 2001). During this time, the prominence of peer influence increases as the supervision of parents decreases concomitantly. Second, availability and opportunity to use substances increases. Students will encounter peers who may have attitudes, norms, and behaviors that promote substance use as well as environments that are conducive to substance use via attitudes, norms and behaviors. A substantial body of literature focuses on the role of

peers in substance use and demonstrates that peers are an important factor (see Borsari & Carey, 2001 for a review).

For adolescents, peer substance use predicts self-reported use (Baer, 2002; Guo, Hill, Hawkins, 2002). Although much of the literature regarding peers and substance use examines the phenomenon in adolescents, the issue of peers remains important in older age groups, such as those who are transitioning to college, for two primary reasons. First, as noted above, the influencing role of parents decreases as the influencing role of peers increases (Coleman, 1980). Second, the college context increases availability and is highly social, with much of the alcohol consumed in small or large groups, (Baer, 2002).

The behavior of a peer group can be predictive of self-reported use (Dembo, 1994). However, there are individual differences that should be taken into consideration. One such individual difference that may interact with peer influence may be personality. A study by Donohew, Hoyle, Clayton, et al. (1999) reported that in a sample of adolescents, sensation seeking had an indirect effect on substance use through peers. Adolescents high in sensation seeking chose friends who were also high sensation seekers and thereby supported substance use and thus provide an example of how individual differences may interact with peer influence to affect substance use.

Other studies in the peers and substance use literature have not addressed individual differences but have focused on the process by which peers influence substance use. A common question has been whether the relationship between peers and substance use can be best described as selection, socialization, or reciprocal determinism. Selection is the process by which a substance-using student seeks out substance-using peers. Socialization is the process by which substance-using peers influence future substance use behavior. Finally, reciprocal

determinism, the combination of selection and socialization, is the process by which a person's behavior influences and is influenced by the environment. To this end, a prospective study was conducted by Read, Wood, & Capone (2005). They employed a longitudinal design and included pre-matriculation levels of peer influence and pre-matriculation levels of alcohol use and problems. Pre-college peer influence (offers of alcohol and social modeling) had reciprocal effects on alcohol use across the transition to college. That is, direct (offers of alcohol) and indirect (social modeling) peer influences prior to entering college predicted alcohol use during freshman and sophomore years. Additionally, alcohol use during freshman year predicted peer influence (offers of alcohol and social modeling) during sophomore year. Thus, peer influence affected later alcohol use and in turn, alcohol use influenced later peer influence. In addition, alcohol problems were stable between pre-college and matriculation. Although alcohol use may be a function of reciprocal effects, alcohol problems appear to be a function of students' selection. These findings highlight the importance of including pre-college variables, such as pre-college substance use and relatively stable individual traits such as personality.

The Read et al. (2005) study provides evidence that pre-college peer influence can predict prospective, self-reported college substance use and associated problems. It also provides a viable framework within which to investigate peer dynamics across the transition to college. By examining pre-college levels of peer influence, substance use and problems as well as assessing them across time, the authors were able to tease apart whether relations that emerged were valid in the 6-, 12-, and 18-month intervals. This study also contributed a more complete picture of substance use during the transition to college by examining alcohol use and alcohol problems.

Although the Read et al, (2005) article has greatly contributed to the understanding of the processes by which peers influence substance use across the transition to college, it does not

provide information as to what personality traits tend to be related to substance use across the transition to college and whether peer use moderates that relationship at all during the transition to college. It is possible that at different points during the transition to college the relationship between substance use, personality and peer use may vary; thereby providing information regarding what personality traits likely make one susceptible to peer influence and which ones may not.

Chapter Two: The Current Study

Although substance use has been studied extensively as it relates to both personality and peers, the two literatures have remained relatively separate. The current study seeks to examine how peer substance use moderates the relation between personality and substance use and problems across the transition to college. Specifically, the study will examine whether personality predicts substance use/problems and whether peer use moderates that relation across college matriculation. As peer context changes from summers to semesters and from home to campus for college students, the role of peer use on substance use will be examined.

The study will focus on two dimensions of impulsivity, sensation seeking and negative urgency. These facets of impulsivity were selected because they are hypothesized to capture two distinct components of impulsivity, disinhibition and dysregulation while experiencing negative affect, respectively. Also, these facets have been differentially related to substance use and problems associated with substance use (Cyders et al, 2009). Therefore, assessing them together will be beneficial in providing a clear picture of college students' experience with use and resulting problems.

The current study seeks to replicate previous findings that 1) college students increase substance use as they transition to college and 2) college students who use substances are more likely to have friends who also use substances (Caspi & Roberts, 2001). Building on prior research, the current study will explore the following questions:

- 1) Do sensation seeking and negative urgency predict substance use?
- 2) Does peer use moderate the relationship between the personality measures and substance use/problems? If so, does the moderated association exist during the transition to college but not during the summer prior?

Specific Hypotheses

Personality and Substance Use

- Sensation seeking will predict substance use
 - Prior to college when availability is low
 - During college while seeking out novel and thrilling experiences
- Negative urgency will predict substance use/problems
 - During the transition while adjusting to college; increased availability

Personality, Peers, and Substance Use

- Peer substance use will moderate the relationship between sensation seeking and substance use
 - Due to homophily. Donohew et al. (1999) reported that sensation seeking had only indirect effects (through friends) on substance use
- Peer substance use will not moderate the relationship between negative urgency and substance use
 - There may be more resources allocated toward management of negative affect experienced adjusting to college and less toward inhibiting rash action. This depletion is likely independent of peer substance use.

The current study will examine developmentally the relations among personality, peers, and substance use/problems as students transition to college. It will build upon previous work by disentangling how multifaceted impulsivity may interact with the variation within the transition to college, such as dynamic peer groups and substance use behavior in different contexts. This study adds to the literature as it is the first to examine negative urgency and its relation to peer influence. Because participants will have multiple time points of use, substance use patterns can

be modeled across time and potential moderators can be identified. The results of the current study will aid in understanding the development of substance among college students and the environmental contexts that are likely to influence use across time.

Chapter Three: Method

Recruitment Procedure

The participants in the current study were recruited as part of a larger on-going, longitudinal study at the university. All participants were recruited from the University of Kentucky Psychology 100 pool of freshmen. To ensure that a number of individuals participating in the study endorsed those delinquent behaviors likely to covary with substance use, a number of participants were selected from introductory psychology pool based on scores from a subset of items of a delinquency screening measure (see Appendix C), which were administered in a mass screening of all introductory psychology classes. Cut scores (top 25%) were created for each semester (fall and spring) and separately by gender. All individuals scoring in the top 25% of their semester and gender group on the delinquency questionnaire were selected and contacted to participate in the study. This selection process served to ensure that the top of the general distribution of delinquency and behavioral problems were well represented. The screening questionnaire was also used to over-sample African American participants.

Participants

A sample of 229 college freshmen (52% Male, 48% Female) participated in this study. All students were between the ages of 18-24 and enrolled at the university. The ethnic composition of the sample was primarily Caucasian. Great efforts were made to include ethnic minorities, to the degree that the ethnic composition of the current study reflected the ethnic composition of the freshmen class at the university (i.e. 81% Caucasian, 6.5% African American, 12.5% Latino/a, Asian, Other). On testing day, participants were required to complete a saliva drug screen and a sobriety test to ensure that they were free of substances that may have altered their performance. Participants completed two testing sessions approximately one year apart.

Approximately, 33% of the sample was lost due to attrition. However, the results do not appear to be adversely affected by the missing data. The statistical models employed require that each participant contribute the independent variable (i.e. personality) and at least one dependent variable (i.e. pre-summer use, fall use, spring use, and post-summer use). Each participant in the entire sample contributed at least one dependant variable. Those participants who did not return to the study, were not statistically different from those who remained on gender, personality, or friends' use. The attritors reported higher levels of fall tobacco smoking, $t(209)= 2.178, p < .05, r = .15$ and reported higher levels of post-summer marijuana use, $t(181)= 2.50, p < .05, r = .18$.

Procedure

Session One. For the first session, the freshman participants signed up for the study time slots using the electronic system of the Psychology 100 Pool and were tested individually. Upon arrival and being greeted by a trained research assistant, consent was obtained and each participant completed the saliva drug screen and sobriety test. Participants were taken to a private room for the session. Each participant was assessed on a variety of measures including retrospective reports of substance use history, current substance use, and perceived substance use of peers. Session one of the study lasted approximately two and one half hours (including a break) and students were given course credit in exchange for their participation as well as \$30.

Session Two. During the year time period after the participants' first session, they received contact for their birthdays and holidays to encourage their continued participation. During participants' sophomore year, after approximately one year had passed, participants were contacted to return for their second session. Participants again completed the saliva drug screen and sobriety test. Similar to session one, each participant was assessed on a variety of measures; including retrospective reports of substance use over the past year (i.e. since they were last seen

at Session One), current substance use, and perceived substance use of peers. Because they were no longer freshman enrolled in the Psychology 100 course, no credit was offered; instead participants received \$50 and a t-shirt for participating. If participants were unable or refused to return to the lab for the second session, they were asked to return a mailed packet of the measures.

Materials

During both testing sessions, participants completed a variety of questionnaires on computer. Each of the following measures was collected twice.

UPPS Impulsive Behavioral Scale (Whiteside & Lynam, 2001) -- This is a 45-item measure of four distinct pathways to impulsive behavior. The pathways are 1) Urgency which can be understood as the tendency to act rashly when experiencing negative affect or positive affect; 2) (lack of) Premeditation which can be understood as low inhibition; 3) (lack of) Perseverance which can be understood as the tendency to persist on tasks; 4) Sensation Seeking which can be understood as the tendency to seek out novel, thrilling experiences. For the purpose of the current study, the pathways of urgency and sensation seeking are of primary interest (see Table 1). Participants completed the UPPS scale twice. Although it was not expected that these measures of personality will vary substantially across the one- year measurement gaps, stability of personality was examined. Correlations were run on the time 1 and time 2 personality variables (e.g. sensation seeking time 1 vs. sensation seeking time 2, etc.) and each demonstrated significant associations from time 1 to time 2, $p < .001$. T-tests were also run to examine any mean level differences and none were found. Data was taken from the session one scores (see Appendix A).

Life History Calendar-- This is a retrospective survey that assesses substance use/abuse.

This measure is completed by having the calendar on the computer screen and the research assistant filling it in with the answers of the participant. The calendar assesses several domains of substance use, including the occurrence of substance use, the frequency and quantity of the substance, as well as the highest amount used of the substance. Each class of drugs is individually assessed.

Session One. During the first assessment of the Life History Calendar, participants reported on their experiences with substance use retrospectively. The calendar was broken up into each year of life from age 13 to current age as a freshman (usually 18). Each year was further broken up into three 4-month periods of time.

Session Two. The second measurement occurred approximately one year later. During this second assessment, the Life History Calendar required participants to retrospectively report on their substance use over the one year period between the first and second sessions. In contrast to the Life History Calendar in session one, the session two calendar only assessed a one year period of time. For this reason, it was broken down into one month periods of time.

Having a second assessment of substance use served as reliability of subject retrospective reports (i.e. from overlapping assessments of substance use), and also allowed for the use of multiple time points and assess potential changes in use. For the purpose of the current study, the Life History Calendar was coded for: 1) average weekly number of drinks, 2) average weekly number of cigarettes, 3) and average weekly number of marijuana puffs (see Tables 3-5, respectively). Using both measurements of the Life History Calendar, 4 time points of interest were extracted. The time points of interest were 1) substance use during the summer prior to college matriculation, 2) substance use during the fall and 3) substance use during the spring, and 4) substance use the summer following freshman year (see Appendix D).

Peer Substance Use Questionnaire-- This measure assesses perceptions of peers' substance use/norms and binge occurrence for each class of drug. Participants answered questions about what substances their three closest friends used, the amount used, the nature of those relationships, as well as how their friends would feel if they (the participant) used the substance. The questionnaire was coded for average amount of substance used from the session one data. Participants completed the peer substance use questionnaire (see Appendix B) twice and the data from both measurements was used to compute stability scores. Of the reports of friends' alcohol, tobacco, and marijuana use at times 1 and 2, the only variable that emerged significant was friends number of daily packs of tobacco, $t(35)= 3.935, p < .001, r = .55$. Participants reported having friends who smoked more cigarettes during time 1 than time 2.

Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, De Le Fuente, & Grant, 1993)—This 10 item measure assesses problems relating to alcohol use. The instrument was designed to screen for hazardous and harmful drinking. The questions assess consumption, drinking behavior, and alcohol related problems. The measure was completed during time 1 and time 2, representing freshman and sophomore years. Data from both waves are included in the analysis (see Appendix C).

Life History Calendar Data Reduction. As previously noted, the Life History Calendar was used to assess substance use across time. Although the Life History Calendar was completed twice by participants, one year apart, four distinct data points (summer preceding freshman year, fall of freshman year, spring of freshman year, and summer preceding sophomore year) were extracted from the two assessments.

Time point 1 (summer preceding freshman year). For all participants, the year 1 assessment of the Life History Calendar was used to extract the summer preceding freshman year

data.

Time point 2 (fall of freshman year). Participants in the current study may have entered the study during either the fall of their freshman year or the spring. Depending on which semester they enrolled in the study, the Life History Calendar that was used to assess current use during that time may vary. For participants who enrolled in the study during the fall semester, their fall data came from the year 2 assessment of the Life History Calendar. For those participants who enrolled in the study during the spring semester, their fall data point came from the year 1 assessment of the Life History Calendar.

Time point 3 (spring of freshman year). For those participants who enrolled in the study during the fall semester, their spring data came from the year 2 assessment of the Life History Calendar. For those participants who enrolled in the study during the spring semester, their spring data came from the year 2 assessment.

Time point 4 (summer preceding sophomore year). For all participants, the year 2 assessment of the Life History Calendar was used to extract the summer preceding sophomore year data.

Example of data from a fall participant. For example, a participant comes in for year 1 of the study during September. Because the fall semester for them would be just beginning, the only data that will be used from their year 1 Life History Calendar will be their retrospective report of summer prior to their fall semester. Their year 2 Life History Calendar will contribute the retrospective data for their fall semester, spring semester and summer preceding sophomore year.

Example of data from a spring participant. For example, a participant comes in for year 1 of the study during April. Because the participant will have completed a full fall semester prior

to enrolling in the study, the data that will be used from their year 1 Life History Calendar will be their retrospective report of summer prior to fall semester and fall semester use. Their year 2 Life History Calendar will contribute the retrospective data for the spring and summer preceding sophomore year.

Analytic Plan

PROC MIXED in version 9.2 of SAS was used to fit a linear mixed model relating substance use to peer substance use, sensation seeking, and negative urgency over the time interval spanning from the summer preceding freshman year of college to the summer preceding sophomore year of college. Since alcohol use was normally distributed, the dependent variable of alcohol use could be assumed to arise from a generalized Poisson distribution with mean equal to an exponential linear combination of independent values. However, the data included non-integers, which Poisson regression cannot handle. Therefore a linear mixed model is the appropriate model rather than a generalized linear mixed model.

Square root transformations were employed for the other substance use variables, tobacco and marijuana; however the variables remained out of the range of acceptability for kurtosis. Therefore tobacco and marijuana variables were dichotomized (0= no use, 1=some use) and a logistic mixed model was employed using PROC GLIMMIX.

Regarding the quantification of substance use itself, substance use was not directly measured at four time points (i.e. summer preceding freshman year, fall, spring, and summer preceding sophomore year). Rather, the life history calendars collected during the freshman and sophomore years were used to quantify, via retrospective aggregation, the level of average weekly substance use within a four-month time interval containing each time point.

A linear mixed model was also fit to examine problems associated with alcohol use, peer

substance use, sensation seeking, and negative urgency from the freshman to sophomore years. For this model however, there were two direct assessments of problems; one each from times 1 and 2. The results for this model should be interpreted in terms of freshman year and sophomore year rather than pre-summer, fall, spring, and post-summer.

Besides the independent variables of peer substance use, sensation seeking, and negative urgency, time was formally incorporated into the linear mixed model and the logistic mixed model as a categorical predictor. Moreover, to allow for the possibility that the associations of peer substance use and personality with drug use evolved over time, the interaction terms of time were formally included with the other independent variables. This also permitted, as post-hoc analyses, the assessment of such associations at any fixed time point. In addition, the model was such that peer use was examined as a moderator of the relationship between personality (i.e. sensation seeking and negative urgency), and substance use at each time point.

Both mixed models contained random effects that both accommodate the non-independence of repeated observations on the same subject and allow subject-specific adjustments to predictors of the outcome at each time point. A p-value less than 0.05 will be taken as a demarcation of statistical significance.

In order to examine the specific changes in substance use across time trend lines were plotted. The trend lines estimate predicted substance use at any fixed value across time, separately for those high (i.e. 75th percentile) and low (i.e. 25th percentile) for each combination of the personality facets.

Table 1

UPPS Personality Variable Descriptions

Personality Variable	Mean	SD	Median	25 th Percentile	75 th Percentile
Sensation Seeking	2.656	.4677	2.714	2.357	3.0
Negative Urgency	2.190	.5310	2.166	1.833	2.583

Table 3

Self-reported Drinking Variables

Substance Use Variable	Mean*	Mean	SD	Median	25 th Percentile	75 th Percentile	% Non-Drinkers
Pre-Summer Drinking	2.3292	1.5262	1.7126	1.0	0	2.7386	33%
Fall Drinking	3.0377	1.7429	1.55005	1.4142	.50	2.8284	22.5%
Spring Drinking	2.9323	1.7124	1.55905	1.4142	.3536	2.8284	23.5%
Post-Summer Drinking	3.0639	1.7504	1.61941	1.2247	.50	2.8284	20.8%

**Denotes mean scores prior to the square root transformation*

**Scores represent average weekly drinking (i.e. number drinks per week x frequency)*

Scale

<i>Number</i>	<i>Frequency</i>
<i>1= 1 drinks</i>	<i>.25= 1x month or less</i>
<i>2= 2 drinks</i>	<i>1= 1x week</i>
<i>3= 3 drinks</i>	<i>2.5= 2.5x week</i>
<i>4= 4 drinks</i>	<i>4.5= 4.5x week</i>
<i>5= 5 drinks</i>	<i>7= daily</i>
<i>6= 8 drinks</i>	

Table 4

Self-reported Tobacco Variables

Substance Use Variable	Mean*	Mean	SD	Median	25 th Percentile	75 th Percentile	% Non Smokers
Pre-Summer Tobacco	.7342	.8596	2.45861	0	0	0	83%
Fall Tobacco	.7485	.8652	2.52150	0	0	0	84.4%
Spring Tobacco	.5548	.7449	2.05896	0	0	0	83.6%
Post-Summer Tobacco	.4151	.6443	2.01739	0	0	0	84.2%

**Denotes mean scores prior to the square root transformation*

**Scores represent average number cigarettes per week (i.e. number cigarettes per week x frequency)*

Scale

Number

Frequency

1= 2.5 cigarettes .25= 1x month or less

2= 9.5 cigarettes 1= 1x week

3= 19.5 cigarettes 2.5= 2.5x week

4= 29.5 cigarettes 4.5= 4.5x week

5= 39.5 cigarettes 7= daily

6= 45 cigarettes

Table 5

Self-reported Marijuana Variables

Substance Use Variable	Mean*	Mean	SD	Median	25 th Percentile	75 th Percentile	% Non-Users
Pre-Summer Marijuana	.3059	.5531	1.55826	0	0	0	75.9%
Fall Marijuana	.3202	.5659	1.51768	0	0	.6124	73%
Spring Marijuana	.4134	.6430	1.86235	0	0	0	79%
Post-Summer Marijuana	.6073	.7793	1.92155	0	0	.4677	70.5%

**Denotes mean scores prior to the square root transformation*

**Scores represent average number marijuana puffs per week (i.e. number puffs per week x frequency)*

Scale

<i>Number</i>	<i>Frequency</i>
<i>1= 1.5 puffs</i>	<i>.25= 1x month or less</i>
<i>2= 3.5 puffs</i>	<i>1= 1x week</i>
<i>3= 6.5 puffs</i>	<i>2.5= 2.5x week</i>
<i>4= 10.5 puffs</i>	<i>4.5= 4.5x week</i>
<i>5= 14.5 puffs</i>	<i>7= daily</i>
<i>6= 16 puffs</i>	

Chapter Four: Results

The current study was designed to examine the relationship between personality and peers and their impact on substance use. Specifically, the study investigated the association between personality and substance use at four time periods within the first year of college. Further, the impact that peers had on the relationship between personality and substance use was examined across time.

Overall effects of personality and substance use

Alcohol. There is a significant overall effect of both sensation seeking on college drinking, $F(4, 582) = 16.20, p < .001, r = .32$ and negative urgency on college drinking $F(4, 582) = 3.28, p < .05, r = .15$.

Tobacco. There is an overall effect of negative urgency on cigarette smoking $F(4, 575) = 2.52, p < .05, r = .13$.

Marijuana. There is a significant overall effect of both sensation seeking ($F(4, 575) = 6.29, p < .001, r = .20$) and negative urgency ($F(4, 575) = 4.61, p < .05, r = .17$) on marijuana use.

The results of the fixed effects of the linear/logistic mixed models suggest that for both sensation seeking and negative urgency there is an overall effect on drinking and marijuana use. Concerning tobacco, negative urgency was the only impulsive personality facet that had an overall effect on smoking.

The trend lines (see Figures 1 – 3) illustrate the estimates of substance use at given values for each combination of personality (i.e. high sensation seeking and high negative urgency, high sensation seeking and low negative urgency, low sensation seeking and high negative urgency, low sensation seeking and low negative urgency). Consistently, the high sensation seeking, high

negative urgency and the low sensation seeking, low negative urgency groups represent the most and least substance use, respectively. Tobacco use had the least variability among the high and low urgency groups across time. However, marijuana results indicate that although the sensation seeking groups have mean level differences, they appear to have similar patterns of use across time. For each of the personality combinations, marijuana use appears to decline through the spring semester and increase during the post-summer. This pattern was consistent across the personality combinations. Alcohol results were different. First, there is a difference between the high sensation seeking groups and the low sensation seeking groups with the high groups drinking more. That difference became more pronounced during the fall and remained across the transition to college.

Do sensation seeking and negative urgency predict substance use across the transition to college?

One linear mixed model was employed for the analysis of average weekly alcohol use and two separate logistic mixed models were employed for the analyses of average weekly tobacco and marijuana use. For each of the models, the peer moderation variable was friends' alcohol, tobacco, or marijuana frequency, respectively (see Table 2).

Alcohol. Sensation seeking predicts alcohol use across all four time points of the transition to college (pre-summer $t(582) = 2.29, p < .05, r = .09$; fall $t(582) = 5.55, p < .001, r = .22$; spring $t(582) = 5.93, p < .001, r = .24$; post-summer $t(582) = 6.13, p < .001, r = .24$).

Additionally, increases in sensation seeking were associated with significant increases in mean level of drinking (see Table 3) across the transition to college (see Table 7). Negative urgency predicts alcohol use only during the fall, $t(582) = 1.98, p < .05, r = .08$.

Tobacco. Sensation seeking predicts cigarette smoking (see Table 4) across all four time

points of the transition to college (pre-summer $t(575) = 2.04, p < .05, r = .08$; fall $t(575) = 2.70, p < .05, r = .11$; spring $t(575) = 2.10, p < .05, r = .09$; post-summer $t(575) = 2.10, p < .05, r = .09$). Increases in sensation seeking were associated with significant increases in the estimated odds of smoking across the transition to college (see Table 8). Negative urgency predicts smoking during the pre-summer $t(575) = 2.45, p < .05, r = .10$; fall $t(575) = 2.83, p < .05, r = .12$; and spring $t(575) = 2.02, p < .05, r = .08$; though increases in negative urgency were associated with significant increases in the estimated odds of smoking for every time period except post-summer.

Notably, both sensation seeking and negative urgency were related to the greatest increase in the estimated odds of smoking, which was during the fall semester; 15% increase and 14% increase, respectively.

Marijuana. Sensation seeking predicts marijuana use (see Table 5) across all four time points of the transition to college (pre-summer $t(575) = 3.85, p < .001, r = .16$; fall $t(575) = 4.17, p < .001, r = .17$; spring $t(575) = 3.88, p < .001, r = .16$; post-summer $t(575) = 3.57, p < .001, r = .13$). Increases in sensation seeking were associated with significant increases in the estimated odds of marijuana use across the transition to college (see Table 8). Negative urgency predicts marijuana use during the pre-summer $t(575) = 2.40, p < .05, r = .10$; fall $t(575) = 4.00, p < .001, r = .16$; and post-summer $t(575) = 3.11, p < .001, r = .13$. Consistently increases in negative urgency were associated with significant increases in the estimated odds of marijuana use for pre-summer, fall, and post-summer.

Similar to the tobacco results, both sensation seeking and negative urgency were related to the greatest increase in the estimated odds of marijuana use, which was during the fall semester; 27% increase and 23% increase, respectively.

In sum, sensation seeking is a consistent predictor of alcohol, tobacco, and marijuana use

as well as a range of time spanning from pre-college through the end of the freshman year. Negative urgency also predicted some substance use at different times, although not as consistently as sensation seeking. The fall was consistently associated with significant increases in substance use. There were modest effect sizes for the above relations.

Does peer substance use moderate the relationship between personality and substance use?

Alcohol. Friends' alcohol use moderated the association between sensation seeking and drinking during the spring ($t(531) = 2.33, p < .05, r = .10$) and post-summer ($t(531) = 2.24, p < .05, r = .10$).

The results indicate that only during the spring and post-summer does friends' drinking moderate the relationship between sensation seeking and drinking (see Figures 4-5). Specifically, peer alcohol use had little association with drinking for those who were higher in sensation seeking. However, for those with intermediate and low levels of sensation seeking, as peer alcohol use increases, self-reported drinking increases concomitantly within the spring and post-summer time points. There was no moderating effect of friends' use on the relationship between negative urgency and self-reported college drinking

Problems associated with alcohol use

The AUDIT was the only measure of problematic use in the study, so predictors of problematic use are analyzed at only two time points, freshman and sophomore years. Two linear mixed models were employed to examine problems associated with alcohol use. The first model predicted the AUDIT and the peer moderation variable was frequency of friends' alcohol use in order to be consistent with the substance use models presented above. The second model predicted the AUDIT and the peer moderation variable was friends' binge occurrence. The friends' binge occurrence variable was selected to investigate the potential influence of peers'

problematic use on the relation between personality and self-reported problems associated with alcohol.

Sensation seeking was a significant predictor of problems associated with alcohol use during both the freshman, $t(149) = 4.7, p < .0001, r = .36$, and sophomore years $t(149) = 4.94, p < .0001, r = .38$. Similarly, negative urgency also was a significant predictor of problems associated with alcohol use across freshman, $t(149) = 3.48, p < .001, r = .27$ and sophomore years, $t(149) = 2.20, p < .05, r = .18$ (see Table 6).

Does peer drinking moderate the relationship between personality and problems associated with drinking?

Friends' alcohol use moderated the association between negative urgency and problematic drinking, $t(134) = 2.93, p < .05, r = .25$, however this effect was only present during freshman year.

In terms of friends' frequency, for those who are lower in negative urgency, the frequency of friends' drinking moderates self-reported problematic drinking. However, as negative urgency increases, drinking increases; although the effect of friends' frequency of drinking becomes less pronounced.

Does peer binge occurrence moderate the relationship between personality and problems associated with drinking?

Friends' binge drinking moderated the association between negative urgency and problematic drinking during freshman year, $t(134) = 2.86, p < .05, r = .24$.

Regarding friends' binge occurrence, for those who are lower in negative urgency, the binge occurrence of friends moderates self-reported problematic drinking. However, as negative urgency increases, the effect of friends' binge occurrence becomes significantly reduced.

The results suggest that both the frequency of friends' drinking as well as their problematic drinking moderate the relationship between negative urgency and self-reported problems associated with drinking. Notably, this effect was only found during the freshman year and not the sophomore year (see Figures 6 and 7).

Table 2

Friend Variable Descriptions

Substance Use Variable	Mean	SD	Median	25 th Percentile	75 th Percentile
Friend Alcohol Frequency	3.4358	1.24029	3.5	2.5	4.33
Friend Marijuana Frequency	2.3782	1.01419	2.0	1.6667	3.0
Friend Binge Occurrence	.5279	.42325	.50	0	1.0
Friend # Tobacco Daily Packs	2.3750	.87838	2.0	2.0	3.0

Friend Alcohol Use scores around Median

3= 1x-2x month; sometimes large amounts

4= 1x-2x week; never large amounts

Friend Marijuana Use scores around Median

2= 1x-2x month

3= 1x-3x week

Friend Binge Occurrence Scores

0= Never

1= Yes

Friend Tobacco Use scores around Median

2= 1/2 pack day

3= 1 pack day

Table 6

AUDIT Problem Variables

Problem Level Variable	Mean	SD	Median	25 th Percentile	75 th Percentile
AUDIT Wave One	.5590	.67034	0	0	1.0
AUDIT Wave Two	.5882	.71202	0	0	1.0

**Scores represent level of problematic drinking*

Scale

0= low level of problem drinking

1= medium level of problem drinking

2= high level of problem drinking

Table 7

Alcohol Results

A one unit increase in sensation seeking (controlling for NU) is associated with an increase in the mean level of drinking by:
.4961 during the pre-summer (95% CI= .070976 to .921224; $p = .0225$)
1.2203 during the fall (95% CI= .789492 to 1.651108; $p < .0001$)
1.3372 during spring (95% CI= .895612 to 1.778788; $p < .0001$)
1.4271 during post-summer (95% CI= .970616 to 1.883584; $p < .0001$)

A one unit increase in negative urgency (controlling for SS) is associated with an increase in the mean level of drinking by:
-.3252 during the pre-summer (95% CI= -.699364 to .048964; $p = .0889$)
.3892 during fall (95% CI= .004844 to .773556; $p = .0477$)
.2246 during spring (95% CI= -.174456 to .623656; $p = .2706$)
.2930 during the post-summer (95% CI= -.123304 to .709304; $p = .1683$)

Table 8

Tobacco and Marijuana Results

A one unit increase in sensation seeking (controlling for NU) is associated with an increase in the estimated odds of smoking by:
11% during the pre-summer (95% CI= 0% to 20%; $p= .0414$)
15% during the fall (95% CI= 3% to 24%; $p= .0071$)
11% during spring (95% CI= 0% to 21%; $p= .0360$)
11% during post-summer (95% CI=.0% to 21%; $p= .0365$)

A one unit increase in negative urgency (controlling for SS) is associated with an increase in the estimated odds of smoking by:
11% during the pre-summer (95% CI= 2% to 20%; $p= .0145$)
14% during fall (95% CI= 4% to 22%; $p= .0049$)
10% during spring (95% CI= 0% to 19%; $p= .0436$)
5% during the post-summer (95% CI= -3% to 15%; $p= .2460$)

A one unit increase in sensation seeking (controlling for NU) is associated with an increase in the estimated odds of marijuana use by:
25% during the pre-summer (95% CI= 11% to 35%; $p= .0001$)
27% during fall (95% CI= 13% to 36%; $p < .001$)
26% during spring (95% CI= 11% to 35%; $p= .0001$)
24% during the post-summer (95% CI= 9% to 34%; $p= .0004$)

A one unit increase in negative urgency (controlling for SS) is associated with an increase in the estimated odds of marijuana use by:
13% during the pre-summer (95% CI= 2% to 22%; $p= .0168$)
23% during fall (95% CI= 10% to 31%; $p < .001$)
11% during spring (95% CI= 0% to 21%; $p= .0548$)
19% during the post-summer (95% CI= 6% to 28%, $p= .0019$)

Figure 1

Alcohol Trend across Time

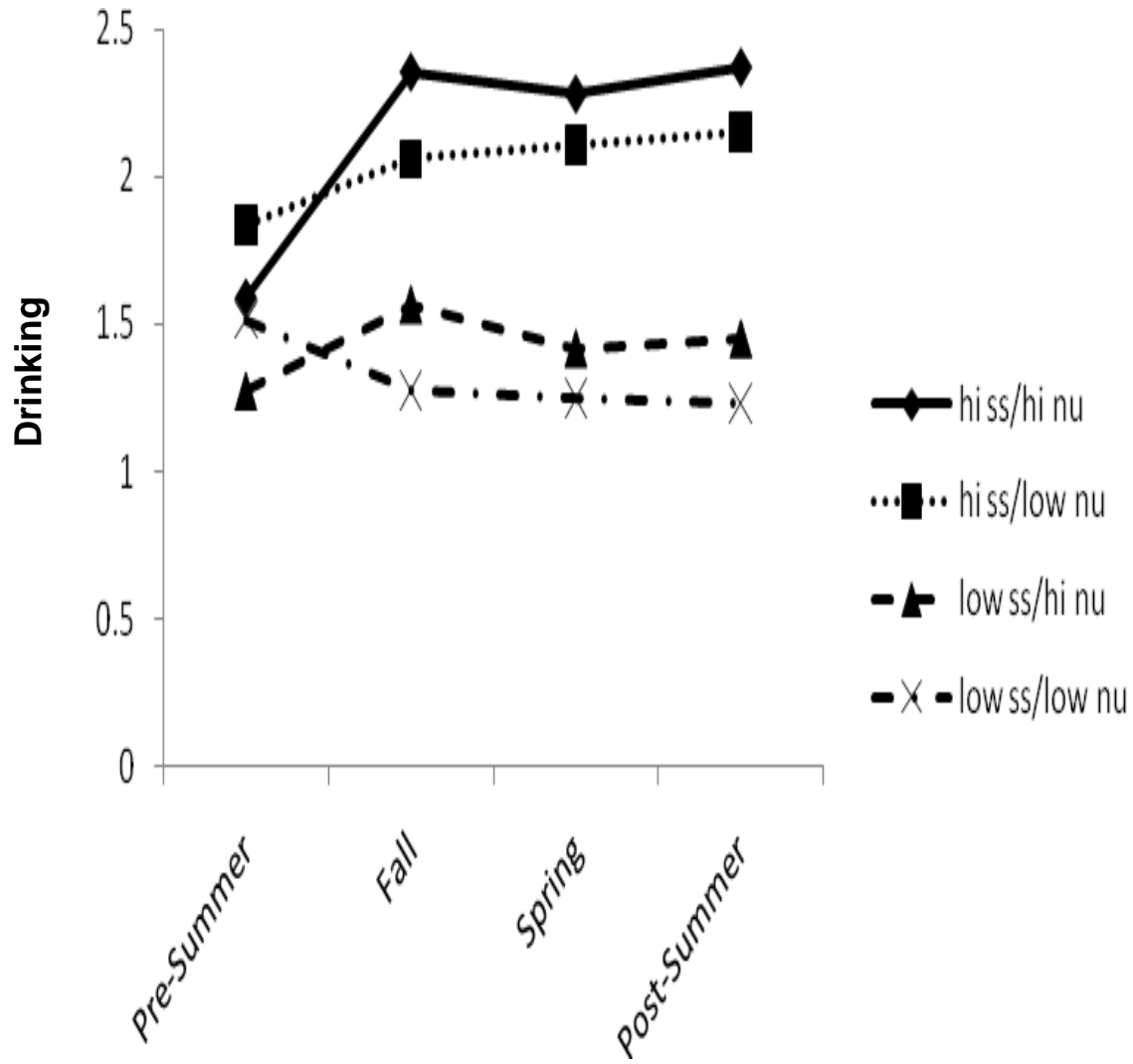


Figure 2

Tobacco Trend across Time

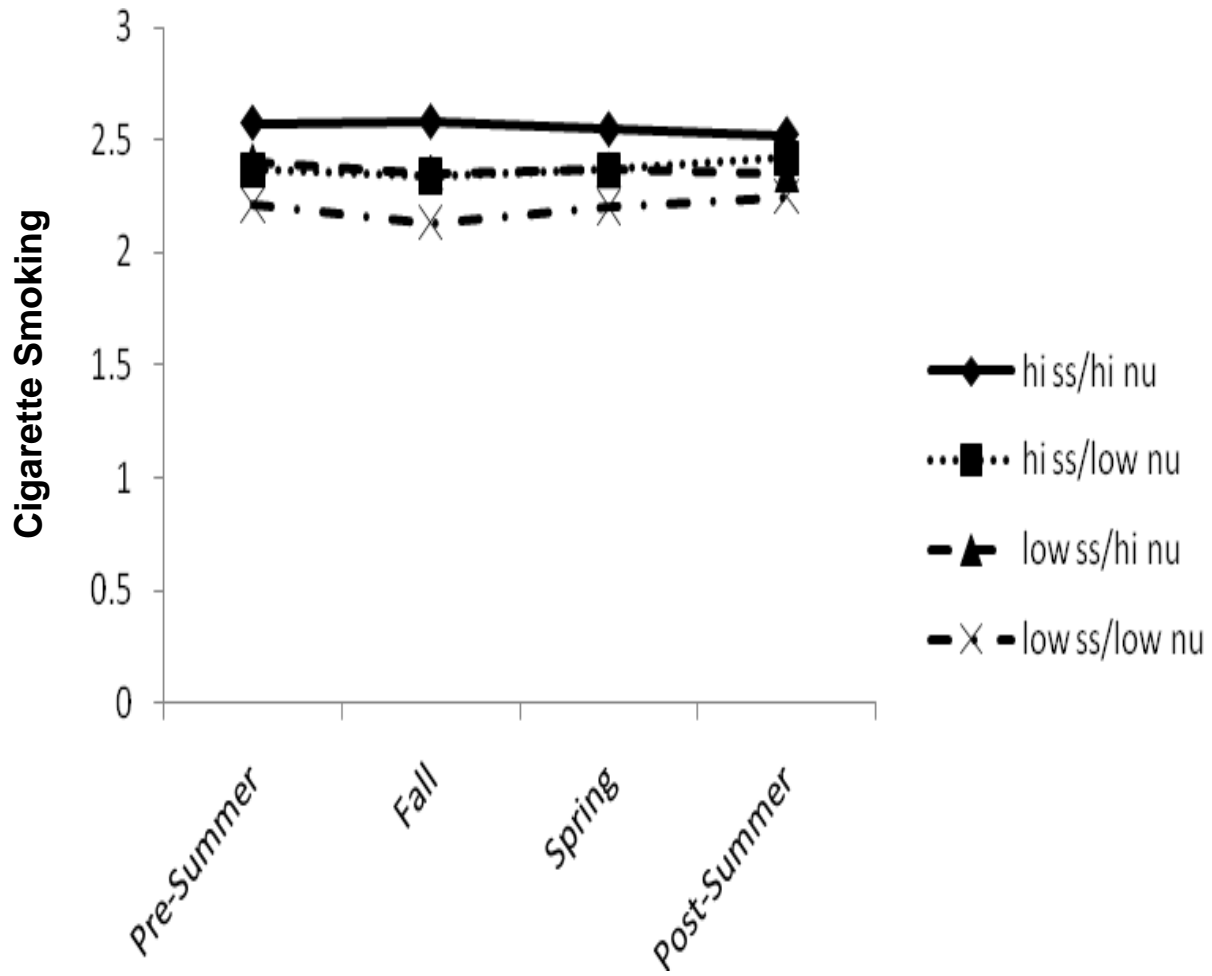


Figure 3

Marijuana Trend across Time

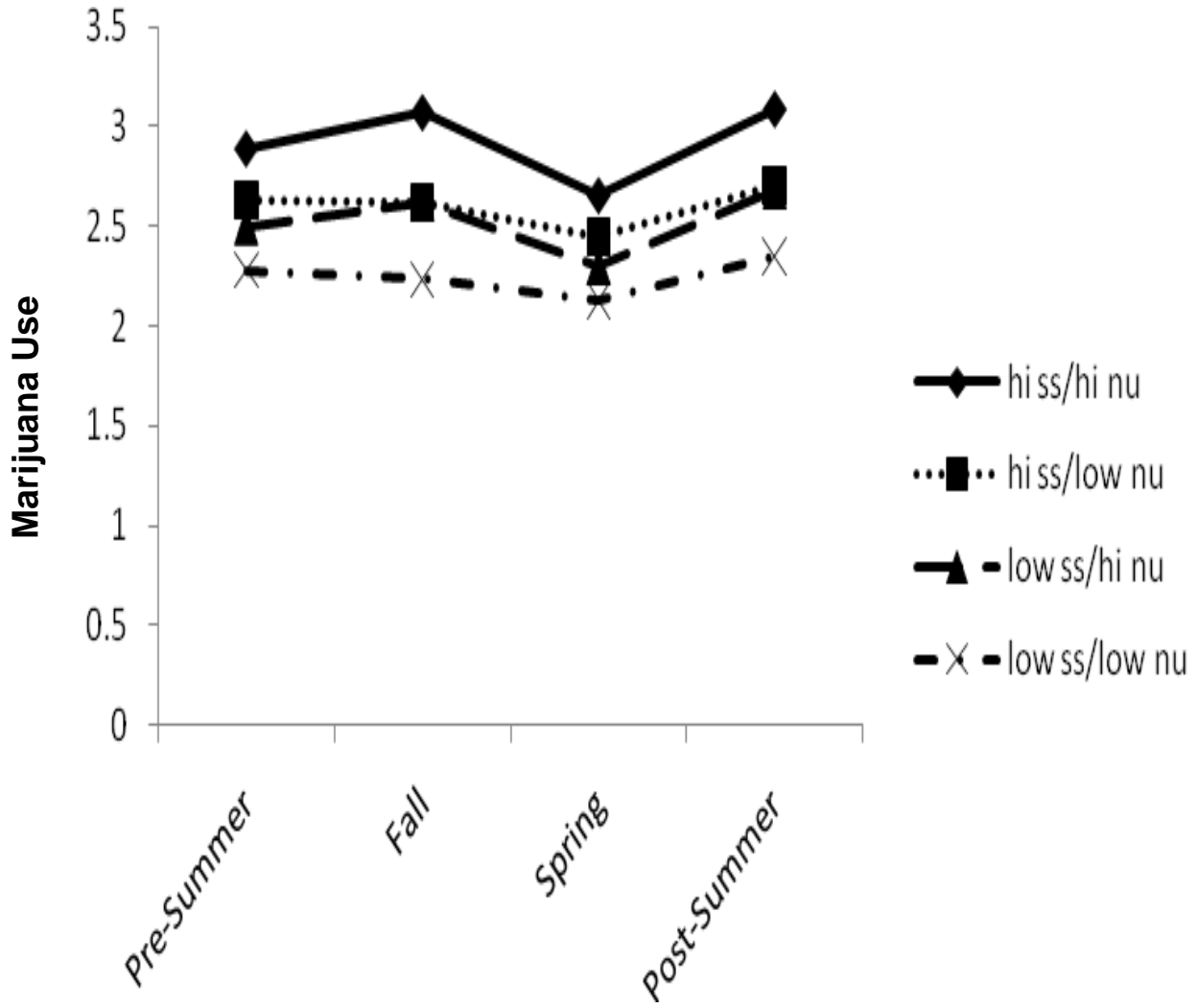


Figure 4

Moderating Effect of Friends' Drinking on the relationship between Self-reported Alcohol Use and Sensation Seeking During Spring Semester

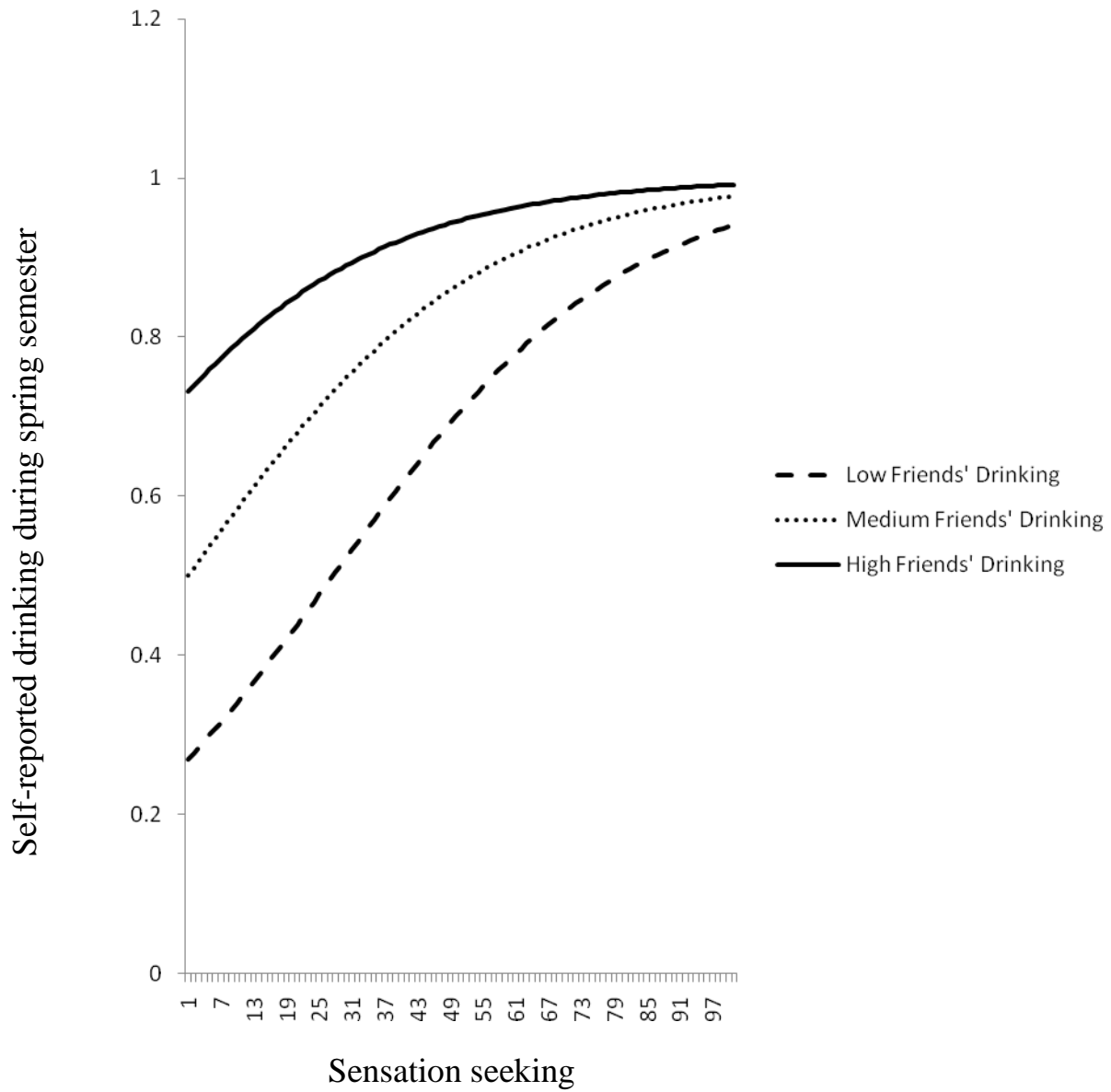


Figure 5

Moderating Effect of Friends' Drinking on the relationship between Self-reported Alcohol Use and Sensation Seeking During Post-Summer

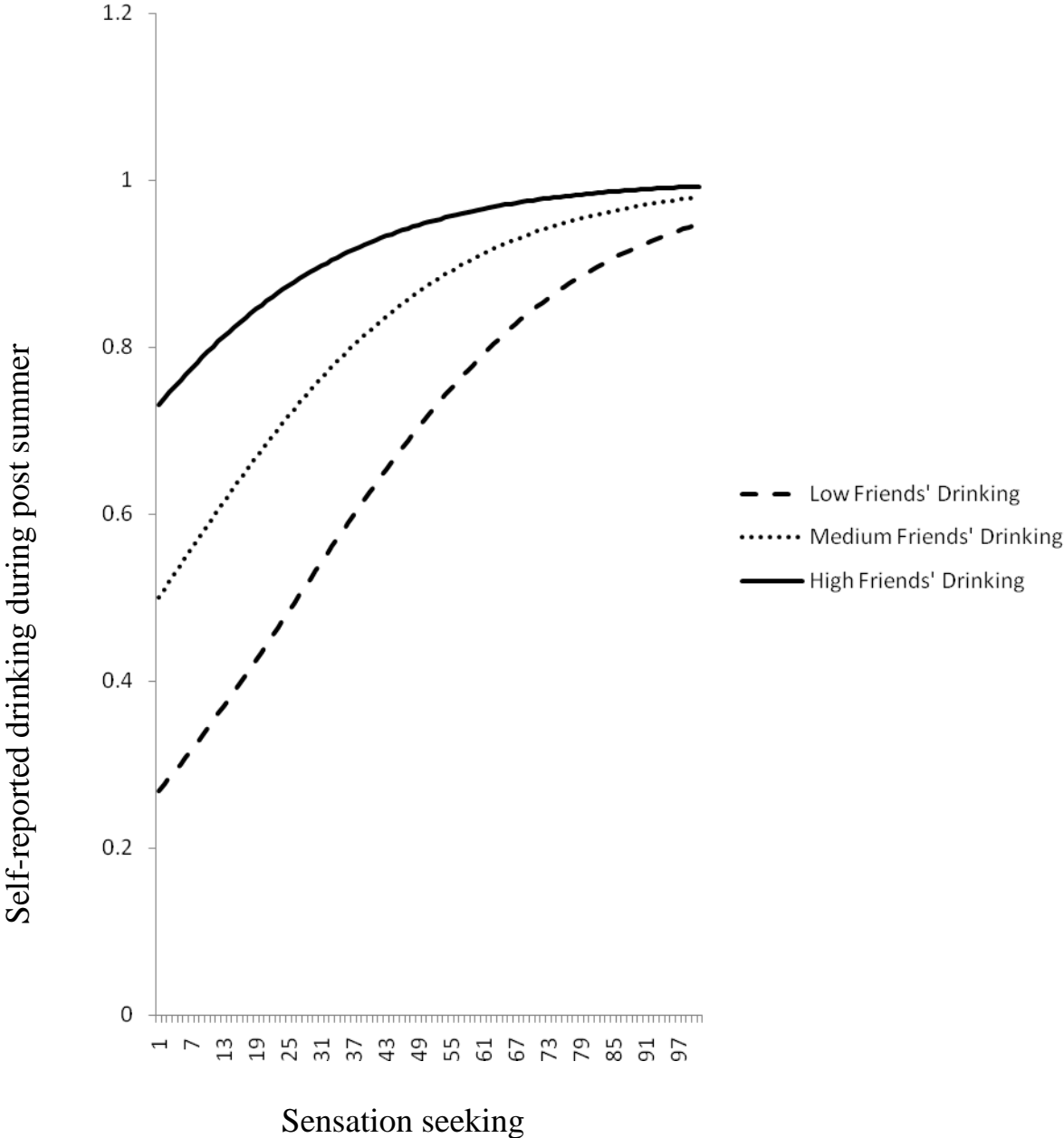


Figure 6

Moderating Effect of Friends' Alcohol Frequency on the relationship between Negative Urgency and AUDIT (problems) During Wave One

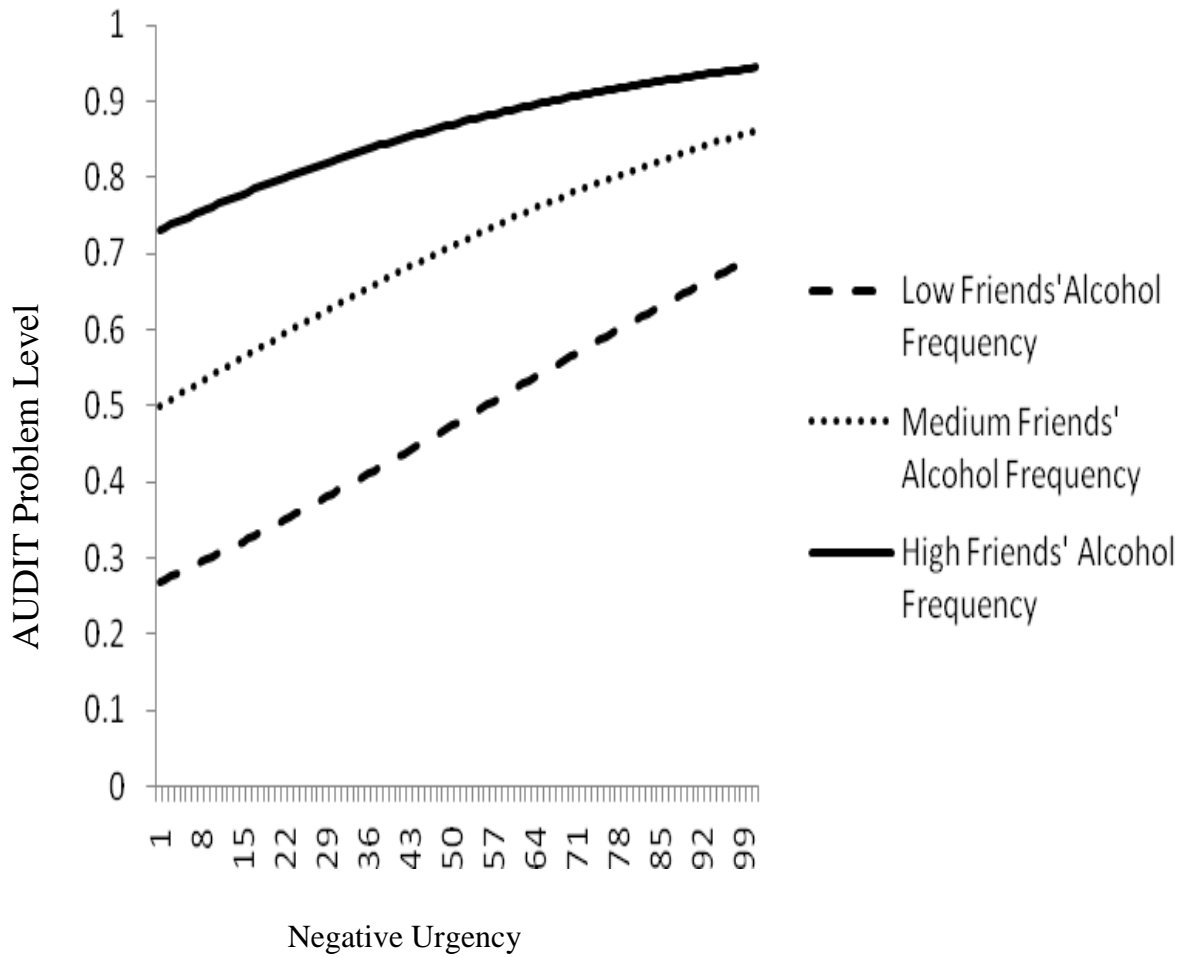
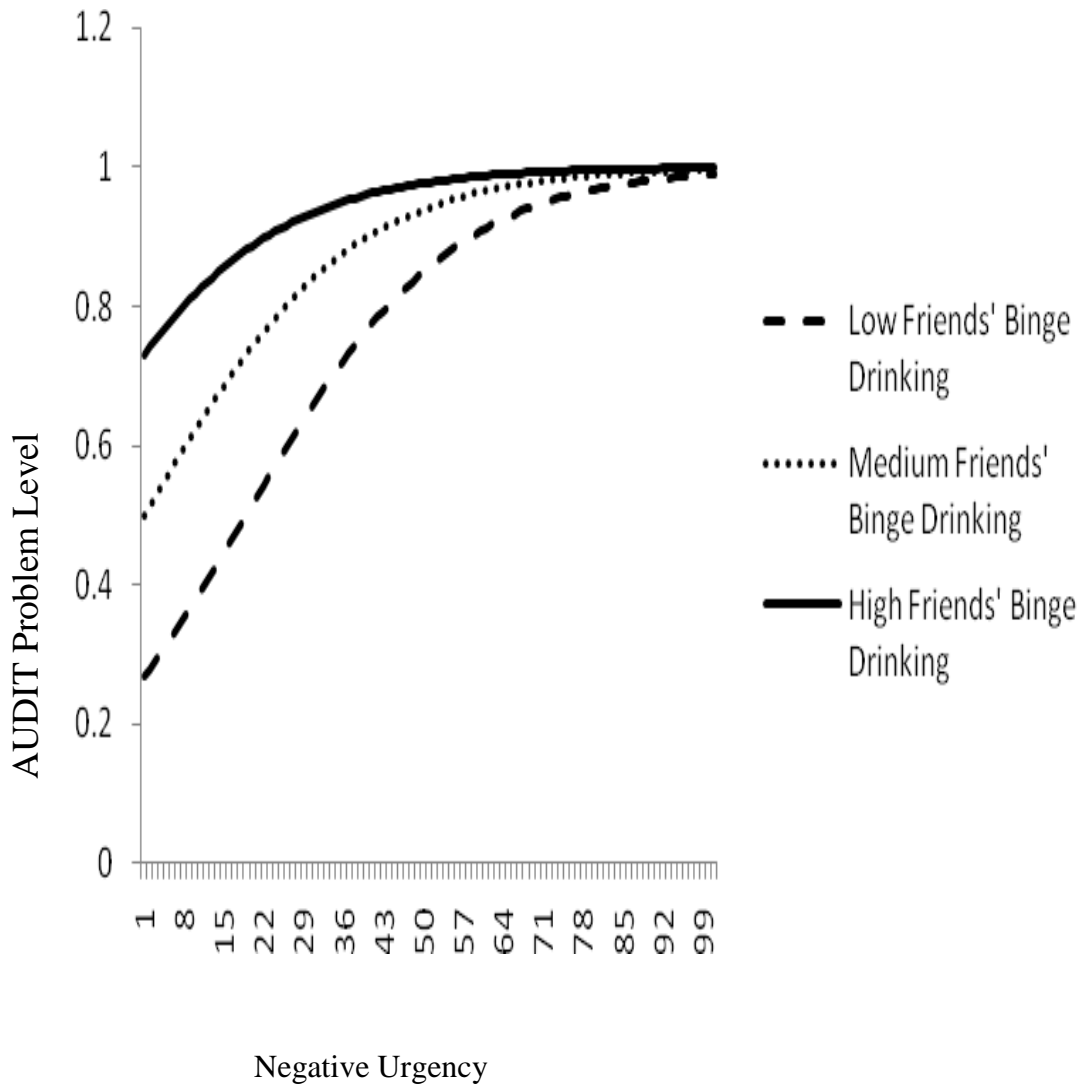


Figure 7

Moderating Effect of Friends' Binge Occurrence on the relationship between Negative Urgency and AUDIT (problems) During Wave One



Chapter Five: Discussion

The transition to college is a particularly important period of adjustment for students. For many, this is the first time living away from parents, the availability of substances increases, and the influence of peers becomes increasingly important. Reports estimate that a staggering 21.2% of college-aged young adults (i.e. age 18-25) meet criteria for alcohol or illicit drug use disorder (Substance Abuse and Mental Health Services Administration SAMHSA, 2006). Impulsive personality has long been investigated as a predictor of use and problems. More recently, researchers have begun to regard impulsivity as a trait with multiple facets.

The present study was designed to examine how two of those impulsive personality traits, the tendency for novel and thrilling experiences as well as the tendency to experience dysregulation under conditions of negative affect, relate to substance use and problems across the transition to college. Further, this study examined how peers impacted the association between impulsive personality and substance use/problems across this critical time of transition. Prior to this investigation, there were no examinations of the potential impact of peers on negative urgency and substance use.

The results of the study provided support for several of the hypotheses set forth. First, sensation seeking did predict substance use during the summer and the first year of college as well as during the summer following the freshman year. Second, negative urgency did predict substance use most consistently during the fall, which was hypothesized to capture the immediate adjustment to college. However, contrary to the hypothesis, negative urgency also predicted substance use at other points during the transition to college, although not consistently. Third, the hypothesis that peers' use would moderate the relationship between sensation seeking and substance use was supported, but only for alcohol at two time points and not for other substances.

Finally, there was support for the hypothesis that peers would not moderate the relationship between negative urgency and substance use. However, peers' use (both frequency and binge occurrence) did moderate the association between problematic drinking and negative urgency during the freshman year.

The trend lines illustrate that there are differences in the manner in which personality predicts substance use across time. First, across substances, high sensation seeking predicted relatively higher amounts of use as compared to the strength of high negative urgency. Also, the results revealed that the high sensation seeking, high negative urgency personality predicted higher substance use than the low sensation seeking, low negative urgency personality. Though high sensation seekers have been conceptualized to be at increased risk of drinking, results of the current study suggest that negative urgency may also be an important factor when delineating who may be at most risk for college drinking. Presumably, negative urgency has an additive prediction capability, even with sensation seeking in the model. Perhaps this could be explained by considering sensation seeking and negative urgency as active and reactive pathways to risky behavior, respectively. It may be the case that an individual who is high in sensation seeking is at increased risk for substance use due in part to an active pathway whereby they seek out substances. If that high sensation seeker is also highly reactive while experiencing negative affect, it is possible that their risk is increased by this additional pathway. Further examinations of the etiology of impulsive personality and substance use will need to be conducted before conclusions can be made, however, based on the evidence, it is reasonable to suggest that both facets be included in substance use models. The effects of personality were especially pronounced for alcohol use across time. But for each substance, there was an increase in use from the pre-summer to the fall. This time represents the transition to college and results support

that personality has the strongest association with increases in college substance use occurring during the immediate transition to college. The fall increase in substance use reported in the current study may be related to a tendency to rely on personality characteristics when one encounters unfamiliar situations, as Caspi & Roberts (2001) asserted. College may be a novel and unfamiliar enough circumstance that personality dispositions become prominent as one seeks new social groups and selects activities.

There were interesting differences in the way that sensation seeking and negative urgency were related to substance use. Consistent with previous findings (Lynam & Miller, 2004; Whiteside & Lynam, 2003; Johnson & Cropsey, 2010; Hutchinson, Patock-Peckham, Cheong, & Nagoshi, 1998), sensation seeking was a strong predictor of substance use. Specifically, sensation seeking was associated with substance use across all four time periods of the transition to college and was associated with each substance. These findings are not surprising considering the body of research that has demonstrated that the tendency to seek out novel and thrilling experiences is associated with substance use. The necessity to seek out external stimulation could be fulfilled by substance use. It is possible that those high in this facet of impulsivity are likely to seek out a variety of situations where they can fulfill this need for stimulation. Because sensation seeking is a strong predictor of substance use, it appears that the need for stimulation is not contingent upon which substance is used nor does it appear to be dependent upon the time period during the first year of college. Therefore, sensation seeking appears to serve as a broad predictor of substance use. It is possible that sensation seeking represents an approach pathway to impulsive behavior and this propensity may not be context (.i.e. substance choice or time period) specific.

Negative urgency also was associated with substance use at various times during the

transition to college, though not as consistently as sensation seeking. It should be noted, however, that negative urgency was most consistently related to substance use during the fall, which can be conceived of as the period within the transition to college that is most indicative of adjustment. Negative urgency may be particularly relevant to substance use during such a time. As previously mentioned, the transition to college brings with it significant life changes for the young adult: increased autonomy, more choices of activities to engage in, and more exposure to a variety of environments with which to interact. It is therefore conceivable that these young adults experience some adjustment to their new lives. As students during the fall semester, they have new living situations and have to navigate the social waters of campus life; this may also be a time of some negative emotion. Other difficult situations may be encountered by new college freshmen that may elicit negative emotion, situations such as dealing with academic pressures, difficulty being away from home, and lacking support systems. Students high in negative urgency and also having a difficult time adjusting to the new pressures of college life may likely to exhibit rash behavior in many circumstances. For instance, if a student high in negative urgency receives their first failing grade on an exam or experiences their first disagreement with a roommate, the subsequent rash action may be drinking. The findings of the current study seem to support the idea that the fall represents a time of particular risk for those high in negative urgency.

The current study further examined differences in moderation relationships by examining the influence of peers' use on personality and substance use as well as substance use problems. Only for alcohol use and only during the spring and post-summer time points, did peers' use moderate the relationship between sensation seeking and drinking. The findings provide some support for the hypothesis that the relation between sensation seeking and substance use can be

moderated by peer use.

It appears that those who are higher in sensation may be at increased risk for drinking due to the strong tendency to seek out risky activities. This approach tendency appears to be prominent regardless of peer alcohol use. Essentially, it appears that the drinking of those intermediate and lower in sensation seeking, who ordinarily would not have the tendency to seek out such risky behaviors, can influence and be influenced by the use of their friends. This is an interesting finding, especially because it only occurred during the later part of the school year for students. The transition to college brings about new environments, increased access to substances, and presumably, new peer groups. It appears that after students have experienced the fall and the major adjustment period, the role of their peers becomes increasingly important. It could be the case that after settling into college and enduring the adjustment, students seek out and establish new peer groups that are subsequently influencing their behavior and/or the behavior of their peers. The findings of reciprocal effects of peer influence and alcohol use as reported from the Read et al. (2005) might suggest that the role of peers in the current study may be a function of reciprocal determinism. It is possible that during the spring and post-summer, alcohol use may influence peer drinking; in turn peer drinking may influence alcohol use.

The finding that peers' use can, at particular times, moderate the association between sensation seeking and drinking, is especially notable in light of the finding that in no instance did peer use moderate the relation between negative urgency and any substance use. Why might this be the case? It could be the case that although in the current study there were some instances within which negative urgency predicted substance use, negative urgency is most consistent when predicting problems associated with use. Several studies support the notion that negative urgency is highly related to problems (Smith, et al., 2010; Cyders Flory, Rainer, & Smith, 2009;

Fischer, et al., 2007). The moderation findings of the current study also provide support for the association between negative urgency and problematic use. Specifically, both peers' drinking and binge drinking moderated the relationship between negative urgency and problematic drinking during the freshman year and this was the only occurrence in which negative urgency was moderated by peers.

Finally, the finding that peer use had no impact on the relationship between negative urgency and substance use could be viewed in light of how negative affect and the subsequent rash action may be relating to each other. It is possible that when one who tends to experience dysregulation under conditions of negative affect experiences intense negative emotions, such an individual may impulsively engage in substance use. The substance use could serve as a negative reinforcer because it could temporarily distract from negative mood and provide a rewarding experience. This idea was introduced by Fisher, Smith, & Cyders (2008) as a potential process for negative urgency relating to binge eating behavior. They noted that a study by Smyth et al., (2007) found bulimic women with higher rates of bingeing under conditions of extreme negative emotion, and that after binge behavior, negative emotion declined and further, positive emotion increased. Perhaps substance use operates in a similar manner for college students who tend to experience dysregulation under conditions of negative affect. Suppose a new student receives their first failing exam and in their distress, impulsively drinks several alcoholic beverages. It is possible that the distress may be temporarily reduced and that a positive feeling ensues. Perhaps a process such as this is cyclical across time therefore leading to problems with alcohol. Presumably because drinking alcohol may lead to more failing grades, which in turn may lead to increases in alcohol consumption. If this is the case, such a process would seem to be highly internal and therefore independent of peer use.

The results of the current study are important for considering future investigations of predictors of substance use among college students. Although the present study provides valuable suggestions for such investigations, the findings should be considered with regard to several limitations. First, though the current study investigated four discrete time points within the transition to college, it should be noted that these time points represent data from only two real measurement assessments. As noted previously, participants completed assessments of substance use twice, one year apart. However, the data from those two time points was both current and retrospective and was extracted to create four time periods of investigation to represent the transition to college. The current study could have been strengthened by actually assessing the participants at each of the four time points and would have eliminated reliance on retrospective data. However, the Life History Calendar, although retrospective in nature, has been employed in other studies and has been found to be reliable.

Second, the measure of peers' substance use was gathered from participants' reporting on the perceived substance use of their friends and not obtained from the friends directly. The accuracy of participants reporting on frequency of their friend's use may be questioned. A better measure would be to have friends of the participants assessed directly. Related to peer use, the current study only included data of peer use from the time one assessment rather than including both time one and time two assessments. There was significant amount of missing data at time two which precluded any discussion of changes in peer influence across time. However, the Peer Substance Use Questionnaire assessed and averaged substance use of the participants' three closest friends. Depending on when the participant came in for their assessment, the friends they reported on could have been friends prior to college or friends met during college. Future studies would benefit from having the friends of the participants complete their own substance use

history. However, if that is not possible, asking participants to specifically report on the substance use of their current college friends may be beneficial.

Finally, one major goal of the current study was to examine the dynamic manner in which sensation seeking and negative urgency relate to substance use and how peers may moderate that relationship. Though the study formally incorporated time into all of the mixed models, interpretation of the results could be strengthened by a model that specifically examined personality and changes in substance use rather than the dynamic interaction of personality and substance use across time. However, much insight has been gained into the role of personality, peers, and substance use. For instance, the current study provided further evidence that sensation seeking and negative urgency have differential relations to substance use and problems across the transition to college. Further, the role of peer use on these associations varies by personality characteristic as well as time period within the first year of college. Future studies should be designed employing methodologies such as trajectory or growth curve analyses to examine changes.

Even considering the potential limitations of the current study, the findings have several important implications. The present study is the first to investigate the impact of peers on the association between both sensation seeking and negative urgency and substance use across the transition to college. The results highlight why this is such an important area of investigation because the role of peers emerges as an increasingly important consideration when assessing the transition to college, substance use, and problems associated with substance use. The current study may help guide our thinking on how the person by situation approach can and should be considered in substance use research, especially for college students. Indeed, there are many contextual factors that may influence substance use for college students and the influence of

peers is just one. Future research should begin to examine other situational contexts related to college students such as resistance to peer influence, Greek affiliation, and living situation. For each of these, they may represent either protective or risk factors as it relates to substance use and problems. For example, resistance to peer influence, not being a member of the Greek community, and living at home with parents may be considered protective against substance use. On the other hand, susceptibility to peer influence, Greek affiliation, and living on campus may be risk factors for substance use due to increased access to substances and those who may use them. Future studies should continue to investigate the potential mitigating role of contextual factors such as these.

The study also has implications for prevention researchers in general. Results provide further evidence that different facets of impulsive personality have different pathways to impulsive behavior. Prevention efforts could be targeted according to the pathway. For instance, for higher sensation seekers, prevention could be focused on how to achieve stimulation in appropriate ways whereas lower sensation seekers could benefit from education on how selection of their situations, environments, and peers can impact their risk of substance use. The high sensation seeking student may benefit from learning about the exciting clubs and organizations offered on their college campus prior to the fall semester. Perhaps summer orientations could highlight for these students how options such as ski clubs could serve to satisfy the need for stimulation. For those higher in negative urgency, perhaps cognitive or mindfulness training on skills of how to mitigate negative emotion before it leads to rash action would be beneficial. The student high in negative urgency may benefit from learning about yoga or meditation clubs on their college campus prior to the fall semester. Although these outlets are not mindfulness or skills training per se, there are similar elements such as observing current states with non-

judgmental awareness. This mindful awareness of states may be helpful for those students high in negative urgency to assist them of being aware of their impulses without acting. In contrast, because those lower in negative urgency did not appear to be at particular risk of substance use in the current study, they may benefit from a more general awareness of substance use and associated risks.

In conclusion, more research is needed in this very complex topic of transitioning to college. For students, parents, and college administrators, and prevention researchers, substance use is of particular concern. The field would benefit from additional investigations of how the relation of impulsive personality to substance use can be moderated by contextual factors.

Appendix A- UPPS

Following are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statements. Be sure to indicate your agreement or disagreement for every statement following.

	Agree Strongly	Agree Some	Disagree Some	Disagree Strongly
1. I have a reserved and cautious attitude toward life.	1	2	3	4
2. I have trouble controlling my impulses.	1	2	3	4
3. I generally seek new and exciting experiences and sensations.	1	2	3	4
4. I generally like to see things through to the end.	1	2	3	4
5. When I am very happy, I can't seem to stop myself from doing things that can have bad consequences.	1	2	3	4
6. My thinking is usually careful and purposeful.	1	2	3	4
7. I have trouble resisting my cravings (for food, cigarettes, etc.).	1	2	3	4
8. I'll try anything once.	1	2	3	4
9. I tend to give up easily.				
10. When I am in a great mood, I tend to get into situations that could cause me problems.				
11. I am not one of those people who blurt out things without thinking.	1	2	3	4
12. I often get involved in things I later wish I could get out of.	1	2	3	4
13. I like sports and games in which you have to choose your next move very quickly.	1	2	3	4
14. Unfinished tasks really bother me.	1	2	3	4
15. I like to stop and think things over before I do them.	1	2	3	4
16. When I feel bad, I will often do things I later regret in order to make myself feel better now.	1	2	3	4
17. I would enjoy water skiing.	1	2	3	4
18. Once I get going on something I hate to stop.	1	2	3	4
19. I tend to lose control when I am in a great mood.	1	2	3	4
20. I don't like to start a project until I know exactly how to proceed.	1	2	3	4
21. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.	1	2	3	4
22. I quite enjoy taking risks.	1	2	3	4
23. I concentrate easily.	1	2	3	4
24. When I am really ecstatic, I tend to get out of control.	1	2	3	4
25. I would enjoy parachute jumping.	1	2	3	4
26. I finish what I start.	1	2	3	4
27. I tend to value and follow a rational, "sensible" approach to things.	1	2	3	4
28. When I am upset I often act without thinking.	1	2	3	4
29. Others would say I make bad choices when I am extremely happy about something.	1	2	3	4

30.	I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	1	2	3	4
31.	I am able to pace myself so as to get things done on time.	1	2	3	4
32.	I usually make up my mind through careful reasoning.	1	2	3	4
33.	When I feel rejected, I will often say things that I later regret.	1	2	3	4
34.	Others are shocked or worried about the things I do when I am feeling very excited.	1	2	3	4
35.	I would like to learn to fly an airplane.	1	2	3	4
36.	I am a person who always gets the job done.	1	2	3	4
37.	I am a cautious person.	1	2	3	4
38.	It is hard for me to resist acting on my feelings.	1	2	3	4
39.	When I get really happy about something, I tend to do things that can have bad consequences.	1	2	3	4
40.	I sometimes like doing things that are a bit frightening.	1	2	3	4
41.	I almost always finish projects that I start.	1	2	3	4
42.	I often make matters worse because I act without thinking when I am upset.	1	2	3	4
43.	When overjoyed, I feel like I can't stop myself from going overboard.	1	2	3	4
44.	I would enjoy the sensation of skiing very fast down a high mountain slope.	1	2	3	4
45.	Sometimes there are so many little things to be done that I just ignore them all.	1	2	3	4
46.	I usually think carefully before doing anything.	1	2	3	4
47.	When I am really excited, I tend not to think of the consequences of my actions.	1	2	3	4
48.	In the heat of an argument, I will often say things that I later regret.	1	2	3	4
49.	I would like to go scuba diving.	1	2	3	4
50.	I tend to act without thinking when I am really excited.	1	2	3	4
51.	I always keep my feelings under control.	1	2	3	4
52.	When I am really happy, I often find myself in situations that I normally wouldn't be comfortable with.	1	2	3	4
53.	Before making up my mind, I consider all the advantages and disadvantages.	1	2	3	4
54.	I would enjoy fast driving.	1	2	3	4
55.	When I am very happy, I feel like it is ok to give in to cravings or overindulge.	1	2	3	4
56.	Sometimes I do impulsive things that I later regret.	1	2	3	4
57.	I am surprised at the things I do while in a great mood.	1	2	3	4

Appendix B- Friend Drug Questionnaire

In the following questionnaire, you will be asked about your closest friends and their use of various substances. Please answer as honestly as possible.

Please enter the initials of your CLOSEST FRIEND:

What is this friend's gender?		MALE		FEMALE			
1.	What is the nature of your relationship with this person?	Best friend	Friend	Significant Other	Parent	Sibling	Other
2.	How many hours per week do you generally spend with this person? (168 hrs. equals a week)	0-6 hrs/week	7-12 hrs/week	13-18 hrs/week	19-24 hrs/week	25-72 hrs/week	73-168 hrs/week
3.	How important do you consider this friend?	Somewhat important		Very important		The most important person in my life	
4.	How long have you known this person?	Less than 1 month	1-3 months	Less than 1 year	1-3 years	More than 3 years	
5.	Does this person smoke cigarettes?	Yes				No	
6.	How many packs per day does he/she smoke?	Just a few (1-4)	About half a pack (5-14)	About a pack (15-24)	About 1 ½ packs (25-34)	About 2 packs (35-44)	More than two packs (45+)
7.	How harmful does he/she think smoking is?	Not at all harmful		Somewhat harmful		Very harmful	
8.	How does/would he/she feel about you smoking cigarettes?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	

9.	Does this person drink alcohol?	Yes					No			
10.	On average, how often does he/she drink?	Less than once a month	About 1-2 times per month, never in large amounts	About 1-2 times per month, sometimes in large amounts	About 1-2 times per week, never in large amounts	About 1-2 times per week, always in large amounts	Almost every day, never in large amounts	Almost every day, sometimes in large amounts	Almost every day, usually in large amounts	
11.	Does he/she ever "binge" drink? (i.e., have five or more drinks in the course of an hour or two?)	Yes					No			
12.	How harmful does he/she think drinking alcohol is?	Not at all harmful			Somewhat harmful		Very harmful			
13.	How does/would he/she feel about you drinking alcohol?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision				
14.	Does he/she smoke marijuana?	Yes					No			
15.	On average, how often does he/she use marijuana?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day				
16.	How much does he/she smoke at a time?	1-2 hits	2-4 hits	4-8 hits	8+ hits					
17.	How harmful does he/she think marijuana is?	Not at all harmful			Somewhat harmful		Very harmful			

18.	How does/would he/she feel about you using marijuana?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
19.	Does he/she use amphetamines? (ex: meth, speed, Ritalin, diet pills)	Yes			No		
20.	On average, how often does he/she use amphetamines?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
21.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
22.	How harmful does he/she think using amphetamines is?	Not at all harmful		Somewhat harmful		Very harmful	
23.	How does/would he/she feel about you using amphetamines?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
24.	Does this person use any other illegal substances?				Yes	No	
25.	Does your friend use non-alcohol depressants (e.g. Barbiturates, Librium, Sesonal, Sleeping Pills, Tranquilizers, Valium, Xanax, etc.)?				Yes	No	
26.	Does your friend use cocaine or crack?				Yes	No	
27.	Does your friend use opioids (e.g. codeine, darvon, demerol, dilaudid, methadone, morphine, opium, percodan, talwin)?				Yes	No	
28.	Does your friend use inhalants (e.g. Glue, Toluene, Gasoline, Paint, Paint Thinner)?				Yes	No	
29.	Does your friend use hallucinogens (e.g. DMT, LSD, Mescaline, Mushrooms, Peyote, Psilocybin)?				Yes	No	

30.	Does your friend use Ecstasy/MDMA?					Yes	No
31.	Does your friend use club drugs (e.g. GHB, Ketamine, Rohypnol)?					Yes	No
32.	On average, how often does he/she use these drugs?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
33.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
34.	How harmful does he/she think using illegal drugs is?	Not at all harmful		Somewhat harmful		Very harmful	
35.	How does/would he/she feel about you using illegal drugs?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	

Please enter the initials of your SECOND CLOSEST FRIEND:

What is this friend's gender?		MALE			FEMALE			
1.	What is the nature of your relationship with this person?	Best friend	Friend	Significant Other	Parent	Sibling	Other	
2.	How many hours per week do you generally spend with this person? (168 hrs. equals a week)	0-6 hrs/week	7-12 hrs/week	13-18 hrs/week	19-24 hrs/week	25-72 hrs/week	73-168 hrs/week	
3.	How important do you consider this friend?	Somewhat important		Very important	The most important person in my life			
4.	How long have you known this person?	Less than 1 month	1-3 months	Less than 1 year	1-3 years	More than 3 years		
5.	Does this person smoke cigarettes?	Yes				No		
6.	How many packs per day does he/she smoke?	Just a few (1-4)	About half a pack (5-14)	About a pack (15-24)	About 1 ½ packs (25-34)	About 2 packs (35-44)	More than two packs (45+)	
7.	How harmful does he/she think smoking is?	Not at all harmful		Somewhat harmful		Very harmful		

8.	How does/would he/she feel about you smoking cigarettes?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision			
9.	Does this person drink alcohol?	Yes				No			
10.	On average, how often does he/she drink?	Less than once a month	About 1-2 times per month, never in large amounts	About 1-2 times per month, sometimes in large amounts	About 1-2 times per week, never in large amounts	About 1-2 times per week, always in large amounts	Almost every day, never in large amounts	Almost every day, sometimes in large amounts	Almost every day, usually in large amounts
11.	Does he/she ever "binge" drink? (i.e., have five or more drinks in the course of an hour or two?)	Yes				No			
12.	How harmful does he/she think drinking alcohol is?	Not at all harmful			Somewhat harmful		Very harmful		
13.	How does/would he/she feel about you drinking alcohol?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision			
14.	Does he/she smoke marijuana?	Yes				No			
15.	On average, how often does he/she use marijuana?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day			
16.	How much does he/she smoke at a time?	1-2 hits	2-4 hits	4-8 hits	8+ hits				

17.	How harmful does he/she think marijuana is?	Not at all harmful		Somewhat harmful		Very harmful	
18.	How does/would he/she feel about you using marijuana?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
19.	Does he/she use amphetamines? (ex: meth, speed, Ritalin, diet pills)		Yes		No		
20.	On average, how often does he/she use amphetamines?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
21.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
22.	How harmful does he/she think using amphetamines is?	Not at all harmful		Somewhat harmful		Very harmful	
23.	How does/would he/she feel about you using amphetamines?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
24.	Does this person use any other illegal substances?			Yes		No	
25.	Does your friend use non-alcohol depressants (e.g. Barbiturates, Librium, Seasonal, Sleeping Pills, Tranquilizers, Valium, Xanax, etc.)?			Yes		No	
26.	Does your friend use cocaine or crack?			Yes		No	
27.	Does your friend use opioids (e.g. codeine, darvon, demerol, dilaudid, methadone, morphine, opium, percodan, talwin)?			Yes		No	
28.	Does your friend use inhalants (e.g. Glue, Toluene,			Yes		No	

	Gasoline, Paint, Paint Thinner)?						
29.	Does your friend use hallucinogens (e.g. DMT, LSD, Mescaline, Mushrooms, Peyote, Psilocybin)?	Yes		No			
30.	Does your friend use Ecstasy/MDMA?	Yes		No			
31.	Does your friend use club drugs (e.g. GHB, Ketamine, Rohypnol)?	Yes		No			
32.	On average, how often does he/she use these drugs?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
33.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
34.	How harmful does he/she think using illegal drugs is?	Not at all harmful		Somewhat harmful		Very harmful	
35.	How does/would he/she feel about you using illegal drugs?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	

Please enter the initials of your THIRD CLOSEST FRIEND:

What is this friend's gender?		MALE		FEMALE			
1.	What is the nature of your relationship with this person?	Best friend	Friend	Significant Other	Parent	Sibling	Other
2.	How many hours per week do you generally spend with this person? (168 hrs. equals a week)	0-6 hrs/week	7-12 hrs/week	13-18 hrs/week	19-24 hrs/week	25-72 hrs/week	73-168 hrs/week
3.	How important do you consider this friend?	Somewhat important		Very important	The most important person in my life		
4.	How long have you known this person?	Less than 1 month	1-3 months	Less than 1 year	1-3 years	More than 3 years	
5.	Does this person smoke cigarettes?	Yes			No		

6.	How many packs per day does he/she smoke?		Just a few (1-4)	About half a pack (5-14)	About a pack (15-24)	About 1 ½ packs (25-34)	About 2 packs (35-44)	More than two packs (45+)	
7.	How harmful does he/she think smoking is?		Not at all harmful		Somewhat harmful		Very harmful		
8.	How does/would he/she feel about you smoking cigarettes?		He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision		
9.	Does this person drink alcohol?		Yes				No		
10.	On average, how often does he/she drink?	Less than once a month	About 1-2 times per month, never in large amounts	About 1-2 times per month, sometimes in large amounts	About 1-2 times per week, never in large amounts	About 1-2 times per week, always in large amounts	Almost every day, never in large amounts	Almost every day, sometimes in large amounts	Almost every day, usually in large amounts
11.	Does he/she ever "binge" drink? (i.e., have five or more drinks in the course of an hour or two?)		Yes				No		
12.	How harmful does he/she think drinking alcohol is?		Not at all harmful		Somewhat harmful		Very harmful		
13.	How does/would he/she feel about you drinking alcohol?		He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision		
14.	Does he/she smoke marijuana?		Yes				No		

15.	On average, how often does he/she use marijuana?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
16.	How much does he/she smoke at a time?	1-2 hits	2-4 hits	4-8 hits	8+ hits		
17.	How harmful does he/she think marijuana is?	Not at all harmful		Somewhat harmful		Very harmful	
18.	How does/would he/she feel about you using marijuana?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
19.	Does he/she use amphetamines? (ex: meth, speed, Ritalin, diet pills)		Yes		No		
20.	On average, how often does he/she use amphetamines?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
21.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
22.	How harmful does he/she think using amphetamines is?	Not at all harmful		Somewhat harmful		Very harmful	
23.	How does/would he/she feel about you using amphetamines?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	
24.	Does this person use any other illegal substances?				Yes	No	

25.	Does your friend use non-alcohol depressants (e.g. Barbiturates, Librium, Seasonal, Sleeping Pills, Tranquilizers, Valium, Xanax, etc.)?	Yes	No				
26.	Does your friend use cocaine or crack?	Yes	No				
27.	Does your friend use opioids (e.g. codeine, darvon, demerol, dilaudid, methadone, morphine, opium, percodan, talwin)?	Yes	No				
28.	Does your friend use inhalants (e.g. Glue, Toluene, Gasoline, Paint, Paint Thinner)?	Yes	No				
29.	Does your friend use hallucinogens (e.g. DMT, LSD, Mescaline, Mushrooms, Peyote, Psilocybin)?	Yes	No				
30.	Does your friend use Ecstasy/MDMA?	Yes	No				
31.	Does your friend use club drugs (e.g. GHB, Ketamine, Rohypnol)?	Yes	No				
32.	On average, how often does he/she use these drugs?	Only once or twice ever	1-2 times a month	1-2 times a week	Almost everyday	Several times a day	
33.	On average, how much does he/she use at a time?	1 pill, line, hit or less	2 pills, lines, hits	3 pills, lines, hits	4 pills, lines, hits	5 pills, lines, hits	6 or more pills, lines, hits
34.	How harmful does he/she think using illegal drugs is?	Not at all harmful	Somewhat harmful	Very harmful			
35.	How does/would he/she feel about you using illegal drugs?	He/she would strongly disagree with my decision	He/she would disagree with my decision	He/she would neither agree nor disagree with my decision	He/she would agree with my decision	He/she would strongly agree with my decision	

Appendix C- Alcohol Use Disorders Identification Test

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?
2. How many drinks containing alcohol do you have on a typical day when you are drinking?
3. How often do you have six or more drinks on one occasion?
4. How often during the last year have you found that you were not able to stop drinking once you had started?
5. How often during the last year have you failed to do what was normally expected from you because of drinking?
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
7. How often during the last year have you had a feeling of guilt or remorse after drinking?
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
9. Have you or someone else been injured as a result of your drinking?
10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

Appendix D--UK Screening Questionnaire

1. What is your gender? (circle one) Male Female
2. What is your home county (e.g. Fayette) and state.
-

3. What is your race/ethnicity?
-

The following questions ask about specific acts and activities that you may have participated in before the age of 18. Please choose yes or no.

4.	Before the age of 18, did you frequently (6 or more times) skip school without permission?	Yes	No
5.	Before the age of 18, did you ever hold a part- or full-time job?	Yes	No
6.	Before the age of 18, did you frequently (6 or more times) stay out much later at night than your parents said you should?	Yes	No
7.	Before the age of 18, did you ever attend religious services regularly?	Yes	No
8.	Before the age of 18, did you ever take something from a store without paying for it that would have cost \$10 or more?	Yes	No
9.	Before the age of 18, did you ever steal someone else's credit card and use it or forge someone else's name on a check?	Yes	No
10.	Before the age of 18, did you ever offer to help a total stranger?	Yes	No
11.	Before the age of 18, did you ever take money or other things without permission from someone's purse or wallet?	Yes	No
12.	Before the age of 18, did you ever break into a car, house, school, or store?	Yes	No
13.	Before the age of 18, did you ever travel to a different country?	Yes	No
14.	Before the age of 18, did you ever take something from an unlocked car or from somebody's yard or porch?	Yes	No
15.	Before the age of 18, did you ever tell lies or trick people into giving you their things or doing what you wanted?	Yes	No
16.	Before the age of 18, did you ever do volunteer work for a charity?	Yes	No
17.	Before the age of 18, did you ever pick on smaller peers or threaten or tease those who were too scared to fight you?	Yes	No
18.	Before the age of 18, did you ever deliberately damage someone's property?	Yes	No
19.	Before the age of 18, did you ever take part in a fight where a group of your friends were against another group?	Yes	No
20.	Before the age of 18, had you ever received an academic scholarship?	Yes	No
21.	Before the age of 18, did you ever have a physical fight with another individual?	Yes	No
22.	Before the age of 18, did you ever baby-sit a child who was under the age of 4 years old?	Yes	No

Appendix E- Life History Calendar

If you were not living at one of the places specified above, please indicate where you were living and which months you lived there:

Location: _____ Months: _____

If you were living with people other than those specified above, please indicate who you were living with and which months you lived with them:

Person/people: _____ Months: _____

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate where you were living during each month. (circle one)	Home	Home	Home	Home	Home	Home	Home	Home	Home	Home	Home	Home
	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm	Dorm
	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment	Apartment
	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House	Greek House
	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)
Please indicate who you were living with during each month. (circle one)	Alone	Alone	Alone	Alone	Alone	Alone	Alone	Alone	Alone	Alone	Alone	Alone
	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family	Parents/ Family
	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates	Roommates
	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)	Other (specify below)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate whether you smoked cigarettes fairly regularly (more than just trying a few times) in each month. (circle one)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	N	N	N	N	N	N	N	N	N	N	N	N
About how often did you smoke in each month? (circle one)	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never
	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month
	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week
	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-
	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week
	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-
	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week
Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	
On average, how many cigarettes did you smoke per day in each month? (circle one)	None	None	None	None	None	None	None	None	None	None	None	None
	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few	Just a few
	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack	½ pack
	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack	1 pack
	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs	1 ½ packs
	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs	2 packs
	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs	>2 packs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate whether you smoked marijuana in each month. (circle one)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	N	N	N	N	N	N	N	N	N	N	N	N
About how often did you smoke marijuana in each month? (circle one)	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never	Never
	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month	1x/month
	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week	1x/week
	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-
	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week	3x/week
	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-	4-
	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week	5x/week
Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	Every day	
On average, how much marijuana did you have per day in each month? (circle one)	None	None	None	None	None	None	None	None	None	None	None	None
	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits
	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits
	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits
	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits
	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits
	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits
What was the most marijuana you had in one day in each month? (circle one)	None	None	None	None	None	None	None	None	None	None	None	None
	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits	1-2 hits
	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits	3-4 hits
	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits	5-8 hits
	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits	9-12 hits
	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits	13-16 hits
	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits	16+ hits

Note: 1 hit = 1 hit from a joint, pipe, or bong.
 ½ joint = 3-4 hits, 1 joint = 5-8 hits, 1 ½ joints = 9-12 hits, 2 joints = 12-16 hits

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate whether you used stimulants in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Were the stimulants prescribed for you in each month? (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
About how often did you use stimulants in each month? (circle one)	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day
On average, what amount of stimulants did you have per day in each month? (circle one)	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units
What was the highest amount of stimulants you had in one day in each month? (circle one)	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units	None 1 unit 2 units 3 units 4 units 5 units 6+ units

LHC - Stimulants

NOTE: 1 unit = 1 pill, 1 line, or 1 hit

If you used stimulants since last year, what kind did you use?

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate whether you used non-alcohol depressants that were not prescribed or at a higher dose than prescribed in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used cocaine/crack in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used opioids in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used inhalants in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used hallucinogens in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used ecstasy/MDMA in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Please indicate whether you used club drugs (e.g., GHB, ketamine, rohypnol) in each month. (circle one)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N

LHC – Other drugs **NOTE:** **Non-alcohol depressants** (ex: barbiturates, Librium, Seasonal, sleeping pills, tranquilizers, Valium, Xanax, etc.)
Opioids (ex: codeine, darvon, dilaudid, methadone, morphine, opium, percodan, talwin)
Inhalants (ex: glue, toluene, gasoline, paint thinner)
Hallucinogens (ex: DMT, LSD, mescaline, mushrooms, peyote, psilocybin)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Please indicate whether you drank alcohol in each month. (circle one)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	N	N	N	N	N	N	N	N	N	N	N	N
About how often did you drink in each month? (circle one)	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day	Never 1x/month 1x/week 2-3x/week 4-5x/week Every day
On average, how many drinks did you have per sitting in each month? (write in a number)	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
What was the most drinks you had in one sitting in each month? (write in a number)	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

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