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PREDICTING BINGE DRINKING AMONG UNDERGRADUATE COLLEGE STUDENTS

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By

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PREDICTING BINGE DRINKING AMONG UNDERGRADUATE COLLEGE STUDENTS

A Dissertation APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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TABLE OF CONTENTS

PAGE

LIST OF TABLES viii

ABSTRACT ix

INTRODUCTION 1

Background of the Problem 1

Statement of the Problem 5

Purpose of the Study 7

Research Questions and Hypotheses 8

REVIEW OF THE LITERATURE 11

Demographic Variables 12

Gender 12

Age 14

Grade Point Average 15

Ethnicity 15

Marital Status 19

Religion 19

Living Arrangements 21

Social and Situational Variables 22

Greek Society 23

Athletics 31

TABLE OF CONTENTS (Continued)

PAGE

Reasons for Drinking 37

Emotional and Psychological Factors 38

Outcome Expectancies and Coping Strategies 40

Social Reasons 48

History of Alcohol and Drug Use at the University of Oklahoma 51

METHODOLOGY 52

Methodological Approach 52

Selection of the Sample 53

Procedures 53

The Survey 54

Data Analysis 55

RESULTS 60

Preliminary Analysis 60

Discriminant of Student Binge Drinking Groups 64

Group Differences 76

DISCUSSION 78

Support for Hypotheses 78

Overview of the Study 93

Limitations of the Study 93

Directions for Future Research 95

TABLE OF CONTENTS (Continued)

PAGE

REFERENCES 98

APPENDICES

A. Tables 113
B. Variable Descriptives 126
C. Use of Alcohol and Other Drugs in the Community Survey 131
D. Prospectus 142

LIST OF TABLES

TABLE		PAGE
1.	Analysis One Classification Results	114
2.	Analysis Two Classification Results	114
3.	Analysis Three Classification Results	115
4.	Analysis Four Classification Results	115
5.	Analysis Five Classification Results	116
6.	Analysis Six Classification Results	116
7.	Reasons for Drinking Test of Equality of Means	118
8.	Other Predictor Variables of Binge Drinking	119
9.	Post hoc Analysis for Reasons for Drinking	120
10.	Post hoc Analysis for Other Predictor Variables of Binge Drinking	122

ABSTRACT

The present investigation sought to provide a comprehensive examination of the binge drinking behavior of undergraduates at the University of Oklahoma so as to determine the best predictors of such behavior. Archival data consisting of a random sample of 503 undergraduates was analyzed utilizing multiple discriminant analysis procedures. A combination of demographic and social variables emerged as the strongest predictors of binge drinking with a modest overall classification accuracy (67.8%). Follow up robust tests of equality of means and subsequent Tamhane post hoc analyses were conducted. Consistent with previous investigations, variables such as Greek membership, ethnicity, use of tobacco products, and residency showed predictive power in predicting binge drinking. Moreover, frequent binge drinkers appeared to be a more psychologically maladjusted group using alcohol for self-medication purposes. Limitations and implications for future research are presented.

INTRODUCTION

Background of the Problem

The use of alcohol on college campuses has been a concern for ongoing studies since the landmark study of 17,000 students by Straus and Bacon in 1953. Despite the fact that approximately one half of undergraduate students are legally underage, the prevalence of alcohol use and abuse among college students is well substantiated (e.g., Alva, 1998; Duitsman & Colbry, 1995; Myerholtz & Rosenberg, 1998). Widespread alcohol use and abuse pose serious concerns for the college student population (e.g., Clayton, 1999; O'Hare & Tran, 1997; Senchak, Leonard, & Greene, 1998; Wood, Read, Palfai, & Stevenson, 2001). Simply being in college increases the likelihood of alcohol consumption. College students report higher levels of alcohol use than young adults not enrolled in college (Prendergast, 1994), a reality that continues to challenge college administrators throughout the United States (Spratt & Turrentine, 2001). Moreover, there is evidence that college-bound students in high school drink alcohol more than their non-college-bound peers (Schulenberg, Maggs, Long, Sher, Gotham, Baer, Kivlahan, Marlatt,& Zucker, 2001). Perhaps more importantly, data collected from several sources indicates that about 42 percent of college students engage in binge drinking, (i.e. drinking to get drunk) (Clayton, 1999; Dickinson, 1999). This is up from a 1997 study by Sher and colleagues that reports one in every three students drink to get drunk (Sher, Bartholow, & Nanda, 2001). Although these statistics are alarming, the National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism released, on March 17, 2005, a statement indicating that the harm to

college students resulting from alcohol consumption may exceed previous estimates (National Institute on Alcohol Abuse and Alcoholism, NIH News, March 17, 2005). Unintentional fatal injuries related to alcohol have increased. In fact, the researchers reported that approximately 1500 alcohol related fatalities occurred among U.S. college students aged 18-24 in 1998. This increased to more than 1700 in 2001. During the same period of time research indicates that the number of college students who drove under the influence of alcohol increased from 2.3 million to 2.8 million. The lead researcher, Ralph W. Hingson, ScD, calls for "…both improved measurement of these problems and efforts to reduce them" (Hingston, Heeren, Winter, & Wechsler, 2005, p.1).

College drinking is considered one of the most significant and complex health problems today (Schulenberg et al., 2001). Much of it is illegal, underage drinking, and most of it is considered an integral part of college life. In fact, David Satcher, M.D. United States Surgeon General 1998-2002, noted startling statistics on college student alcohol use including the fact that students spend $5.5 billion on alcohol each year (reportedly more than they spend on soft drinks, tea, milk, juice, coffee and books, combined; Dervarics, 1999). Yet, according to Schulenberg and colleagues (2001), "Despite the large sums of money dedicated to prevention and intervention programs, few programs have shown any significant results, and researchers continue to ask the same fundamental questions year after year" (p. 474).

With the popularity of alcohol, it is not surprising that a significant proportion of college students in the United States are heavy users of alcohol, which puts them at

an increased risk for numerous negative consequences (Bennett, McCrady, Johnson, & Pandina, 1999; Clements, 1999). Alcohol use is increasingly associated with residence hall damage, violent behavior, student attrition, property damage, lower academic performance (Dorsey, Scherer, & Real, 1999), legal difficulties, and missed classes (Werner & Greene, 1992). More importantly, alcohol use is related to injuries to self and others (Dorsey et al., 1999) as well as sexually transmitted disease and unplanned pregnancy (Werner & Greene, 1992). According to Crawford and Novak (2000), "Alcohol is involved in the majority of crimes and accidents that occur on college campuses. Even non-drinkers on campuses where alcohol use is prevalent are likely to experience damaged property and personal injury resulting from others' irresponsible drinking" (p. 269).

Surprisingly, one study found that 23 percent of students are frequent binge drinkers, that is, those who have consumed at least five drinks in a row at least three times during a two-week period (Wechsler, Lee, Kuo, & Lee, 2000). This figure is up from 20 percent when the first nationwide study was conducted in 1993. Binge drinking has been shown to be more prevalent among college students than among their same-age peers and is strongly related to serious injuries and injury-related deaths, particularly fatal motor vehicle crashes. A Harvard study found that binge drinkers are seven times more likely to miss classes and ten times more likely to damage property as are light drinkers (Marcus, 2000).

"For the more than six million Americans who attend college full-time, binge drinking is arguably the single most important cause of preventable morbidity and

mortality. Bingeing (heavy episodic alcohol consumption) is associated with a substantially heightened risk of serious social and psychological consequences" (Dowdall, Crawford, & Wechsler, 1998, p.706). Binge drinking is defined as the consumption of five or more drinks in one sitting (Syre, Martino-McAllister, & Vanada, 1997 and Johnston, O'Malley, & Bachman, 2001). Some criticism has been leveled at this definition, which also accounts for gender by defining binge drinking as consisting of five or more drinks by a male or four or more drinks by a women over a two-hour period (NIH Newsletter, 2004 and Wechsler, Dowdall, Davenport, & Rimm, 1995 and Wechsler, Lee, Nelson, & Lee, 2001). Other researchers believe that a real binge is 8, 10, or more drinks, but Wechsler (2000) argues that defining binge drinking out of existence will not change the fact of this complex and destructive problem.

Given the detrimental effects of alcohol use, particularly binge drinking, it is important to identify those college students who are most likely to engage in heavy alcohol use. One approach to identifying such individuals is to examine demographic variables such as gender and age which may act as predictor variables. Keefe and Newcomb (1996) took the approach one step further by categorizing factors that increase the use and abuse of alcohol as either contextual or psychosocial in nature. Included as contextual factors are the demographic variables such as gender while psychosocial factors include everything from personal attitudes toward substance abuse to social norms and significant reference groups (e.g. Greek society membership). Using data from both groups of factors, Grenier and colleagues described the highest at-risk drinkers as "freshmen, males, members of fraternities,

single, off-campus residents, and children of parents on the high end of the education continuum" (Grenier, Gorskey, & Folse, 1998, p. 79). In addition to the aforementioned demographics, researchers report that age (Makimoto, 1998), grade point average (Engs, Diebold, & Hanson, 1996), ethnicity (Clements, 1999), marital status (Makimoto, 1998), religiosity (Dunn, 2005), and athletic status (Gutgesell & Canterbury, 1999) are related to collegiate alcohol consumption. While this is a starting point for predicting those students most likely to engage in binge drinking, it may also be helpful to know why students choose to drink. If university administrators are able to identify the reasons their undergraduates are engaging in heavy alcohol consumption, more appropriate alternatives may be presented.

Statement of the Problem

The negative consequences of alcohol use by college students are staggering. Alcohol use is associated with lower socioeconomic backgrounds, lower ACT scores, greater sensation seeking, and greater risk accessibility (Brown, 1997). A survey conducted by Harvard University's School of Public Health found that frequent binge drinkers, defined as those individuals who had binged three or more times in the past two weeks, were four times as likely as those who did not binge to get behind in school work, five times as likely to have sex without protection, and 10 times as likely to damage property (Wechsler, Lee, Kuo, & Lee, 2000).

Despite almost a decade of good intentions and promising interventions, the persistence of binge drinking remains "a phenomenon of campus culture across student generations" (Keeling, 2000, p.196). Wechsler, Dowdall, Maenner, Gledhill-

Hoyt, and Lee (1998) concluded, "binge drinking is by far the single most serious public health problem confronting American colleges" (p. 257). The fact that binge drinking is often associated with the use of another substance such as an illegal drug compounds the problem dramatically. Basing their findings on the results of three national surveys, Gledhill-Hoyt, Hang Lee, Strote, and Wechsler (2000) found that, of those students who reported the use of an illicit drug (other than marijuana) in the past 30 days, 77% of them also reported binge drinking.

In 1990 the United States Public Health Service established national health promotion and disease prevention objectives for the year 2000 (Lewis, Goodhart, & Burns, 1996). One objective was directed toward reducing high-risk drinking behavior among college students. In order to accomplish this goal, the first step is to identify the factors that influence student drinking (e.g., Carey & Correia, 1997; Crawford & Novak, 2000; Sher et al., 2001). A multitude of studies have attempted to uncover the factors that influence college students' decisions about alcohol use. However, most preventive intervention programs that draw upon this research have failed to significantly influence college student drinking (Robinette, 1997). Given the failure of previous prevention intervention strategies to combat collegiate binge drinking coupled with the fact binge drinking and its deleterious consequences remain, including, but not limited to the alcohol related death of a University of Oklahoma student in 2004, additional studies focusing on predictor variables are needed. The information gleaned from such studies can shed light on the problem and guide prevention intervention strategies.

Purpose of the Study

Despite the considerable research conducted to identify predictive factors of college drinking, relatively few studies have focused exclusively on binge drinking at specific locales. What is needed is an equation for predicting binge drinking above chance. This study attempts to do just that by adopting a network approach to determining factors that influence binge alcohol use by Oklahoma undergraduates. Students were asked to report on a number of factors, including social systems, membership in Greek organizations, demographic variables and their reasons for drinking.

By determining specifics about heavy alcohol use from University of Oklahoma undergraduates, it may be possible to plan successful interventions for future students. Many recent studies conclude that successful interventions are those that are student-specific oriented. As Turrisi, Padilla, and Wiersma (2000) succinctly put it, "different types of college students drink for different reasons" (p. 598).

A study comparing college binge drinking in California with other states (Wechsler et al, 1997) substantiates this sort of approach that considers the unique demographic and other determining variables applicable to different colleges throughout the United States. In a more recent study, Wechsler et al., 2000 estimated that binge drinking rates at different colleges vary from one to 80 percent of students, a finding which strongly suggests that "institutional approaches should be shaped by the particular conditions of a given campus" (p. 39).

Despite mounting evidence that a one-size-fits-all approach to the problem is simply not working, most colleges continue to implement a variety of intervention programs based on doing much the same thing. Generally, this includes educating students about alcohol use, implementing school policies to limit student access to alcohol, restricting advertising at sports events, and providing alcohol-free dormitories (Wechsler et al., 2000). It is the intent of this study to explore those variables shown in past studies to correlate to alcohol use and compare those findings as they may or may not apply to University of Oklahoma undergraduates. It is hoped that the results will enable future intervention programs to specifically and effectively target those students at risk for alcohol use.

Research Questions and Hypotheses

The hypotheses for this investigation will be tested by examining data collected by this researcher at the request of the Norman Prevention Coalition (Higher Education Committee) during the time period of January 1, 1997 to May 1, 1997.

This investigation is designed to examine three primary research questions. These questions are:

RQ1: Which of the following is the best independent predictor of binge drinking? (a) demographic variables, which include gender, age, grade point average, ethnicity, marital status, religiosity and living arrangements; (b) social variables, which include membership in Greek organizations and athletic participation; (c) a unique combination of demographic variables (gender, age, grade point average, ethnicity,

marital status, religiosity and living arrangements) and social variables (membership in Greek organizations and athletic participation).

RQ2: What are the most common reasons for undergraduate drinking?

(a) to relax or relieve tension; (b) to have a good time with friends; (c) to get drunk; (d) to fit in with a group one likes; (e) to get away from one's problems or troubles; (f) because of boredom; (g) to relieve depression; (h) to get through the day; (i) to get to sleep; (j) to enhance sexual pleasure or opportunity; (k) to increase enjoyment of music or food; (l) because one likes the taste; (m) because it's the thing to do; (n) because one feels better when drinking; (o) to help one be less shy with others; (p) to celebrate at ceremonial occasions; (q) other.

RQ3: What is the relationship between students' reasons for drinking and binge drinking?

These research questions will be answered by testing the following relevant hypotheses.

H1a: Gender, specifically, being male will be positively related to binge drinking and being female will be negatively related to binge drinking, consistent with the research of Borynski (2003), Turner et al. (2000), and Wechsler et al. (2000).

H1b: Age will be inversely related to binge drinking as consistent with the research of Makimoto (1998).

H1c: Grade point average will be negatively related to binge drinking as consistent with the research of Engs et al. (1996).

H1d: Ethnicity, specifically being Caucasian will be positively related to binge drinking as consistent with the research of Clements (1999), Martin (1998), Prendergast (1994), and Wechsler et al. (2000). Ethnicity, specifically being Hispanic, will be more positively related to binge drinking than will being of another minority ethnic group, as consistent with the research of Bennett, Miller, and Woodall (1999), Clements (1999), and Prince (1999).

H1e: Marital status, specifically being married, will be inversely related to binge drinking while being single will be positively related to binge drinking as consistent with the research of Makimoto (1998), Prince (1999) and Wechsler et al. (1997).

H1f: Religiosity will be negatively related to binge drinking as consistent with the research of Dunn (2005), Engs, et al. (1996), and Poulson et al. (1998).

H1g: Living arrangements will relate to binge drinking such that those males students living in fraternities will engage in more binge drinking behavior than students residing in other domiciles as consistent with the research of Larimer et al. (1997) and Wechsler et al. (1998). Females residing in sororities will engage in more binge drinking behavior than students living in other places as consistent with the research of Wechsler et al. (1998). Individuals residing in off campus apartments or homes will be more likely to engage in heavy drinking than those individuals living in

on-campus (e.g. residence halls) as consistent with the research of Basten and Kavanagh (1996), Grenier et al. (1998), Prince (1999), Vaillant and Scanlan (1996), and Wechsler et al. (2000).

H2a: Being a member of a Greek organization will be positively related to binge drinking as consistent with the research Carter and Kahnweiler (2000), Gomez (2000), Larimer et al. (1997), Sher et al. (2001), Turner et al. (2000), and Wechsler, et al. (1998).

H2b: Being an intercollegiate athlete will be positively related to binge drinking as a consistent with the research of Gutgesell and Canterbury (1999), Meilman et al. (1999), Nelson and Wechsler (2001), Wechsler et al. (1997).

Review of the Literature

Since the landmark study of 17,000 students by Straus and Bacon in 1953 studies on alcohol use by college students have received considerable attention. The multiple variables that correlate with alcohol use by college students makes the task of identifying particular risky factors for the purpose of predicting which students will or will not experience problem drinking no small task. Moreover, the literature is exhaustive, but by no means conclusive. For the purpose of clarity, the literature on variables selected for this study will be organized and presented under the following headings: Demographic, Social and Situational, and Reasons for Drinking. It should be noted, however, that manipulating the studies in this manner does not in any way

imply that the variables under each heading act independently from one another. In point of fact, multicolinearity likely abounds.

Demographic Variables

Gender

The majority of studies have found that males consistently drink more than females (e.g., Basten & Kavanagh, 1996; Clements, 1999; Engs et al., 1996; Douglas & Collins, 1997; Grenier et al., 1998); Lo, 1996), even after factoring out the discrepancies in body weight and composition (Vaillant & Scanlan, 1996), ethnicity (Keefe & Newcomb, 1996), and race (Fennell, 1997). Maggs, Frome, Eccels, and Barber (1997) also found these gender differences, although her study revealed that there was no gender difference in the number of binge days per week. The reasons for drinking differed between the sexes, but it can be said with some degree of confidence that simply being a male puts one at more risk for using alcohol (Crawford & Novak, 2000; Lewis, Goodhart, & Burns, 1996). Males are also at a higher risk for alcohol addiction (Vaillant & Scanlan, 1999). Prendergast (1994) found that men are more likely than women to use alcohol, to drink greater quantities and more frequently, and to have more alcohol-related problems. O'Hare and Tran (1997) found significant gender differences in the areas of heavy drinking and subjective self-assessment of a substance abuse problem, with males rating 18.4 percent (*n*-220) and women rating 3.6 percent (*n*=174).

Gender differences in risk factors for alcohol use have been the focus of research for many years. However, it can be argued that much of the information has been from studies of men (Wiesbeck, 2003). In a longitudinal study begun in 1971, Liu and Kaplan (1996) investigated these gender differences to determine how they affect the use of alcohol. The random sample consisted of 6,074 young male and female seventh grade students, with a follow-up study of these same people in the 1980s, when the subjects were in their mid-20s. Although the subjects were not all college students, some generalizations based on gender differences may reasonably apply to undergraduates. The study found that, generally, males tend to use alcohol to gain a sense of self-importance and report they feel more important or more powerful when they drink. Males also seek social bonding through the use of alcohol and tend to report they drink because their friends do so. In contrast, females were found to use alcohol because of personal problems, as a form of self-medication. Some studies indicate that women are drinking larger amounts and more frequently and there are trends to suggest that sex differences in drinking may be diminishing, especially in the student population (Kashubeck & Mintz, 1996; Lo, 1996; Ricciardelli &Williams, 1997). However, women tend to drink for different reasons than men. While males tend to drink as a part of the socialization process, some studies conclude that women are more likely to resort to alcohol as a means of self-medication for personal problems (Liu & Kaplan, 1996). However, a study by McCormack (1996) provided contradictory conclusions. They found that college men tend to drink when they feel under pressure, while the increase in drinking among college women is probably related to the "increased acceptance of drinking when attending social events such as

parties and dating" (p. 67). Despite indications that women are drinking more, many researchers continue to find consistent and large sex differences in drinking (Ricciardelli & Williams, 1997).

Age

In a study comparing California college drinkers with students in 140 colleges nationwide, Wechsler et al. (1997) found that California students experienced significantly less alcohol use, abuse and problems associated with the use of alcohol than did their counterparts. In comparing characteristics of the two samples of students, it was found that California students were older, more likely to be non-white, more likely married, and less likely to live on campus. The most important finding and the factor determined to exert the most influence in predicting alcohol use was age. This would tend to support those study findings that alcohol use is a temporary problem that lessens with age. It is no coincidence, then, that being a freshman, versus a senior, increases one's risk for alcohol use (Crawford & Novak, 2000; Engs et al., 1996; Grenier et al., 1998).

On the other hand, Prince (1999) found that senior college students report more problematic drinking behaviors than any other class. Yet another study (Clements, 1999) found that the frequency of student binge drinking did not vary significantly by year in school. Despite these contradictory findings, age is thought to be generally associated with drinking patterns (i.e., There is an inverse relationship between age and frequency of alcohol use). In essence, problem drinking lessens with increased age. In a 1996 study by Vaillant and Hiller-Sturmhoefel that followed young

alcoholics for a period of eight years, 1/3 of the subjects returned to asymptomatic drinking during the study, citing changes in social responsibilities (e.g., marriage) and peer groups as their reasons for changing their drinking behavior. Maturation and the lifestyle changes that go along with the process appear to play an important role in predicting patterns of alcohol use.

Grade Point Average

Engs et al. (1996) suggested that a student's grade point average (GPA) may be a better determining factor in predicting alcohol use than one's year in school. They concluded that the lower a student's GPA, the higher was the percentage of students who drank or were heavy drinkers. Contrarily, those students with a 4.0 GPA reported consuming one third of the number of drinks than those with GPAs under 2.0.

Ethnicity

Not surprisingly, ethnicity has been examined as a possible moderator variable in predicting alcohol use. Vaillant and Hiller-Sturmhoefel (1996) found ethnic differences in drinking behaviors among their white male subjects who represented a variety of backgrounds, including Irish, Polish, Russian, English, Northern European, Italian and other Southern European, Anglo Canadian, and French Canadian. Although a similar proportion of males in each ethnic group (about 20%) were abstinent, alcoholism rates varied among the groups. For example, alcohol abuse and dependence were five times less common in males of Italian and other Southern European descent compared with other ethnic groups (e.g. Irish). The authors point

out though, that these differences might be attributed at least in part, to variations in the cultural attitudes toward alcohol consumption.

The identifying demographics of those least likely to drink continued to be African American or Asian Americans, aged 24 years or older, married, and with no high school history of alcohol abuse. Among various ethnic groups of Asian Americans, surveys indicate that Japanese-Americans have the highest, and Chinese-Americans the lowest, percentage of heavy drinkers. On the other hand, Southeast Asians (e.g., Vietnamese) are considered at high risk for heavy drinking (Makimoto, 1998). Despite these differences, Asian Americans as a whole demonstrated the lowest levels of alcohol use compared with other ethnic groups. These lower rates of alcohol use have been related to a lower incidence of risk factors such as poor family relationships and poor academic performance among Asian Americans.

However, a study by Wall and colleagues (2001) suggested a genetic association with the development of alcohol use in Asian Americans. Participants in the study were 180 (44% male, 56% female) paid college students who had biological parents and grandparents of Asian heritage. A blood sample from each participant was collected for genotyping at the ALDH2 locus using polymerase chain reaction of DNA and allele-specific oligonucleotide probes since previous research has indicated that ALDH2, to date, is the candidate gene with the strongest association with alcohol dependence. The ALDH2*2 allele is prevalent among northeastern Asians, but extremely rare in non-Asians.

Study results suggested that the onset of alcohol use for Asian Americans may be at a relatively later age than for non-Asians and that this finding is likely due to nongenetic or indirect genetic influences, such as parental modeling. However, ALDH2 status was found to have a significant association with regular drinking, binge drinking, and maximum drinks ever consumed in a 24-hour period. Specifically, those individuals with ALDH2*2 alleles were less likely to be regular drinkers, were less likely to have ever engaged in binge drinking, and reported a lower maximum number of drinks consumed in a 24-hour period than those who lacked this genetic mutation. Study findings further suggest an early influence of ALDH2 on alcohol drinking behavior, such as sensitivity to alcohol, as well (Wall, et al., 2001).

Prince (1999) found White and Hispanic students drank more than other ethnic groups. Prendergast (1994) found similar results, as did Bennett et al. (1999) and Lewis et al. (1996). In the former study, current use as defined by some use of alcohol in the past 30 days was reported by 87 percent of White students, 64 percent of Hispanic students, 59 percent of African American students, and 35 percent of Asian Americans. In the study by Bennett et al. (1999), Hispanic students reported highest rates of alcohol use, with non-White, non-Hispanic students reporting larger rates of abstinence than other ethnic groups. However, Wechsler et al. (2000) found indications that binge drinking is on the rise among African-American college students. The 1999 Harvard School of Public Health College Alcohol Study (CAS) showed that the proportion of African-American students who are binge drinkers has risen over the past four years. Still, the CAS survey shows only 16.5% engage in binge drinking as compared to 48% of White students. "Reasons for the lower level of

drinking among African American students include their lower level of disposable income, their social isolation, their need to study to make up for poor educational preparation, the high proportion of women among African American college attendees, and the common attitudes among African American students that drinking is not 'cool' or is contrary to their religious beliefs" (Wechsler et al., p. 204).

Clements (1999) found that White students, compared with African-American or non-White students, drink more frequently, drink larger quantities, and are more likely to engage in binge drinking. However, despite the lower levels of consumption, African-American males had higher rates of alcohol-related problems than white males. Hispanic students were found to drink less frequently and binge drink less than White students. However, Hispanic students were found to participate in both behaviors more than African-American students.

In separate studies by Bennett, McCrady, Johnson and Pandina (1999) and Prince (1999), Hispanic students reported higher rates of binge drinking than other ethnic groups, while non-white, non-Hispanic students reported greater rates of abstinence than other students. Similar results were reported by Martin (1998), who also found that white college students used more alcohol and participated in more binge drinking than did their African-American counterparts.

Changes in drinking patterns appear likely. For example, the 1999 Harvard study that reexamined alcohol use at colleges (that were previously surveyed in 1993 and 1997) revealed a decrease in alcohol consumption among Hispanic, African American, and Asian students, as well as a decrease in freshman drinking.

Interestingly, the significant rise in frequent binge drinking occurred in those students who had been binge drinkers in high school (Wechsler et al., 2000).

Marital Status

Marriage is thought to be a stabilizing variable that decreases the likelihood of alcohol use. Being single greatly increases a student's likelihood to drink (Grenier et al., 1998). While marriage might be seen as a stabilizing influence in a student's life, other variables have been shown to more accurately predict a student's decision about alcohol use. For example, Prince (1999) found that being married was actually a determinant for heavy drinking when associated also with Greek affiliation and residing off campus.

Religion

Religion is another variable associated with a student's decision to engage in alcohol use. In a nationwide study of student alcohol use, Engs et al. (1996) found that, of those students who stated a religious preference, Catholics reported the highest percentage of heavy drinking. Post-hoc tests revealed that students who identified themselves as Catholics and Jews consumed the highest mean of number of drinks per week compared with students who identified themselves as Protestants. Moreover, those who did not consider religion to be important showed a higher percentage of drinkers as compared to those who did consider religion important. Among drinkers, those to whom religion was not important were also likely to be heavy drinkers. The

least religious students reported consumption of twice as many drinks as compared to the most religious students.

Similar findings were reported in a study by Poulson, Eppler, Satterwhite, Wuensch and Bass (1998) which examined alcohol use, religious beliefs, and risky sexual behaviors. The majority (84%) of the collegiate participants reported having engaged in sexual intercourse, but only 27% of the students reported consistent use of condoms. In fact, 70% reported that they were less likely to use condoms when they drank before engaging in sexual activity. More than one third (39%) used alcohol to enhance sexual experiences, while 68% had experienced a negative effect on their sexual behavior due to alcohol use. Alcohol consumption was also high for this study sample (75%), with only 25% reporting no regular alcohol use. Almost half (46%) used alcohol one to two times per week, another 23% used alcohol three to four times per week, and 7% used alcohol five or more times per week, on average. The strength and nature of students' religious beliefs appeared to play a major role in decisions about sexual activity. Sixty percent believed in attending church or actually did attend church on a regular basis, 78% believed that God operated in their daily lives, and 80% believed they would go to heaven when they died. In addition, most students (77%) did not believe that alcohol use was a sin.

Consistent with most research findings, the male students in this study had significantly higher levels of alcohol use than the females. Males also had higher rates of risky sexual behavior than the females, although there was no significant difference in their overall frequency of sexual activity. Gender differences for strength of

religious beliefs were small. For females, strength of religious beliefs was negatively correlated with both alcohol consumption and risky sexual behavior. Overall, Poulson et al. (1998) demonstrated that religion as a variable that influences students' decisions about alcohol use is not limited to religious affiliation. Specifically, students' perceived religious beliefs about drinking may be a greater predictor of their own drinking practices than that of their church affiliation.

Living Arrangements

Where the potential male drinker lives is also a determinant of whether a student will or will not drink. In separate studies, Basten and Kavanagh (1996) and Vaillant and Scanlan (1996) found that male students who resided both off campus and on campus consumed more alcohol than did those who lived with their parents, while those living off campus in houses or apartments were at greater risk for alcohol use than were those residing on campus. In the 1996 Vaillant and Scanlan study, this held true for both sexes with regard to risk for alcohol addiction. A greater number of students living off campus in houses or apartments were at risk for alcohol addiction (20 out of 21, 95%) followed by those students residing on campus (35 out of 45, 78%). The least number of students at risk for alcohol addiction resided with their parents (7 out of 28, 61%). A post hoc analysis revealed the significant difference occurred between the students who lived off campus and those who lived on campus. Grenier et al. (1998) found similar results, that is, that off-campus residents report significantly higher alcohol use than do students living under other circumstances.

In another study (Ricciardelli & Williams, 1997), gender differences were observed in three types of living arrangements: living at home with parents, living in dormitories on campus, and living independently off campus. Sex differences were found in two types of living arrangements, on campus and living independently, with women drinking less than men. However, those women living on campus showed higher levels of alcohol use than the other women; moreover, their drinking levels did not differ significantly from men living on campus, lending at least some credibility for the convergence hypothesis that sex differences in drinking may be diminishing (Clements, 1999). Similar results were found by Prince (1999). That is, that residing off campus increased drinking levels for both men and women.

In a 1999 resurvey of colleges that participated in the 1993 and 1997 surveys, the College Alcohol Study (CAS) by the Harvard School of Public Health (Wechsler et al., 2000) found little change in the self-reported drinking behaviors with two notable exceptions. Binge drinking decreased among students living on campus in dormitories and increased among those living off campus.

Social and Situational Variables

Social influence variables are among the strongest correlates of alcohol use and misuse. It is commonly accepted that others' alcohol use, particularly that of close friends, is among the strongest predictors of students' alcohol use (Wood et al., 2001).

Greek Society

A 1994 study by Harvard University referred to Greek organizations as "functional saloons," with 86 percent of men and 80 percent of women living in fraternities and sororities reporting participation in binge drinking (as cited in Winston, 1998). "Members of [Greek] organizations, particularly men residing in fraternities, have been shown on average to drink more frequently, consume more on typical drinking occasions, more often engage in 'binge drinking,' and report more alcohol-related negative consequences than students not residing in fraternities" (Larimer, Irvine, Kilmer, & Marlatt, 1997, p. 587). An interesting study by O'Connor, Cooper and Thiel (1996) suggests that fraternity and sorority members may drink more because "students who identified themselves as heavy drinkers pledged more than those who identified themselves as light drinkers, those who currently don't drink, or those who have never drank" (p. 672).

Indeed, study after study has shown that members of these Greek societies drink substantially more alcohol than nonmembers (e.g., Gomez, 2000; Sher et al., 2001). They also experience more of the problems associated with alcohol abuse, including illness, violence, and sexual assault. Even though Greek members represent only a small minority of the national college population, their influence is far greater because they often serve as a center for social activities on many campuses even though their number may be small. Wechsler et al. (1998) found that 2 of 3 fraternity and sorority members are binge drinkers. For those members who live in Greek

houses, the statistics are even more staggering: 4 of 5 are binge drinkers and half are frequent bingers!

Dorsey et al. (1999) propose that social groups such as Greek societies play a notable role in shaping and promoting behaviors because of the peer-influence factor, which itself is a strong predictor of college drinking. The role of peer influence may even be greater within Greek communities because they are generally considered to be a cohesive network that minimizes diversity and both strongly advocates and rewards its members to adopt the norms and values of the group. Many other studies also find that Greek organizations share a significant relationship with excessive alcohol use (e.g., Larimer et al., 1997; Prendergast, 1994;Wechsler, et al., 2000). Dorsey and her colleagues (1999) believe that a fuller understanding of the dynamics involved in the differences between Greeks' and non-Greeks' social networks is needed. For example, it might be assumed from research data that Greek members drink more than their non-Greek counterparts because of their social insulation within their fraternities and sororities. However, Dorsey et al. (1999) found this was not the case. One might expect that Greek members would have few other social influences, but in fact they tend to have outside strong social networks, including close connections with friends as well as with family members. So, while one might expect the diversity of perspectives afforded by a network of social influences to lead to less participation in alcohol use, in fact study results suggested the opposite. In point of fact, the broader the range of social influences, the higher the participation in risky behavior such as alcohol use.

A study of self-reported alcohol use by college fraternity and sorority members by Alva (1998) was used to compare alcohol use patterns with non-Greek-affiliated students. Subjects were undergraduate college students from four campuses in California. The Core Alcohol and Drug Survey used in the study consisted of 39 questions, divided into three sets in order to determine information about demographic variables, peer norms, and perceived benefits of alcohol. As expected, Greek-affiliated students reported significantly higher levels of alcohol consumption than non-Greek students, with males reporting higher levels of alcohol consumption (2.77 drinks per week) than females (1.11 drinks per week).

A stepwise discriminant analysis was used to determine the difference between students who were members of Greek organizations and non-Greek members based on their perceptions of peer norms and the benefits attributed to alcohol use. Greek members were more likely to believe that alcohol use "enhances social activity, makes women sexier, and facilitates bonding" (Alva, 1998, p. 8). As for peer norms, Greek members were more likely to have friends who did not disapprove of heavy or binge drinking. On the contrary, most studies show that alcohol use and binge drinking are considered to be "the norm within the Greek community" (Carter & Kahnweiler, 2000, p. 667).

Significantly, situational circumstances for all of Alva's study groups proved to be an important factor in alcohol use. Across all categories, college students most frequently used alcohol at private parties. As predicted, more Greek members reported using alcohol (68.85%) at a fraternity or sorority house compared to non-Greeks

(10.60%). Among non-Greeks, a bar or restaurant (49.05%) and place of residence (10.10%) were the most frequently reported locations of alcohol use. Alva's findings were similar to those of Wechsler, et al. (2000) and represent a residence change in binge drinking from an earlier study (Wechsler et al., 1994). Binge drinking decreased among students living in dormitories and increased among those living off campus.

Alva (1998) pointed out that a causal relationship between membership in a Greek society and drinking behaviors and expectancies cannot be assumed (despite a preponderance of correlational evidence) Both the self-reported nature of the information collected and the single questionnaire format used limit the ability to draw causal conclusions. Other factors may even precede a college student's affiliation in a Greek organization. In other words, a student's perceptions of college drinking and Greek membership may exist well before entry into college. A 1997 study by Larimer and colleagues also suggests that heavy drinkers may choose to live in fraternity or sorority houses with reputations for permissive heavy drinking. Of course, even within the Greek system, men clearly show heavier drinking behaviors than do women. Though this finding is consistent with gender differences in drinking patterns in general, in many instances Panhellenic policies mandating non-alcoholic sorority functions may also contribute to the differences in alcohol consumption.

Findings by Brown (1997) did not substantiate those of Alva, but instead indicated that Greek status generally did not predict greater alcohol use in general. A detailed analysis of multiple variables revealed that, with few exceptions, membership in any collegiate organization was not as strong an indicator of alcohol use as were

demographic, personality, and expectancy variables. (Two significant exceptions included the effects of both fraternity membership and athletic participation on predicting greater alcohol use in a bar. Again, this situational finding contrasts with Alva's conclusions.) O'Connor, Cooper, and Thiel (1996) found a significant relationship between pre-college levels of alcohol consumption and the likelihood that a freshman would pledge a fraternity. Specifically, those freshman students who identified themselves as heavy drinkers pledged more than those who identified themselves as light drinkers, those who currently do not drink, or those who have never drank. Overall consumption level tended to be a very good predictor of whether or not people pledged, thus strongly suggesting that the fraternity experience alone cannot be solely responsible for increased alcohol consumption.

In order to examine how perceived norms affect high-risk behaviors, Larimer and her colleagues (1997) studied 376 students (41.8% male) from five fraternities and five sororities at a large, West Coast, public university. Those Greek houses represented were selected on the basis of house reputation for alcohol use. Norms for quantity and frequency of drinking were assessed by the Drinking Norms Rating Form developed by Baer, et al. (1991). Students reported on their own alcohol use and their perception of the norm quantity and frequency of drinking for a typical member of their own fraternity or sorority, a typical same-sex Greek member and a non-Greek student. Those men in houses with high-alcohol-use reputations perceived their houses as having reputations for heavier drinking compared to males of average- and low-drinking houses. They also viewed their house as significantly more popular, having better looking members, being more sexually active, and wealthier than did males

from average- and low-drinking houses. On the other hand, they saw themselves as significantly less friendly than males in average- and low-drinking houses, while members of average-drinking houses viewed themselves as less friendly than men in low-drinking houses. Finally, males in high-drinking houses viewed themselves as better academically than did those in low-drinking houses; members of average-drinking houses viewed their house as academically superior to men in high- and low-drinking houses.

Similar results were noted for women, although some differences were noted. MANOVA indicated significant differences between house-reputation categories on all house characteristics with the exception of friendliness. Women of all houses reported their reputation for friendliness to be above average. Post hoc analyses indicated that females in houses with high- and average-drinking reputations did not differ significantly in their perceptions of their reputations for alcohol use; however, both of these groups viewed their reputation for alcohol consumption to be higher than did those in low-drinking houses. Moreover, women in high-drinking houses saw their houses as more popular, better looking, more sexually active, wealthier, and academically superior compared to women in average-and low-drinking houses. Members of average-drinking houses viewed their houses as more popular, better looking, and wealthier than those in low-drinking houses.

Both men and women in high-drinking houses generally perceived high-risk alcohol use as more acceptable within their houses than did members of low-drinking houses. Contrary to the perceived norms theory that students generally perceive their

peers to use more alcohol than they in fact do, men in high-drinking houses perceived their use of alcohol to be greater than the norm for the average Greek member not a part of their house, and their perceived house norm was the same as the actual average self-reported consumption in their houses. In addition, there was no significant difference between the actual norm and the perceived house norm in those members in the average-and low-drinking houses. While the authors of the study cite a limited sample size in average- and low-drinking houses as a possible reason for their failure to find differences between the actual norm and the perceived house norm, their results for the women in the study did in fact indicate a pattern of biased norms consistent with earlier studies. Women in these sororities generally perceive others drink more than they do, both within their house as well as within the Greek system (Larimer, 1997).

The research in this area continues to leave unanswered questions concerning Greeks and alcohol use. The chief problem centers around inconsistent study results and leaves in doubt whether Greek membership leads students to drink more than they otherwise might, that is, a causal effect, or whether students with heavy drinking inclinations seek out Greek affiliations once they enter college. Some studies (e.g., Prendergast, 1994; Sher et al., 2001) suggest a causal effect, while others find evidence of a selective effect, such as the one by O'Connor et al. (1996). Still others indicate evidence for both causal and selective effects, such as the one by Baer et al., 2001. Other variables associated with Greek membership and drinking, such as perceived peer norms and alcohol expectancies, further complicate the issue. Nonetheless, the association between Greek membership and heavy drinking is clear.

Another study by Sher et al. (2001) found that Greeks are consistently more inclined than non-Greeks to believe that higher levels of alcohol use are the norm and that their peers are more supportive of heavy, or binge, drinking. This could suggest that perceptions of heavy drinking norms in the Greek system are largely responsible for heavy alcohol use among fraternity and sorority members. Yet, the discrepancy between actual norms and perceived norms for Greeks seems to be less than what was once generally assumed. Carter and Kahnweiler (2000) found that Greeks have a more accurate perception of their own alcohol use than do typical college students. Similar conclusions can be drawn from the study by Wechsler and Kuo (2000). They found a significant relationship between students' perceptions of their friends' binge drinking and their own alcohol use. Students are likely to report that their friends drink at the same level as they do.

This fact may not be as startling as one might think. In a study by Sher and his colleagues (2001), analyses of the research data consistently indicated that, while Greeks drank more heavily than non-Greeks during the college years, the difference between the two groups was no longer apparent three years after college. This finding suggests that the Greek system provides a social environment that encourages a heavy drinking lifestyle. However, once Greek members leave the campus and this lifestyle behind, their use of alcohol decreases. Some researchers consider this kind of college drinking to be a developmental phase, which is why studies demonstrate convincingly that even high levels of drinking and problems with drinking during college are not always indicative of long-term use and problems, nor are they predictive of future psychological or social problems.

Athletics

Another group that receives research attention similar to that of the Greeks is the college athletes. Because the findings appear to be similar for each group, there is concern about overlapping memberships, that is, that the students studied as members of a Greek organization are the same ones also studied as college athletes. Meilman et al. (1999) attempted to clarify the issue. Students from 125 colleges completed a Core Survey. The use of such a large sample size increased the chance of producing statistically significant findings, and the probability of making a Type I error was reduced by using a significance level of .0001 rather than the more traditional .05 for all of the chi-square analyses.

Those students who engaged in both Greek life and intercollegiate athletics consumed the most alcohol and engaged in the most binge drinking. The main effect for degree of Greek and intercollegiate athletic involvement was significant, $F(3,45136)=1,120.52$, $p<.001$; binge drinking, $X(3,N=45680)= 3,192.13$, $p<.001$. (Consistent with other research, men reported drinking more than women, regardless of Greek or athletic status.) Greek athletes consumed the most alcohol, followed by Greek nonathletes, non-Greek athletes, and non-Greek nonathletes. Overall, fraternity and sorority members were more involved in drinking than the athletes.

Some studies have speculated that athletes would be less likely to use alcohol than nonathletes because of their concern with physical fitness and good health practices, but recent research has failed to support this position, according to Leichliter (1998). Instead, these researchers report that, along with higher alcohol use,

college athletes have a tendency "to experience more drinking-related consequences, exhibit more high-risk behaviors, and engage in more sexual violence than their nonathletic counterparts" (p. 258).

A survey of students at 140 colleges found a strong correlation between athletic involvement and alcohol use. For the purposes of the 1997 study, conducted by Wechsler, Davenport, Dowdall, Grossman, and Zanakos, students were divided into three groups according to the extent of their involvement in college athletics: (1) those who were involved (i.e., who spent one or more hours a day in sports and deemed athletics as important to them), (2) those who were partly involved (i.e., who spent one or more hours a day in sports or believed participation in athletics was important), and (3) those who were not at all involved in sports (i.e., who spent no time in college sports and who did not consider athletic involvement as important). The survey (by mail) consisted of a 20-page questionnaire about drinking behaviors, including certain variables that could be significant predictors of binge drinking. It was found that a majority (61%) of males involved in athletics engaged in binge drinking, compared to 55% of those partly involved and 43% of those not involved. Men involved in athletics also engaged in more frequent heavy drinking than those not involved. One quarter of the involved males were drunk three or more times in the past month compared with 17% of those not involved. For female students, more of those involved in athletics engaged in binge drinking (50%) than those not involved. Although more women involved in athletics drank heavily, the relationship was not as great as it was among males. In general, the findings suggested that rates of binge drinking increased as involvement in athletics increased. Gutgesell and Canterbury

(1999) found similar results and that student athletes engage in binge drinking more often than students not involved in athletics.

Leichliter et al. (1998) also demonstrated a correlation between the degree of athletic involvement and alcohol use. Data was obtained from a random sample of 58,453 students from 125 colleges across the country who took part in Core Alcohol and Drug Surveys. Students were identified using the degree of their athletic involvement: not participating, participating as a team member, or participating in a leadership role. For the entire sample, those students involved in athletic leadership roles consumed significantly more alcohol in a week than did other team members and nonathletes. Those students reporting no athletic involvement consumed the least amount of alcohol. In keeping with the findings of many other studies, men reported more alcohol use than women. Contrary to the notion that team leaders would behave more responsibly than other team members, this study found that team leaders, (especially males), demonstrated heavier alcohol use and alcohol-related problems.

Leichliter et al. (1998) studied alcohol use among leaders and non-leaders in college athletics. They hypothesized that leaders of athletic teams would drink less than non-leader team members because of the responsibility involved with their leadership roles. Surprisingly, leaders of athletic teams actually drank more on average than did non-leaders (7.34 vs. 8.25 drinks per week, $p<.05$). These studies tend to suggest that that alcohol use increases as involvement rises both within and across high-alcohol-use student groups.

Thombs (2000) found that just over one third of his study sample (35.1%) of college athletes began drinking on a regular basis before high school graduation. An additional 29.2% began drinking regularly during their freshman year of college, and 11.7% started drinking later in college. A large part of the sample (38.5%) reported they drink and become drunk (21.3%) on a weekly basis. Interestingly, early onset of drinking proved a strong predictor for heavy alcohol use.

Alcohol is apparently the drug of choice for college athletes, at least according to studies sponsored by the National Collegiate Athletic Association (Bower & Martin, 1999). According to this source, more than 87% of the athletes surveyed reported using alcohol during the year preceding the study; they also reported an increase in binge drinking. Although alcohol usage was somewhat lower in the 1997 survey (approximately 80%), binge drinking continued to be a concern (Gutgesell & Canterbury, 1999). White student athletes reported more alcohol use than African-American student athletes in all of the surveys conducted by the NCAA: 92% vs. 68% in 1985, 91% vs. 78% in 1988, 91% vs. 74% in 1993, and 84% vs. 60% in 1997 (Gutgesell & Canterbury, 1999). In general, track and field athletes report less social drinking than do most other athletes. Male and female lacrosse teams report the highest percentage of student athletes consuming alcohol (95% for males and 96% for females). Male fencing athletes (69%) and females in gymnastics (75%) report the lowest percentages. In a separate study of African-American female basketball players by Bower and Martin (1999), 72% of the 50 athletes in the study reported having used alcohol, and 46% had engaged in binge drinking. Drinking as a part of socializing was the athletes' most frequently reported reason for alcohol use, and it was noted that both

frequency and quantity of alcohol use were more likely outside of the sport season than during the playing season.

Traditional campus activities also influence college students' decisions about alcohol use. For example, "Sport and alcohol have a long-standing association" (Gutgesell & Canterbury, 1999, p. 129), as represented by those spectators and athletes who consume the alcohol and by the relationship between sports and sponsorship by beer companies. According to Bower and Martin (1999), alcohol is "the drug of choice for college athletes", with more than 87 percent of the athletes surveyed reporting the use of alcohol in the year preceding each study. It might be assumed that athletes would be more conscious of the negative health consequences of alcohol use than nonathletes, but studies generally demonstrated that athletes drink more alcohol and suffer more consequences from use than do nonathletes (Leichliter, Meilman, Presley, & Cashin, 1998).

These percentages of alcohol use are startling, but the frequency of binge drinking among college athletes poses even greater concerns. About 25% of those student athletes who regularly drink report consumption of 3 to 5 drinks at one time at least once a week (Gutgesell & Canterbury, 1999). Moreover, 4% report having 10 or more drinks at one time at least once a week, and 1% report drinking 10 or more drinks at a time at least five times a week, if not more. Gutgesell and Canterbury (1999) concluded that the strongest predictors of binge drinking were athlete residence in a fraternity or sorority, a party lifestyle, participation in other risky behaviors and high school binge drinking.

Much concern exists about college sports promotion by companies seeking exposure for their alcohol (and tobacco) products. Bloom, Hogan, and Blazing (1997) studied whether this type of promotion might be isolated as a causal factor for inappropriate use of alcohol products by young people. Although advertising and its role in the use of alcohol has been researched extensively, with both conflicting and controversial results, the role of sports promotion itself has not received much research attention. Although the subjects of this mail survey were young people between the ages of 13 and 18, implications for college students can be drawn. Results suggest that attending college football games and watching televised college basketball games increases a person's likelihood to drink beer. However, even though this study demonstrates an association between college sports promotion and drinking beer, the existence of cause and effect could not be established. Nonetheless, Gutgesell and Canterbury (1999) found that 63% of the student athletes in their study began alcohol use while in high school, and 14% started in junior high school or before. Their conclusion is that "reduction of advertising in association with sporting events may be a form of preventive medicine" (Gutgesell & Canterbury, 1999,p. 383).

Perhaps it is the social environment conducive to alcohol use and binge drinking shared by both college athletes and Greek members that creates such similar study findings for the two groups. This might explain, at least in part, why athletes continue to drink and drink heavily despite their increased exposure to alcohol education and prevention programs. According to a recent Harvard study (Nelson & Wechsler, 2001), college athletes are more likely to be associated with factors that are associated with higher rates of binge drinking, such as strong social ties, a large

number of friends who binge drink, an emphasis on the importance of parties and sports, and socializing for two or more hours a day. According to the perceived norms hypothesis on which this social environment explanation for alcohol use is based, most college students overestimate the amount of alcohol consumption by their peers. Then, as a result of these exaggerated perceptions, students feel pressured to increase their own drinking to conform to what they perceive to be the norm in their social environment.

Situational considerations are not limited to Greek organizations, athletes, or other peer groups, but also concern the ability to predict alcohol use and its negative consequences according to individual circumstances. Turrisi et al. (2000) studied 364 college students (37.9% male, 62.1% female) consisting of three distinct groups: traditional freshmen, non-traditional freshmen (i.e., older than 18 or younger), and upperclassmen.

Reasons for Drinking

As with other variables involved in the prediction of alcohol use, gender differences appear in the personal reasons for drinking. Just as research generally indicates that males drink more than females, both sexes seem to drink for different reasons. Males seem to drink primarily to enhance arousal and justify deviant behavior, while women are more likely to use alcohol to forget about perceived failures or problems and negative emotions (Crawford & Novak, 2000). Slicker (1997) found that reasons for not drinking were also significantly related to alcohol use. Light drinkers cited religious and/or moral reasons significantly more often than other

student groups. Moderate drinkers gave safety reasons for not drinking, while heavy drinkers gave expense as their chief reason for not drinking

Emotional & Psychological Factors

The influences of emotional and psychological factors, such as psychiatric disorders, have received research attention. Many studies exploring associations of problem drinking with psychiatric disorders have focused on depression since both alcoholism and depression tend to run in families and frequently occur together in the same individual. Vaillant and Hiller-Sturmhoefel (1996) summarized such findings in two longitudinal studies of drinking behaviors and their consequences in 268 male college students and 456 inner-city, 11-to-16-year-old males. Pointing out that the association of problem drinking and depression has led to the hypothesis that individuals drink to self-medicate, or alleviate, their depression, Vaillant and Hiller-Sturmhoefel (1996) found the opposite to be true. In most instances depression was a consequence of alcoholism (since abstinence from alcohol has been shown to alleviate depression). Moreover, Valliant and Hiller-Strumhoefel (1996) concluded that the sole psychiatric disorder that clearly contributes to the risk for problem drinking is sociopathy. This study found that, while many sociopaths abuse alcohol as part of their antisocial behavior, most problem drinkers are not sociopathic except as a result of alcohol addiction.

Self-esteem has received much research attention, although study results have often been inconsistent. Some research has offered evidence of an inverse relationship between self-esteem and drinking while other studies have found the highest levels of

alcohol use in those students with the most positive self-esteem. Still other research has failed to find any relationship at all between alcohol use and self-esteem. Crawford and Novak (2000) attempted to clarify the relationship between these two variables in a study of 431 students of a large Midwestern university during the years 1995 and 1996. Self-esteem was measured using the reliable Rosenberg Self-Esteem Scale which consists of ten items designed to assess a person's overall sense of self worth. Of those students participating in the survey, 70% were reported drinkers and 37%, over half of those who used alcohol, indicated that they engaged in binge drinking. Consistent with most research, males consumed significantly more drinks per week than females and were also significantly more likely than females to binge drink. The women in the sample, however, showed significantly lower levels of self-esteem than did the males.

Individual differences in social-emotional adjustment are associated with predictable patterns of levels of alcohol use, reasons for use, and problems with use. For instance, those who are more rebellious, impulsive, and self-indulgent have consistently been found to be heavy drinkers compared to their more mature peers. Understanding heavy alcohol use in college students requires an evaluation of how and why they drink as well as an assessment of how much they drink. A 1996 study by Weinberger and Bartholomew found that students with low self-restraint consumed higher levels of alcohol, used drinking to increase positive effect, and high levels of alcohol-related problems. Moreover, those most tempted to have "one too many" tend to be those least likely to possess self-restraint and therefore least able to afford the resulting alcohol myopia. So, while peer groups may be an important predictor for

alcohol consumption, personal adjustment makes a significant contribution to the development of problematic drinking patterns.

Outcome Expectancies and Coping Strategies

One body of research suggests that certain beliefs about the outcomes associated with alcohol use may be related to increased alcohol consumption. Such beliefs are referred to as alcohol outcome expectancies (Marx, Nichols-Anderson, Messman-Moore, Miranda, & Porter, 2000). Put another way, "alcohol expectancies are people's beliefs about how alcohol affects them" (Mulligan, Judith, & Bryant, 2000, p. 240). The strength and patterns of alcohol expectancies seem to change according to the context of alcohol use (Mulligan et al., 2000). Moreover, these alcohol expectancies may be a strong predictor of alcohol use (Brown, 1997), particularly alcohol expectancy of positive social outcomes (Cumsille, Sayer, & Graham, 2000).

Specific expectancies associated with alcohol use include social, cognitive, physical, and emotional effects. Anticipated social and emotional benefits from drinking are considered the best measures of current and future alcohol use (Vik, Carrello, & Nathan, 1999). Indeed, alcohol's positive reinforcement is characterized by perceived enhancement of social and physical pleasure (Carey & Correia, 1997). On the other hand, drinking to cope negatively reinforces alcohol use and is a strong predictor of problem drinking among college students (Carey & Correia, 1997). Anticipated alcohol effects, then, may reflect either positive or negative reinforcement of drinking behavior.

Maggs and colleagues (1997) conducted a longitudinal study to look at positive versus negative expectancies and consequences and how students experience alcohol and its effects. One important finding emerged from her study. After weeks when students had positive experiences with drinking, they drank more the following week, as might be expected. However, when these students experienced negative consequences from drinking, this had no apparent effect on their future avoidance of such experiences. It seems likely that students' persistent drinking behaviors despite negative consequences are related to the fact that most college drinking occurs in social contexts. Indeed, the belief that alcohol use facilitates social interactions has been shown to be a significant predictor of drinking behavior (Senchak et al., 1998).

In a study of expectancies, Vik and colleagues (1998) found that, generally, beliefs that drinking enhances pleasant experiences correlated better with current alcohol use than did expectations that alcohol reduces negative or unpleasant effects. The study also revealed that the distinction between positive and negative reinforcement principles is most remarkable with regard to social effects. It has already been acknowledged that social factors have considerable influence on college student drinking (Senchak et al., 1998). What Vik et al. (1998) demonstrated in their study is that social enhancement and social coping expectancies are indeed separable and distinct domains and that these factors relate differentially to college student drinking. Student drinking correlated most strongly with increased enjoyment in social situations (mean correlation = .35). In contrast, drinking to cope with negative social situations was only modestly related to drinking measures (mean correlation = .16).

Vik and his colleagues (1998) conducted four two-way analyses of variance (ANOVA) to test for the effects of sex and heavy drinking on each expectancy domain. Eighty-one percent of the women and 88% of the men were classified as recent heavy drinkers. Men endorsed more alcohol expectancies than did women for all four expectancy domains: Social Enhancement, $F(1,402)=32.04$, $p<.001$; Social Coping, $F(1,402)=9.24$,$p<.05$; Personal Enhancement, $F(1,402)=21.28$,$p<.001$; and Personal Coping, $F(1,402)=25.84$,$p<.001$. Heavy drinkers consistently scored higher on expectancy domains than did those who did not binge: Social Enhancement, $F(1,402)=43.41$,$p<.001$; Social Coping, $F(1,402)=41.19$,$p<.05$; Personal Enhancement, $F(1,402)=66.60$,$p<.001$; and Personal Coping, $F(1,402)=27.38$,$p<.001$.

Ricciardelli and Williams (1997) also studied gender differences in alcohol use and alcohol expectancies in a volunteer group of 179 (78 males and 101 females) first-year psychology students. In addition, their study focused on the students' living arrangements: living at home with parents, living on-campus, and living independently. For those students living at home, no gender differences were noted for either the amount of alcohol used or the alcohol expectancies measured, giving some support for the convergence hypothesis that college women are drinking as much as men. However, gender differences were noted in the other two living arrangements. Women living on-campus reported drinking at higher levels than the other women. Moreover, as with women living at home, the drinking levels for those living on-campus did not differ significantly from men living on campus. However, those women living on-campus had lower alcohol expectancies. Gender differences were noted in drinking patterns only for those men and women living independently.

Women reported drinking less than men, but women also reported higher levels of alcohol expectancies. It would seem, then, that there was no support for the convergence hypothesis in those situations where gender stereotypes were the greatest that is, living independently.

Age seems to play a role in the relationship between alcohol expectancies and drinking. Leigh and Stacy assessed alcohol expectancies in a nationally representative sample of persons aged 12 and older as part of the National Alcohol Survey (2004). The authors hypothesized that the relationship of expectancy to drinking may vary with age as alcohol expectancies may change as drinking experience accrues. The researchers found that in all age and gender groups, positive expectancy was positively related to alcohol use and negative expectancy was related negatively to alcohol use. Positive expectancy was a superior or equal predictor of drinking than negative expectancy among the subjects under 35 years of age while negative expectancy was the best predictor of drinking in most subjects over 35 years old. When data included only drinkers (leaving out the data from abstainers or those who had not yet begun drinking), the positive expectancy was generally a stronger predictor than negative expectancy. As the authors noted, the results suggest that negative expectancy predicts abstention from alcohol and positive expectancy generally predicted level of drinking among drinkers (Leigh & Stacy, 2004).

A study by Stacy (1997) explored how previous behavior may predict future behavior with regard to alcohol use. However, his research is based on the 1992 findings by Goldman, Roehrich, and Brannick that outcome expectancies regarding

alcohol use can be modeled as a network of relationships in memory. The memory association approach, developed by Stacy, Leigh, and Weingardt (1994), maintains that people differ in the strength of their associations between outcomes, such as relaxation, and behaviors, such as drinking. Stacy (1997) concluded, "For individuals with strong associations between alcohol use and an outcome like relaxation, alcohol use spontaneously comes to mind when the related outcome is used as a prompt" (p. 61).

There is little doubt that alcohol outcome expectancies have been demonstrated to be an important predictor of alcohol use among college students. However, Cronin (1997) found that students' reasons for drinking may be a more powerful predictor of college drinking than outcome expectancies. Cronin (1997) developed a Reasons for Drinking Scale (RFD) and administered it, along with the Alcohol Expectancy Questionnaire (AEQ), in order to assess the effectiveness of reasons for drinking versus expectancies in predicting alcohol use among a college student sample. The RFD consists of three groupings of items, including personal motivations for alcohol use, such as Mood Enhancement factors and Tension Reduction factors, as well as social motivations, or, Social Camaraderie (drinking in social contexts). Intercorrelations among the three groupings ranged from .51 to .60, suggesting that, although interrelated, the three groupings are sufficiently different to merit separate consideration.

The RFD accounted for additional variance above and beyond the AEQ on all four measures of alcohol use: average drinks per occasion, frequency of binge

episodes, frequency of drinking (days), and alcohol-related problems. Using stepwise multiple regression, the RFD was superior to the AEQ in predicting alcohol use as well as alcohol-related problems. The Social Camaraderie group of items proved to be the best predictor of frequency of consumption, average amount consumed, and frequency of binge drinking (Cronin,1997).

Cronin (1997) accounted for the advantages of using his RFD over the AEQ as a predictor of alcohol use by explaining the "mental algebra" which an individual engages in to conclude his stated reason for drinking. Expectancies, he asserted, like attitudes, may be one of many cognitive and social factors which influence an individual's decision to drink. Therefore, "the identification of reasons for drinking would presumably be the result of the drinker's decision process and thus encompasses a range of cognitive and social factors such as expectancies, self-efficacy, religious convictions, perceived norms, etc." (Cronin, 1997, p.1292).

Alcohol use is also one way that college students may cope with stress (Kassel, Jackson, & Unrod, 2000). Those students who believe that they have good coping capabilities to successfully alleviate negative moods are far less likely to experience drinking problems than those whose expectancies are lower. However, Noel and Cohen (1997) found, contrary to expectations, that students' alcohol use decreased significantly at a time when they should have been experiencing high levels of stress (the week before final exams).

Lengua and Stormshak (2000) examined the effects of gender, gender roles, and personality on coping strategies and psychological symptoms. Expected findings

were based on prior research findings that suggest that females appear to favor coping strategies such as social support, emotion-focused, and avoidant behavior, while males appear to favor coping with stress through other activities, more often using alcohol relative to females. Coping strategies have been traditionally categorized as either problem-focused coping, which are direct problem solving efforts, or emotion-focused coping, which involves efforts to manage or reduce stress by positive reframing and avoidance. Generally, problem-focused coping is associated with lower levels of psychological symptoms, whereas emotion-focused coping is associated with higher levels of symptoms.

Participants in the study, 250 undergraduates at the University of Washington, completed a set of self-report coping, personality, and symptom measures in group sessions. Results of the study suggested that gender roles are important predictors of personality, coping, and symptoms, and that gender roles, personality, and coping, both individually and in combination, predict psychological symptoms. Gender roles also predicted personality factors and coping behaviors and were directly related to symptom outcomes. Masculinity significantly predicted higher levels of achievement orientation, as well as active and positive cognitive coping. On the other hand, masculinity predicted lower levels of avoidant coping and depression, findings consistent with prior research relating masculinity to lower depression and higher self-esteem. Significantly, the relation between masculinity and depression was accounted for by active coping. However, masculinity did not predict uniformly positive findings. Rather, masculinity also predicted higher levels of externalizing problems of antisocial behavior and alcohol use. In contrast, femininity predicted higher levels of

affiliation orientation and avoidant coping, as well as internalizing problems of depression and low self-esteem, and lower levels of achievement orientation, active coping, antisocial behavior, and alcohol use.

A recent article brings renewed attention to the issue of self-medication. Inherent to the self-medication concept is that individuals with mental health disorders believe their symptoms are treatable and they seek to alleviate the symptoms through the use of substances and/or professional mental health care (Harris & Edlund, 2005). Harris and Edlund (2005) evaluated the relationship between one's unmet need for mental health care and substance use among 18,849 adults between the ages of 18 and 65. The researchers found that those individuals with mental health problems were more likely than the general population to use illicit drugs. However, they did not engage in heavy drinking at higher rates than the general population. In fact, Harris and Edlund found that those individuals who sought mental health treatment had a significantly lower rate of heavy alcohol use than those who did not use mental health services (2005). As the authors noted, this research has important implications as it suggests that mental health treatment may be more effective in treating the underlying symptoms that prompt alcohol use (Harris & Edlund, 2005). The findings of this study may be applied to the college population in that greater accessibility to mental health services on college campuses may result in a reduction of alcohol abuse by college students.

While some research has suggested that alcohol problems are associated with drinking in order to cope with negative affect (Simons, et al., 1998), Wild et al. (2001)

found no support for this view. Instead, in a study of 286 college students they found that males who felt they would be giving up significant benefits by reducing their alcohol use were more likely to be problem drinkers, and males who typically drank in order to avoid social rejection were less likely to be problem drinkers. Further quantitative research on drinking motives has focused on the four factors of enhancement motives, coping motives, social motives, and conformity motives (Simons, Correia, Carey, & Borsari, 1998). These motives consistently predict drinking behavior across different demographic groups.

No doubt the expectancy aspect of alcohol use plays an important role in sexual behavior. Survey results suggest that "people who believe in alcohol's sexual effects are more likely to drink before a sexual experience" (George & Stoner, 2000, p. 122). Despite some conflicting study results, there is at least some indication that alcohol use may also be linked to unsafe sexual practices since it seems fairly conclusive that excessive alcohol use impairs one's judgment (Poulson, Eppler, Satterwhite, Wuensch, & Bass, 1998). (Aertgeerts, Buntinx, Bande-Knops, Vandermeulen, Roelants, Ansoms, & Fevery, 2000). Sexually transmitted diseases and unplanned pregnancies are also problems related to alcohol use.

Social Reasons

The new sense of freedom for students in college provides a unique opportunity for students to engage in self-evaluation and the formation of new identities within what they perceive of as a protected place (Dorsey et al., 1999). Crawford and Novak (2000) focused their study on how a student's increased

awareness of the possibility of engaging in peer norm infractions might in turn create feelings of embarrassment which would then lead to drinking in order to alleviate the feelings. Participants in the study were 431 students (with females overrepresenting by 68%) who were enrolled in introductory sociology and criminal justice courses at a large Midwestern university. Just under 70% of the students reported use of alcohol, and 37% (over half of the students who used alcohol) reported they engaged in binge drinking. Those students having a low level of public self-consciousness were most likely to use alcohol, a finding contradictory to the authors' hypothesis.

Drinking to socialize is related to the personality trait of extroversion, which has proved to be a reliable predictor of alcohol use (Martsh & Miller, 1997). Liu and Kaplan (1996) found that males tend to seek social bonding through the use of alcohol and report that they often drink because their friends are doing it. Moreover, males seem to be more influenced by their peers to consume alcohol than females (Valliant & Scanlan, 1996).

Spratt and Turrentine (2001) studied how alcohol use might vary with involvement in low-alcohol-use student groups. Their study was based on the hypothesis that groups may select leaders who embody the general values of the group. Logically, then, if high-alcohol-use groups select leaders who drink heavily, low-alcohol-use groups might select leaders who are less involved with alcohol. Those with multiple involvements in low-alcohol-use groups might be expected to show the lowest alcohol use. A sample from minority and religious groups were selected as examples of low-use organizations since research generally suggests that non-White

students and those with active religious affiliation would drink less on average than other students. Respondents (n=1,992) were coded according to the number of leadership positions held in these types of organizations and categorized as follows: active members with no leadership positions in either type of group (n=958), students with a leadership role in either minority or religious groups, but not both (n=887), and students with leadership positions in both minority and religious groups (n=147).

The instrument chosen for the study was the self-report Core Alcohol and Drug Survey, a widely used instrument found to be both valid and reliable. The dependent variable was the average number of drinks per week. For the overall sample the mean was 3.61, lower than the national average of 4.5 drinks per week for all college students as determined by Presley, Meilman, and Cashin (1997). A one-way ANOVA was used to compare the average number of drinks per week for students in the three different categories of leadership roles. A significant difference was found among the three groups, $F(2,1955)=35.23$, $p=.000$.

Contrary to the study hypothesis, those students with dual leadership roles were found to drink significantly more drinks per week on average (M=9.75,SD=20.38) than those with one leadership role (M=2.75,SD=8.08) and those with no leadership positions (M=3.46,SD=7.56). Study results, then, for those with no leadership or only one leadership role supported the researchers' hypothesis. However, for those with two leadership roles, actual findings contradicted the hypothesis. Indeed, the average number of drinks per week for students with two leadership positions was found to be higher than the rate of drinking for leaders of athletic teams

and sororities. Only fraternity members and leaders drank more than students who were leaders of both religious and minority organizations. Moreover, demographic factors were unable to explain the difference in the number of heavy drinkers between the two leadership groups. Spratt and Turrentine (2001) concluded that leadership appears to become a risk factor for alcohol use, at least for some students. Specifically, the role of "leader" becomes a psychosocial stressor and alcohol may be the drug of choice to help reduce the impact.

History of Alcohol and Drug Use at the University of Oklahoma

Although the University of Oklahoma was founded over 110 years ago, the study of alcohol use by its students is relatively new. The Norman Prevention Coalition (Higher Education Committee) approached Dr. Avraham Scherman in the late 1990s to assess the drug and alcohol use at the University of Oklahoma. The Norman Prevention Coalition awarded a $3000 grant to begin the project and another $1000 grant was received by the Oklahoma Psychological Association. The pilot study assessed the drug and alcohol use of university faculty, staff and students via mail-out survey. The low faculty and staff response rate (below 20%) coupled with limited resources necessitated the decision of this researcher to focus exclusively on undergraduate students. Moreover, the low response rate and the cost of the mail-out approach prompted the use of group administration in this investigation.

`METHODOLOGY

Methodological Approach

This investigation utilized archival data based upon a survey of undergraduates attending the University of Oklahoma. The survey used was self-administered and, therefore, self-report in format. This reduced the likelihood of self-desirable responding. This approach was employed, as the goal was to obtain information from a large sample of the undergraduate population in a relatively short period of time.

The independent variables were considered the predictor variables and the dependent variable was considered the outcome variable. This investigation includes several different independent variables: (gender, age, grade point average, ethnicity [White, African American, Native American, Hispanic, Asian American], marital status, religiosity, living arrangements [Greek house (fraternity or sorority), residence hall, house or apartment in Norman, residence outside of Norman, and student housing] Greek organization membership, athletic participation, tobacco use, level of intoxication). The one dependent variable in this study was binge drinking. Binge drinking was measured by item number eight on the survey. The item read, "Over the last two weeks, how many times have you had five or more drinks in a row?" The available responses are (1) none; (2) once; (3) twice; (4) 3 to 5 times; (5) 10 or more times. .As is consistent with the literature, the binge drinking variable is being divided into three groups so as to enable comparison between those groups (Wechsler & Dowdall, 1998). The three groups are (1) Non Bingers, (2) Occasional Bingers, and (3) Frequent Bingers. Non bingers are those persons who acknowledge drinking, but

do not engage in binge drinking behavior. Occasional binge drinkers are those who have had consumed five or more drinks in a row one or two times during the last two weeks. Frequent binge drinkers are those who have binged three or more times during the same time period. This study also examined the reasons for drinking

Selection of the Sample

An initial sample size of 687 was obtained from the 1,000 students sampled. This corresponds to a 68.7% response rate. The sample used in this study consisted of a probability sample of 1,000 randomly selected undergraduate students attending the University of Oklahoma during the 1997 spring semester. Given that the focus of this investigation was on binge drinking, the 158 self-identified abstainers were deleted from the analyses. After the data were systematically examined additional cases were eliminated from the analyses secondary to obvious error (e.g. one subject reported his age to be 11). Similarly suspicious cases were eliminated as were those cases with missing values. The final sample size was 503.

Procedures

A list of the undergraduate courses, provided by the university administration, was selected until a sample size of 1000 students was reached. After permission was solicited from the course instructors, the researchers presented the study to the students. Surveys were distributed and then collected during the next regularly scheduled class period. All participants were required to sign a consent form prior to taking part in the experiment. The confidential nature of their responses was explained, including measures take to ensure anonymity. Additionally, it was emphasized that the participants could discontinue with the experiment at any time

without being penalized in any manner. The sampling did not include a matching procedure. Participants were expected to benefit from this investigation via the knowledge gained from the information they provide. As the methodological approach utilized in this investigation was voluntary and anonymous in nature, there was minimal risk to the participants in this study.

The gender distribution of the study was expected to reflect the true male/female ratio among the undergraduate population at the university. However, this was not borne out. The sample consisted of 38.6 % males and 61.0% females. The university reported gender ratio is approximately 50/50. In regard to the distribution of classes, this sample consisted of 26.0% freshmen, 31.8% sophomores, 22.1% juniors, and 19.9% seniors. One respondent (0.2% of the sample) failed to report his/her grade level. This sample is different from that of the university in so much as the university enrollment contains approximately 21% freshmen, 21% sophomores, 21% juniors, and 32% seniors. Given the sample/university discrepancy, any analysis regarding gender or classification should be interpreted with caution.

The Survey

The Use of Alcohol, Tobacco and Other Drugs in the Community Survey was the instrument used in this investigation. The survey was developed by the University of Michigan's Initiative on Alcohol and Other Drugs (Hamid, 1995). The survey was developed to collect data so as to identify trends in substance use, identify students who may be considered high-risk and to assist in designing drug and alcohol prevention programs. The questionnaire is displayed in Appendix B.

The survey consists of 60 items of which 25 have multiple questions within the item. This translates to 353 distinct variables. Overall, the survey is divided into five domains (1) the frequency of the consumption of alcohol, tobacco, illicit, prescription, and over-the-counter drugs; (2) problems resulting from substance use; (3) the place and social circumstances of the substance use; (4) strategies employed to regulate drinking; (5) the perceptions of norms and attitudes about substance use in peer groups and the community (Martin, 2000). The last nineteen items on the survey are sociodemographic and descriptive in nature.

The present investigation focused on the prediction of binge drinking from demographic and social variables. It also explored the relationship of students' reasons for drinking and their level of drinking. The remaining items will not be reviewed in depth at this time.

Data Analysis

The data for this investigation were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows version 13. Following examination of the database for accuracy, six independent multiple discriminant analyses were conducted utilizing various groups of predictor variables. Subsequently, equalites of means were conducted with post hoc analyses.

As the goal of this investigation was to determine factors that predict binge drinking behavior among undergraduate college students, discriminant analysis was an appropriate choice as it can be used to predict group membership on the basis of quantitative predictor variables (Green & Salkind, 2005). The outcome variable was binge drinking behavior. In the survey, the binge drinking variable is Item 11 (coded

OVER 5**),** and it reads, "Over the last two weeks, how many times have you had five or more drinks in a row? (1) None; (2) Once; (3) Twice; (4) 3 to 5 times; (5) 10 or more times." As is consistent with the literature, the participants who acknowledged drinking were classified into three binge drinking groups. so as to enable comparison between those groups (Wechsler & Dowdall, 1998).

The three groups are (1) Non Bingers, (2) Occasional Bingers, and (3) Frequent Bingers. Non bingers are those persons who acknowledge drinking, but do not engage in binge drinking behavior. Occasional binge drinkers are those who have had consumed five or more drinks in a row one or two times during the last two weeks. Frequent binge drinkers are those who have binged three or more times during the same time period.

The variables used in the analyses and their corresponding survey items are listed below:

TOB 1 Item 1, "How frequently have you smoked cigarettes during the past 30 days? (1) Not at all; (2) Less than one cigarette per day; (3) One to five cigarettes per day; (4) About one-half pack per day; (5) About one pack per day; (6) About one and one-half packs per day; (7) Two packs or more per day".

TOB 2 Item 2, "How frequently have you used smokeless tobacco (chew, stuff) in the past 30 days? (1) Not at all; (2) Once or twice; (3) Occasionally; (4) Several times a week; (5) Everyday".

REASON 1-17 Items 16a-16q are prefaced by the following question: What have been your MOST IMPORTANT reasons for drinking alcoholic beverages? (Circle all that apply)

REASON 1 Item 16a, "To relax or relieve tension".

REASON 2 Item 16b, "To have a good time with my friends".

REASON 3 Item 16c, "To get drunk".

REASON 4 Item 16d, "To fit in with a group I like".

REASON 5 Item 16e, "To get away from my problems or troubles".

REASON 6 Item 16f, "Because of boredom, nothing else to do".

REASON 7 Item 16g, "To relieve depression".

REASON 8 Item 16h, "To get through the day".

REASON 9 Item 16i, "To get to sleep".

REASON 10 Item 16j, "To enhance sexual pleasure or opportunity".

REASON 11 Item 16k, "To increase my enjoyment of music or food".

REASON 12 Item 16l, "Because I like the taste".

REASON 13 Item 16m, "Because it's the thing to do".

REASON 14 Item 16n, "Because I feel better when I'm drinking".

REASON 15 Item 16o, "To help me be less shy with others".

REASON 16 Item 16p, "To celebrate at ceremonial occasions".

REASON 17 Item 16q, "Other_____".

STUDROLE Item 42, "Role at University" (1) Freshman; (2) Sophomore; (3) Junior; (4) Senior; (5) Law student; (6) Graduate student; (7) Post-graduate training; (8) Not seeking a degree; (9) Other_____".

GPA Item 46, "Approximate grade point average, on a 4-point scale: ___.___ ___".

AGE Item 48, "Age: ___ ____".

GENDER Item 49, "Gender: (1) Male; (2) Female".

ETHNIC Item 51, "Primary ethnic origin: (1) American Indian/Native American; (2) Asian/Pacific Islander; (3) African; (4) Hispanic (Chicano/Latino/Mexican); (5) Arab/Middle Eastern; (6) White/European (not of Hispanic Origin); (7) Other_____".

MARITAL Item 53, "Marital status: (1) Single; (2) Married/domestic partner; (3) Separated; (4) Divorced; (5) Widowed".

HOUSING Item 55, "Living where during the school year?: (1) Residence hall; (2) Fraternity; (3) Sorority; (4) Student housing; (5) House/apartment in Norman; (6) Outside of Norman".

GREEK Item 56, "Greek affiliation? (1) Yes; (2) No".

STUDACT Are prefaced by Item 57, Please indicate how many hours per week you spend on each on the following types of activities. (Count each activity in only one category).

Hours per week (1) None; (2) 1-4 hours; (3) 5-9 hours; (4) 10-15 hours; (5) 16 or more

STUDACT2 Item 57b, Participating in intercollegiate athletics.

RELIGI1 Item 58, How important are religious or spiritual values to you? (1) Not at all important; (2) Not very important; (3) Mildly important; (4) Important; (5) Very important".

Statistical procedures were conducted in order to answer the following questions:

(1) Which demographic variable(s) and/or social variable(s) is/are the best independent predictor(s) of binge drinking?. (2) What are the most common reasons

for undergraduate drinking?, (3) What is the relationship between students' reasons for drinking and binge drinking? and related hypotheses.

RESULTS

Preliminary Analyses

The description of the participants is presented in the same order as is discussed in the hypotheses section (gender, age, grade point average, ethnicity, marital status, religiosity, year in school, living arrangements, Greek status, athletic participation, and reasons for drinking).

Of the 503 respondents, 194 were male (38.6 percent) and 301 (61.0 percent) were female. Two students (0.4 percent) failed to identify their gender.

The ages of the students ranged from 18 to 25 years old. The mode was 22 with 44 students reported being this age. The average age of the students was 20.16 years.

In terms of grade point average (gpa), the students' self-reported grade point averages ranged from 0.50 to 4.00. The mode was 3.00 with 61 students (12.1 percent) reporting this grade point average. The average gpa was 3.09. It was notable that 12 students (2.4 percent) reported a gpa of 2.00. Thirty-six students (7.2 percent) reported a gpa of 2.50. Fifteen students (3.0 percent) reported a gpa of 3.75. Twenty-four students (4.8 percent) reported a gpa of 3.50. Twenty-nine students (5.8 percent) reported a gpa of 4.00.

Of the 503 students, 33 (6.6 percent) identified themselves as American Indian/Native American, 17 (3.4 percent) identified themselves as Asian/Pacific Islander, 21 (4.2 percent) identified themselves as African American, 12 (2.4 percent) identified themselves as Hispanic, and 401 (79.7 percent) identified themselves as White.

Of the 503 students, 473 (94.0 percent) were single, 27 (5.4 percent) were married or had a domestic partner, 1 (0.2 percent) was separated, and 1 (0.2 percent) was divorced. One student (0.2 percent) did not respond to this item.

Of the 503 students, 258 students (51.3 percent) report spending time each week engaged in religious activities. Two hundred twenty-five students (44.7 percent) report spending 1-4 hours per week, 26 (5.2 percent) report spending 6-9 hours per week, 5 students (1 percent) report spending 10-15 hours per week, and 2 students (0.4 percent) report spending 16 or more hours per week engaged in religious activities. One student (0.2 percent) failed to respond to this item.

Of the 503 respondents, 131 (26.0) were freshmen 160 (31.8 percent) were sophomores, 111 (22.1 percent) were juniors, and 100 (19.9 percent) were seniors. One student (0.2 percent) failed to respond to this item.

Of the 503 respondents, 124 (24.7 percent) lived in the residence halls, 91 (18.1 percent) lived in fraternities or sororities, 24 (4.8 percent) lived in student housing, 222 (44.1 percent) lived in a house or apartment in Norman, and 41 (8.2 percent) lived outside of Norman.

Of the 503 students, 202 (40.2 percent) were part of the Greek system, 300 (59.6 percent) were not and one student (0.2 percent) failed to respond to this item.

Of the 503 students, 138 (27.4 percent) report participating in intercollegiate athletics. Seventy-seven students (15.3 percent) report spending 1- 4 hours per week, 19 students (3.8 percent) report spending 5-9 hours per week, 14 students (2.8 percent) report spending 10-15 hours per week and 28 students (5.6 percent) report spending

16 or more hours per week participating in intercollegiate athletics. Two students from the sample failed to respond to this item.

Of the 503 students, 233 (46.3 percent) fell into the "no binge" category; 171 (34.0 percent) fell into the "occasional binge" category, 99 (19.7 percent) fell into the "frequent binge" category.

Reason 1: "To relax or relieve tension"

This reason for drinking was endorsed by 258 (51.3 percent) students. This reason for drinking was not endorsed by 245 (48.7 percent) students.

Reason 2: "To have a good time with my friends"

This reason for drinking was endorsed by 417 (82.9 percent) students. This reason for drinking was not endorsed by 86(17.1 percent) students.

Reason 3: "To get drunk"

This reason for drinking was endorsed by 168 (33.4 percent) students. This reason for drinking was not endorsed by 335 (66.6 percent) students.

Reason 4: "To fit in with a group I like"

This reason for drinking was endorsed by 22 (4.4 percent) students. This reason for drinking was not endorsed by 481 (95.6 percent) students.

Reason 5: "To get away from my problems or troubles"

This reason for drinking was endorsed by 84 (16.7 percent) students. This reason for drinking was not endorsed by 419 (83.3 percent) students.

Reason 6: "Because of boredom, nothing else to do"

This reason for drinking was endorsed by 89 (17.7 percent) students. This reason for drinking was not endorsed by 414 (82.3 percent) students.

Reason 7: "To relieve depression"

This reason for drinking was endorsed by 52 (10.3 percent) students. This reason for drinking was not endorsed by 451 (89.7 percent) students.

Reason 8: "To get through the day"

This reason for drinking was endorsed by 8 (1.6 percent) students. This reason for drinking was not endorsed by 495 (98.4 percent) students.

Reason 9: "To get to sleep"

This reason for drinking was endorsed by 32 (6.4 percent) students. This reason for drinking was not endorsed by 471 (93.6 percent) students.

Reason 10 "To enhance sexual pleasure or opportunity"

This reason for drinking was endorsed by 68 (13.5 percent) students. This reason for drinking was not endorsed by 435 (86.5 percent) students. .

Reason 11 "To increase my enjoyment of music or food"

This reason for drinking was endorsed by 75 (14.9 percent) students. This reason for drinking was not endorsed by 428 (85.1 percent) students.

Reason 12 "Because I like the taste"

This reason for drinking was endorsed by 222 (44.1 percent) students. This reason for drinking was not endorsed by 281 (55.9 percent) students.

Reason 13"Because it's the thing to do"

This reason for drinking was endorsed by 16 (3.2 percent) students. This reason for drinking was not endorsed by 487 (96.8 percent) students.

Reason 14 "Because I feel better when I'm drinking"

This reason for drinking was endorsed by 38 (7.6 percent) students. This reason for drinking was not endorsed by 465 (92.4 percent) students.

Reason 15 " To help me be less shy with others"

This reason for drinking was endorsed by 119 (23.7 percent) students. This reason for drinking was not endorsed by 384 (76.3 percent) students.

Reason 16 "To celebrate at ceremonial occasions"

This reason for drinking was endorsed by 267 (53.1 percent) students. This reason for drinking was not endorsed by 236 (46.9 percent) students.

Reason 17 "Other_____"

This reason for drinking was endorsed by 24 (4.8 percent) students. This reason for drinking was not endorsed by 479 (95.2 percent) students.

Discrimination of Student Binge Drinking Groups

Multiple discriminant function analyses were conducted with the three binge drinking groups (Non Binge, Occasional Binge, Frequent Binge) serving as the dependent variables. Blocks of possible predictor variables were simulateously entered into equations with the ultimate goal of finding support for the research hypotheses (i.e. "What are the best predictors of binge drinking and what is the relationship between students' reasons for undergraduate drinking behavior and binge drinking?") As the focus of this investigation was on binge drinking, the 158 self-described abstainers were eliminated from the original sample of 687 cases. After a

list-wise deletion of cases with missing values (*n*=26), the responses of 503 undergraduates were included in the analysis.

I

In analysis one, discriminating variables (gender, age, grade point average, ethnicity [White, African American, Native American, Hispanic, Asian American], marital status, religiosity, living arrangements [Greek house (fraternity or sorority), residence hall, house or apartment in Norman, residence outside of Norman, and student housing], and year in school) were entered simultaneously. Past research has suggested that possible predictor variables be entered sequentially in blocks (based on the research question at hand) rather than allowed to drop out secondary to failure to achieve an arbitrary level of statistical significance (Getz & Bray, 2005). The initial block was chosen as these variables have been found to be strongly associated with student drinking behavior.

One of the two discriminant functions was statistically significant (Wilks' Lambda = .814; $p < .0001$). Function 1 was statistically significant indicating that the overall predictors differentiated among the three binge drinking groups (Non bingers, Occasional bingers, Frequent bingers). Eigenvalues associated with discriminant functions are indicative of the value of the functions in differentiating the groups (i.e. larger the eigenvalue, the better the groups are differentiated) (Nourusis, 2005). The eigenvalue for Function 1 (analysis one) was .20. Although the eigenvalue was statistically significant, the eta square indicated that only 17% of the variability of the scores for the first discriminant function was accounted for by the differences among

the three drinker groups (eta square is obtained by squaring the function's canonical correlation). Function 2 was not significant ($p < .751$) and therefore cannot be interpreted.

According to numerous sources, the discriminator's correlations with the function (i.e. structure coefficient) constitute useful criteria for assessing their importance (e.g. Getz & Bray, 2005). Structure coefficients >.300 (with Wilks's lambda $p < .05$) are considered to make substantial, independent contributions to the function (Thombs, 2000). Structure coefficients are the pooled within-group correlations between each variable and the function (Norusis, 2005). An examination of the structure coefficients for Function 1 indicates that six variables made substantial contributions to the function (coefficients >.300).

White (.491)

Greek residence (.448)

Gender (-.415)

African American (-.340)

House/apartment outside Norman (-.308)

Year in school (-.308)

The classification results of the first discriminant analysis are shown in Table One. In classifying these cases, prior probabilities were used to determine group membership. The prior probabilities procedure adjusts the classification coefficients to reflect the unequal sizes of the groups. When the group sizes are noticeably different, as in this study, the adjustment for prior probabilities provides a more realistic assessment of the ability of the discriminant functions to classify cases (Norusis,

2005). In analysis one, the discriminant functions, overall, correctly classified 53% of the students into the three binge drinker groups. The variables were most effective in correctly classifying the Non Bingers (78.5%) and the Occasional Bingers (38.4%). The variables were least effective in correctly classifying the Frequent Bingers (18.8%).

To assess how well the classification procedure would predict in a new sample, the leave-out-one technique was calculated. Similarly, it was able to correctly classify 51% of the cases into the three binge drinker groups. Although the overall classification rate of the sample was 53%, the variables correctly classified occasional bingers only slightly above chance (38.4% classification versus 33.3% chance classification). Moreover, the frequent binge drinkers were correctly classified significantly below chance. Given this less than optimal classification using demographic variables and the fact that the literature (Tombs, 2000; Wechsler & Davenport, 1997) suggests that social group membership (e.g. intercollegiate athletes and Greek membership) can have a greater effect on binge drinking than demographics, a second analysis was conducted utilizing group membership as predictors.

II.

In analysis two, 503 undergraduates were included in the analysis with two discriminating variables (Greek membership and intercollegiate athletic status) entered into the analysis simultaneously. In the second analysis, one of the two discriminant functions was statistically significant (Wilks' Lambda = .872; $p < .0001$).

Again, only Function 1 was statistically significant (Function 2 = $p < .823$) indicating that the overall predictors differentiated among the three binge drinking groups (non bingers, occasional bingers, frequent bingers). An examination of the structure coefficients indicated that only one variable (being a member of Greek society) made a substantial and independent contribution to the function (structure coefficient = .994).

In analysis two, the discriminant function, overall, correctly classified 54% of the students into the three binge drinker groups (see Table Two). However, it failed to accurately classify any of the Frequent Bingers. Still, 78.4% of the Non Bingers and 52.9% of the Occasional Bingers were correctly classified indicating that Greek membership was a powerful variable in predicting drinking behavior. To assess how well the classification procedure would predict in a new sample, the leave-out-one technique was calculated and the exact aforementioned results were obtained. Given the power of this analysis utilizing only two predictor variables, a third analysis was conducted including these predictors as well as the original demographics.

III.

In analysis three, the aforementioned discriminating variables (gender, age, grade point average, ethnicity, marital status, religiosity, living arrangements, and year in school) along with Greek membership and intercollegiate athletic status were simultaneously entered resulting in one significant discriminant function ($p < .0001$) and an overall superior classification accuracy.

An examination of the structure coefficients for Function 1 indicated that four variables made substantial contributions to the function (i.e. coeffients > .300).

Greek (.717)

White (-.406)

Greek residence (-.365)

Gender (.327)

In analysis three, the discriminant functions, overall, correctly classified 57% of the students into the three binge drinker groups (see Table Three). The variables were most effective in correctly classifying the Non Binge group (79.3%) and the Occasional Binge group (44.2%). Again, the variables were not effective in correctly classifying the Frequent Binge group (23.2%). Similar results were obtained utilizing the leave-out-one technique.

IV.

In analysis four, the research question: "What is the relationship between students' reasons for drinking and binge drinking?" was examined. The 503 undergraduates were included in the analysis with seventeen discriminating variables (reasons for drinking) entered simultaneously: (1)

Reason 1 "To relax or relieve tension"

Reason 2: "To have a good time with my friends"

Reason 3: "To get drunk"

Reason 4: "To fit in with a group I like"

Reason 5: "To get away from my problems or troubles"

Reason 6:"Because of boredom, nothing else to do"

Reason 7: "To relieve depression".

Reason 8: "To get through the day"

Reason 9: "To get to sleep"

Reason 10: "To enhance sexual pleasure or opportunity"

Reason 11: "To increase my enjoyment of music or food"

Reason 12: "Because I like the taste"

Reason 13: "Because it's the thing to do"

Reason 14: "Because I feel better when I'm drinking"

Reason 15: " To help me be less shy with others"

Reason 16: "To celebrate at ceremonial occasions"

Reason 17: "Other_____") .

In the fourth analysis, both of the discriminant functions were statistically significant (Function 1: $p < .0001$) and (Function 2: $p < .009$). The first discriminant function extracted maximized the differences on this function among the groups (i.e. non binge drinker, occasional binge drinker, and frequent binge drinker). The second

function extracted also maximized the differences but had the added constraint of being uncorrelated with Function 1. The eigenvalue for Function 1 was .280 while the eigenvalue for Function 2 was .068 (canonical correlations were .467 and .252 respectively). Thus, approximately 22% of the variability of the scores for Function 1 was accounted for by differences among the three groups while approximately 6% of the variability of the scores for Function 2 was accounted for by the binge drinker factor.

An examination of the structure coefficients for Function 1 found that seven variables made substantial contributions to the function (i.e. coefficients > .300).

Reason 3 “To get drunk” (.763)

Reason 2 “To have a good time with my friends” (.604)

Reason 15 “To help me be less shy with others; (.336)

Reason 14 “Because I feel better when I’m drinking” (.333)

Reason 6 “Because of boredom (.330)

Reason 10 “To enhance sexual pleasure or opportunity (.308)

Reason 1 “To relax or relieve tension” (.304)

An examination of the structure coefficients for Function 2 found that 5 variables made substantial contributions to the function (i.e. coefficients > .300).

Reason 7 “To relieve depression” (.489)

Reason 8 “To get through the day” (.442)

Reason 2 “To have a good time with my friends” (-.418)

Reason 5 “To get away from my problems or troubles”(.337)

Reason 16 “To celebrate at ceremonial occasions” (.304)

In analysis four, the discriminant functions, overall, correctly classified 56% of the students into the three binge drinker groups (see Table Four). Again the variables were most effective in correctly classifying the Non Binge drinker (77.7%). While, the Occasional Binge drinker and Frequent Binge drinker groups were classified with far less accuracy (36.3% and 38.4% respectively). Similarly, the leave-out-one technique classified 53% of the cases into the three binge drinker groups.

V

In analysis five, the responses of 503 undergraduates were included and 18 predictor variables that had previously been identified as the strongest structure coefficients (>.300) from the first four analyses, as well as two new predictors (i.e. smoking and smokeless tobacco), were entered into the analysis simultaneously. The previous four analyses faired poorly in terms of correct classification of the frequent binge drinker group. Frequent binge drinkers are more likely to engage in potentially dangerous behaviors. For example, tobacco use has been shown to signal the possible development of a syndrome of other hazardous or deviant behaviors (Everett, et. al., 1998). Previous research suggests a positive relation between tobacco use (both cigarette smoking and smokeless tobacco use) and the use of alcohol (Everett, et. al., 1998). Therefore, the tobacco variables (smoking and smokeless) were entered into the analysis with the hope of improving classification accuracy for the frequent binge drinker group.

Both discriminant functions were statistically significant: Function 1 (Wilks' Lambda = .536; p < .0001) and Function 2 (Wilks' Lambda= .914; *p* < .001). Thus, the overall predictors differentiated among the three groups. The eigenvalue for Function 1 was .705 with a canonical correlation of .643 while the eigenvalue for Function 2 was .094 with a canonical correlation of .294. Approximately 41% of the variability of the scores for Function 1 was accounted for by differences among the three groups while approximately 9% of the variability of the scores for Function 2 was accounted for by the binge drinker factor.

An examination of the structure coefficients for Function 1 found that 5 variables made substantial contributions to the function (i.e. coefficients > .300).

Smoking (.553)

Reason 3 "To get drunk" (.481)

Greek membership (.441)

Reason 2 "To have a good time with my friends" (.380)

Using smokeless tobacco (.304)

An examination of the structure coefficients for Function 2 found that 6 variables made substantial, independent contributions to the function.

Greek house (fraternity/sorority residence (.462)

Reason 2 "To have a good time with my friends" (.423)

Tobacco1 (smoking; -.412)

Reason 7 ("To relax or relieve tension" (-.394)

Reason 8 “To get through the day” (-.357)

Greek membership (-.306)

In analysis five, the discriminant functions, overall, correctly classified 63.7% of the students into the three groups (see Table Five). As with the previous analyses, the variables were most effective in correctly classifying the Non Binge drinker group (78%). Still, the discriminant functions performed well as 52.7% of the Occasional Binge drinker group and 49% of the Frequent Binge drinker group were classified correctly. For the first time, the latter group was classified better than chance.

VI

A final sixth discriminant analysis was conducted with 21 variables entered into the equation simultaneously. As in analysis five, the same 20 variables were utilized as well as a new variable called “How High.” On this variable, students were asked to respond to the question, “When you drink alcoholic beverages, how high or buzzed, do you usually get?” They were given four choices: (1) “Not at all high or buzzed; (2) “A little high or buzzed”; (3) “Moderately high or buzzed”, or (4) “Very high/drunk/wasted.”

Both of the discriminant functions were statistically significant (Function 1: $p<$ 0001; Function 2: $p < .002$). The eigenvalue for Function 1 was .873 with a Canonical Correlation of .683. The eigenvalue for Function 2 was .092 with a Canonical Correlation of .291. Thus, approximately 47% of the variability of the scores for Function 1 was accounted for by differences among the three groups while

approximately 8% of the variability of the scores for Function 2 was accounted for by the binge drinker factor.

An examination of the structure coefficients for Function 1 indicated that five variables made substantial contributions to the function:

How High (.653)

Tobacco1 (smoking) (.521)

Reason3 “To get drunk” (.428)

Greek membership (.393)

Reason 2 “To have a good time with my friends” (.328).

An examination of the structure coefficients for Function 2 indicated that six variables made substantial contributions to the function:

Greek House (residency in fraternity/sorority (.468)

Tobacco1 (smoking) (-.426)

Reason2 “To have a good time with my friends” (.405)

Reason 7 “To relieve depression” (.489).

Reason 8 “To get through the day” (.442).

Greek membership (-.310)

In analysis six (see Table Six), the discriminant functions, overall, correctly classified 67.8% of the students into the three binge drinker groups: 78.1% of the Non Binge Drinker group were correctly classified; 62.5% of the Occasional Binge Drinker group were correctly classified; and 53.1% of the Frequent Binge Drinker group were correctly classified. Similarly, 63.2% of the cross-validated grouped cases were correctly classified.

The Kappa coefficient, an index that corrects for chance agreements, was computed. A Kappa of .485 was obtained. Kappa ranges in value from –1 to +1. Thus, the obtained Kappa indicated moderate accuracy in prediction (Green & Salkind, 2005).

Group Differences

Although, one-way analyses of variance are often used to evaluate the relationship between an independent variable (e.g. binge drinking groups) and dependent variables (e.g. reasons for alcohol use), they are frequently utilized inappropriately. That is, a priori assumptions regarding their legitimate use are often ignored. For example, to appropriately use ANOVAs, it is assumed that the dependent variable is normally distributed for each of the populations as defined by different levels of the factor, that the variances of the dependent variable are the same for all populations and that the cases represent random samples from the populations and the scores on the test variable are independent of each other (Green & Salkind, 2005; Norusis, 2005). Therefore, it was concluded that ANOVAs would be inappropriate for this data.

Instead, Brown-Forsythe statistical tests were conducted to ascertain if there were differences between the means of the three drinker groups (Non Binge drinker, Occasional Binge drinker, and Frequent Binge drinker) on dependent variables. The dependent variables were the variables examined in the previous significant discriminant functions. The Brown-Forsythe statistical tests are robust tests of equality of means and do not require that all population variances are equal. In fact,

the method allows for group variances that are markedly unequal and group sample sizes that are quite different (Green & Salkind, 2005; Norusis, 2005).

For purposes of clarity, Table Seven shows the Brown-Forsythe robust test of equality of means for the seventeen Reasons for drinking while Table Eight shows the tests for the remaining variables. Post hoc tests were conducted with the Tamhane procedure as this method does not assume that population variances are equal (see Tables Nine and Ten).

As can be seen in Tables Seven and Eight, group means differed significantly for 13 of 17 reasons and for Tob1 (smoking), Tob2 (using smokeless tobacco), HowHigh (drinking to achieve a level of intoxication), Studrole (year in school), GPA (grade point average), age, gender, marital status, membership in a Greek organization, White ethnicity, living in a Greek House, and living outside of Norman. African-Americans were not represented in the Frequent Binge drinking group and therefore Brown-Forsythe statistics could not be conducted.

Post hoc analyses revealed significant between-groups differences for: Reasons 1,2,3,5,6,7.10,12,14, 15, and 17 and for Tob1, Tob2, HowHigh, Studrole, GPA, gender, marital status, Greek membership, White ethnicity, African-American ethnicity, living in a Greek house, and living outside of Norman (see Tables Nine and Ten).

DISCUSSION

Support for Hypotheses

This investigation was designed to examine three primary research questions. These questions were

RQ1: Which of the following is the best independent predictor of binge drinking?

(a) demographic variables, which include gender, age, grade point average, ethnicity, marital status, religiosity and living arrangements; (b) social variables, which include membership in Greek organizations and athletic participation; (c) a unique combination of demographic variables (gender, age, grade point average, ethnicity, marital status, religiosity and living arrangements) and social variables (membership in Greek organizations and athletic participation).

I

As can be gleaned from the results, a combination of demographic variables, social variables, and personal reasons for drinking alcohol, appears to be the best predictor of binge drinking. In Analysis one, the first discriminant analysis, one function was significant (indicative of group differentiation) and six structure coefficients (> .300) emerged as the best variables in separating the three groups of drinkers: White, Greek Residence, gender, African-American, house or apartment outside of Norman, and year in school.

(According to hypothesis H1d: Ethnicity, specifically being Caucasian will be positively related to binge drinking as consistent with the research of Clements (1999), Martin (1998), Prendergast (1994), and Wechsler et al. (2000).

This hypothesis was supported by the first discriminant analysis as being White was the strongest structure coefficient for the significant function. As can be seen from Table Eight, the Brown-Forsythe robust tests of equality of means found significant differences among the three groups ($p < .0001$) and post hoc Tamhane analyses (see Table Ten) found that the Frequent Binge drinker group had more white students than the Non Binge drinker group ($p< .0001$) and the Occasional Binge drinker group had more white subjects than the Non Binge drinker group ($p< .0001$).

Furthermore, African-American ethnicity emerged as a strong structure coefficient and Brown-Forsythe tests found significant differences among the three groups for the variable of African-American ethnicity. Specifically, post hoc tests found that African-American students were less likely to be in the Occasional Binge drinker group or the Frequent Binge drinker group. The Non Binge drinker group differed significantly from the Occasional Binge drinker group ($p < .05$) and the Frequent Binge drinker group ($p < .0001$). In summary, significantly fewer African-American students engaged in binge drinking in this sample.

(**According to hypothesis H1g: Living arrangements will relate to binge drinking such that those males students living in fraternities will engage in more binge drinking behavior than students residing in other domiciles as consistent with the research of Larimer et al. (1997) and Wechsler et al. (1998). Females**

residing in sororities will engage in more binge drinking behavior than students living in other places as consistent with the research of Wechsler et al. (1998).

Residency in a Greek fraternity/sorority house emerged as a strong predictor in group differentiation. That is, the Frequent Binge Drinker group was comprised of more students residing in a fraternity/sorority house than the Non Binge Drinker group ($p = .014$; Table Ten). Moreover, the Occasional Binge Drinker group was comprised of more students living in a fraternity/sorority house than the Non Binge Drinker group ($p < 0001$). No significant differences were found between the Occasional Binge group and the Frequent Binge group.

(According to hypothesis H1a: Gender, specifically, being male will be positively related to binge drinking and being female will be negatively related to binge drinking, consistent with the research of Borynski (2003), Turner et al. (2000), and Wechsler et al. (2000).

Gender was found to be a strong structure coefficient and an examination of Table Ten indicates that the Frequent Binge Drinker group was comprised of significantly more males than the Non Binge Drinker group. As can be seen from Table Eight, the Brown Forsythe robust test of equality of means found that there were significant differences among the three groups ($p < .001$). Although the conservative post hoc Tamhane analyses did not result in significant differences between the Non Binge and Occasional drinker groups or between the Occasional and Frequent Binge drinker groups, a significant difference was detected between the Non Binge and Frequent Binge drinker groups ($p = .001$).

(According to hypothesis H1g: Individuals residing in off campus apartments or homes will be more likely to engage in heavy drinking than those individuals living in on-campus (e.g. residence halls) as consistent with the research of Basten and Kavanagh (1996), Grenier et al. (1998), Prince (1999), Vaillant and Scanlan (1996), and Wechsler et al. (2000).

The variable having a house/apartment in Norman did not emerge as a significant structure coefficient. Furthermore, tests of equality of means revealed no significant group differences (see Table Eight). Living outside of Norman emerged as the fifth most influential structure coefficient. Upon further inspection, residing in a Greek house is positively related to binge drinking while living outside of Norman is inversely related to binge drinking. That is, more Non Binge Drinkers lived outside of Norman than Frequent Binge Drinkers ($p < .0001$). No significant differences were found between the Non Binge group and the Occasional Binge group nor were there significant differences between the Occasional and Frequent groups.

While the current investigation provides support for the relationship between living in a fraternity or sorority and binge drinking, there was no support found for the hypothesis that living in residence halls or that living in off campus residences relate to binge drinking at the University of Oklahoma.

Finally, year in school was found to be a strong structure coefficient. Subjects in the Non Binge Drinker group were significantly further along in their studies than the students in the Frequent Binge Drinker group. The Brown-Forsythe robust test of equality of means revealed a significant difference between the binge drinking groups

in relation to year in school (p = .009). An examination of the post hoc Tamhane procedure reveals a significant difference between the Non Binge and Frequent Binge drinking groups (p = .018). No other significant differences were noted.

Although a significant discriminant function was found for analysis one and an examination of the group centroids indicated good group differentiation, there was poor classification for the Frequent Binge Drinker group (see Table 1). This does not diminish the significance of the aforementioned findings, however. In fact, many researchers do not use the classification component of the discriminant analysis procedures. At any rate, it appears from Analysis one that binge drinking in this sample is consistent with past research. That is, the Frequent Binge drinking group contained significantly more White males living in a Greek residence and who tended to have less education.

II

(According to hypothesis H2a: Being a member of a Greek organization will be positively related to binge drinking as consistent with the research Carter and Kahnweiler (2000), Gomez (2000), Larimer et al. (1997), Sher et al. (2001), Turner et al. (2000), and Wechsler, et al. (1998).

In Analysis Two, membership in a fraternity/sorority emerged as the strongest structure coefficient (.994). Table 8 indicates that there was a significant difference among the means of the three groups and post hoc analyses (see Table 10) revealed that the Frequent Binge Drinker group has significantly more students affiliated with

Greek society than the Non Binge Drinker group (p< .0001). Furthermore, the Occasional Binge Drinker group had significantly more students in a fraternity/sorority than the Non Binge Drinker group (p<. 0001)

According to hypothesis H2b: Being an intercollegiate athlete will be positively related to binge drinking as a consistent with the research of Gutgesell and Canterbury (1999), Meilman et al. (1999), Nelson and Wechsler (2001), Wechsler et al. (1997).

As can be seen in Table Eight, the Brown-Forsythe robust tests of mean indicated that there were no significant differences between the groups (p = .561). In analysis two, only Greek membership and athletic status were entered, yet 52.9% of the Occasional Binge Drinker group and 78.4% of the Non Binge Drinker group were correctly classified (see Table 2). As can be seen in Table Eight, no significant differences were found among the means of the three groups for athletic status.

III

Given the power of the analysis, Greek membership (and athletic status) along with the previous demographic variables were entered in Analysis three. Four of the previously discussed variables made substantial contributions to the one significant discriminant function: (1) Greek membership, (2) White, (3) Greek Residence, and (4) Gender in order of importance.

IV

Analysis four examined the common reasons for undergraduate drinking and will be discussed below.

V

As can be seen from the results, Analysis five included two new variables in an effort to improve classification of the Frequent Binge Drinker group. Additionally, the 18 strong structure coefficients identified from the previous four analyses were simultaneously entered with two new variables: smoking and the use of smokeless tobacco. These latter two variables were selected as the literature suggests that individuals who abuse alcohol tend to engage in more hazardous behavior (Everett et al., 1998). Therefore, it was thought that they would likely use tobacco products more than the other groups. Indeed, the outcome indicated that this is so. Both discriminant functions were significant and 5 structure coefficients were identified as making a substantial contribution to Function 1: Smoking, Reason3 ("To get drunk"), Greek membership, Reason2 ("To have a good time with my friends"), and using smokeless tobacco.

In regard to the smoking variable, all group mean differed significantly (see Table Eight) and in the expected direction. That is, the Non Binge Drinker group had the lowest means for smoking, followed by the Occasional Binge Drinker group and the Frequent Binge Drinker group (see Table Ten; $p < .0001$). Not surprisingly, the same relationship was found for Reason3 ("To get drunk"). That is, this question was

endorsed significantly more frequently by the Frequent Binge group followed by the Occasional Binge group (see Table Ten).

For Reason2 ("To have a good time with my friends"), more students endorsed this item in the Frequent Binge group than in the Non Binge group ($p < .0001$). The Occasional Binge group also endorsed this item more often than the Non Binge group ($p < .0001$). However, there was no significant difference between the Occasional and the Frequent Binge groups ($p = .951$).

Finally, the Frequent Binge group reported that they used smokeless tobacco more often than the Non Binge group (p, .0001) and the Occasional Binge group ($p < .05$). The Occasional Binge group reported using smokeless tobacco more often than the Non Binge group ($p < .02$).

Six structure coefficients emerged as strong contributors to Function 2: Greek house, Reason2 ("To have a good time with my friends"); smoking; Reason7 ("To relax or relieve tension"), Reason8 ("To get through the day"), and Greek membership.

The Frequent Binge group endorsed Reason7 ("To relax or relieve tension") more often than the Non Binge group ($p < .005$) and the Occasional Binge group ($p = .006$). However, there was no significant difference between the Non Binge and Occasional Binge groups ($p = .999$).

There were no significant differences between the groups for Reason8 ("To get through the day") and this was likely due to the stringent nature of the analyses

conducted (Frequent Binge drinkers differed from the Non Binge drinkers with *p*= .069).

Overall, Analysis five accurately classified 63.7% of the groups. More importantly, 49% of the Frequent Binge drinkers were accurately classified (much better than chance) and 52.7% of the Occasional Binge drinkers were accurately classified. Additionally, 78% of the Non Binge drinkers were classified. Indeed, the data indicate that the frequent binge drinkers engage in more hazardous behavior (i.e. use of tobacco) and appear to drink for different purposes. They appear to be a group who have greater psychological problems (i.e. depression) and may be using alcohol as a form of "self-medication." As noted in the previous analyses, the Non Bingers and Occasional Bingers are more accurately classified.

VI

Further support for this conclusion was found in Analysis Six that introduced a new variable, "How High." Frequent Binge drinkers reported that drank with the purpose of reaching a higher level of intoxication than both the Occasional Binge drinkers (p, .0001) and the Non Binge Drinkers (*p*, .0001). Furthermore, the Occasional Binge drinkers reported that they drank with the purpose of reaching a higher level of intoxication than the Non Binge Drinker group ($p < .0001$). This variable was the strongest structure coefficient for the significant Function 1.

The last discriminant function correctly classified 67.8% of the sample: 78.1% of the Non Binger Drinker group, 62.5% of the Occasional Binge Drinker group, and

53.1% of the Frequent Binge Drinker group with a Kappa of .485 indicative of moderate statistical classification accuracy. This analysis used 21 predictor variables (the new How High variable, the two tobacco variables, and the 18 strong structure coefficients from previous analyses). Two significant functions were obtained with Function 1 having 5 strong structure coefficients: (1) How High, (2) Smoking, (3), "To get drunk", (4) Greek membership and (5) "To have a good time with my friends. Function 2 had six strong structure coefficients: (1) Greek residency, (2) Smoking, (3) "To have a good time with my friends, (4) To relieve depression. (5) "To get through the day", and (6) Greek membership. Again, Function 2 was more of a "psychological" function.

RQ2: What are the most common reasons for undergraduate drinking?

(a) to relax or relieve tension; (b) to have a good time with friends; (c) to get drunk; (d) to fit in with a group one likes; (e) to get away from one's problems or troubles; (f) because of boredom; (g) to relieve depression; (h) to get through the day; (i) to get to sleep; (j) to enhance sexual pleasure or opportunity; (k) to increase enjoyment of music or food; (l) because one likes the taste; (m) because it's the thing to do; (n) because one feels better when drinking; (o) to help one be less shy with others; (p) to celebrate at ceremonial occasions; (q) other.

By far, the most common reason for drinking is Reason2: To have a good time with my friends. This reason was endorsed by 417 (82.9%) of the students. This was followed by:

Reason	Endorsements
Reason 16: To celebrate at ceremonial occasions	267 (53.1%)
Reason 1: To relax or relieve tension.	258 (51.3 %)
Reason 12: Because I like the taste.	222 (44.1%)
Reason 3: To get drunk.	168 (33.4%)
Reason15: To help me be less shy with others.	119 (23.7%)
Reason 6: Because of boredom, nothing else to do.	89 (17.7%)
Reason 5: To get away from my problems or troubles.	84 (16.7%)
Reason 11: To increase my enjoyment of music or food.	75 (14.9%)
Reason10: To enhance sexual pleasure or opportunity.	68 (13.5%)
Reason 7: To relieve depression.	52 (10.3%)
Reason 14: Because I feel better when I'm drinking.	38 (7.6%)
Reason 9: To get to sleep.	32 (6.4 %)
Reason 17: Other_____was	24 (4.8 %)
Reason 4: To fit in with a group I like.	22 (4.4 %)
Reason 13: Because it's the thing to do.	16 (3.2%)
Reason 8: To get through the day.	8 (1.6%)

RQ3: What is the relationship between students' reasons for drinking and binge drinking?

IV

The fourth discriminant analysis conducted with the 17 possible reason for drinking entered simultaneously revealed two significant functions with 7 variables/reasons associated with the first and 5 variables/reasons associated with the second. The 7 substantial structure coefficients for Function 1 are: Reason3 ("To get drunk"), Reason 2 ("To have a good time with my friends"), Reason 15 "To help me be less shy with others"), Reason 14 ("Because I feel better when I'm drinking"), Reason 6 "Because of boredom, nothing else to do"), Reason 10 ("To enhance sexual pleasure or opportunity") and Reason 1 ("To relax or relieve tension"). The 5 structure coefficients for Function 2 are: Reason 7 ("To relieve depression"), Reason 8 ("To get through the day"), Reason 2 ("To have a good time with my friends"), Reason 5 ("To get away from my problems or troubles") and Reason 16 ("To celebrate at ceremonial occasions"). Factor 1 appears to have more to do with party behavior and hedonism while Factor 2 appears to be related to "self medication" for unhappiness. Moreover, the Frequent Binge Drinker group are more closely related to Function 2.

As can be seen in Table Seven, significant differences were found for the above Reasons with the exception of Reason 16. Post hoc analyses (see Table Nine) found that the Frequent Binge group endorsed Reason 3 ("To get drunk") more frequently than the Non Binge group ($p < .0001$) and the Occasional Binge group ($p < .0001$) and that the Occasional Binge group endorsed the item more frequently than the Non Binge group ($p < .0001$).

The Frequent Binge group and the Occasional Binge group endorsed Reason 2 ("To have a good time with my friends") more often than the Non Binge group (p<. 0001). However, there were no significant differences between the Frequent Binge group and the Occasional Binge group.

The Frequent Binge group and the Occasional Binge group endorsed Reason 15 ("To help me be less shy with others") more often than the Non Binge group (p<. 005), although there were no significant differences between the Frequent and Occasional groups.

The Frequent Binge group and the Occasional Binge group endorsed Reason 14 ("Because I feel better when I'm drinking") more often than the Non Binge group (P<. 05), although there were no significant differences between the Frequent and Occasional groups.

The Frequent Binge group endorsed Reason 6 ("Because of boredom, nothing else to do") more often than the No Binge group (P<. 005). There were no significant differences between the Occasional and Non Binge groups nor were there significant differences between the Frequent and Occasional groups.

The Frequent Binge group endorsed Reason 10 (: To enhance sexual pleasure or opportunity") more often than the Non Binge group (P<. 005) and the Occasional Binge group (p<. 05). No significant differences were found between the Occasional and Non Binge groups.

The Frequent Binge group endorsed Reason 1 (“To relax or relieve tension”) more often than the Non Binge group (p< .0001) and the Occasional Binge group (p<. 02). No significant differences were found between the Occasional and Non Binge groups.

The Frequent Binge group endorsed Reason 7 (“To relieve depression”) more often than the Non Binge group (p< .005) and the Occasional Binge group (p= .006). No significant differences were found between the Occasional and Non Binge groups.

Post hoc analyses revealed no significant differences for Reason 8 (“To get through the day”), although the Frequent Binge group endorsed this item more frequently than the Non Binge group and the Occasional Binge group (P<. 07 and .09 respectively).

The Frequent Binge group endorsed Reason 5 (“To get away from my problems or troubles”) more often than the Non Binge group (p,.005) and the Occasional Binge group (p,.03). No significant differences were found between the Occasional and Non Binge groups.

Other Research Hypotheses:

H1b: Age will be inversely related to binge drinking as consistent with the research of Makimoto (1998). Age did not emerge as a significant structure coefficient in any of the discriminant analyses conducted. An examination of the Brown–Forsythe robust test of equality of means revealed a significant result (p = .034). However, because of the stringent post hoc analyses, no significant difference

was found between any of the binge drinking groups. It may be noteworthy that significance was approached in regard to the non binge and frequent binge drinking groups (p = .073). Nevertheless, the lack of significance precludes any interpretation

H1c: Grade point average will be negatively related to binge drinking as consistent with the research of Engs et al. (1996). This variable did not emerge as a strong structure coefficient in any of the discriminant analyses. The Brown-Forsythe robust test of equality of means indicated that there was a significant difference (p = .015) in grade point average among the three binge drinking groups. An examination of the post hoc Tamhane analysis revealed a significant difference between the Frequent and Non Binge drinking groups (p = .018). The difference, as reflected by a comparison of groups means, provides support for the hypothesis that grade point average is negatively related to binge drinking behavior. More specifically, those students in the Non Binge group have an average grade point average of 3.15 while those students in the Frequent Binge drinking group have an average grade point average of 2.95.

H1e: Marital status, specifically being married, will be inversely related to binge drinking while being single will be positively related to binge drinking as consistent with the research of Makimoto (1998), Prince (1999) and Wechsler et al. (1997). Although the Brown-Forsythe robust test of equality of means revealed a significant difference among the three binge drinking groups, this variable was not a significant structure coefficient in the discriminant analyses and does not account for

much variance. Still, the Frequent Binge drinkers had significantly more single students than the Non Binge drinker group ($p<.001$).

H1f: Religiosity will be negatively related to binge drinking as consistent with the research of Dunn (2005), Engs, et al. (1996), and Poulson et al. (1998). This hypothesis is not supported by the data in this investigation. Religiosity did not emerge as a substantial structure coefficient in the discriminant analyses nor was the Brown-Forsythe robust test of equality of means statistically significant.

Overview of the Study

The present investigation sought to provide a comprehensive examination of the binge drinking behavior of undergraduates at the University of Oklahoma so as to determine the best predictors of such behavior. Certainly many variables (e.g. being a single white male in a Greek organization living in a fraternity with poorer grades and also using tobacco products) that previous research has implicated as being predictive of binge drinking were once again found to be strong predictors of binge drinking at the University of Oklahoma. Moreover, Frequent Binge drinkers appear to be a more psychologically maladjusted group who engage in hazardous behavior (i.e. use of tobacco products). Frequent binge drinkers at the University of Oklahoma appear to drink in an effort to self-medicate (e.g. to relieve depression, to relieve tension, etc.).

Limitations of this Study

Despite the significance of the aforementioned findings, they must be interpreted with caution due to several limitations of this study. First, the measure

used in this study was self-report in nature. Some degree of inaccuracy in reporting is likely. However, this approach is considered valid when respondents are assured anonymity and privacy (Johnston & O'Malley, 1985). Given the psychological nature of late adolescent/early adult males, and their significant representation in the frequent binge drinking group, it is possible that they may have over reported their alcohol intact to appear to fit a particular image (e.g. man who can handle alcohol). However, it is important to note that this study was conducted at a time when the university administration was concerned about substance use on campus and was partnering with community agencies to examine the use of alcohol at the University of Oklahoma. The focus on this issue was followed in the university newspapers so the student body was aware of it. Perhaps the fear of more stringent alcohol policies prompted research participants to downplay their actual alcohol consumption.

A second limitation is the issue of self-selection. As in any survey study, the students who participated in the study may be different in some way than those who chose not to complete the survey. Third, the sample in this investigation was from one campus. Therefore, the results cannot be generalized to other universities. Fourth, this investigation did not examine specific issues of alcohol dependency or alcoholism. It may be true that some of the undergraduates who fell into the frequent binge drinking group meet the Diagnostic and Statistical Manual of Mental Disorder - IV (DSM IV) criteria for alcohol dependence. Those individuals may be qualitatively different from those who are frequent bingers, but do not meet the formal criteria for alcohol dependence.

A fifth limitation is that given the length of time that has passed since the data were collected, the current undergraduate population at the University of Oklahoma may be qualitatively different than those students who completed the survey. Although the University of Oklahoma does not keep statistics on the number of military veterans enrolled (C. Jorgenson, personal communication, September 8, 2005), there may be more Gulf War and Iraqi War military veterans enrolled at the university. Given the experiences of these individuals their use of substances may differ remarkably from the 1997 undergraduates. Similarly, given the tragedy of 9/11 there may be more of a nihilistic or fatalistic attitude that would be reflected in current students' substance use

Finally, the distinction between the occasional binge drinking group and the frequent binge drinking group is, in the strictest sense, only one additional episode of binge drinking. This blurry distinction may have impacted the results of the study. Results may have been different if the two categories were collapsed. Moreover, the results may have been different if the study examined only those who engaged in binge drinking at an extreme rate (e.g. everyday).

Directions for Future Research

As with any study, replication is warranted. A current study of the University of Oklahoma undergraduates should be completed so as to determine if the aforementioned predictors of binge drinking are applicable to those attending the university at this time. Similarly, studies like this investigation should be completed at other universities so as to determine if the predictors of binge drinking are unique to the University of Oklahoma or if they are applicable to other universities. Perhaps the

geographic and cultural aspects of the University of Oklahoma are unique and play a role in the use of substances by its undergraduates. For example, the University of Oklahoma is located in a relatively rural state situated in "the bible belt". Conservative values abound and may influence substance use in a way that may not occur in more urban or liberal settings. Moreover, the feelings of vulnerability following the Oklahoma City bombing may influence the substance use of undergraduates at the University of Oklahoma.

Longitudinal research that monitors undergraduate substance use from the beginning of freshman year until graduation may shed additional light on predictors of binge drinking behavior. Moreover, research examining the impact of current university implemented alcohol related policies, (e.g. dry campus) should be studied to determine their impact on the drinking behavior of students. It is important to note that the binge drinkers tended to be freshman and sophomores. Perhaps the older, more educationally advanced students play a role in the inculcation of drinking norms. In a similar vein, these younger students are away from their parents' immediate influence and are likely to fall prey to engage in the socially normative behavior. The current information focused freshman orientation that call attention to the dangers of drinking should be examined to determine their effectiveness. Additional research may be able to examine how and why certain students are less likely to adopt the alcohol consumption practices of their peers. This research could have significant impact on prevention and intervention programs.

Given the fact that the frequent binge drinkers in this investigation tended to drink to relieve depression, it may be prudent for additional studies to pursue this line

of research. Moreover, it may be efficacious for university resources to be allocated to train fraternity and sorority leaders or housemothers to informally assess the members for signs of depression that may lead to substance use in an effort to self-medicate. In a related vein, it would be helpful to study prevention programs designed to help students cope with stress in more constructive ways. Examples, of programs could be extracurricular sports, yoga classes and courses on relaxation techniques.

Lastly, the current investigation did not address issues of alcohol dependence. Perhaps some of the binge drinkers meet the DSM-IV diagnostic criteria for alcohol dependence or abuse. A study examining predictors of alcohol dependence in the undergraduate population is warranted.

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APPENDIX A

TABLES

Table 1 Analysis One Classification Results

Classification Results [b,c]						
		Over 5	Predicted Group Membership			Total
			No Binge	Occasional	Frequent	
Original	Count	No Binge	179	39	10	228
		Occasional	92	63	9	164
		Frequent	44	34	18	96
	%	No Binge	78.5	17.1	4.4	100.0
		Occasional	56.1	38.4	5.5	100.0
		Frequent	45.8	35.4	18.8	100.0
Cross-validated [a]	Count	No Binge	170	47	11	228
		Occasional	92	61	11	164
		Frequent	45	35	16	96
	%	No Binge	74.6	20.6	4.8	100.0
		Occasional	56.1	37.2	6.7	100.0
		Frequent	46.9	36.5	16.7	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 53.3% of original grouped cases correctly classified.						
[c] 50.6% of cross-validated grouped cases correctly classified.						

Table 2 Analysis Two Classification Results

Classification Results [b,c]						
		Over 5	Predicted Group Membership			Total
			No Binge	Occasional	Frequent	
Original	Count	No Binge	182	50	0.0	232
		Occasional	80	90	0.0	170
		Frequent	38	60	0.0	98
	%	No Binge	78.4	21.6	0.0	100.0
		Occasional	47.1	52.9	0.0	100.0
		Frequent	38.8	61.2	0.0	100.0
Cross-validated [a]	Count	No Binge	182	50	0.0	232
		Occasional	80	90	0.0	170
		Frequent	38	60	0.0	98
	%	No Binge	78.4	21.6	0.0	100.0
		Occasional	47.1	52.9	0.0	100.0
		Frequent	38.8	61.2	0.0	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 54.4% of original grouped cases correctly classified.						
[c] 54.4% of cross-validated grouped cases correctly classified.						

Table 3 Analysis Three Classification Results

Classification Results [b,c]						
		Over 5	Predicted Group Membership			Total
			No Binge	Occasional	Frequent	
Original	Count	No Binge	180	38	9	227
		Occasional	75	72	16	163
		Frequent	35	38	22	95
	%	No Binge	79.3	16.7	4.0	100.0
		Occasional	46.0	44.2	9.8	100.0
		Frequent	36.8	40.0	23.2	100.0
Cross-validated [a]	Count	No Binge	173	43	11	227
		Occasional	75	70	18	163
		Frequent	35	45	15	95
	%	No Binge	76.2	18.9	4.8	100.0
		Occasional	46.0	42.9	11.0	100.0
		Frequent	36.8	47.4	15.8	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 56.5% of original grouped cases correctly classified.						
[c] 53.2% of cross-validated grouped cases correctly classified.						

Table 4 Analysis Four Classification Results

Classification Results [b,c]						
		Over 5	Predicted Group Membership			Total
			No Binge	Occasional	Frequent	
Original	Count	No Binge	181	38	14	233
		Occasional	88	62	21	171
		Frequent	28	33	38	99
	%	No Binge	77.7	16.3	6.0	100.0
		Occasional	51.5	36.3	12.3	100.0
		Frequent	28.3	33.3	38.4	100.0
Cross-validated [a]	Count	No Binge	178	41	14	233
		Occasional	91	55	25	171
		Frequent	28	36	35	99
	%	No Binge	76.4	17.6	6.0	100.0
		Occasional	53.2	32.2	14.6	100.0
		Frequent	28.3	36.4	35.4	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 55.9% of original grouped cases correctly classified.						
[c] 53.3% of cross-validated grouped cases correctly classified.						

Table 5 Analysis Five Classification Results

Classification Results [b,c]						
			Predicted Group Membership			Total
		Over 5	No Binge	Occasional	Frequent	
Original	Count	No Binge	181	43	8	232
		Occasional	50	89	30	169
		Frequent	15	35	48	98
	%	No Binge	78.0	18.5	3.4	100.0
		Occasional	29.6	52.7	17.8	100.0
		Frequent	15.3	35.7	49.0	100.0
Cross-validated [a]	Count	No Binge	178	46	8	232
		Occasional	59	73	37	169
		Frequent	16	39	43	98
	%	No Binge	76.7	19.8	3.4	100.0
		Occasional	34.9	43.2	21.9	100.0
		Frequent	16.3	39.8	43.9	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 63.7% of original grouped cases correctly classified.						
[c] 58.9% of cross-validated grouped cases correctly classified.						

Table 6: Analysis Six Classification Results

Classification Results [b,c]						
			Predicted Group Membership			Total
		Over 5	No Binge	Occasional	Frequent	
Original	Count	No Binge	178	43	7	228
		Occasional	43	105	20	168
		Frequent	11	35	52	98
	%	No Binge	78.1	18.9	3.1	100.0
		Occasional	25.6	62.5	11.9	100.0
		Frequent	11.2	35.7	53.1	100.0
Cross-validated [a]	Count	No Binge	176	45	7	228
		Occasional	48	89	31	168
		Frequent	14	37	47	98
	%	No Binge	77.2	19.7	3.1	100.0
		Occasional	28.6	53.0	18.5	100.0
		Frequent	14.3	37.8	48.0	100.0
[a] Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.						
[b] 67.8% of original grouped cases correctly classified.						
[c] 63.2% of cross-validated grouped cases correctly classified.						

Table 7 Reasons for Drinking Test of Equality of Means

Robust Tests of Equality of Means					
		Statistic [a]	**df1**	**df2**	**Sig.**
Reason 1	Brown-Forsythe	7.748	2	405.753	0.000
Reason 2	Brown-Forsythe	37.916	2	460.619	0.000
Reason 3	Brown-Forsythe	38.029	2	333.399	0.000
Reason 4	Brown-Forsythe	0.453	2	307.056	0.636
Reason 5	Brown-Forsythe	6.497	2	281.929	0.002
Reason 6	Brown-Forsythe	6.871	2	293.014	0.001
Reason 7	Brown-Forsythe	7.799	2	227.548	0.001
Reason 8	Brown-Forsythe	4.709	2	125.261	0.011
Reason 9	Brown-Forsythe	0.288	2	331.104	0.750
Reason 10	Brown-Forsythe	6.782	2	263.486	0.001
Reason 11	Brown-Forsythe	3.171	2	299.206	0.043
Reason 12	Brown-Forsythe	4.558	2	380.387	0.011
Reason 13	Brown-Forsythe	1.372	2	234.483	0.256
Reason 14	Brown-Forsythe	6.419	2	259.615	0.002
Reason 15	Brown-Forsythe	7.659	2	327.921	0.001
Reason 16	Brown-Forsythe	2.849	2	397.637	0.059
Reason 17	Brown-Forsythe	3.899	2	379.459	0.021
[a] Asymptotically F distributed.					

Reason 1 = To relax or relieve tension.
Reason 2 = To have a good time with my friends.
Reason 3 = To get drunk.
Reason 4 = To fit in with a group I like.
Reason 5 = To get away from my problems or troubles.
Reason 6 = Because of boredom, nothing else to do.
Reason 7 = To relieve depression.
Reason 8 = To get through the day.
Reason 9 = To get to sleep.
Reason 10 = To enhance sexual pleasure or opportunity.
Reason 11 = To increase my enjoyment of music or food.
Reason 12 = Because I like the taste.
Reason 13 = Because it's the thing to do.
Reason 14 = Because I feel better when I'm drinking.
Reason 15 = To help me be less shy with others.
Reason 16 = To celebrate at ceremonial occasions.
Reason 17 = Other_____.

Table 8 Other predictor variables of binge drinking.

Robust Tests of Equality of Means [b]					
		Statistic [a]	**df1**	**df2**	**Sig.**
Tob1	Brown-Forsythe	44.106	2	224.540	0.000
Tob2	Brown-Forsythe	12.295	2	217.619	0.000
How High	Brown-Forsythe	104.305	2	437.265	0.000
Studrole	Brown-Forsythe	4.744	2	406.810	0.009
Gpa	Brown-Forsythe	4.242	2	331.534	0.015
Age	Brown-Forsythe	3.423	2	417.860	0.034
Gender	Brown-Forsythe	7.410	2	361.433	0.001
Marital	Brown-Forsythe	3.795	2	400.054	0.023
Greek	Brown-Forsythe	33.618	2	351.830	0.000
Studact2	Brown-Forsythe	0.578	2	433.479	0.561
Religil	Brown-Forsythe	2.266	2	351.832	0.105
White	Brown-Forsythe	15.653	2	465.072	0.000
African Amer	Brown-Forsythe	0.000		0.000	0.000
Native Amer	Brown-Forsythe	0.108	2	368.250	0.898
Hispanic	Brown-Forsythe	2.649	2	466.980	0.072
Asian Amer	Brown-Forsythe	2.536	2	453.499	0.080
Greek House	Brown-Forsythe	11.906	2	322.230	0.000
Residence Hall	Brown-Forsythe	0.223	2	368.923	0.801
House/apt Norman	Brown-Forsythe	1.679	2	381.819	0.188
Live Outside Norman	Brown-Forsythe	6.821	2	490.741	0.001
Student Housing	Brown-Forsythe	2.471	2	457.565	0.086

[a] Asymptotically F distributed.

[b] Robust tests of equality of means cannot be performed for African Amer because at least one group has 0 variance.

Tob1= smoking cigarettes
Tob2 = smokeless tobacco
How High = level of intoxication
Studrole = year in school
Gpa = grade point average
Age = age in years
Gender = male or female
Marital = current marital status
Greek = Greek organization membership
Studact2 = intercolliegiate athletics
Religi1 = importance of religious or spiritual values
White = White/Caucasian ethnic background
African Amer = African American ethnic background
Hispanic = Hispanic ethnic background
Asian Amer = Asian American background
Residence Hall = student resides in university residence hall
GreekHouse = residence in fraternity or sorority
House/aptNorman = residence in city of Norman
LiveOutsideNorman = residence outside of city of Norman
Student Housing = student resides in university student housing

Table 9 Post hoc analysis for reasons for drinking (see Table 7 for mean differences).

Multiple Comparisons Tamhane							
Dependent Variable	**(I) Over 5**	**(J) Over 5**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
						Lower Bound	**Upper Bound**
Reason 1	**No Binge**	**Occasional**	-.062	.050	.518	-.18	.06
		Frequent	-.230(*)	.057	.000	-.37	-.09
	Occasional	**No Binge**	.062	.050	.518	-.06	.18
		Frequent	-.168(*)	.061	.019	-.31	-.02
	Frequent	**No Binge**	.230(*)	.057	.000	.09	.37
		Occasional	.168(*)	.061	.019	.02	.31
Reason 2	**No Binge**	**Occasional**	-.236(*)	.035	.000	-.32	-.15
		Frequent	-.250(*)	.037	.000	-.34	-.16
	Occasional	**No Binge**	.236(*)	.035	.000	.15	.32
		Frequent	-.014	.029	.951	-.08	.06
	Frequent	**No Binge**	.250(*)	.037	.000	.16	.34
		Occasional	.014	.029	.951	-.06	.08
Reason 3	**No Binge**	**Occasional**	-.219(*)	.045	.000	-.33	-.11
		Frequent	-.469(*)	.054	.000	-.60	-.34
	Occasional	**No Binge**	.219(*)	.045	.000	.11	.33
		Frequent	-.250(*)	.061	.000	-.40	-.10
	Frequent	**No Binge**	.469(*)	.054	.000	.34	.60
		Occasional	.250(*)	.061	.000	.10	.40
Reason 4	**No Binge**	**Occasional**	.008	.019	.969	-.04	.05
		Frequent	-.018	.028	.890	-.08	.05
	Occasional	**No Binge**	-.008	.019	.969	-.05	.04
		Frequent	-.026	.028	.741	-.09	.04
	Frequent	**No Binge**	.018	.028	.890	-.05	.08
		Occasional	.026	.028	.741	-.04	.09
Reason 5	**No Binge**	**Occasional**	-.028	.035	.817	-.11	.06
		Frequent	-.168(*)	.051	.003	-.29	-.05
	Occasional	**No Binge**	.028	.035	.817	-.06	.11
		Frequent	-.141(*)	.054	.028	-.27	-.01
	Frequent	**No Binge**	.168(*)	.051	.003	.05	.29
		Occasional	.141(*)	.054	.028	.01	.27
Reason 6	**No Binge**	**Occasional**	-.077	.037	.107	-.17	.01
		Frequent	-.177(*)	.051	.002	-.30	-.05
	Occasional	**No Binge**	.077	.037	.107	-.01	.17
		Frequent	-.100	.055	.198	-.23	.03
	Frequent	**No Binge**	.177(*)	.051	.002	.05	.30
		Occasional	.100	.055	.198	-.03	.23
Reason 7	**No Binge**	**Occasional**	-.003	.027	.999	-.07	.06
		Frequent	-.149(*)	.045	.004	-.26	-.04
	Occasional	**No Binge**	.003	.027	.999	-.06	.07
		Frequent	-.146(*)	.047	.006	-.26	-.03
	Frequent	**No Binge**	.149(*)	.045	.004	.04	.26
		Occasional	.146(*)	.047	.006	.03	.26
Reason 8	**No Binge**	**Occasional**	-.002	.007	.995	-.02	.02
		Frequent	-.056	.024	.069	-.12	.00
	Occasional	**No Binge**	.002	.007	.995	-.02	.02
		Frequent	-.055	.025	.085	-.11	.01
	Frequent	**No Binge**	.056	.024	.069	.00	.12
		Occasional	.055	.025	.085	-.01	.11

Table 9 (Continued)

Dependent Variable	(I) Over 5	(J) Over 5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Reason 9	No Binge	Occasional	.002	.024	1.000	-.06	.06
		Frequent	-.021	.032	.885	-.10	.06
	Occasional	No Binge	-.002	.024	1.000	-.06	.06
		Frequent	-.022	.033	.874	-.10	.06
	Frequent	No Binge	.021	.032	.885	-.06	.10
		Occasional	.022	.033	.874	-.06	.10
Reason 10	No Binge	Occasional	-.039	.032	.538	-.11	.04
		Frequent	-.162(*)	.048	.003	-.28	-.05
	Occasional	No Binge	.039	.032	.538	-.04	.11
		Frequent	-.124(*)	.051	.047	-.25	.00
	Frequent	No Binge	.162(*)	.048	.003	.05	.28
		Occasional	.124(*)	.051	.047	.00	.25
Reason 11	No Binge	Occasional	-.020	.034	.912	-.10	.06
		Frequent	-.112	.048	.059	-.23	.00
	Occasional	No Binge	.020	.034	.912	-.06	.10
		Frequent	-.092	.050	.193	-.21	.03
	Frequent	No Binge	.112	.048	.059	.00	.23
		Occasional	.092	.050	.193	-.03	.21
Reason 12	No Binge	Occasional	-.058	.050	.566	-.18	.06
		Frequent	-.179(*)	.059	.009	-.32	-.04
	Occasional	No Binge	.058	.050	.566	-.06	.18
		Frequent	-.121	.063	.157	-.27	.03
	Frequent	No Binge	.179(*)	.059	.009	.04	.32
		Occasional	.121	.063	.157	-.03	.27
Reason 13	No Binge	Occasional	.002	.016	.998	-.03	.04
		Frequent	-.035	.026	.462	-.10	.03
	Occasional	No Binge	-.002	.016	.998	-.04	.03
		Frequent	-.037	.027	.420	-.10	.03
	Frequent	No Binge	.035	.026	.462	-.03	.10
		Occasional	.037	.027	.420	-.03	.10
Reason 14	No Binge	Occasional	-.085(*)	.026	.004	-.15	-.02
		Frequent	-.106(*)	.036	.011	-.19	-.02
	Occasional	No Binge	.085(*)	.026	.004	.02	.15
		Frequent	-.020	.042	.949	-.12	.08
	Frequent	No Binge	.106(*)	.036	.011	.02	.19
		Occasional	.020	.042	.949	-.08	.12
Reason 15	No Binge	Occasional	-.144(*)	.042	.002	-.25	-.04
		Frequent	-.169(*)	.053	.005	-.30	-.04
	Occasional	No Binge	.144(*)	.042	.002	.04	.25
		Frequent	-.025	.059	.965	-.17	.12
	Frequent	No Binge	.169(*)	.053	.005	.04	.30
		Occasional	.025	.059	.965	-.12	.17
Reason 16	No Binge	Occasional	.014	.050	.990	-.11	.13
		Frequent	-.126	.059	.097	-.27	.02
	Occasional	No Binge	-.014	.050	.990	-.13	.11
		Frequent	-.139	.062	.074	-.29	.01
	Frequent	No Binge	.126	.059	.097	-.02	.27
		Occasional	.139	.062	.074	-.01	.29

Table 9 (Continued)

Dependent Variable	(I) Over 5	(J) Over 5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Reason 17	No Binge	Occasional	.055(*)	.020	.016	.01	.10
		Frequent	.033	.026	.517	-.03	.10
	Occasional	No Binge	-.055(*)	.020	.016	-.10	-.01
		Frequent	-.023	.022	.667	-.08	.03
	Frequent	No Binge	-.033	.026	.517	-.10	.03
		Occasional	.023	.022	.667	-.03	.08
* The mean difference is significant at the .05 level.							

Reason 1 = To relax or relieve tension.
Reason 2 = To have a good time with my friends.
Reason 3 = To get drunk.
Reason 4 = To fit in with a group I like.
Reason 5 = To get away from my problems or troubles.
Reason 6 = Because of boredom, nothing else to do.
Reason 7 = To relieve depression.
Reason 8 = To get through the day.
Reason 9 = To get to sleep.
Reason 10 = To enhance sexual pleasure or opportunity.
Reason 11 = To increase my enjoyment of music or food.
Reason 12 = Because I like the taste.
Reason 13 = Because it's the thing to do.
Reason 14 = Because I feel better when I'm drinking.
Reason 15 = To help me be less shy with others.
Reason 16 = To celebrate at ceremonial occasions.
Reason 17 = Other_____.

Table 10 Post hoc analysis for other predictor variables of binge drinking (see Table 8 for mean differences).

Multiple Comparisons Tamhane							
Dependent Variable	**(I) noover5**	**(J) noover5**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
						Lower Bound	**Upper Bound**
tob1	**No Binge**	**Occasional**	-.436(*)	.093	.000	-.66	-.21
		Frequent	-1.299(*)	.152	.000	-1.67	-.93
	Occasional	**No Binge**	.436(*)	.093	.000	.21	.66
		Frequent	-.863(*)	.166	.000	-1.26	-.46
	Frequent	**No Binge**	1.299(*)	.152	.000	.93	1.67
		Occasional	.863(*)	.166	.000	.46	1.26
tob2	**No Binge**	**Occasional**	-.236(*)	.085	.017	-.44	-.03
		Frequent	-.621(*)	.136	.000	-.95	-.29
	Occasional	**No Binge**	.236(*)	.085	.017	.03	.44
		Frequent	-.385(*)	.153	.038	-.75	-.02
	Frequent	**No Binge**	.621(*)	.136	.000	.29	.95
		Occasional	.385(*)	.153	.038	.02	.75
How High	**No Binge**	**Occasional**	-.682(*)	.071	.000	-.85	-.51
		Frequent	-1.088(*)	.083	.000	-1.29	-.89
	Occasional	**No Binge**	.682(*)	.071	.000	.51	.85
		Frequent	-.406(*)	.079	.000	-.60	-.22
	Frequent	**No Binge**	1.088(*)	.083	.000	.89	1.29
		Occasional	.406(*)	.079	.000	.22	.60
Studrole	**No Binge**	**Occasional**	.240	.108	.078	-.02	.50
		Frequent	.347(*)	.125	.018	.05	.65
	Occasional	**No Binge**	-.240	.108	.078	-.50	.02
		Frequent	.107	.129	.792	-.20	.42
	Frequent	**No Binge**	-.347(*)	.125	.018	-.65	-.05
		Occasional	-.107	.129	.792	-.42	.20
Gpa	**No Binge**	**Occasional**	6.399	5.436	.561	-6.64	19.44
		Frequent	19.994(*)	7.209	.018	2.61	37.38
	Occasional	**No Binge**	-6.399	5.436	.561	-19.44	6.64
		Frequent	13.595	7.390	.189	-4.22	31.41
	Frequent	**No Binge**	-19.994(*)	7.209	.018	-37.38	-2.61
		Occasional	-13.595	7.390	.189	-31.41	4.22
Age	**No Binge**	**Occasional**	.314	.156	.130	-.06	.69
		Frequent	.404	.179	.073	-.03	.83
	Occasional	**No Binge**	-.314	.156	.130	-.69	.06
		Frequent	.090	.185	.948	-.35	.53
	Frequent	**No Binge**	-.404	.179	.073	-.83	.03
		Occasional	-.090	.185	.948	-.53	.35

Table 10 (continued)

Dependent Variable	(I) noover5	(J) noover5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Gender	No Binge	Occasional	.103	.049	.101	-.01	.22
		Frequent	.222(*)	.059	.001	.08	.36
	Occasional	No Binge	-.103	.049	.101	-.22	.01
		Frequent	.119	.063	.174	-.03	.27
	Frequent	No Binge	-.222(*)	.059	.001	-.36	-.08
		Occasional	-.119	.063	.174	-.27	.03
Marital	No Binge	Occasional	.032	.031	.658	-.04	.11
		Frequent	.080(*)	.021	.001	.03	.13
	Occasional	No Binge	-.032	.031	.658	-.11	.04
		Frequent	.048	.026	.193	-.02	.11
	Frequent	No Binge	-.080(*)	.021	.001	-.13	-.03
		Occasional	-.048	.026	.193	-.11	.02
Greek	No Binge	Occasional	.311(*)	.047	.000	.20	.42
		Frequent	.397(*)	.056	.000	.26	.53
	Occasional	No Binge	-.311(*)	.047	.000	-.42	-.20
		Frequent	.087	.062	.419	-.06	.24
	Frequent	No Binge	-.397(*)	.056	.000	-.53	-.26
		Occasional	-.087	.062	.419	-.24	.06
Studact2	No Binge	Occasional	-.102	.112	.743	-.37	.17
		Frequent	-.099	.120	.794	-.39	.19
	Occasional	No Binge	.102	.112	.743	-.17	.37
		Frequent	.003	.128	1.000	-.30	.31
	Frequent	No Binge	.099	.120	.794	-.19	.39
		Occasional	-.003	.128	1.000	-.31	.30
Religi1	No Binge	Occasional	.050	.148	.982	-.30	.40
		Frequent	.381	.190	.134	-.08	.84
	Occasional	No Binge	-.050	.148	.982	-.40	.30
		Frequent	.331	.195	.249	-.14	.80
	Frequent	No Binge	-.381	.190	.134	-.84	.08
		Occasional	-.331	.195	.249	-.80	.14
White	No Binge	Occasional	-.17762(*)	.03924	.000	-.2717	-.0835
		Frequent	-.18932(*)	.04375	.000	-.2944	-.0842
	Occasional	No Binge	.17762(*)	.03924	.000	.0835	.2717
		Frequent	-.01170	.04052	.988	-.1092	.0858
	Frequent	No Binge	.18932(*)	.04375	.000	.0842	.2944
		Occasional	.01170	.04052	.988	-.0858	.1092
African Amer	No Binge	Occasional	.04957(*)	.02064	.050	.0001	.0991
		Frequent	.07296(*)	.01707	.000	.0319	.1140
	Occasional	No Binge	-.04957(*)	.02064	.050	-.0991	-.0001
		Frequent	.02339	.01159	.129	-.0046	.0513
	Frequent	No Binge	-.07296(*)	.01707	.000	-.1140	-.0319
		Occasional	-.02339	.01159	.129	-.0513	.0046
Native Amer	No Binge	Occasional	.01019	.02449	.966	-.0485	.0689
		Frequent	-.00204	.03076	1.000	-.0762	.0721
	Occasional	No Binge	-.01019	.02449	.966	-.0689	.0485
		Frequent	-.01223	.03153	.973	-.0882	.0637
	Frequent	No Binge	.00204	.03076	1.000	-.0721	.0762
		Occasional	.01223	.03153	.973	-.0637	.0882

Table 10 (continued)

Dependent Variable	(I) noover5	(J) noover5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Hispanic	No Binge	Occasional	.02693	.01510	.209	-.0093	.0631
		Frequent	.02853	.01619	.219	-.0103	.0674
	Occasional	No Binge	-.02693	.01510	.209	-.0631	.0093
		Frequent	.00159	.01304	.999	-.0298	.0330
	Frequent	No Binge	-.02853	.01619	.219	-.0674	.0103
		Occasional	-.00159	.01304	.999	-.0330	.0298
Asian Amer	No Binge	Occasional	.03396	.01766	.157	-.0084	.0763
		Frequent	.03130	.02031	.329	-.0175	.0801
	Occasional	No Binge	-.03396	.01766	.157	-.0763	.0084
		Frequent	-.00266	.01742	.998	-.0446	.0393
	Frequent	No Binge	-.03130	.02031	.329	-.0801	.0175
		Occasional	.00266	.01742	.998	-.0393	.0446
Greek House	No Binge	Occasional	-.19057(*)	.03926	.000	-.2849	-.0962
		Frequent	-.13209(*)	.04601	.014	-.2433	-.0209
	Occasional	No Binge	.19057(*)	.03926	.000	.0962	.2849
		Frequent	.05848	.05433	.631	-.0722	.1892
	Frequent	No Binge	.13209(*)	.04601	.014	.0209	.2433
		Occasional	-.05848	.05433	.631	-.1892	.0722
Residence Hall	No Binge	Occasional	.00058	.04312	1.000	-.1029	.1040
		Frequent	-.03238	.05302	.904	-.1602	.0954
	Occasional	No Binge	-.00058	.04312	1.000	-.1040	.1029
		Frequent	-.03296	.05564	.911	-.1670	.1010
	Frequent	No Binge	.03238	.05302	.904	-.0954	.1602
		Occasional	.03296	.05564	.911	-.1010	.1670
House/apt Norman	No Binge	Occasional	.09043	.04969	.195	-.0288	.2096
		Frequent	.02185	.06004	.977	-.1228	.1665
	Occasional	No Binge	-.09043	.04969	.195	-.2096	.0288
		Frequent	-.06858	.06264	.619	-.2194	.0823
	Frequent	No Binge	-.02185	.06004	.977	-.1665	.1228
		Occasional	.06858	.06264	.619	-.0823	.2194
Live Outside Norman	No Binge	Occasional	.05584	.02846	.144	-.0124	.1241
		Frequent	.09997(*)	.02565	.000	.0384	.1615
	Occasional	No Binge	-.05584	.02846	.144	-.1241	.0124
		Frequent	.04413	.02358	.176	-.0125	.1008
	Frequent	No Binge	-.09997(*)	.02565	.000	-.1615	-.0384
		Occasional	-.04413	.02358	.176	-.1008	.0125
Student housing	No Binge	Occasional	.03943	.02104	.174	-.0110	.0899
		Frequent	.03837	.02399	.297	-.0193	.0960
	Occasional	No Binge	-.03943	.02104	.174	-.0899	.0110
		Frequent	-.00106	.02161	1.000	-.0531	.0510
	Frequent	No Binge	-.03837	.02399	.297	-.0960	.0193
		Occasional	.00106	.02161	1.000	-.0510	.0531

* The mean difference is significant at the .05 level.

Table 10 (continued)

Tob1= smoking cigarettes
Tob2 = smokeless tobacco
How High = level of intoxication
Studrole = year in school
Gpa = grade point average
Age = age in years
Gender = male or female
Marital = current marital status
Greek = Greek organization membership
Studact2 = intercolliegiate athletics
Religi1= importance of religious or spiritual values
White = White/Caucasian ethnic background
African Amer = African American ethnic background
Hispanic = Hispanic ethnic background
Asian Amer = Asian American ethnic background
Residence Hall = student resides in university residence hall
Greek House = residence in fraternity or sorority
House/apt Norman = residence in city of Norman
Live Outside Norman = residence outside of city of Norman
Student Housing = student resides in university student housing

APPENDIX B

VARIABLE DESCRIPTIVES

Descriptives									
Dependent Variable		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Reason 1	No Binge	233	.45	.498	.033	.38	.51	0	1
	Occasional	171	.51	.501	.038	.43	.58	0	1
	Frequent	99	.68	.470	.047	.58	.77	0	1
	Total	503	.51	.500	.022	.47	.56	0	1
Reason 2	No Binge	233	.70	.459	.030	.64	.76	0	1
	Occasional	171	.94	.246	.019	.90	.97	0	1
	Frequent	99	.95	.220	.022	.91	.99	0	1
	Total	503	.83	.377	.017	.80	.86	0	1
Reason 3	No Binge	233	.17	.374	.025	.12	.22	0	1
	Occasional	171	.39	.488	.037	.31	.46	0	1
	Frequent	99	.64	.483	.049	.54	.73	0	1
	Total	503	.33	.472	.021	.29	.38	0	1
Reason 4	No Binge	233	.04	.203	.013	.02	.07	0	1
	Occasional	171	.04	.185	.014	.01	.06	0	1
	Frequent	99	.06	.240	.024	.01	.11	0	1
	Total	503	.04	.205	.009	.03	.06	0	1
Reason 5	No Binge	233	.12	.331	.022	.08	.17	0	1
	Occasional	171	.15	.360	.028	.10	.21	0	1
	Frequent	99	.29	.457	.046	.20	.38	0	1
	Total	503	.17	.373	.017	.13	.20	0	1
Reason 6	No Binge	233	.12	.321	.021	.07	.16	0	1
	Occasional	171	.19	.396	.030	.13	.25	0	1
	Frequent	99	.29	.457	.046	.20	.38	0	1
	Total	503	.18	.382	.017	.14	.21	0	1
Reason 7	No Binge	233	.07	.261	.017	.04	.11	0	1
	Occasional	171	.08	.266	.020	.04	.12	0	1
	Frequent	99	.22	.418	.042	.14	.31	0	1
	Total	503	.10	.305	.014	.08	.13	0	1
Reason 8	No Binge	233	.00	.066	.004	.00	.01	0	1
	Occasional	171	.01	.076	.006	-.01	.02	0	1
	Frequent	99	.06	.240	.024	.01	.11	0	1
	Total	503	.02	.125	.006	.00	.03	0	1
Reason 9	No Binge	233	.06	.238	.016	.03	.09	0	1
	Occasional	171	.06	.235	.018	.02	.09	0	1
	Frequent	99	.08	.274	.028	.03	.14	0	1
	Total	503	.06	.244	.011	.04	.09	0	1
Reason 10	No Binge	233	.09	.287	.019	.05	.13	0	1
	Occasional	171	.13	.336	.026	.08	.18	0	1
	Frequent	99	.25	.437	.044	.17	.34	0	1
	Total	503	.14	.342	.015	.11	.17	0	1

VARIABLE DESCRIPTIVES (continued)

Dependent Variable		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Reason 11	**No Binge**	233	.12	.326	.021	.08	.16	0	1
	Occasional	171	.14	.348	.027	.09	.19	0	1
	Frequent	99	.23	.424	.043	.15	.32	0	1
	Total	503	.15	.357	.016	.12	.18	0	1
Reason 12	**No Binge**	233	.39	.488	.032	.32	.45	0	1
	Occasional	171	.44	.498	.038	.37	.52	0	1
	Frequent	99	.57	.498	.050	.47	.67	0	1
	Total	503	.44	.497	.022	.40	.48	0	1
Reason 13	**No Binge**	233	.03	.159	.010	.01	.05	0	1
	Occasional	171	.02	.152	.012	.00	.05	0	1
	Frequent	99	.06	.240	.024	.01	.11	0	1
	Total	503	.03	.176	.008	.02	.05	0	1
Reason 14	**No Binge**	233	.03	.159	.010	.01	.05	0	1
	Occasional	171	.11	.315	.024	.06	.16	0	1
	Frequent	99	.13	.339	.034	.06	.20	0	1
	Total	503	.08	.265	.012	.05	.10	0	1
Reason 15	**No Binge**	233	.15	.362	.024	.11	.20	0	1
	Occasional	171	.30	.459	.035	.23	.37	0	1
	Frequent	99	.32	.470	.047	.23	.42	0	1
	Total	503	.24	.425	.019	.20	.27	0	1
Reason 16	**No Binge**	233	.51	.501	.033	.45	.58	0	1
	Occasional	171	.50	.501	.038	.42	.57	0	1
	Frequent	99	.64	.483	.049	.54	.73	0	1
	Total	503	.53	.500	.022	.49	.57	0	1
Reason 17	**No Binge**	233	.07	.261	.017	.04	.11	0	1
	Occasional	171	.02	.132	.010	.00	.04	0	1
	Frequent	99	.04	.198	.020	.00	.08	0	1
	Total	503	.05	.213	.010	.03	.07	0	1
Gpa	**No Binge**	230	315.12	55.626	3.668	307.89	322.34	150	400
	Occasional	167	308.72	51.841	4.012	300.80	316.64	150	400
	Frequent	97	295.12	61.121	6.206	282.81	307.44	50	400
	Total	494	309.03	55.902	2.515	304.09	313.97	50	400
Age	**No Binge**	233	20.34	1.612	.106	20.14	20.55	18	24
	Occasional	171	20.03	1.509	.115	19.80	20.26	18	25
	Frequent	99	19.94	1.434	.144	19.65	20.23	18	24
	Total	503	20.16	1.550	.069	20.02	20.29	18	25
Gender	**No Binge**	233	1.69	.463	.030	1.63	1.75	1	2
	Occasional	170	1.59	.494	.038	1.51	1.66	1	2
	Frequent	98	1.47	.502	.051	1.37	1.57	1	2
	Total	501	1.61	.488	.022	1.57	1.66	1	2
Marital	**No Binge**	232	1.09	.288	.019	1.05	1.13	1	2
	Occasional	171	1.06	.320	.024	1.01	1.11	1	4
	Frequent	99	1.01	.101	.010	.99	1.03	1	2
	Total	502	1.06	.275	.012	1.04	1.09	1	4
How High	**No Binge**	229	1.98	.811	.054	1.88	2.09	1	4
	Occasional	170	2.66	.615	.047	2.57	2.76	1	4
	Frequent	99	3.07	.627	.063	2.95	3.20	1	4
	Total	498	2.43	.837	.038	2.36	2.51	1	4

VARIABLE DESCRIPTIVES (continued)

Dependent Variable		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Studrole	**No Binge**	232	2.51	1.105	.073	2.37	2.65	1	4
	Occasional	171	2.27	1.039	.079	2.11	2.43	1	4
	Frequent	99	2.16	1.017	.102	1.96	2.36	1	4
	Total	502	2.36	1.074	.048	2.26	2.45	1	4
Greek	**No Binge**	233	1.78	.414	.027	1.73	1.83	1	2
	Occasional	170	1.47	.501	.038	1.39	1.55	1	2
	Frequent	99	1.38	.489	.049	1.29	1.48	1	2
	Total	502	1.60	.491	.022	1.55	1.64	1	2
Studact2	**No Binge**	232	1.48	1.105	.073	1.34	1.63	1	5
	Occasional	171	1.58	1.121	.086	1.42	1.75	1	5
	Frequent	98	1.58	.941	.095	1.39	1.77	1	5
	Total	501	1.54	1.079	.048	1.44	1.63	1	5
Religi1	**No Binge**	232	4.72	1.521	.100	4.53	4.92	1	6
	Occasional	169	4.67	1.412	.109	4.46	4.89	1	6
	Frequent	99	4.34	1.611	.162	4.02	4.66	1	6
	Total	500	4.63	1.508	.067	4.50	4.76	1	6
White	**No Binge**	233	.6996	.45943	.03010	.6403	.7589	.00	1.00
	Occasional	171	.8772	.32918	.02517	.8275	.9269	.00	1.00
	Frequent	99	.8889	.31587	.03175	.8259	.9519	.00	1.00
	Total	503	.7972	.40247	.01795	.7620	.8325	.00	1.00
African Amer	**No Binge**	233	.0730	.26063	.01707	.0393	.1066	.00	1.00
	Occasional	171	.0234	.15159	.01159	.0005	.0463	.00	1.00
	Frequent	99	.0000	.00000	.00000	.0000	.0000	.00	0.00
	Total	503	.0417	.20022	.00893	.0242	.0593	.00	1.00
Native Amer	**No Binge**	233	.0687	.25344	.01660	.0360	.1014	.00	1.00
	Occasional	171	.0585	.23534	.01800	.0230	.0940	.00	1.00
	Frequent	99	.0707	.25764	.02589	.0193	.1221	.00	1.00
	Total	503	.0656	.24784	.01105	.0439	.0873	.00	1.00
Hispanic	**No Binge**	233	.0386	.19312	.01265	.0137	.0636	.00	1.00
	Occasional	171	.0117	.10783	.00825	-.0046	.0280	.00	1.00
	Frequent	99	.0101	.10050	.01010	-.0099	.0301	.00	1.00
	Total	503	.0239	.15276	.00681	.0105	.0372	.00	1.00
Asian Amer	**No Binge**	233	.0515	.22150	.01451	.0229	.0801	.00	1.00
	Occasional	171	.0175	.13167	.01007	-.0023	.0374	.00	1.00
	Frequent	99	.0202	.14141	.01421	-.0080	.0484	.00	1.00
	Total	503	.0338	.18089	.00807	.0180	.0496	.00	1.00
Greek House	**No Binge**	233	.0901	.28698	.01880	.0531	.1272	.00	1.00
	Occasional	171	.2807	.45066	.03446	.2127	.3487	.00	1.00
	Frequent	99	.2222	.41786	.04200	.1389	.3056	.00	1.00
	Total	503	.1809	.38533	.01718	.1472	.2147	.00	1.00
Residence Hall	**No Binge**	233	.2403	.42821	.02805	.1851	.2956	.00	1.00
	Occasional	171	.2398	.42819	.03274	.1751	.3044	.00	1.00
	Frequent	99	.2727	.44763	.04499	.1834	.3620	.00	1.00
	Total	503	.2465	.43141	.01924	.2087	.2843	.00	1.00
House/apt Norman	**No Binge**	233	.4764	.50052	.03279	.4118	.5410	.00	1.00
	Occasional	171	.3860	.48825	.03734	.3123	.4597	.00	1.00
	Frequent	99	.4545	.50046	.05030	.3547	.5544	.00	1.00
	Total	503	.4414	.49704	.02216	.3978	.4849	.00	1.00

VARIABLE DESCRIPTIVES (continued)

Dependent Variable		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Live Outside Norman	**No Binge**	233	.1202	.32586	.02135	.0781	.1622	.00	1.00
	Occasional	171	.0643	.24606	.01882	.0272	.1015	.00	1.00
	Frequent	99	.0202	.14141	.01421	-.0080	.0484	.00	1.00
	Total	503	.0815	.27389	.01221	.0575	.1055	.00	1.00
Student Housing	**No Binge**	233	.0687	.25344	.01660	.0360	.1014	.00	1.00
	Occasional	171	.0292	.16897	.01292	.0037	.0547	.00	1.00
	Frequent	99	.0303	.17229	.01732	-.0041	.0647	.00	1.00
	Total	503	.0477	.21337	.00951	.0290	.0664	.00	1.00

Reason 1 = To relax or relieve tension.
Reason 2 = To have a good time with my friends.
Reason 3 = To get drunk.
Reason 4 = To fit in with a group I like.
Reason 5 = To get away from my problems or troubles.
Reason 6 = Because of boredom, nothing else to do.
Reason 7 = To relieve depression.
Reason 8 = To get through the day.
Reason 9 = To get to sleep.
Reason 10 = To enhance sexual pleasure or opportunity.
Reason 11 = To increase my enjoyment of music or food.
Reason 12 = Because I like the taste.
Reason 13 = Because it's the thing to do.
Reason 14 = Because I feel better when I'm drinking.
Reason 15 = To help me be less shy with others.
Reason 16 = To celebrate at ceremonial occasions.
Reason 17 = Other_____.

Tob1= smoking cigarettes
Tob2 = smokeless tobacco
How High = level of intoxication
Studrole = year in school
Gpa = grade point average
Age = age in years
Gender = Male or female
Marital = current marital status
Greek = Greek organization membership
Studact2 = intercolliegiate athletics
Religi1= importance of religious or spiritual values
White = White/Caucasian ethnic background
African Amer = African American ethnic background
Hispanic = Hispanic ethnic background
Asian Amer = Asian American ethnic background
Residence Hall = student resides in university residence hall
Greek House = residence in fraternity or sorority
House/apt Norman = residence in city of Norman
Live Outside Norman = residence outside of city of Norman
Student Housing = student resides in university student housing

APPENDIX C

USE OF ALCOHOL, TOBACCO, AND OTHER DRUGS

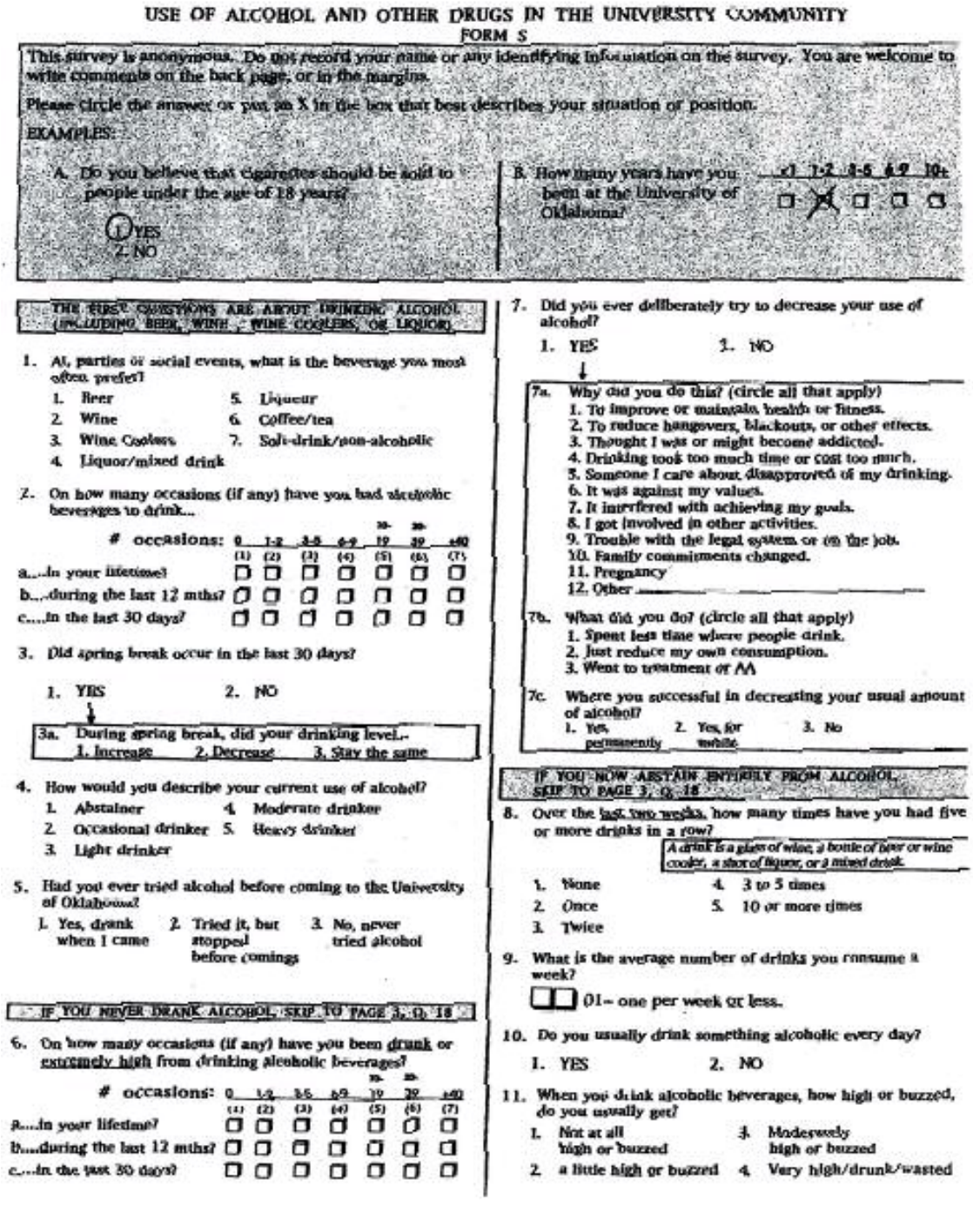
IN THE UNIVERSTIY COMMUNITY SURVEY

(FORM S)

(Form S)

SURVEY ON THE USE OF ALCOHOL, TOBACCO, AND OTHER DRUGS IN THE UNIVERSITY COMMUNITY

This Survey is intended to be completely "ANONYMOUS." Your security is our first priority. Please do not write any identifying information on this booklet!!



USE OF ALCOHOL AND OTHER DRUGS IN THE UNIVERSITY COMMUNITY

FORM S

This survey is anonymous. Do not record your name or any identifying information on the survey. You are welcome to write comments on the back page, or in the margins.

Please circle the answer or put an X in the box that best describes your situation or position.

EXAMPLES:

A. Do you believe that cigarettes should be sold to people under the age of 18 years?
(1) YES
2. NO

B. How many years have you been at the University of Oklahoma?
<1 1-2 3-5 6-9 10+
☐ ☒ ☐ ☐ ☐

THE FIRST QUESTIONS ARE ABOUT DRINKING ALCOHOL (INCLUDING BEER, WINE, WINE COOLERS, OR LIQUOR)

1. At parties or social events, what is the beverage you most often prefer?
1. Beer
2. Wine
3. Wine Coolers
4. Liquor/mixed drink
5. Liqueur
6. Coffee/tea
7. Soft-drink/non-alcoholic

2. On how many occasions (if any) have you had alcoholic beverages to drink...

# occasions:	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a...In your lifetime?	☐	☐	☐	☐	☐	☐	☐
b...during the last 12 mths?	☐	☐	☐	☐	☐	☐	☐
c...In the last 30 days?	☐	☐	☐	☐	☐	☐	☐

3. Did spring break occur in the last 30 days?
1. YES
2. NO

3a. During spring break, did your drinking level..
1. Increase
2. Decrease
3. Stay the same

4. How would you describe your current use of alcohol?
1. Abstainer
2. Occasional drinker
3. Light drinker
4. Moderate drinker
5. Heavy drinker

5. Had you ever tried alcohol before coming to the University of Oklahoma?
1. Yes, drank when I came
2. Tried it, but stopped before comings
3. No, never tried alcohol

IF YOU NEVER DRANK ALCOHOL, SKIP TO PAGE 3, Q. 18

6. On how many occasions (if any) have you been drunk or extremely high from drinking alcoholic beverages?

# occasions:	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a...In your lifetime?	☐	☐	☐	☐	☐	☐	☐
b...during the last 12 mths?	☐	☐	☐	☐	☐	☐	☐
c...In the last 30 days?	☐	☐	☐	☐	☐	☐	☐

7. Did you ever deliberately try to decrease your use of alcohol?
1. YES
2. NO

7a. Why did you do this? (circle all that apply)
1. To improve or maintain health or fitness.
2. To reduce hangovers, blackouts, or other effects.
3. Thought I was or might become addicted.
4. Drinking took too much time or cost too much.
5. Someone I care about disapproved of my drinking.
6. It was against my values.
7. It interfered with achieving my goals.
8. I got involved in other activities.
9. Trouble with the legal system or on the job.
10. Family commitments changed.
11. Pregnancy
12. Other _____

7b. What did you do? (circle all that apply)
1. Spent less time where people drink.
2. Just reduce my own consumption.
3. Went to treatment or AA

7c. Where you successful in decreasing your usual amount of alcohol?
1. Yes, permanently
2. Yes, for awhile
3. No

IF YOU NOW ABSTAIN ENTIRELY FROM ALCOHOL, SKIP TO PAGE 3, Q. 18

8. Over the last two weeks, how many times have you had five or more drinks in a row?
A drink is a glass of wine, a bottle of beer or wine cooler, a shot of liquor, or a mixed drink.
1. None
2. Once
3. Twice
4. 3 to 5 times
5. 10 or more times

9. What is the average number of drinks you consume a week?
☐☐ 01= one per week or less.

10. Do you usually drink something alcoholic every day?
1. YES
2. NO

11. When you drink alcoholic beverages, how high or buzzed, do you usually get?
1. Not at all high or buzzed
2. a little high or buzzed
3. Moderately high or buzzed
4. Very high/drunk/wasted

12. When you drunk alcoholic during the past year, how often were you?

	Not at All	A Few of the Times	Some of the Times	Most of the Times	Every Time
a. Alone	1	2	3	4	5
b. With a date or spouse	1	2	3	4	5
c. With friends	1	2	3	4	5

13. What have been your MOST IMPORTANT reasons for drinking alcoholic beverages? *(Circle all that apply)*

1. To relax or relieve tension
2. To have a good time with my friends
3. To get drunk
4. To fit in with a group I like
5. To get away from my problems or troubles
6. Because of boredom, nothing else to do
7. To relieve depression
8. To get through the day
9. To get to sleep
10. To enhance sexual pleasure or opportunity
11. To increase my enjoyment of music or food
12. Because I like the taste
13. Because it's the thing to do
14. Because I feel better when I'm drinking
15. To help me be less shy with others
16. To celebrate at ceremonial occasions

14. Compared to before you came to OU, has your current use of alcohol...
1. Increased
2. Decreased
3. Stayed the same

15. Please indicate how often during the past year you have experienced the following as a result of drinking.

	Never (1)	1-2 Times (2)	3-5 Times (3)	6 or more Times (4)
a. Had a hangover	☐	☐	☐	☐
b. Performed poorly on a test or important project	☐	☐	☐	☐
c. Missed a class or work due to drinking	☐	☐	☐	☐
d. Been in trouble with police or University authorities	☐	☐	☐	☐
e. Damaged property, pulled a fire alarm, ect...	☐	☐	☐	☐
f. Been hurt or injured after drinking	☐	☐	☐	☐
g. Got nauseated or vomited...	☐	☐	☐	☐
h. Driven a car while under the influence	☐	☐	☐	☐
i. Been arrested for driving while under the influence...	☐	☐	☐	☐
j. Got into a heated argument or fighting while drinking ...	☐	☐	☐	☐
k. Had a memory loss after drinking	☐	☐	☐	☐
l. Been embarrassed or disturbed by something you did while drinking	☐	☐	☐	☐
m. Were sexually harassed or molested after drinking	☐	☐	☐	☐
n. You harassed or molested someone else after drinking.	☐	☐	☐	☐
o. Seriously thought about suicide	☐	☐	☐	☐
p. Someone you know said you should cut down	☐	☐	☐	☐
q. Friend or significant other threatened to leave	☐	☐	☐	☐
r. Were afraid you might be alcoholic	☐	☐	☐	☐
s. Been annoyed by people criticizing your drinking	☐	☐	☐	☐
t. Had a drink first thing in the morning as an "eyeopener"	☐	☐	☐	☐
u. Felt guilt or remorse after drinking	☐	☐	☐	☐
v. Felt that you should cut down on your drinking	☐	☐	☐	☐
w. Were disciplined at work because of drinking	☐	☐	☐	☐
x. Drinking may have hurt your chances for a promotion, raise, or better job	☐	☐	☐	☐

16. When you are drinking, how do you usually decidle when to stop
1. I drink about the same amount as the people around me.
2. My body tells me when to stop or slow down.
3. I stop when the alcohol is gone or I pass out.
4. I know from past experience how many drinks I can handle.

17. How often do you consciously do the following things to limit the amount or effect of alcohol you drink?

	Seldom/ Never	Some-Times	Often	Always
a. Avoid drinking with heavy drinkers	1	2	3	4
b. Select drinks that your can drink slowly	1	2	3	4
c. Limit the number of drinks you can have in a given time	1	2	3	4
d. Drink non-alcoholic drinks .	1	2	3	4
e. Disguise non-alcoholic drinks to look like alcoholic drinks	1	2	3	4
f. Rewarding yourself for limiting drinking	1	2	3	4
g. Punish yourself for not limiting drinking	1	2	3	4
h. Eat before or while drinking	1	2	3	4
i. Confine drinking to certain time periods	1	2	3	4

THE NEXT QUESTIONS ASK ABOUT VARIOUS TYPES OF DRUGS

18. Have you ever used the following types of drugs? DO NOT include drugs used under a doctor's prescription.	In your lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No (1)	Yes (2)	No (1)	Yes (2)	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a. Marijuana (grass, pot) or hashish (hash)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Crack cocaine (cocaine in chunk or rock form)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Cocaine in any form	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
d. LSD ("acid")	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
e. Other psychedelics (mescaline, peyote, psilocybin, PCP)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
f. Amphetamine, methamphetamine (including uppers, speed, bennies, dexies)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
g. Crystal meth ("ice")	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
h. Downers (e.g., Halcyon, Dalmane, barbiturates, goofballs, reds, yellows)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
i. Tranquilizers (e.g., Librium, Valium, Ativan)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
j. Heroin (smack, horse, skag)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
k. Other narcotics (e.g., methadone, opium, morphine, codeine, Demerol)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
l. Inhalants (glue, aerosol sprays, nitrites, other gases or sprays)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
m. Designer drugs (e.g., ecstasy, MDMA)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
n. Anabolic steroids	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
19. Think about any drugs mentioned above, have you ever used any of them through injection by needle?	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

20. Have you used the following types of drugs based on a doctor's prescription?	In your lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No (1)	Yes (2)	No (1)	Yes (2)	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a. Sleeping meds. (e.g., Halcyon, Dalmane, Restoril)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Minor Tranquilizers (e.g., Librium, Valium, Ativan)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Stimulants (e.g., weight loss pills, Ritalin)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
d. Prescription pain medication (e.g., codeine, Darvon, Demerol, Tylenol 3)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

21. Have you ever used the following types of over-the-counter drugs?	In your lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No (1)	Yes (2)	No (1)	Yes (2)	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a. Diet pills (e.g., Dexatrim, Dietac, Prolamine)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Stay-awake pills (e.g., NoDoz, Vivarin)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Other non-prescription stimulants or pep pills	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

THE NEXT QUESTIONS ASK ABOUT THE SOCIAL CONTEXT OF ALCOHOL AND DRUG USE

22. Some people like having alcohol available at social gatherings, while others don't. Which do you prefer?
1. Have available 2. Have available with limits 3. Not have available

23. Now think about the parties and social events you attended in the last 6 months.

If you have not attended parties or social events, check here and go to Question 24 ☐

At these social events, how often...	Never	Seldom	Some-times	Usually	Always
a. Was alcohol served or available?	1	2	3	4	5
b. Were other beverages equally available?	1	2	3	4	5
c. Was food served or available?	1	2	3	4	5
d. Was drinking the reason for the event?	1	2	3	4	5
e. Did most people drink but not get drunk?	1	2	3	4	5
f. Did most people get drunk?	1	2	3	4	5
g. Did you get drunk?	1	2	3	4	5
h. Did you feel pressure to drink alcohol?	1	2	3	4	5
i. Did you feel pressure to use other drugs?	1	2	3	4	5
j. Were games played that require or encourage a lot of drinking?	1	2	3	4	5
k. Did you take part in drinking games?	1	2	3	4	5

24. Please indicate how often during the past 12 months you have experienced the following as a result of other people's drinking or drug use.

At these social events, how often...	Never (1)	1-2 Seldom (2)	3-5 Times (3)	6-9 usually (4)	10+ Always (5)
a. Others' drinking/use made a situation or event better or more enjoyable	☐	☐	☐	☐	☐
b. Others' drinking/use made you feel more comfortable	☐	☐	☐	☐	☐
c. An enjoyable event was spoiled by others' drinking or drug use	☐	☐	☐	☐	☐
d. Your work or study was disrupted	☐	☐	☐	☐	☐
e. Your sleep was disrupted	☐	☐	☐	☐	☐
f. Your property was damaged or stolen	☐	☐	☐	☐	☐
g. You were embarrassed by someone's behavior	☐	☐	☐	☐	☐
h. You were sexually harassed or assaulted by someone drunk or high	☐	☐	☐	☐	☐
i. You feared violence or were attacked or intimidated	☐	☐	☐	☐	☐
j. You had to take care of someone with a drinking or drug problem	☐	☐	☐	☐	☐

25. Circle each place where you used alcohol or drugs during the past year.

	(Circle all that apply) Alcohol	Drugs
a. DID NOT USE	1	1
b. Bar or restaurant	2	2
c. At home	3	3
d. Someone else's residence	4	4
e. Formal OU event	5	5
f. Informal OU event (e.g., Small gathering)	6	6
g. Off-campus meeting or Conference	7	7
h. During or before work	8	8
i. During or before class	9	9
j. At parent's home	10	10

26. When a friend or colleague's chronic drinking or drug use concerns you, would you likely to...

	Very Likely	Likely	Not Likely
a. Help restrain or control dangerous behavior	1	2	3
b. Try to reduce the person's access to the alcohol or drug	1	2	3
c. Contact an authority to assist the person if there is a crisis (e.g., medical care, police, security)	1	2	3
d. Report the person to his/her advisor or some other authority	1	2	3
e. Help the person with responsibilities if he/she is not able to handle regular tasks	1	2	3
f. Make allowances for the person's problem and do not expect him/her to perform as well as usual	1	2	3
g. Cover for the person so he/she won't get in trouble with authorities	1	2	3
h. Counsel the person about his or her reasons for misuse of alcohol or drugs	1	2	3
i. Confront the person and ask him or her to stop using	1	2	3
j. Talk to the person about what you see happening, with specific examples	1	2	3
k. Try to get the person to a source of help, such as Counseling Services or the Faculty and Staff Assistance Program	1	2	3
l. Other	1	2	3

26. When you don't do anything, what is the usual reason?

1. It's the person's own responsibility.
2. I have no authority to take action.
3. I don't know what to do.
4. It wouldn't do any good.
5. I might lose the person as a friend.
6. Other _____

THESE NEXT QUESTIONS ARE ABOUT OTHER PEOPLE'S USE OF AND ATTITUDES ABOUT ALCOHOL AND OTHER DRUGS. PLEASE MAKE YOUR BEST ESTIMATE, BASED ON YOUR OBSERVATIONS OF OTHERS.

27. Think of the people you see socially...

	a. About how many would you estimate... None	A few	Some	Most	b. For those that do, about how often (best estimate): Less than 1/month	Once/ Month	Twice/ Month	Once/ week	2-4/ Week	5 times Week	Daily
a. Drink alcoholic beverages?	1	2	3	4	1	2	3	4	5	6	7
b. Drink to get drunk?	1	2	3	4	1	2	3	4	5	6	7
c. Use marijuana or hashish?	1	2	3	4	1	2	3	4	5	6	7

28. Now think about all adults...

	a. About how many would you estimate... None	A few	Some	Most	b. For those that do, about how often (best estimate): Less than 1/month	Once/ Month	Twice/ Month	Once/ Week	2-4/ Week	5 times Week	Daily
a. Drink alcoholic beverages?	1	2	3	4	1	2	3	4	5	6	7
b. Drink to get drunk?	1	2	3	4	1	2	3	4	5	6	7
c. Use marijuana or hashish?	1	2	3	4	1	2	3	4	5	6	7

29. How much do you think people risk harming themselves (physically or in other ways) if they...

	No Risk	Slight Risk	Moderate Risk	Great Risk	Can't Say
a. Smoke one or more packs of cigarettes/day	1	2	3	4	5
b. Try marijuana (pot, grass) once or twice	1	2	3	4	5
c. Smoke marijuana occasionally	1	2	3	4	5
d. Smoke marijuana regularly	1	2	3	4	5
e. Try LSD once or twice	1	2	3	4	5
f. Try cocaine once or twice	1	2	3	4	5
g. Have one or two drinks nearly every day	1	2	3	4	5
h. Have four or five drinks nearly every day	1	2	3	4	5
i. Have 5 or more drinks once or twice each weekend	1	2	3	4	5

30. Do you find the following behaviors acceptable or unacceptable? How about your friends, the people you see socially? How do most adults, do you think they would find them acceptable or unacceptable?

	a. Do you find this... Accept-able	Don't Care	Unac-ceptable	b. Do your friends find this... Accept-able	Don't Care	Unac-ceptable	b. Do Most adults find this... Accept-able	Don't Care	Unac-ceptable
a. Drinking alcoholic beverages to be sociable	1	2	3	1	2	3	1	2	3
b. Giving parties where alcohol is served	1	2	3	1	2	3	1	2	3
c. Giving parties where the only drinks are alcohol	1	2	3	1	2	3	1	2	3
d. Letting loose and having fun when drinking	1	2	3	1	2	3	1	2	3
e. Losing control when drinking	1	2	3	1	2	3	1	2	3
f. Drinking to get drunk	1	2	3	1	2	3	1	2	3
g. Being so drunk they throw up	1	2	3	1	2	3	1	2	3
h. Getting loud and aggressive when drinking	1	2	3	1	2	3	1	2	3
i. Drinking to get away from troubles	1	2	3	1	2	3	1	2	3
j. Drinking to fit in with a group	1	2	3	1	2	3	1	2	3
k. Providing alcohol to someone under age 21	1	2	3	1	2	3	1	2	3
l. Pressuring people to drink alcohol	1	2	3	1	2	3	1	2	3
m. Driving after two or three drinks	1	2	3	1	2	3	1	2	3
n. Making sexual advances to someone who is drunk or high	1	2	3	1	2	3	1	2	3

31. People who sell or serve alcohol are becoming increasingly liable for damages or injuries that can result from drunken behavior.

	a. Do you approve or disapprove of hosts and alcohol servers doing the following?			b. Do you think most adults would approve or disapprove?		
	Approve	Don't Care	Disap-Prove	Approve	Don't Care	Disap-Prove
a. Setting time limits on how long alcohol will be available	1	2	3	1	2	3
b. Require a trained server to serve drinks	1	2	3	1	2	3
c. Limiting the number of drinks to each person attending	1	2	3	1	2	3
d. Refuse drinks to people who appear intoxicated	1	2	3	1	2	3
e. Take car keys away from some one drunk who wants to drive	1	2	3	1	2	3
f. Check IDs to prevent under age drinking	1	2	3	1	2	3
g. Refusing to admittance to uninvited/unauthorized people	1	2	3	1	2	3
h. Require that food be provided along with alcohol	1	2	3	1	2	3
i. Require that non-alcoholic beverages be available	1	2	3	1	2	3

THE FOLLOWING QUESTIONS ARE ABOUT NORMAN AND THE UNIVERSITY OF OKLAHOMA

32. Do you think advertising of alcohol affects how much people drink?
   1. YES
   2. NO
   3. DON'T KNOW

33. Do you think campus publications and events should advertise alcohol beverages?
   1. YES
   2. NO
   3. DON'T KNOW

34. Do you think the university has a responsibility to provide assistance services to people who have problems with alcohol or other drugs?
   a. Services for faculty and staff: 1. YES 2. NO
   b. Services for Students: 1. YES 2. NO

35. If you had a problem with alcohol or drugs, where would you be most likely to go to find help?
   1. University Health Services (Goddard)
   2. Employee Assistance Program
   3. OU Counseling Clinic (Public Clinic)
   4. Residence Hall
   5. Greek office
   6. Off-campus
   8. Other _____

36. Have you or a dependent used treatment services for alcohol or other drugs since coming to OU?
   1. YES
   2. NO

37. Do you think the University's health benefits provide adequate coverage for alcohol and drug treatment?
   1. YES
   2. NO
   3. DON'T KNOW

THE LAST QUESTIONS INVOLVE YOUR BACKGROUND AND CURRENT SITUATION

38. Role at University
   1. Freshman
   2. Sophomore
   3. Junior
   4. Senior
   5. Law student
   6. Graduate student
   7. Post-graduate training
   8. Not seeking a degree
   9. Other _____

39. Student Status:
   1. Full-time
   2. Part-time
   3. Not currently enrolled

40. In which school or college is your major area of study?
   1. Architecture
   2. Arts and Sciences
   3. Business Administration
   4. Education
   5. Engineering
   6. Fine Arts
   7. Law
   8. Liberal Studies
   9. Graduate College
   10. Other _____

41. Approximate grade point average.
   on a 4-point scale: ☐.☐☐

42. Job Status:
   1. Working Full-time
   2. Working Part-time
   3. Not working

43. Age: ☐☐

44. Gender:
   1. Male 2. Female

45. Sexual orientation:
   1. Heterosexual
   2. Lesbian/gay
   3. Bisexual

46. Primary ethnic origin:
   1. American Indian/Native American
   2. Asian/Pacific Islander
   3. African
   4. Hispanic (Chicano/Latino/Mexican)
   5. Arab/Middle Eastern
   6. White/European (Not of Hispanic Origin)
   7. Other _____

47. Are you an *American Citizen*:
   1. YES
   2. NO

48. Marital status
   1. *Single*
   2. Married/domestic partner
   3. Separated
   4. Divorced
   5. Widowed

49. Living with whom: *(Circle All that Apply)*
   1. Alone
   2. Parent(s) or other relatives
   3. Spouse or significant other
   4. *Children*
   5. Roommate(s)

50. Living where during the school year?
   1. Residence Hall
   2. Fraternity
   3. Sorority
   4. Student housing
   5. House/Apartment in Norman
   6. outside of Norman

51. *Please indicate* how many hour per week you spend on each on the following types of activities. *(Circle each activity in only one category)*

Hours per week	None (1)	1-4 Hours (2)	5-9 Hours (3)	10-15 Hours (4)	16 or More (5)
a. Student organization(s)	☐	☐	☐	☐	☐
b. Participating in intercollegiate athletics	☐	☐	☐	☐	☐
c. Other physical activities (e.g., intramural athletics, walking, biking, ect...)	☐	☐	☐	☐	☐
d. Enjoying the arts (music, theater, ect.)	☐	☐	☐	☐	☐
e. Political activities	☐	☐	☐	☐	☐
f. Religious activities	☐	☐	☐	☐	☐
g. Volunteer work	☐	☐	☐	☐	☐
h. Leisure time with family or friends	☐	☐	☐	☐	☐

52. How important are religious or spiritual values to you?
   1. Not at all important
   2. Not very important
   3. Mildly important
   5. *Important*
   6. Very important

53. What position does your church or religion take regarding alcohol and other drugs?
(Circle All That Apply)
   1. NO CHURCH OR RELIGIOUS AFFILIATION
   2. Allows/supports moderate or ritual use of alcohol
   3. Allows/supports moderate or ritual use of other drugs
   4. Disapproves of alcohol use
   5. Disapproves of other (non-medicinal) drug use
   6. Takes no position on alcohol use
   7. Takes no position on other (non-medicinal) drug use

54. Which of the following statements best describes the use of alcoholic beverages by people in your household when you were growing up?
   1. Drinking was disapproved of; alcohol was not present.
   2. Alcohol was seldom drunk but occasional drinking was OK.
   3. Alcohol was drunk on special occasions (celebrations).
   4. Light or moderate drinking, *but no* drunkenness.
   5. Moderate to heavy drinking, with occasional drunkenness.
   6. Regular heavy drinking with frequent drunkenness.
   7. One or more adults in your home were treated for alcoholism.

8

Perceived Risk Instrument
(Amendment to Questionnaire)

- Of the Drugs Listed Below, how dangerous do you think the drug is to the user?

List of Drugs	Level of Perceived Danger				
	No Danger	Slight Danger	Moderate Danger	Great Danger	Can't Say
a. Tobacco	1	2	3	4	5
b. Alcohol	1	2	3	4	5
c. Marijuana (grass, pot) or hashish (hash)	1	2	3	4	5
d. Crack cocaine (cocaine in chunk or rock form)	1	2	3	4	5
e. Cocaine in any form	1	2	3	4	5
f. LSD ("acid")	1	2	3	4	5
g. Other psychedelics (mescaline, peyote, psilocybin, PCP)	1	2	3	4	5
h. Amphetamine, methamphetamine (including uppers, speed, bennies, dexies)	1	2	3	4	5
i. Crystal meth ("ice")	1	2	3	4	5
j. Downers (e.g., Halcyon, Dalmane, barbiturates, goofballs, reds, yellows)	1	2	3	4	5
k. Tranquilizers (e.g., Librium, Valium, Ativan)	1	2	3	4	5
l. Heroin (smack, horse, skag)	1	2	3	4	5
m. Other narcotics (e.g., methadone, opium, morphine, codeine, Demerol)	1	2	3	4	5
n. Inhalants (glue, aerosol sprays, nitrites, other gases or sprays)	1	2	3	4	5
o. Designer drugs (e.g., ecstasy, MDMA)	1	2	3	4	5
p. Anabolic Steroids	1	2	3	4	5

Thank you for help participation *in this survey.* Your assistance is a vital part of our attempt to learn about the alcohol and drug use on the University of Oklahoma campus. In an effort to more efficiently and effectively conduct this survey, we would appreciate *your feedback.* Please complete the section below.

Thank you again for your help!

1. How long did it take you to complete the survey? _____

2. What, if any, items do you *have questions* about (lack of clarity, ect...)? _____

3. Please make any comments *that may* be helpful with future administrations of this survey.

This Questionnaire was adapted from a similar survey conducted at the University of Michigan in 1990.

APPENDIX D

PROSPECTUS

Running head: PREDICTING BINGE DRINKING

Predicting Binge Drinking Among Undergraduate College Students

Jennifer J. Whatley

University of Oklahoma

Predicting Binge Drinking Among Undergraduate College Students

INTRODUCTION

Background of the Problem

The use of alcohol on college campuses has been a concern for ongoing studies since the landmark study of 17,000 students by Straus and Bacon in 1953. Despite the fact that approximately one half of undergraduate students are legally underage, the prevalence of alcohol use and abuse among college students is well substantiated (e.g., Alva, 1998; Duitsman & Colbry, 1995; Myerholtz & Rosenberg, 1998). Widespread alcohol use and abuse pose serious concerns for the college student population (e.g., Clayton, 1999; O'Hare & Tran, 1997; Senchak, Leonard, & Greene, 1998; Wood, Read, Palfai, & Stevenson, 2001). Simply being in college increases the likelihood of alcohol consumption. College students report higher levels of alcohol use than young adults not enrolled in college (Prendergast, 1994), a reality that continues to challenge college administrators throughout the United States (Spratt & Turrentine, 2001). Moreover, there is evidence that college-bound students in high school drink alcohol more than their non-college-bound peers (Schulenberg, Maggs, Long, Sher, Gotham, Baer, Kivlahan, Marlatt,& Zucker, 2001). Perhaps more importantly, data collected from several sources indicates that about 42 percent of college students engage in binge drinking, that is, drinking to get drunk (Clayton, 1999; Dickinson, 1999). This is

up from a 1997 study by Sher and colleagues that reports one in every three students drink to get drunk (Sher, Bartholow, & Nanda, 2001). Although these statistics are alarming, the National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism released, on March 17, 2005, a statement indicating that the harm to college students resulting from alcohol consumption may exceed previous estimates (National Institute on Alcohol Abuse and Alcoholism, NIH News, March 17, 2005). Unintentional fatal injuries related to alcohol have increased. In fact, the researchers reported that approximately 1500 alcohol related fatalities occurred among U.S. college students aged 18-24 in 1998. This increased to more than 1700 in 2001. During the same period of time research indicates that the number of college students who drove under the influence of alcohol increased from 2.3 million to 2.8 million. The lead researcher, Ralph W. Hingson, ScD, calls for "…both improved measurement of these problems and efforts to reduce them" (Hingston, Heeren, Winter, & Wechsler, 2005, p.1).

College drinking is considered one of the most significant and complex health problems today (Schulenberg et al., 2001). Much of it is illegal, underage drinking, and most of it is considered an integral part of college life. In fact, David Satcher, M.D. United States Surgeon General 1998-2002, noted startling statistics on college student alcohol use including the fact that students spend $5.5 billion on alcohol each year. That is reportedly more than they spend on soft drinks, tea, milk, juice, coffee and books, combined (Dervarics, 1999). Yet, according to Schulenberg and colleagues (2001), "Despite the large sums of money dedicated to prevention and intervention

programs, few programs have shown any significant results, and researchers continue to ask the same fundamental questions year after year" (p. 474).

With the popularity of alcohol, it is not surprising that a significant proportion of college students in the United States are heavy users of alcohol, which puts them at an increased risk for numerous negative consequences (Bennett, McCrady, Johnson, & Pandina, 1999; Clements, 1999). Alcohol use is increasingly associated with residence hall damage, violent behavior, student attrition, property damage, lower academic performance (Dorsey, Scherer, & Real, 1999), legal difficulties, and missed classes (Werner & Greene, 1992). More importantly, alcohol use is related to injuries to self and others (Dorsey et al., 1999) as well as sexually transmitted disease and unplanned pregnancy (Werner & Greene, 1992). According to Crawford and Novak (2000), "Alcohol is involved in the majority of crimes and accidents that occur on college campuses. Even non-drinkers on campuses where alcohol use is prevalent are likely to experience damaged property and personal injury resulting from others' irresponsible drinking" (p. 269).

Surprisingly, one study found that 23 percent of students are frequent binge drinkers, that is, those who have consumed at least five drinks in a row at least three times during a two-week period (Wechsler, Lee, Kuo, & Lee., 2000). This figure is up from 20 percent when the first nationwide study was conducted in 1993. Binge drinking has been shown to be more prevalent among college students than among their same-age peers and is strongly related to serious injuries and injury-related deaths, particularly fatal motor vehicle crashes. A Harvard study found that binge

drinkers are seven times more likely to miss classes and ten times more likely to damage property as are light drinkers (Marcus, 2000).

"For the more than six million Americans who attend college full-time, binge drinking is arguably the single most important cause of preventable morbidity and mortality. Bingeing (heavy episodic alcohol consumption) is associated with a substantially heightened risk of serious social and psychological consequences" (Dowdall, Crawford, & Wechsler, 1998, p.706). Binge drinking is defined as the consumption of five or more drinks in one sitting (Syre, Martino-McAllister, & Vanada, 1997 and Johnston, O'Malley, & Bachman, 2001). Some criticism has been leveled at this definition, which also accounts for gender by defining binge drinking as consisting of five or more drinks by a male or four or more drinks by a women over a two-hour period (NIH Newsletter, 2004 and Wechsler, Dowdall, Davenport, & Rimm, 1995 and Wechsler, Lee, Nelson, & Lee, 2001). Other researchers believe that a real binge is 8, 10, or more drinks, but Wechsler (2000) argues that defining binge drinking out of existence will not change the fact of this complex and destructive problem.

Given the detrimental effects of alcohol use, particularly binge drinking, it is important to identify those college students who are most likely to engage in heavy alcohol use. One approach to identifying such individuals is to examine demographic variables such as gender and age which may act as predictor variables. Keefe and Newcomb (1996) took the approach one step further by categorizing factors that increase the use and abuse of alcohol as either contextual or psychosocial in nature.

Included as contextual factors are the demographic variables such as gender while psychosocial factors include everything from personal attitudes toward substance abuse to social norms and significant reference groups (e.g. Greek society membership). Using data from both groups of factors, Grenier and colleagues described the highest at-risk drinkers as "freshmen, males, members of fraternities, single, off-campus residents, and children of parents on the high end of the education continuum" (Grenier, Gorskey, & Folse, 1998, p. 79). In addition to the aforementioned demographics, researchers report that age (Makimoto, 1998), grade point average (Engs, Diebold, & Hanson, 1996), ethnicity (Clements, 1999), marital status (Makimoto, 1998), religiosity (Dunn, 2005), and athletic status (Gutgesell & Canterbury, 1999) are related to collegiate alcohol consumption. While this is a starting point for predicting those students most likely to engage in binge drinking, it may also be helpful to know why students choose to drink. If university administrators are able to identify the reasons their undergraduates are engaging in heavy alcohol consumption, more appropriate alternatives may be presented.

Statement of the Problem

The negative consequences of alcohol use by college students are staggering. Alcohol use is associated with lower socioeconomic backgrounds, lower ACT scores, greater sensation seeking, and greater risk accessibility (Brown, 1997). A survey conducted by Harvard University's School of Public Health found that frequent binge drinkers, defined as those individuals who had binged three or more times in the past two weeks, were four times as likely as those who did not binge to get behind in

school work, five times as likely to have sex without protection, and 10 times as likely to damage property (Wechsler, Lee, Kuo, & Lee, 2000).

Despite almost a decade of good intentions and promising interventions, the persistence of binge drinking remains "a phenomenon of campus culture across student generations" (Keeling, 2000, p.196). Wechsler, Dowdall, Maenner, Gledhill-Hoyt, and Lee (1998) concluded, "binge drinking is by far the single most serious public health problem confronting American colleges" (p. 257). The fact that binge drinking is often associated with the use of another substance such as an illegal drug compounds the problem dramatically. Basing their findings on the results of three national surveys, Gledhill-Hoyt, Hang Lee, Strote, and Wechsler (2000) found that, of those students who reported the use of an illicit drug (other than marijuana) in the past 30 days, 77% of them also reported binge drinking.

In 1990 the United States Public Health Service established national health promotion and disease prevention objectives for the year 2000 (Lewis, Goodhart, & Burns, 1996). One objective was directed toward reducing high-risk drinking behavior among college students. In order to accomplish this goal, the first step is to identify the factors that influence student drinking (e.g., Carey & Correia, 1997; Crawford & Novak, 2000; Sher et al., 2001). A multitude of studies have attempted to uncover the factors that influence college students' decisions about alcohol use. However, most preventive intervention programs that draw upon this research have failed to significantly influence college student drinking (Robinette, 1997). Given the failure of previous prevention intervention strategies to combat collegiate binge drinking

coupled with the fact binge drinking and its deleterious consequences remain, including, but not limited to the alcohol related death of a University of Oklahoma student in 2004, additional studies focusing on predictor variables are needed. The information gleaned from such studies can shed light on the problem and guide prevention intervention strategies.

Purpose of the Study

Despite the considerable research conducted to identify predictive factors of college drinking, relatively few studies have focused exclusively on binge drinking at specific locales. What is needed is an equation for predicting binge drinking above chance. This study attempts to do just that by adopting a network approach to determining factors that influence binge alcohol use by Oklahoma undergraduates. Students were asked to report on a number of factors, including social systems, membership in Greek organizations, demographic variables and their reasons for drinking.

By determining specifics about heavy alcohol use from University of Oklahoma undergraduates, it may be possible to plan successful interventions for future students. Many recent studies conclude that successful interventions are those that are student-specific oriented. As Turrisi, Padilla, and Wiersma (2000) succinctly put it, "different types of college students drink for different reasons" (p. 598).

A study comparing college binge drinking in California with other states (Wechsler et al, 1997) substantiates this sort of approach that considers the unique

demographic and other determining variables applicable to different colleges throughout the United States. In a more recent study, Wechsler et al., 2000 estimated that binge drinking rates at different colleges vary from one to 80 percent of students, a finding which strongly suggests that "institutional approaches should be shaped by the particular conditions of a given campus" (p. 39).

Despite mounting evidence that a one-size-fits-all approach to the problem is simply not working, most colleges continue to implement a variety of intervention programs based on doing much the same thing. Generally, this includes educating students about alcohol use, implementing school policies to limit student access to alcohol, restricting advertising at sports events, and providing alcohol-free dormitories (Wechsler et al., 2000). It is the intent of this study to explore those variables shown in past studies to correlate to alcohol use and compare those findings as they may or may not apply to University of Oklahoma undergraduates. It is hoped that the results will enable future intervention programs to specifically and effectively target those students at risk for alcohol use.

Research Questions and Hypotheses

The hypotheses for this investigation will be tested by examining data collected by this researcher at the request of the Norman Prevention Coalition (Higher Education Committee) during the time period of January 1, 1997 to May 1, 1997.

This investigation is designed to examine two primary research questions. These questions are:

RQ1: Which of the following is the best independent predictor of binge drinking?

(a) demographic variables, which include gender, age, grade point average, ethnicity, marital status, religiosity and living arrangements; (b) social variables, which include membership in Greek organizations and athletic participation; (c) a unique combination of demographic variables (gender, age, grade point average, ethnicity, marital status, religiosity and living arrangements) and social variables (membership in Greek organizations and athletic participation).

RQ2: What are the most common reasons for undergraduate drinking?

(a) to relax or relieve tension; (b) to have a good time with friends; (c) to get drunk; (d) to fit in with a group one likes; (e) to get away from one's problems or troubles; (f) because of boredom; (g) to relieve depression; (h) to get through the day; (i) to get to sleep; (j) to enhance sexual pleasure or opportunity; (k) to increase enjoyment of music or food; (l) because one likes the taste; (m) because it's the thing to do; (n) because one feels better when drinking; (o) to help one be less shy with others; (p) to celebrate at ceremonial occasions; (q) other.

RQ3: What is the relationship between students' reasons for drinking and binge drinking?

These research questions will be answered by testing the following relevant hypotheses.

H1a: Gender, specifically, being male will be positively related to binge drinking and being female will be negatively related to binge drinking, consistent with the research of Borynski (2003), Turner et al. (2000), and Wechsler et al. (2000).

H1b: Age will be inversely related to binge drinking as consistent with the research of Makimoto (1998).

H1c: Grade point average will be negatively related to binge drinking as consistent with the research of Engs et al. (1996).

H1d: Ethnicity, specifically being Caucasian will be positively related to binge drinking as consistent with the research of Clements (1999), Martin (1998), Prendergast (1994), and Wechsler et al. (2000). Ethnicity, specifically being Hispanic, will be more positively related to binge drinking than will being of another minority ethnic group, as consistent with the research of Bennett, Miller, and Woodall (1999), Clements (1999), and Prince (1999).

H1e: Marital status, specifically being married, will be inversely related to binge drinking while being single will be positively related to binge drinking as consistent with the research of Makimoto (1998), Prince (1999) and Wechsler et al. (1997).

H1f: Religiosity will be negatively related to binge drinking as consistent with the research of Dunn (2005), Engs, et al. (1996), and Poulson et al. (1998).

H1g: Living arrangements will relate to binge drinking such that those males students living in fraternities will engage in more binge drinking behavior than students residing in other domiciles as consistent with the research of Larimer et al. (1997) and Wechsler et al. (1998). Females residing in sororities will engage in more binge drinking behavior than students living in other places as consistent with the research of Wechsler et al. (1998). Individuals residing in off campus apartments or homes will be more likely to engage in heavy drinking than those individuals living in on-campus (e.g. residence halls) as consistent with the research of Basten and Kavanagh (1996), Grenier et al. (1998), Prince (1999), Vaillant and Scanlan (1996), and Wechsler et al. (2000). Individuals living with their parents will be least likely to engage in heavy drinking behavior as consistent with the research of Vaillant and Scanlan (1996).

H2a: Being a member of a Greek organization will be positively related to binge drinking as consistent with the research Carter and Kahnweiler (2000), Gomez (2000), Larimer et al. (1997), Sher et al. (2001), Turner et al. (2000), and Wechsler, et al. (1998).

H2b: Being an intercollegiate athlete will be positively related to binge drinking as a consistent with the research of Gutgesell and Canterbury (1999), Meilman et al. (1999), Nelson and Wechsler (2001), Wechsler et al. (1997).

Limitations of this Study

The most apparent limitation of this investigation is the use of a self-report format. Issues of accurate and/or honest responding must be considered when interpreting the results of the study. In addition, the examination of reasons for undergraduates' drinking is exploratory in nature. Despite the importance of this data, the nature of the question necessitates the utilization of descriptive and correlational statistics. This does permit the assumption of causality.

Review of the Literature

Since the landmark study of 17,000 students by Straus and Bacon in 1953 studies on alcohol use by college students have received considerable attention. The multiple variables that correlate with alcohol use by college students makes the task of identifying particular risky factors for the purpose of predicting which students will or will not experience problem drinking no small task. Moreover, the literature is exhaustive, but by no means conclusive. For the purpose of clarity, the literature on variables selected for this study will be organized and presented under the following headings: Demographic, Social and Situational, and Reasons for Drinking. It should be noted, however, that manipulating the studies in this manner does not in any way imply that the variables under each heading act independently from one another. In point of fact, multicolinearity likely abounds.

Demographic Variables

Gender

The majority of studies have found that males consistently drink more than females (e.g., Basten & Kavanagh, 1996; Clements, 1999; Engs et al., 1996; Douglas & Collins, 1997; Grenier et al., 1998); Lo, 1996), even after factoring out the discrepancies in body weight and composition (Vaillant & Scanlan, 1996), ethnicity (Keefe & Newcomb, 1996), and race (Fennell, 1997). Maggs, Frome, Eccels, and Barber (1997) also found these gender differences, although her study revealed that there was no gender difference in the number of binge days per week. The reasons for drinking differed between the sexes, but it can be said with some degree of confidence that simply being a male puts one at more risk for drinking than being a female does (Crawford & Novak, 2000; Lewis, Goodhart, & Burns, 1996). Males are also at a higher risk for alcohol addiction (Vaillant & Scanlan, 1999). Prendergast (1994) found that men are more likely than women to use alcohol, to drink greater quantities and more frequently, and to have more alcohol-related problems. O'Hare and Tran (1997) found significant gender differences in the areas of heavy drinking and subjective self-assessment of a substance abuse problem, with males rating 18.4 percent (*n*-220) and women rating 3.6 percent (*n*=174). With so much data demonstrating the effect of gender on differences in alcohol use, it is worth noting that gender differences are not a determining factor for those college students who abstain. Clements (1999) found a total of 15.7% of his study sample of 306 undergraduates reported they abstain from

alcohol use. Of these, 16.9% of the males and 15.3% of the females reported abstaining from alcohol use, a difference not statistically significant.

Gender differences in risk factors for alcohol use have been the focus of research for many years. However, it can be argued that much of the information has been from studies of men (Wiesbeck, 2003). In a longitudinal study begun in 1971, Liu and Kaplan (1996) investigated these gender differences to determine how they affect the use of alcohol. The random sample consisted of 6,074 young male and female seventh grade students, with a follow-up study of these same people in the 1980s, when the subjects were in their mid-20s. Although the subjects were not all college students, some generalizations based on gender differences may reasonably apply to undergraduates. The study found that, generally, males tend to use alcohol to gain a sense of self-importance and report they feel more important or more powerful when they drink. Males also seek social bonding through the use of alcohol and tend to report they drink because their friends do so. In contrast, females were found to use alcohol because of personal problems, as a form of self-medication. Some studies indicate that women are drinking larger amounts and more frequently and there are trends to suggest that sex differences in drinking may be diminishing, especially in the student population (Kashubeck & Mintz, 1996; Lo, 1996; Ricciardelli &Williams, 1997). However, women tend to drink for different reasons than men. While males tend to drink as a part of the socialization process, some studies conclude that women are more likely to resort to alcohol as a means of self-medication for personal problems (Liu & Kaplan, 1996). However, a study by McCormack (1996) provided contradictory conclusions. They found that college men tend to drink when they feel

under pressure, while the increase in drinking among college women is probably related to the "increased acceptance of drinking when attending social events such as parties and dating" (p. 67). Despite indications that women are drinking more, many researchers continue to find consistent and large sex differences in drinking (Ricciardelli & Williams, 1997).

Age

In a study comparing California college drinkers with students in 140 colleges nationwide, Wechsler et al. (1997) found that California students experienced significantly less alcohol use, abuse and problems associated with the use of alcohol than did their counterparts. In comparing characteristics of the two samples of students, it was found that California students were older, more likely to be non-white, more likely married, and less likely to live on campus. The most important finding and the factor determined to exert the most influence in predicting alcohol use was age. This would tend to support those study findings that alcohol use is a temporary problem that lessens with age. It is no coincidence, then, that being a freshman, versus a senior, increases one's risk for alcohol use (Crawford & Novak, 2000; Engs et al., 1996; Grenier et al., 1998).

On the other hand, Prince (1999) found that senior college students report more problematic drinking behaviors than any other class. Yet another study (Clements, 1999) found that the frequency of student binge drinking did not vary significantly by year in school. Despite these contradictory findings, age is thought to be generally associated with drinking patterns (i.e., There is an inverse relationship

between age and frequency of alcohol use). In essence, problem drinking lessens with increased age. In a 1996 study by Vaillant and Hiller-Sturmhoefel that followed young alcoholics for a period of eight years, 1/3 of the subjects returned to asymptomatic drinking during the study, citing changes in social responsibilities (e.g., marriage) and peer groups as their reasons for changing their drinking behavior. Maturation and the lifestyle changes that go along with the process appear to play an important role in predicting patterns of alcohol use.

Grade Point Average

Engs et al. (1996) suggested that a student's grade point average (GPA) may be a better determining factor in predicting alcohol use than one's year in school. They concluded that the lower a student's GPA, the higher was the percentage of students who drank or were heavy drinkers. Contrarily, those students with a 4.0 GPA reported consuming one third of the number of drinks than those with GPAs under 2.0.

Ethnicity

Not surprisingly, ethnicity has been examined as a possible moderator variable in predicting alcohol use. Vaillant and Hiller-Sturmhoefel (1996) found ethnic differences in drinking behaviors among their white male subjects who represented a variety of backgrounds, including Irish, Polish, Russian, English, Northern European, Italian and other Southern European, Anglo Canadian, and French Canadian. Although a similar proportion of males in each ethnic group (about 20%) were abstinent, alcoholism rates varied among the groups. For example, alcohol abuse and

dependence were five times less common in males of Italian and other Southern European descent compared with other ethnic groups (e.g. Irish). The authors point out though, that these differences might be attributed at least in part, to variations in the cultural attitudes toward alcohol consumption.

The identifying demographics of those least likely to drink continued to be African American or Asian Americans, aged 24 years or older, married, and with no high school history of alcohol abuse. Among various ethnic groups of Asian Americans, surveys indicate that Japanese-Americans have the highest, and Chinese-Americans the lowest, percentage of heavy drinkers. On the other hand, Southeast Asians (e.g., Vietnamese) are considered at high risk for heavy drinking (Makimoto, 1998). Despite these differences, Asian Americans as a whole demonstrated the lowest levels of alcohol use compared with other ethnic groups. These lower rates of alcohol use have been related to a lower incidence of risk factors such as poor family relationships and poor academic performance among Asian Americans.

However, a study by Wall and colleagues (2001) suggested a genetic association with the development of alcohol use in Asian Americans. Participants in the study were 180 (44% male, 56% female) paid college students who had biological parents and grandparents of Asian heritage. A blood sample from each participant was collected for genotyping at the ALDH2 locus using polymerase chain reaction of DNA and allele-specific oligonucleotide probes since previous research has indicated that ALDH2, to date, is the candidate gene with the strongest association with alcohol

dependence. The ALDH2*2 allele is prevalent among northeastern Asians, but extremely rare in non-Asians.

Study results suggested that the onset of alcohol use for Asian Americans may be at a relatively later age than for non-Asians and that this finding is likely due to nongenetic or indirect genetic influences, such as parental modeling. However, ALDH2 status was found to have a significant association with regular drinking, binge drinking, and maximum drinks ever consumed in a 24-hour period. Specifically, those individuals with ALDH2*2 alleles were less likely to be regular drinkers, were less likely to have ever engaged in binge drinking, and reported a lower maximum number of drinks consumed in a 24-hour period than those who lacked this genetic mutation. Study findings further suggest an early influence of ALDH2 on alcohol drinking behavior, such as sensitivity to alcohol, as well (Wall, et al., 2001).

Prince (1999) found White and Hispanic students drank more than other ethnic groups. Prendergast (1994) found similar results, as did Bennett et al. (1999) and Lewis et al. (1996). In the former study, current use as defined by some use of alcohol in the past 30 days was reported by 87 percent of White students, 64 percent of Hispanic students, 59 percent of African American students, and 35 percent of Asian Americans. In the study by Bennett et al. (1999), Hispanic students reported highest rates of alcohol use, with non-White, non-Hispanic students reporting larger rates of abstinence than other ethnic groups. However, Wechsler et al. (2000) found indications that binge drinking is on the rise among African-American college students. The 1999 Harvard School of Public Health College Alcohol Study (CAS)

showed that the proportion of African-American students who are binge drinkers has risen over the past four years. Still, the CAS survey shows only 16.5% engage in binge drinking as compared to 48% of White students. "Reasons for the lower level of drinking among African American students include their lower level of disposable income, their social isolation, their need to study to make up for poor educational preparation, the high proportion of women among African American college attendees, and the common attitudes among African American students that drinking is not 'cool' or is contrary to their religious beliefs" (Wechsler et al., p. 204).

Clements (1999) found that White students, compared with African-American or non-White students, drink more frequently, drink larger quantities, and are more likely to engage in binge drinking. However, despite the lower levels of consumption, African-American males had higher rates of alcohol-related problems than white males. Hispanic students were found to drink less frequently and binge drink less than White students. However, Hispanic students were found to participate in both behaviors more than African-American students.

In separate studies by Bennett, McCrady, Johnson and Pandina (1999) and Prince (1999), Hispanic students reported higher rates of binge drinking than other ethnic groups, while non-white, non-Hispanic students reported greater rates of abstinence than other students. Similar results were reported by Martin (1998), who also found that white college students used more alcohol and participated in more binge drinking than did their African-American counterparts.

Changes in drinking patterns appear likely. For example, the 1999 Harvard study that reexamined alcohol use at colleges (that were previously surveyed in 1993 and 1997) revealed a decrease in alcohol consumption among Hispanic, African American, and Asian students, as well as a decrease in freshman drinking. Interestingly, the significant rise in frequent binge drinking occurred in those students who had been binge drinkers in high school (Wechsler et al., 2000).

Marital Status

Marriage is thought to be a stabilizing variable that decreases the likelihood of alcohol use. Being single greatly increases a student's likelihood to drink (Grenier et al., 1998). While marriage might be seen as a stabilizing influence in a student's life, other variables have been shown to more accurately predict a student's decision about alcohol use. For example, Prince (1999) found that being married was actually a determinant for heavy drinking when associated also with Greek affiliation and residing off campus.

Religion

Religion is another variable associated with a student's decision to engage in alcohol use. In a nationwide study of student alcohol use, Engs et al. (1996) found that, of those students who stated a religious preference, Catholics reported the highest percentage of heavy drinking. Post-hoc tests revealed that students who identified themselves as Catholics and Jews consumed the highest mean of number of drinks per week compared with students who identified themselves as Protestants. Moreover,

those who did not consider religion to be important showed a higher percentage of drinkers as compared to those who did consider religion important. Among drinkers, those to whom religion was not important were also likely to be heavy drinkers. The least religious students reported consumption of twice as many drinks as compared to the most religious students.

Similar findings were reported in a study by Poulson, Eppler, Satterwhite, Wuensch and Bass (1998) which examined alcohol use, religious beliefs, and risky sexual behaviors. The majority (84%) of the collegiate participants reported having engaged in sexual intercourse, but only 27% of the students reported consistent use of condoms. In fact, 70% reported that they were less likely to use condoms when they drank before engaging in sexual activity. More than one third (39%) used alcohol to enhance sexual experiences, while 68% had experienced a negative effect on their sexual behavior due to alcohol use. Alcohol consumption was also high for this study sample (75%), with only 25% reporting no regular alcohol use. Almost half (46%) used alcohol one to two times per week, another 23% used alcohol three to four times per week, and 7% used alcohol five or more times per week, on average. The strength and nature of students' religious beliefs appeared to play a major role in decisions about sexual activity. Sixty percent believed in attending church or actually did attend church on a regular basis, 78% believed that God operated in their daily lives, and 80% believed they would go to heaven when they died. In addition, most students (77%) did not believe that alcohol use was a sin.

Consistent with most research findings, the male students in this study had significantly higher levels of alcohol use than the females. Males also had higher rates of risky sexual behavior than the females, although there was no significant difference in their overall frequency of sexual activity. Gender differences for strength of religious beliefs were small. For females, strength of religious beliefs was negatively correlated with both alcohol consumption and risky sexual behavior. Overall, Poulson et al. (1998) demonstrated that religion as a variable that influences students' decisions about alcohol use is not limited to religious affiliation. Specifically, students' perceived religious beliefs about drinking may be a greater predictor of their own drinking practices than that of their church affiliation.

In making the distinction between spirituality and religious affiliation, Patock-Peckham, Hutchinson, Cheong, and Nagoshi (1998) used the concept of intrinsic and extrinsic religiosity, based on Gordon Allport's proposal that religious thoughts and practices are two divergent personality continuums related to a person's religious orientation. Four different types of drinking variables were measured: problems with drinking, frequency of alcohol use, amount consumed on each occasion, and frequency of inebriation. Because of the small number of students in certain religious categories, the final sample included only those reported to be Protestant, Roman Catholic, or of no religion. Results found that there was indeed a distinction between students' religious affiliations and their religious orientations. Moreover, while religious affiliation was associated with decreased alcohol use as compared to those with no religious affiliation, the different correlations of intrinsic religiosity with alcohol use in Catholics versus Protestants suggested the cultural norms particular to

different religions seem to have unique effects on drinking-related behaviors and cognitions. (For instance, Catholics were found to drink more than Protestants for celebratory reasons, perhaps due to the fact that Catholics celebrate mass with the use of wine and also are more likely to sanction drinking at many church functions.)

The results indicted that for self-identified Catholics, being intrinsically religious was positively associated with drinking problems, expectations of physiological changes and depression, as well as pathological and celebratory reasons for alcohol use. On the other hand, for self-identified Protestants, being intrinsically religious was negatively associated with drinking quantity and frequency of inebriation, but positively associated with drinking control. Extrinsic religiosity seemed to play less of a role than intrinsic religiosity. For self-identified Catholics, being extrinsically religious was positively related only with celebratory reasons for alcohol use and expectations of physiological changes, whereas for self-identified Protestants, being extrinsically religious was significantly negatively correlated with perceived accepted drinking norms for the people in their lives (Patock-Peckham, 1998).

More recently, Borynski (2003) examined how college students' membership in religious organizations may moderate their binge drinking behavior. This research extended that of Grenier et al. (1998) that revealed students who belong to groups that oppose alcohol consumption drink significantly less alcohol than students who belong to groups that sanction alcohol consumption. In the recent study, one hundred forty-four undergraduate students were questioned using the Core Alcohol and Drug Survey

as well as the Group Identification Scale, which reflects one's level of identification with an activity, and the 'Age-Universal' I-E---12 which assesses intrinsic and extrinsic dimensions of religiosity. Borynski (2003) found that for both males and females, involvement in one type of organization (e.g. high alcohol involvement organization) did not significantly increase the likelihood of being involved in another organization (e.g. low alcohol involvement organization). Contrary to the hypothesis, the results revealed that membership in a high alcohol consumption organization was not significantly related to alcohol consumption. However gender influenced binge drinking, average number of drinks per week, and frequency of usage within a year (i.e. males consume more and drink more often than females) (Borynski, 2003). Membership in low alcohol consumption organizations significantly influenced the frequency of alcohol usage within the previous year, but not levels of binge drinking and average number of drinks consumed each week (Borynski, 2003).

The relationship of religiosity to binge drinking behavior was negatively correlated, but it was not statistically significant. Moreover, there was not a significant relationship between one's level of identification with organizations (neither high alcohol consumption organizations or low alcohol consumption organizations) (Borynski, 2003). Given her unsupported hypotheses regarding membership in particular organizations and religiosity, Borynski noted that when college students drink, regardless of their membership in low alcohol consumption organizations, they are similar in how often they binge drink and the average number of drinks they consume. Given these results, cognitive dissonance theory does not explain college students' drives to engage in alcohol consumption (Borynski, 2003).

In contrast to the findings of Borynski, Dunn (2005) found that among a sample of high school seniors, students of both genders who believed religion was very important were less likely to have begun alcohol use, to be a current consumer, and to have binge drank. These contrasting results may be due to the many differences between those students still in high school and under their parents' supervision or they may be due to factors that are yet to be determined.

Living Arrangements

Where the potential male drinker lives is also a determinant of whether a student will or will not drink. In separate studies, Basten and Kavanagh (1996) and Vaillant and Scanlan (1996) found that male students who resided both off campus and on campus consumed more alcohol than did those who lived with their parents, while those living off campus in houses or apartments were at greater risk for alcohol use than were those residing on campus. In the 1996 Vaillant and Scanlan study, this held true for both sexes with regard to risk for alcohol addiction. A greater number of students living off campus in houses or apartments were at risk for alcohol addiction (20 out of 21, 95%) followed by those students residing on campus (35 out of 45, 78%). The least number of students at risk for alcohol addiction resided with their parents (7 out of 28, 61%). A post hoc analysis revealed the significant difference occurred between the students who lived off campus and those who lived on campus. Grenier et al. (1998) found similar results, that is, that off-campus residents report significantly higher alcohol use than do students living under other circumstances.

In another study (Ricciardelli & Williams, 1997), gender differences were observed in three types of living arrangements: living at home with parents, living in dormitories on campus, and living independently off campus. Sex differences were found in two types of living arrangements, on campus and living independently, with women drinking less than men. However, those women living on campus showed higher levels of alcohol use than the other women; moreover, their drinking levels did not differ significantly from men living on campus, lending at least some credibility for the convergence hypothesis that sex differences in drinking may be diminishing (Clements, 1999). Similar results were found by Prince (1999). That is, that residing off campus increased drinking levels for both men and women.

In a 1999 resurvey of colleges that participated in the 1993 and 1997 surveys, the College Alcohol Study (CAS) by the Harvard School of Public Health (Wechsler et al., 2000) found little change in the self-reported drinking behaviors with two notable exceptions. Binge drinking decreased among students living on campus in dormitories and increased among those living off campus.

Social and Situational Variables

Social influence variables are among the strongest correlates of alcohol use and misuse. It is commonly accepted that others' alcohol use, particularly that of close friends, is among the strongest predictors of students' alcohol use (Wood et al., 2001). In order to distinguish between various types of social influences, researchers often use the "active" and "passive" distinctions proposed in 1991 by Graham and colleagues (Graham, 1991). Active social influences refer to direct social pressure that

requires an immediate response, such as being offered a drink. Passive social influences include two distinguishable types: social modeling and misperception of peer norms. The former is the "process by which observation of others performing a behavior (e.g., heavy drinking) is thought to increase the likelihood of the observer adopting that behavior" (Wood et al., 2001, p. 33). Misperception of norms is thought to influence alcohol use by serving as a benchmark by which students measure their own drinking behavior, thereby providing justification to engage in heavy drinking.

The processes by which social influences contribute to drinking behavior are described in social learning theory (SLT) models of alcohol use. The chief components of SLT include "socioenvironmental factors (e.g., stress, social modeling, and perceived norms), coping skills and cognitive variables (e.g., self-efficacy, outcome expectancies)" (Wood et al., 2001, p. 33). Wood et al. (2001) examined relations between these different types of social influence and alcohol use behaviors and problems. For students without prior drinking experience, perceived norms was the sole predictor of future use. For those students with drinking experience, each of the social influence factors was related to future alcohol use. Consistent with a principal feature of SLT as applied to alcohol use, the study findings supported the claim that socioenvironmental factors influence alcohol-related perceptions that, in turn, influence alcohol use. In addition, there is enough support to suggest that social influences may affect drinking behaviors by altering expectations of alcohol's effects.

Greek Society

A 1994 study by Harvard University referred to Greek organizations as "functional saloons," with 86 percent of men and 80 percent of women living in fraternities and sororities reporting participation in binge drinking (as cited in Winston, 1998). "Members of [Greek] organizations, particularly men residing in fraternities, have been shown on average to drink more frequently, consume more on typical drinking occasions, more often engage in 'binge drinking,' and report more alcohol-related negative consequences than students not residing in fraternities" (Larimer, Irvine, Kilmer, & Marlatt, 1997, p. 587). An interesting study by O'Connor, Cooper and Thiel (1996) suggests that fraternity and sorority members may drink more because "students who identified themselves as heavy drinkers pledged more than those who identified themselves as light drinkers, those who currently don't drink, or those who have never drank" (p. 672).

Indeed, study after study has shown that members of these Greek societies drink substantially more alcohol than nonmembers (e.g., Gomez, 2000; Sher et al., 2001). They also experience more of the problems associated with alcohol abuse, including illness, violence, and sexual assault. Even though Greek members represent only a small minority of the national college population, their influence is far greater because they often serve as a center for social activities on many campuses even though their number may be small. Wechsler et al. (1998) found that 2 of 3 fraternity and sorority members are binge drinkers. For those members who live in Greek

houses, the statistics are even more staggering: 4 of 5 are binge drinkers and half are frequent bingers!

Dorsey et al. (1999) propose that social groups such as Greek societies play a notable role in shaping and promoting behaviors because of the peer-influence factor, which itself is a strong predictor of college drinking. The role of peer influence may even be greater within Greek communities because they are generally considered to be a cohesive network that minimizes diversity and both strongly advocates and rewards its members to adopt the norms and values of the group. Many other studies also find that Greek organizations share a significant relationship with excessive alcohol use (e.g., Larimer et al., 1997; Prendergast, 1994;Wechsler, et al., 2000). Dorsey and her colleagues (1999) believe that a fuller understanding of the dynamics involved in the differences between Greeks' and non-Greeks' social networks is needed. For example, it might be assumed from research data that Greek members drink more than their non-Greek counterparts because of their social insulation within their fraternities and sororities. However, Dorsey et al. (1999) found this was not the case. One might expect that Greek members would have few other social influences, but in fact they tend to have outside strong social networks, including close connections with friends as well as with family members. So, while one might expect the diversity of perspectives afforded by a network of social influences to lead to less participation in alcohol use, in fact study results suggested the opposite. In point of fact, the broader the range of social influences, the higher the participation in risky behavior such as alcohol use.

A study of self-reported alcohol use by college fraternity and sorority members by Alva (1998) was used to compare alcohol use patterns with non-Greek-affiliated students. Subjects were undergraduate college students from four campuses in California. The Core Alcohol and Drug Survey used in the study consisted of 39 questions, divided into three sets in order to determine information about demographic variables, peer norms, and perceived benefits of alcohol. As expected, Greek-affiliated students reported significantly higher levels of alcohol consumption than non-Greek students, with males reporting higher levels of alcohol consumption (2.77 drinks per week) than females (1.11 drinks per week).

A stepwise discriminant analysis was used to determine the difference between students who were members of Greek organizations and non-Greek members based on their perceptions of peer norms and the benefits attributed to alcohol use. Greek members were more likely to believe that alcohol use "enhances social activity, makes women sexier, and facilitates bonding" (Alva, 1998, p. 8). As for peer norms, Greek members were more likely to have friends who did not disapprove of heavy or binge drinking. On the contrary, most studies show that alcohol use and binge drinking are considered to be "the norm within the Greek community" (Carter & Kahnweiler, 2000, p. 667).

Significantly, situational circumstances for all of Alva's study groups proved to be an important factor in alcohol use. Across all categories, college students most frequently used alcohol at private parties. As predicted, more Greek members reported using alcohol (68.85%) at a fraternity or sorority house compared to non-Greeks

(10.60%). Among non-Greeks, a bar or restaurant (49.05%) and place of residence (10.10%) were the most frequently reported locations of alcohol use. Alva's findings were similar to those of Wechsler, et al. (2000) and represent a residence change in binge drinking from an earlier study (Wechsler et al., 1994). Binge drinking decreased among students living in dormitories and increased among those living off campus.

Alva (1998) pointed out that a causal relationship between membership in a Greek society and drinking behaviors and expectancies cannot be assumed (despite a preponderance of correlational evidence) Both the self-reported nature of the information collected and the single questionnaire format used limit the ability to draw causal conclusions. Other factors may even precede a college student's affiliation in a Greek organization. In other words, a student's perceptions of college drinking and Greek membership may exist well before entry into college. A 1997 study by Larimer and colleagues also suggests that heavy drinkers may choose to live in fraternity or sorority houses with reputations for permissive heavy drinking. Of course, even within the Greek system, men clearly show heavier drinking behaviors than do women. Though this finding is consistent with gender differences in drinking patterns in general, in many instances Panhellenic policies mandating non-alcoholic sorority functions may also contribute to the differences in alcohol consumption.

Findings by Brown (1997) did not substantiate those of Alva, but instead indicated that Greek status generally did not predict greater alcohol use in general. A detailed analysis of multiple variables revealed that, with few exceptions, membership in any collegiate organization was not as strong an indicator of alcohol use as were

demographic, personality, and expectancy variables. (Two significant exceptions included the effects of both fraternity membership and athletic participation on predicting greater alcohol use in a bar. Again, this situational finding contrasts with Alva's conclusions.) O'Connor, Cooper, and Thiel (1996) found a significant relationship between pre-college levels of alcohol consumption and the likelihood that a freshman would pledge a fraternity. Specifically, those freshman students who identified themselves as heavy drinkers pledged more than those who identified themselves as light drinkers, those who currently do not drink, or those who have never drank. Overall consumption level tended to be a very good predictor of whether or not people pledged, thus strongly suggesting that the fraternity experience alone cannot be solely responsible for increased alcohol consumption.

In order to examine how perceived norms affect high-risk behaviors, Larimer and her colleagues (1997) studied 376 students (41.8% male) from five fraternities and five sororities at a large, West Coast, public university. Those Greek houses represented were selected on the basis of house reputation for alcohol use. Norms for quantity and frequency of drinking were assessed by the Drinking Norms Rating Form developed by Baer, et al. (1991). Students reported on their own alcohol use and their perception of the norm quantity and frequency of drinking for a typical member of their own fraternity or sorority, a typical same-sex Greek member and a non-Greek student. Those men in houses with high-alcohol-use reputations perceived their houses as having reputations for heavier drinking compared to males of average- and low-drinking houses. They also viewed their house as significantly more popular, having better looking members, being more sexually active, and wealthier than did males

from average- and low-drinking houses. On the other hand, they saw themselves as significantly less friendly than males in average- and low-drinking houses, while members of average-drinking houses viewed themselves as less friendly than men in low-drinking houses. Finally, males in high-drinking houses viewed themselves as better academically than did those in low-drinking houses; members of average-drinking houses viewed their house as academically superior to men in high- and low-drinking houses.

Similar results were noted for women, although some differences were noted. MANOVA indicated significant differences between house-reputation categories on all house characteristics with the exception of friendliness. Women of all houses reported their reputation for friendliness to be above average. Post hoc analyses indicated that females in houses with high- and average-drinking reputations did not differ significantly in their perceptions of their reputations for alcohol use; however, both of these groups viewed their reputation for alcohol consumption to be higher than did those in low-drinking houses. Moreover, women in high-drinking houses saw their houses as more popular, better looking, more sexually active, wealthier, and academically superior compared to women in average-and low-drinking houses. Members of average-drinking houses viewed their houses as more popular, better looking, and wealthier than those in low-drinking houses.

Both men and women in high-drinking houses generally perceived high-risk alcohol use as more acceptable within their houses than did members of low-drinking houses. Contrary to the perceived norms theory that students generally perceive their

peers to use more alcohol than they in fact do, men in high-drinking houses perceived their use of alcohol to be greater than the norm for the average Greek member not a part of their house, and their perceived house norm was the same as the actual average self-reported consumption in their houses. In addition, there was no significant difference between the actual norm and the perceived house norm in those members in the average-and low-drinking houses. While the authors of the study cite a limited sample size in average- and low-drinking houses as a possible reason for their failure to find differences between the actual norm and the perceived house norm, their results for the women in the study did in fact indicate a pattern of biased norms consistent with earlier studies. Women in these sororities generally perceive others drink more than they do, both within their house as well as within the Greek system (Larimer, 1997).

The research in this area continues to leave unanswered questions concerning Greeks and alcohol use. The chief problem centers around inconsistent study results and leaves in doubt whether Greek membership leads students to drink more than they otherwise might, that is, a causal effect, or whether students with heavy drinking inclinations seek out Greek affiliations once they enter college. Some studies (e.g., Prendergast, 1994; Sher et al., 2001) suggest a causal effect, while others find evidence of a selective effect, such as the one by O'Connor et al. (1996). Still others indicate evidence for both causal and selective effects, such as the one by Baer et al., 2001. Other variables associated with Greek membership and drinking, such as perceived peer norms and alcohol expectancies, further complicate the issue. Nonetheless, the association between Greek membership and heavy drinking is clear.

Another study by Sher et al. (2001) found that Greeks are consistently more inclined than non-Greeks to believe that higher levels of alcohol use are the norm and that their peers are more supportive of heavy, or binge, drinking. This could suggest that perceptions of heavy drinking norms in the Greek system are largely responsible for heavy alcohol use among fraternity and sorority members. Yet, the discrepancy between actual norms and perceived norms for Greeks seems to be less than what was once generally assumed. Carter and Kahnweiler (2000) found that Greeks have a more accurate perception of their own alcohol use than do typical college students. Similar conclusions can be drawn from the study by Wechsler and Kuo (2000). They found a significant relationship between students' perceptions of their friends' binge drinking and their own alcohol use. Students are likely to report that their friends drink at the same level as they do.

This fact may not be as startling as one might think. In a study by Sher and his colleagues (2001), analyses of the research data consistently indicated that, while Greeks drank more heavily than non-Greeks during the college years, the difference between the two groups was no longer apparent three years after college. This finding suggests that the Greek system provides a social environment that encourages a heavy drinking lifestyle. However, once Greek members leave the campus and this lifestyle behind, their use of alcohol decreases. Some researchers consider this kind of college drinking to be a developmental phase, which is why studies demonstrate convincingly that even high levels of drinking and problems with drinking during college are not always indicative of long-term use and problems, nor are they predictive of future psychological or social problems.

Athletics

Another group that receives research attention similar to that of the Greeks is the college athletes. Because the findings appear to be similar for each group, there is concern about overlapping memberships, that is, that the students studied as members of a Greek organization are the same ones also studied as college athletes. Meilman et al. (1999) attempted to clarify the issue. Students from 125 colleges completed a Core Survey. The use of such a large sample size increased the chance of producing statistically significant findings, and the probability of making a Type I error was reduced by using a significance level of .0001 rather than the more traditional .05 for all of the chi-square analyses.

Those students who engaged in both Greek life and intercollegiate athletics consumed the most alcohol and engaged in the most binge drinking. The main effect for degree of Greek and intercollegiate athletic involvement was significant, $F(3,45136)=1,120.52$, $p<.001$; binge drinking, $X(3,N=45680)= 3,192.13$, $p<.001$. (Consistent with other research, men reported drinking more than women, regardless of Greek or athletic status.) Greek athletes consumed the most alcohol, followed by Greek nonathletes, non-Greek athletes, and non-Greek nonathletes. Overall, fraternity and sorority members were more involved in drinking than the athletes.

Some studies have speculated that athletes would be less likely to use alcohol than nonathletes because of their concern with physical fitness and good health practices, but recent research has failed to support this position, according to Leichliter (1998). Instead, these researchers report that, along with higher alcohol use,

college athletes have a tendency "to experience more drinking-related consequences, exhibit more high-risk behaviors, and engage in more sexual violence than their nonathletic counterparts" (p. 258).

A survey of students at 140 colleges found a strong correlation between athletic involvement and alcohol use. For the purposes of the 1997 study, conducted by Wechsler, Davenport, Dowdall, Grossman, and Zanakos, students were divided into three groups according to the extent of their involvement in college athletics: (1) those who were involved (i.e., who spent one or more hours a day in sports and deemed athletics as important to them), (2) those who were partly involved (i.e., who spent one or more hours a day in sports or believed participation in athletics was important), and (3) those who were not at all involved in sports (i.e., who spent no time in college sports and who did not consider athletic involvement as important). The survey (by mail) consisted of a 20-page questionnaire about drinking behaviors, including certain variables that could be significant predictors of binge drinking. It was found that a majority (61%) of males involved in athletics engaged in binge drinking, compared to 55% of those partly involved and 43% of those not involved. Men involved in athletics also engaged in more frequent heavy drinking than those not involved. One quarter of the involved males were drunk three or more times in the past month compared with 17% of those not involved. For female students, more of those involved in athletics engaged in binge drinking (50%) than those not involved. Although more women involved in athletics drank heavily, the relationship was not as great as it was among males. In general, the findings suggested that rates of binge drinking increased as involvement in athletics increased. Gutgesell and Canterbury

(1999) found similar results and that student athletes engage in binge drinking more often than students not involved in athletics.

Leichliter et al. (1998) also demonstrated a correlation between the degree of athletic involvement and alcohol use. Data was obtained from a random sample of 58,453 students from 125 colleges across the country who took part in Core Alcohol and Drug Surveys. Students were identified using the degree of their athletic involvement: not participating, participating as a team member, or participating in a leadership role. For the entire sample, those students involved in athletic leadership roles consumed significantly more alcohol in a week than did other team members and nonathletes. Those students reporting no athletic involvement consumed the least amount of alcohol. In keeping with the findings of many other studies, men reported more alcohol use than women. Contrary to the notion that team leaders would behave more responsibly than other team members, this study found that team leaders, (especially males), demonstrated heavier alcohol use and alcohol-related problems.

Leichliter et al. (1998) studied alcohol use among leaders and non-leaders in college athletics. They hypothesized that leaders of athletic teams would drink less than non-leader team members because of the responsibility involved with their leadership roles. Surprisingly, leaders of athletic teams actually drank more on average than did non-leaders (7.34 vs. 8.25 drinks per week, $p<.05$). These studies tend to suggest that that alcohol use increases as involvement rises both within and across high-alcohol-use student groups.

Thombs (2000) found that just over one third of his study sample (35.1%) of college athletes began drinking on a regular basis before high school graduation. An additional 29.2% began drinking regularly during their freshman year of college, and 11.7% started drinking later in college. A large part of the sample (38.5%) reported they drink and become drunk (21.3%) on a weekly basis. Interestingly, early onset of drinking proved a strong predictor for heavy alcohol use.

Alcohol is apparently the drug of choice for college athletes, at least according to studies sponsored by the National Collegiate Athletic Association (Bower & Martin, 1999). According to this source, more than 87% of the athletes surveyed reported using alcohol during the year preceding the study; they also reported an increase in binge drinking. Although alcohol usage was somewhat lower in the 1997 survey (approximately 80%), binge drinking continued to be a concern (Gutgesell & Canterbury, 1999). White student athletes reported more alcohol use than African-American student athletes in all of the surveys conducted by the NCAA: 92% vs. 68% in 1985, 91% vs. 78% in 1988, 91% vs. 74% in 1993, and 84% vs. 60% in 1997 (Gutgesell & Canterbury, 1999). In general, track and field athletes report less social drinking than do most other athletes. Male and female lacrosse teams report the highest percentage of student athletes consuming alcohol (95% for males and 96% for females). Male fencing athletes (69%) and females in gymnastics (75%) report the lowest percentages. In a separate study of African-American female basketball players by Bower and Martin (1999), 72% of the 50 athletes in the study reported having used alcohol, and 46% had engaged in binge drinking. Drinking as a part of socializing was the athletes' most frequently reported reason for alcohol use, and it was noted that both

frequency and quantity of alcohol use were more likely outside of the sport season than during the playing season.

Traditional campus activities also influence college students' decisions about alcohol use. For example, "Sport and alcohol have a long-standing association" (Gutgesell & Canterbury, 1999, p. 129), as represented by those spectators and athletes who consume the alcohol and by the relationship between sports and sponsorship by beer companies. According to Bower and Martin (1999), alcohol is "the drug of choice for college athletes", with more than 87 percent of the athletes surveyed reporting the use of alcohol in the year preceding each study. It might be assumed that athletes would be more conscious of the negative health consequences of alcohol use than nonathletes, but studies generally demonstrated that athletes drink more alcohol and suffer more consequences from use than do nonathletes (Leichliter, Meilman, Presley, & Cashin, 1998).

These percentages of alcohol use are startling, but the frequency of binge drinking among college athletes poses even greater concerns. About 25% of those student athletes who regularly drink report consumption of 3 to 5 drinks at one time at least once a week (Gutgesell & Canterbury, 1999). Moreover, 4% report having 10 or more drinks at one time at least once a week, and 1% report drinking 10 or more drinks at a time at least five times a week, if not more. Gutgesell and Canterbury (1999) concluded that the strongest predictors of binge drinking were athlete residence in a fraternity or sorority, a party lifestyle, participation in other risky behaviors and high school binge drinking.

Much concern exists about college sports promotion by companies seeking exposure for their alcohol (and tobacco) products. Bloom, Hogan, and Blazing (1997) studied whether this type of promotion might be isolated as a causal factor for inappropriate use of alcohol products by young people. Although advertising and its role in the use of alcohol has been researched extensively, with both conflicting and controversial results, the role of sports promotion itself has not received much research attention. Although the subjects of this mail survey were young people between the ages of 13 and 18, implications for college students can be drawn. Results suggest that attending college football games and watching televised college basketball games increases a person's likelihood to drink beer. However, even though this study demonstrates an association between college sports promotion and drinking beer, the existence of cause and effect could not be established. Nonetheless, Gutgesell and Canterbury (1999) found that 63% of the student athletes in their study began alcohol use while in high school, and 14% started in junior high school or before. Their conclusion is that "reduction of advertising in association with sporting events may be a form of preventive medicine" (Gutgesell & Canterbury, 1999,p. 383).

Perhaps it is the social environment conducive to alcohol use and binge drinking shared by both college athletes and Greek members that creates such similar study findings for the two groups. This might explain, at least in part, why athletes continue to drink and drink heavily despite their increased exposure to alcohol education and prevention programs. According to a recent Harvard study (Nelson & Wechsler, 2001), college athletes are more likely to be associated with factors that are associated with higher rates of binge drinking, such as strong social ties, a large

number of friends who binge drink, an emphasis on the importance of parties and sports, and socializing for two or more hours a day. According to the perceived norms hypothesis on which this social environment explanation for alcohol use is based, most college students overestimate the amount of alcohol consumption by their peers. Then, as a result of these exaggerated perceptions, students feel pressured to increase their own drinking to conform to what they perceive to be the norm in their social environment.

Situational considerations are not limited to Greek organizations, athletes, or other peer groups, but also concern the ability to predict alcohol use and its negative consequences according to individual circumstances. Turrisi et al. (2000) studied 364 college students (37.9% male, 62.1% female) consisting of three distinct groups: traditional freshmen, non-traditional freshmen (i.e., older than 18 or younger), and upperclassmen.

Parental Factors

Having parents who drink also has been shown to predict negative consequences. Woldt and Bradley (1996) studied the effects of parental drinking on 300 male and 350 female students, aged 18-23, at the University of Montana and found that parental problem drinking was linked to students' problem personality traits, such as low self-esteem, as well as to more personal motives for drinking and to greater alcohol use for both sexes.

In a national random sample of 17,592 college students, Weitzman and Wechsler (2000) found that approximately ten percent of students reported having problem-drinking parents. The children of problem-drinkers exhibited one of two tendencies. They showed higher than normal odds of past twelve month's abstinence or heavy episodic drinking. The males tended to report more heavy episodic drinking than did the females. Also, those with affected mothers were the most at risk for heavy episodic alcohol consumption (Weitzman & Wechsler, 2000).

In a separate, longitudinal study, Sher et al., (1996) found evidence that outcome expectancies mediate part of the risk factor associated with a family history of alcoholism. On the other hand, some studies indicate a genetic predisposition to alcoholism. Vaillant and Hiller-Sturmhoefel (1996) found that the children of alcoholic parents--particularly sons of alcoholic fathers--are at increased risk of becoming alcoholic compared to children whose parents are not alcoholic. (The authors of the study do point out the difficulty in separating genetic and environmental effects of alcoholic family members.) Fischer (1997), however, found no significant difference in the number of problem drinkers who were from alcoholic families or non-alcoholic families, that is, being from an alcoholic family background was not shown to be a significant predictor of problem drinking in students.

Reasons for Drinking

As with other variables involved in the prediction of alcohol use, gender differences appear in the personal reasons for drinking. Just as research generally indicates that males drink more than females, both sexes seem to drink for different

reasons. Males seem to drink primarily to enhance arousal and justify deviant behavior, while women are more likely to use alcohol to forget about perceived failures or problems and negative emotions (Crawford & Novak, 2000). Slicker (1997) found that reasons for not drinking were also significantly related to alcohol use. Light drinkers cited religious and/or moral reasons significantly more often than other student groups. Moderate drinkers gave safety reasons for not drinking, while heavy drinkers gave expense as their chief reason for not drinking.

Emotional & Psychological Factors

The influences of emotional and psychological factors, such as psychiatric disorders, have received research attention. Many studies exploring associations of problem drinking with psychiatric disorders have focused on depression since both alcoholism and depression tend to run in families and frequently occur together in the same individual. Vaillant and Hiller-Sturmhoefel (1996) summarized such findings in two longitudinal studies of drinking behaviors and their consequences in 268 male college students and 456 inner-city, 11-to-16-year-old males. Pointing out that the association of problem drinking and depression has led to the hypothesis that individuals drink to self-medicate, or alleviate, their depression, Vaillant and Hiller-Sturmhoefel (1996) found the opposite to be true. In most instances depression was a consequence of alcoholism (since abstinence from alcohol has been shown to alleviate depression). Moreover, Valliant and Hiller-Strumhoefel (1996) concluded that the sole psychiatric disorder that clearly contributes to the risk for problem drinking is sociopathy. This study found that, while many sociopaths abuse alcohol as part of

their antisocial behavior, most problem drinkers are not sociopathic except as a result of alcohol addiction.

Self-esteem has received much research attention, although study results have often been inconsistent. Some research has offered evidence of an inverse relationship between self-esteem and drinking while other studies have found the highest levels of alcohol use in those students with the most positive self-esteem. Still other research has failed to find any relationship at all between alcohol use and self-esteem. Crawford and Novak (2000) attempted to clarify the relationship between these two variables in a study of 431 students of a large Midwestern university during the years 1995 and 1996. Self-esteem was measured using the reliable Rosenberg Self-Esteem Scale which consists of ten items designed to assess a person's overall sense of self worth. Of those students participating in the survey, 70% were reported drinkers and 37%, over half of those who used alcohol, indicated that they engaged in binge drinking. Consistent with most research, males consumed significantly more drinks per week than females and were also significantly more likely than females to binge drink. The women in the sample, however, showed significantly lower levels of self-esteem than did the males.

Individual differences in social-emotional adjustment are associated with predictable patterns of levels of alcohol use, reasons for use, and problems with use. For instance, those who are more rebellious, impulsive, and self-indulgent have consistently been found to be heavy drinkers compared to their more mature peers. Understanding heavy alcohol use in college students requires an evaluation of how

and why they drink as well as an assessment of how much they drink. A 1996 study by Weinberger and Bartholomew found that students with low self-restraint consumed higher levels of alcohol, used drinking to increase positive effect, and high levels of alcohol-related problems. Moreover, those most tempted to have "one too many" tend to be those least likely to possess self-restraint and therefore least able to afford the resulting alcohol myopia. So, while peer groups may be an important predictor for alcohol consumption, personal adjustment makes a significant contribution to the development of problematic drinking patterns.

Outcome Expectancies and Coping Strategies

One body of research suggests that certain beliefs about the outcomes associated with alcohol use may be related to increased alcohol consumption. Such beliefs are referred to as alcohol outcome expectancies (Marx, Nichols-Anderson, Messman-Moore, Miranda, & Porter, 2000). Put another way, "alcohol expectancies are people's beliefs about how alcohol affects them" (Mulligan, Judith, & Bryant, 2000, p. 240). The strength and patterns of alcohol expectancies seem to change according to the context of alcohol use (Mulligan et al., 2000). Moreover, these alcohol expectancies may be a strong predictor of alcohol use (Brown, 1997), particularly alcohol expectancy of positive social outcomes (Cumsille, Sayer, & Graham, 2000).

Specific expectancies associated with alcohol use include social, cognitive, physical, and emotional effects. Anticipated social and emotional benefits from drinking are considered the best measures of current and future alcohol use (Vik,

Carrello, & Nathan, 1999). Indeed, alcohol's positive reinforcement is characterized by perceived enhancement of social and physical pleasure (Carey & Correia, 1997). On the other hand, drinking to cope negatively reinforces alcohol use and is a strong predictor of problem drinking among college students (Carey & Correia, 1997). Anticipated alcohol effects, then, may reflect either positive or negative reinforcement of drinking behavior.

Maggs and colleagues (1997) conducted a longitudinal study to look at positive versus negative expectancies and consequences and how students experience alcohol and its effects. One important finding emerged from her study. After weeks when students had positive experiences with drinking, they drank more the following week, as might be expected. However, when these students experienced negative consequences from drinking, this had no apparent effect on their future avoidance of such experiences. It seems likely that students' persistent drinking behaviors despite negative consequences are related to the fact that most college drinking occurs in social contexts. Indeed, the belief that alcohol use facilitates social interactions has been shown to be a significant predictor of drinking behavior (Senchak et al., 1998).

In a study of expectancies, Vik and colleagues (1998) found that, generally, beliefs that drinking enhances pleasant experiences correlated better with current alcohol use than did expectations that alcohol reduces negative or unpleasant effects. The study also revealed that the distinction between positive and negative reinforcement principles is most remarkable with regard to social effects. It has already been acknowledged that social factors have considerable influence on college

student drinking (Senchak et al., 1998). What Vik et al. (1998) demonstrated in their study is that social enhancement and social coping expectancies are indeed separable and distinct domains and that these factors relate differentially to college student drinking. Student drinking correlated most strongly with increased enjoyment in social situations (mean correlation = .35). In contrast, drinking to cope with negative social situations was only modestly related to drinking measures (mean correlation = .16).

Vik and his colleagues (1998) conducted four two-way analyses of variance (ANOVA) to test for the effects of sex and heavy drinking on each expectancy domain. Eighty-one percent of the women and 88% of the men were classified as recent heavy drinkers. Men endorsed more alcohol expectancies than did women for all four expectancy domains: Social Enhancement, $F(1,402)=32.04$, $p<.001$; Social Coping, $F(1,402)=9.24$,$p<.05$; Personal Enhancement, $F(1,402)=21.28$,$p<.001$; and Personal Coping, $F(1,402)=25.84$,$p<.001$. Heavy drinkers consistently scored higher on expectancy domains than did those who did not binge: Social Enhancement, $F(1,402)=43.41$,$p<.001$; Social Coping, $F(1,402)=41.19$,$p<.05$; Personal Enhancement, $F(1,402)=66.60$,$p<.001$; and Personal Coping, $F(1,402)=27.38$,$p<.001$.

Ricciardelli and Williams (1997) also studied gender differences in alcohol use and alcohol expectancies in a volunteer group of 179 (78 males and 101 females) first-year psychology students. In addition, their study focused on the students' living arrangements: living at home with parents, living on-campus, and living independently. For those students living at home, no gender differences were noted for either the amount of alcohol used or the alcohol expectancies measured, giving some

support for the convergence hypothesis that college women are drinking as much as men. However, gender differences were noted in the other two living arrangements. Women living on-campus reported drinking at higher levels than the other women. Moreover, as with women living at home, the drinking levels for those living on-campus did not differ significantly from men living on campus. However, those women living on-campus had lower alcohol expectancies. Gender differences were noted in drinking patterns only for those men and women living independently. Women reported drinking less than men, but women also reported higher levels of alcohol expectancies. It would seem, then, that there was no support for the convergence hypothesis in those situations where gender stereotypes were the greatest that is, living independently.

Age seems to play a role in the relationship between alcohol expectancies and drinking. Leigh and Stacy assessed alcohol expectancies in a nationally representative sample of persons aged 12 and older as part of the National Alcohol Survey (2004). The authors hypothesized that the relationship of expectancy to drinking may vary with age as alcohol expectancies may change as drinking experience accrues. The researchers found that in all age and gender groups, positive expectancy was positively related to alcohol use and negative expectancy was related negatively to alcohol use. Positive expectancy was a superior or equal predictor of drinking than negative expectancy among the subjects under 35 years of age while negative expectancy was the best predictor of drinking in most subjects over 35 years old. When data included only drinkers (leaving out the data from abstainers or those who had not yet begun drinking), the positive expectancy was generally a stronger

predictor than negative expectancy. As the authors noted, the results suggest that negative expectancy predicts abstention from alcohol and positive expectancy generally predicted level of drinking among drinkers (Leigh & Stacy, 2004).

A study by Stacy (1997) explored how previous behavior may predict future behavior with regard to alcohol use. However, his research is based on the 1992 findings by Goldman, Roehrich, and Brannick that outcome expectancies regarding alcohol use can be modeled as a network of relationships in memory. The memory association approach, developed by Stacy, Leigh, and Weingardt (1994), maintains that people differ in the strength of their associations between outcomes, such as relaxation, and behaviors, such as drinking. Stacy (1997) concluded, "For individuals with strong associations between alcohol use and an outcome like relaxation, alcohol use spontaneously comes to mind when the related outcome is used as a prompt" (p. 61).

There is little doubt that alcohol outcome expectancies have been demonstrated to be an important predictor of alcohol use among college students. However, Cronin (1997) found that students' reasons for drinking may be a more powerful predictor of college drinking than outcome expectancies. Cronin (1997) developed a Reasons for Drinking Scale (RFD) and administered it, along with the Alcohol Expectancy Questionnaire (AEQ), in order to assess the effectiveness of reasons for drinking versus expectancies in predicting alcohol use among a college student sample. The RFD consists of three groupings of items, including personal motivations for alcohol use, such as Mood Enhancement factors and Tension

Reduction factors, as well as social motivations, or, Social Camaraderie (drinking in social contexts). Intercorrelations among the three groupings ranged from .51 to .60, suggesting that, although interrelated, the three groupings are sufficiently different to merit separate consideration.

The RFD accounted for additional variance above and beyond the AEQ on all four measures of alcohol use: average drinks per occasion, frequency of binge episodes, frequency of drinking (days), and alcohol-related problems. Using stepwise multiple regression, the RFD was superior to the AEQ in predicting alcohol use as well as alcohol-related problems. The Social Camaraderie group of items proved to be the best predictor of frequency of consumption, average amount consumed, and frequency of binge drinking (Cronin,1997).

Cronin (1997) accounted for the advantages of using his RFD over the AEQ as a predictor of alcohol use by explaining the "mental algebra" which an individual engages in to conclude his stated reason for drinking. Expectancies, he asserted, like attitudes, may be one of many cognitive and social factors which influence an individual's decision to drink. Therefore, "the identification of reasons for drinking would presumably be the result of the drinker's decision process and thus encompasses a range of cognitive and social factors such as expectancies, self-efficacy, religious convictions, perceived norms, etc." (Cronin, 1997, p.1292).

Alcohol use is also one way that college students may cope with stress (Kassel, Jackson, & Unrod, 2000). Those students who believe that they have good coping capabilities to successfully alleviate negative moods are far less likely to experience

drinking problems than those whose expectancies are lower. However, Noel and Cohen (1997) found, contrary to expectations, that students' alcohol use decreased significantly at a time when they should have been experiencing high levels of stress (the week before final exams).

Lengua and Stormshak (2000) examined the effects of gender, gender roles, and personality on coping strategies and psychological symptoms. Expected findings were based on prior research findings that suggest that females appear to favor coping strategies such as social support, emotion-focused, and avoidant behavior, while males appear to favor coping with stress through other activities, more often using alcohol relative to females. Coping strategies have been traditionally categorized as either problem-focused coping, which are direct problem solving efforts, or emotion-focused coping, which involves efforts to manage or reduce stress by positive reframing and avoidance. Generally, problem-focused coping is associated with lower levels of psychological symptoms, whereas emotion-focused coping is associated with higher levels of symptoms.

Participants in the study, 250 undergraduates at the University of Washington, completed a set of self-report coping, personality, and symptom measures in group sessions. Results of the study suggested that gender roles are important predictors of personality, coping, and symptoms, and that gender roles, personality, and coping, both individually and in combination, predict psychological symptoms. Gender roles also predicted personality factors and coping behaviors and were directly related to symptom outcomes. Masculinity significantly predicted higher levels of achievement

orientation, as well as active and positive cognitive coping. On the other hand, masculinity predicted lower levels of avoidant coping and depression, findings consistent with prior research relating masculinity to lower depression and higher self-esteem. Significantly, the relation between masculinity and depression was accounted for by active coping. However, masculinity did not predict uniformly positive findings. Rather, masculinity also predicted higher levels of externalizing problems of antisocial behavior and alcohol use. In contrast, femininity predicted higher levels of affiliation orientation and avoidant coping, as well as internalizing problems of depression and low self-esteem, and lower levels of achievement orientation, active coping, antisocial behavior, and alcohol use.

A recent article brings renewed attention to the issue of self-medication. Inherent to the self-medication concept is that individuals with mental health disorders believe their symptoms are treatable and they seek to alleviate the symptoms through the use of substances and/or professional mental health care (Harris & Edlund, 2005). Harris and Edlund (2005) evaluated the relationship between one's unmet need for mental health care and substance use among 18,849 adults between the ages of 18 and 65. The researchers found that those individuals with mental health problems were more likely than the general population to use illicit drugs. However, they did not engage in heavy drinking at higher rates than the general population. In fact, Harris and Edlund found that those individuals who sought mental health treatment had a significantly lower rate of heavy alcohol use than those who did not use mental health services (2005). As the authors noted, this research has important implications as it suggests that mental health treatment may be more effective in treating the underlying

symptoms that prompt alcohol use (Harris & Edlund, 2005). The findings of this study may be applied to the college population in that greater accessibility to mental health services on college campuses may result in a reduction of alcohol abuse by college students.

While some research has suggested that alcohol problems are associated with drinking in order to cope with negative affect (Simons, et al., 1998), Wild et al. (2001) found no support for this view. Instead, in a study of 286 college students they found that males who felt they would be giving up significant benefits by reducing their alcohol use were more likely to be problem drinkers, and males who typically drank in order to avoid social rejection were less likely to be problem drinkers. Further quantitative research on drinking motives has focused on the four factors of enhancement motives, coping motives, social motives, and conformity motives (Simons, Correia, Carey, & Borsari, 1998). These motives consistently predict drinking behavior across different demographic groups.

No doubt the expectancy aspect of alcohol use plays an important role in sexual behavior. Survey results suggest that "people who believe in alcohol's sexual effects are more likely to drink before a sexual experience" (George & Stoner, 2000, p. 122). Despite some conflicting study results, there is at least some indication that alcohol use may also be linked to unsafe sexual practices since it seems fairly conclusive that excessive alcohol use impairs one's judgment (Poulson, Eppler, Satterwhite, Wuensch, & Bass, 1998). (Aertgeerts, Buntinx, Bande-Knops,

Vandermeulen, Roelants, Ansoms, & Fevery, 2000). Sexually transmitted diseases and unplanned pregnancies are also problems related to alcohol use.

Social Reasons

The new sense of freedom for students in college provides a unique opportunity for students to engage in self-evaluation and the formation of new identities within what they perceive of as a protected place (Dorsey et al., 1999). Crawford and Novak (2000) focused their study on how a student's increased awareness of the possibility of engaging in peer norm infractions might in turn create feelings of embarrassment which would then lead to drinking in order to alleviate the feelings. Participants in the study were 431 students (with females overrepresenting by 68%) who were enrolled in introductory sociology and criminal justice courses at a large Midwestern university. Just under 70% of the students reported use of alcohol, and 37% (over half of the students who used alcohol) reported they engaged in binge drinking. Those students having a low level of public self-consciousness were most likely to use alcohol, a finding contradictory to the authors' hypothesis.

Drinking to socialize is related to the personality trait of extroversion, which has proved to be a reliable predictor of alcohol use (Martsh & Miller, 1997). Liu and Kaplan (1996) found that males tend to seek social bonding through the use of alcohol and report that they often drink because their friends are doing it. Moreover, males seem to be more influenced by their peers to consume alcohol than females (Valliant & Scanlan, 1996).

Spratt and Turrentine (2001) studied how alcohol use might vary with involvement in low-alcohol-use student groups. Their study was based on the hypothesis that groups may select leaders who embody the general values of the group. Logically, then, if high-alcohol-use groups select leaders who drink heavily, low-alcohol-use groups might select leaders who are less involved with alcohol. Those with multiple involvements in low-alcohol-use groups might be expected to show the lowest alcohol use. A sample from minority and religious groups were selected as examples of low-use organizations since research generally suggests that non-White students and those with active religious affiliation would drink less on average than other students. Respondents (n=1,992) were coded according to the number of leadership positions held in these types of organizations and categorized as follows: active members with no leadership positions in either type of group (n=958), students with a leadership role in either minority or religious groups, but not both (n=887), and students with leadership positions in both minority and religious groups (n=147).

The instrument chosen for the study was the self-report Core Alcohol and Drug Survey, a widely used instrument found to be both valid and reliable. The dependent variable was the average number of drinks per week. For the overall sample the mean was 3.61, lower than the national average of 4.5 drinks per week for all college students as determined by Presley, Meilman, and Cashin (1997). A one-way ANOVA was used to compare the average number of drinks per week for students in the three different categories of leadership roles. A significant difference was found among the three groups, $F(2,1955)=35.23$, $p=.000$.

Contrary to the study hypothesis, those students with dual leadership roles were found to drink significantly more drinks per week on average (*M*=9.75,*SD*=20.38) than those with one leadership role (*M*=2.75,*SD*=8.08) and those with no leadership positions (*M*=3.46,*SD*=7.56). Study results, then, for those with no leadership or only one leadership role supported the researchers' hypothesis. However, for those with two leadership roles, actual findings contradicted the hypothesis. Indeed, the average number of drinks per week for students with two leadership positions was found to be higher than the rate of drinking for leaders of athletic teams and sororities. Only fraternity members and leaders drank more than students who were leaders of both religious and minority organizations. Moreover, demographic factors were unable to explain the difference in the number of heavy drinkers between the two leadership groups. Spratt and Turrentine (2001) concluded that leadership appears to become a risk factor for alcohol use, at least for some students. Specifically, the role of "leader" becomes a psychosocial stressor and alcohol may be the drug of choice to help reduce the impact.

History of Alcohol and Drug Use at the University of Oklahoma

Although the University of Oklahoma was founded over 110 years ago, the study of alcohol use by its students is relatively new. The Norman Prevention Coalition (Higher Education Committee) approached Dr. Avraham Scherman in the late 1990s to assess the drug and alcohol use at the University of Oklahoma. The Norman Prevention Coalition awarded a $3000 grant to begin the project and another $1000 grant was received by the Oklahoma Psychological Association. The pilot study assessed the drug and alcohol use of university faculty, staff and students via

mail-out survey. The low faculty and staff response rate (below 20%) coupled with limited resources necessitated the decision of this researcher to focus exclusively on undergraduate students. Moreover, the low response rate and the cost of the mail-out approach prompted the use of group administration in this investigation.

METHODOLOGY

Methodological Approach

This investigation will utilize archival data based upon a survey of undergraduates attending the University of Oklahoma. As the hypotheses in this investigation are both correlational and predictive in nature, correlations as well as discriminant analyses will be computed. The survey used was self-administered and, therefore, self-report in format which reduces the likelihood of self-desirable responding. This approach was employed as the goal was to obtain information from a large sample of the undergraduate population in a relatively short period of time.

The independent variables are considered the predictor variables and the dependent variable is considered the outcome variable. This investigation includes eleven different independent variables:

(gender, age, grade point average, ethnicity, marital status, sexual orientation, job status, religiosity, living arrangements, Greek organization membership, athletic participation). The one dependent variable in this study is binge drinking. Binge drinking is measured by item number eleven on the survey. The item reads, “Over the last two weeks, how many times have you had five or more drinks in a row?” The

available responses are (1) none; (2) once; (3) twice; (4) 3 to 5 times; (5) 10 or more times.

Selection of the Sample

The sample used in this study consisted of a probability sample of 1,000 randomly selected undergraduate students attending the University of Oklahoma during the 1997 spring semester. A list of the undergraduate courses, provided by the university administration, was selected until a sample size of 1000 students was reached. After permission was solicited from the course instructors, the researchers presented the study to the students. Surveys were distributed and then collected during the next regularly scheduled class period. All participants were required to sign a consent form prior to taking part in the experiment. The confidential nature of their responses was explained, including measures take to ensure anonymity. Additionally, it was emphasized that the participants could discontinue with the experiment at any time without being penalized in any manner. The sampling did not include a matching procedure.

A total sample size of 690 was obtained from the possible 1000 participants. The gender distribution was expected to reflect the true male/female ratio among the undergraduate population at the university. Moreover, the distribution of classes (freshmen, sophomores, juniors, and seniors) was expected to represent the actual university breakdown.

Participants will benefit from this investigation via the knowledge gained from the information they provide. If the information gleaned from the investigation suggests a need to address alcohol issues on campus, the participants will be the

beneficiaries of prevention/intervention programs implemented by the university. As the methodological approach utilized in this investigation is voluntary and anonymous in nature, there is no risk to the participants in this study.

According to Cohen (1977) in nondirectional (two tailed) tests in order to obtain statistical power of .80 with an alpha of 0.05 and a medium effect size (r = .30) a sample size of 84 is necessary.

Therefore, the sample size of this investigation will have sufficient statistical power to reject the null hypothesis when it is false.

The Survey

The Use of Alcohol, Tobacco and Other Drugs in the Community Survey was the instrument used in this investigation. The survey was developed by the University of Michigan's Initiative on Alcohol and Other Drugs (Hamid, 1995). The survey was developed to collect data so as to identify trends in substance use, identify students who may be considered high-risk and to assist in designing drug and alcohol prevention programs.

The survey consists of 60 items of which 25 have multiple questions within the item. This translates to 353 distinct variables. Overall, the survey is divided into five domains (1) the frequency of the consumption of alcohol, tobacco, illicit, prescription, and over-the-counter drugs; (2) problems resulting from substance use; (3) the place and social circumstances of the substance use; (4) strategies employed to regulate drinking; (5) the perceptions of norms and attitudes about substance use in peer groups and the community (Martin, 2000). The last nineteen items on the survey are sociodemographic and descriptive in nature.

The present investigation focuses on the prediction of binge drinking from demographic and social variables as well as the exploration of the relationship of students' reasons for drinking and their level of drinking. The remaining items (278 variables) will not be reviewed in depth at this time.

Procedures

Archival survey data will be acquired from the University of Oklahoma administration. The survey procedures will be reviewed at this time. An undergraduate course enrollment list was obtained from the university administration and permission to solicit students' participation was received from course instructors. The researchers presented the study to the students emphasizing the anonymous and confidential nature of the investigation. Surveys were distributed and then collected during the next regularly scheduled class period. All participants were required to sign a consent form prior to taking part in the experiment. They also received a written description of the study, including its purpose and relevance to substance use on campus. Informed consent was assumed through the completion and return of the survey. Participants were provided the opportunity to sign a piece of paper confirming their participation in the study so that they would receive credit from their instructor (if this was an existing course option). The participation list was signed after the survey was returned to the researchers. The list and survey were stored separately so as to ensure confidentiality yet allow appropriate credit to be granted.

Data Analysis

The data for this investigation will be analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows version 12. The first step in the data

analysis process will be to examine the database for accuracy. The second step will be to calculate descriptive statistics including measures of central tendency and dispersion (e.g. means and standard deviations, frequencies, percentages and cross-tabulations of variables). Next, the hypotheses will be tested using canonical correlation analysis. As the goal of this investigation is to determine factors that predict binge drinking behavior among undergraduate college students, canonical correlation is an appropriate choice as it calculates the relationship between two pairs of variables (i.e. gender and binge drinking behavior) (Hays, 1994). The canonical variate for the outcome variable will be binge drinking behavior. In the survey, the binge drinking variable is Item 11 (coded OVER 5**),** and it reads, "Over the last two weeks, how many times have you had five or more drinks in a row? (1) None; (2) Once; (3) Twice; (4) 3 to 5 times; (5) 10 or more times." The other canonical variate (e.g. the independent variable) will vary with each correlation calculated so as to conclude with 72 canonical correlations, each time using a different variable (e.g. TOB1, YOUTH). The 72 variables and their corresponding survey items are listed below:

TOB 1 Item 1, "How frequently have you smoked cigarettes during the past 30 days? (1) Not at all; (2) Less than one cigarette per day; (3) One to five cigarettes per day; (4) About one-half pack per day; (5) About one pack per day; (6) About one and one-half packs per day; (7) Two packs or more per day".

TOB 2 Item 2, "How frequently have you used smokeless tobacco (chew, stuff) in the past 30 days? (1) Not at all; (2) Once or twice; (3) Occasionally; (4) Several times a week; (5) Everyday".

TOB 3 Item 3, "How frequently have you used smokeless tobacco (chew, stuff) in the past 30 days?
(1) No; (2) Yes, occasionally; (3) Yes, daily".

BEV 1 Item 4, "At parties or social events, what is the beverage you most often prefer? (1) Beer; (2) Wine; (3) Wine coolers; (4) Liquor/mixed drinks; (5) Liqueur; (6) Coffee/tea; (7) Soft-drink/non-alcoholic".

BEV 2 Item 5a, "On how many occasions (if any) have you had alcoholic beverages to drink in your lifetime? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

BEV 3 Item 5b, "On how many occasions (if any) have you had alcoholic beverages to drink during the last 12 months? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

BEV 4 Item 5c, "On how many occasions (if any) have you had alcoholic beverages to drink during the last 30 months? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

USE 1 Item 7, "How would you describe your current use of alcohol? (1) Abstainer; (2) Occasional drinker; (3) Light drinker; (4) Moderate drinker; (5) Heavy drinker".

USE 2 Item 8, "Had you ever tried alcohol before coming to the University of Oklahoma? (1) Yes, drank when I came; (2) Tried it, but stopped before coming; (3) No, never tried alcohol".

USE 3 Item 9a, "On how many occasions (if any) have you been drunk or extremely high from drinking alcoholic beverages in your lifetime? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

USE 4 Item 9b, "On how many occasions (if any) have you been drunk or extremely high from drinking alcoholic beverages during the last 12 months? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

USE 5 Item 9c, "On how many occasions (if any) have you been drunk or extremely high from drinking alcoholic beverages in the last 30 days? (1) 0; (2) 1-2; (3) 3-5; (4) 6-9; (5) 10-19; (6) 20-39; (7) +40".

AVGDRKW Item 12, "What is the average number of drinks you consume a week? __ __ 01= one drink per week or less".

DAILY Item 13, "Do you usually drink something alcoholic every day? (1) Yes; (2) No".

HOWHIGH Item 14, "When you drink alcoholic beverages, how high or buzzed, do you usually get? (1) Not at all; (2) A little high or buzzed; (3) Moderately high or buzzed; (4) Very high/drunk/wasted".

YEAR 1 Item 15a, "When you drank alcohol during the past year, how often were you alone? (1) Not at all; (2) A few of the times; (3) Some of the times; (4) Most of the times; (5) Every time".

YEAR 2 Item 15b, "When you drank alcohol during the past year, how often were you with a date or spouse? (1) Not at all; (2) A few of the times; (3) Some of the times; (4) Most of the times; (5) Every time".

YEAR 3 Item 15c, "When you drank alcohol during the past year, how often were you with friends? (1) Not at all; (2) A few of the times; (3) Some of the times; (4) Most of the times; (5) Every time".

REASON 1-17 Items 16a-16q are prefaced by the following question: What have been your MOST IMPORTANT reasons for drinking alcoholic beverages? (Circle all that apply)

REASON 1 Item 16a, "To relax or relieve tension".

REASON 2 Item 16b, "To have a good time with my friends".

REASON 3 Item 16c, "To get drunk".

REASON 4 Item 16d, "To fit in with a group I like".

REASON 5 Item 16e, "To get away from my problems or troubles".

REASON 6 Item 16f, "Because of boredom, nothing else to do".

REASON 7 Item 16g, "To relieve depression".

REASON 8 Item 16h, "To get through the day".

REASON 9 Item 16i, "To get to sleep".

REASON 10 Item 16j, "To enhance sexual pleasure or opportunity".

REASON 11 Item 16k, "To increase my enjoyment of music or food".

REASON 12 Item 16l, "Because I like the taste".

REASON 13 Item 16m, "Because it's the thing to do".

REASON 14 Item 16n, "Because I feel better when I'm drinking".

REASON 15 Item 16o, "To help me be less shy with others".

REASON 16 Item 16p, "To celebrate at ceremonial occasions".

REASON 17 Item 16q, "Other_____".

BEFOREOU Item 17, "Compared to before you came to OU, has your current use of alcohol… (1) Increased; (2) Decreased, (3) Stayed the same".

PASTTX Item 40, "Have you or your dependent used treatment services for alcohol or other drugs since coming to OU? (1) Yes; (2) No".

STUDROLE Item 42, "Role at University" (1) Freshman; (2) Sophomore; (3) Junior; (4) Senior; (5) Law student; (6) Graduate student; (7) Post-graduate training; (8) Not seeking a degree; (9) Other_____".

STSTATUS Item 44, "Student Status (1) Full-time; (2) Part-time; (3) Not currently enrolled".

STUDMAJ Item 45, "In which school or college is your major area of study? (1) Architecture; (2) Arts and Sciences; (3) Business Administration; (4) Education; (5) Engineering; (6) Fine Arts; (7) Law; (8) Liberal Studies; (9) Graduate College; (10) Other_____".

GPA Item 46, "Approximate grade point average, on a 4-point scale: ___.___ ___".

JOBSTAT Item 47, "Job status: (1) Working full-time; (2) Working part-time".

AGE Item 48, "Age: ___ ____".

GENDER Item 49, "Gender: (1) Male; (2) Female".

SEXORIEN Item 50, "Sexual orientation: (1) Heterosexual; (2) Lesbian/gay; (3) Bisexual".

ETHNIC Item 51, "Primary ethnic origin: (1) American Indian/Native American; (2) Asian/Pacific Islander; (3) African; (4) Hispanic

(Chicano/Latino/Mexican); (5) Arab/Middle Eastern; (6) White/European (not of Hispanic Origin); (7) Other_____".

AMCITZ Item 52, "Are you an American Citizen: (1) Yes; (2) No".

MARITAL Item 53, "Marital status: (1) Single; (2) Married/domestic partner; (3) Separated; (4) Divorced; (5) Widowed".

LIVWITH 1 Item 54, "Living with whom (circle all that apply): (1) Alone".

LIVWITH 2 Item 54, "Living with whom (circle all that apply): (1) Parent(s) or other relatives".

LIVWITH 3 Item 54, "Living with whom (circle all that apply): (1) Spouse or significant other".

LIVWITH 4 Item 54, "Living with whom (circle all that apply): (1) Children".

LIVWITH 5 Item 54, "Living with whom (circle all that apply): (1) Roommate(s)".

HOUSING Item 55, "Living where during the school year?: (1) Residence hall; (2) Fraternity; (3) Sorority; (4) Student housing; (5) House/apartment in Norman; (6) Outside of Norman".

GREEK Item 56, "Greek affiliation? (1) Yes; (2) No".

STUDACT1-STUDENTACT8 Are prefaced by Item 57, Please indicate how many hours per week you spend on each on the following types of activities. (Count each activity in only one category).

Hours per week (1) None; (2) 1-4 hours; (3) 5-9 hours; (4) 10-15 hours; (5) 16 or more

STUDACT1 Item 57a, Student organization(s).

STUDACT2 Item 57b, Participating in intercollegiate athletics.

STUDACT3 Item 57c, Other physical activities (e.g. intramural athletics, walking, biking, etc.).

STUDACT4 Item 57d, Enjoying the arts (music, theater, etc.).

STUDACT5 Item 57e, Political activities.

STUDACT6 Item 57f, Religious activities.

STUDACT7 Item 57g, Volunteer work.

STUDACT8 Item 57h, Leisure time with family or friends.

RELIGI1 Item 58, How important are religious or spiritual values to you? (1) Not at all important; (2) Not very important; (3) Mildly important; (4) Important; (5) Very important".

RELIGI2-RELIG8 Item 59 What position does your church or religion take regarding alcohol and other drugs? (Circle all that apply).

RELIGI2 Item 59a, No church or religious affiliation.

RELIGI3 Item 59b, Allows/supports moderate or ritual use of alcohol.

RELIGI4 Item 59c, Allows/supports moderate or ritual use of other drugs.

RELIGI5 Item 59d, Disapproves of alcohol use.

RELIGI6 Item 59e, Disapproves of other (non-medicinal) drug use.

RELIGI7 Item 59f, Takes no position on alcohol use.

RELIGI8 Item 59g, Takes no position on other (non-medicinal) drug use.

YOUTH, Item 60, "Which of the following statements best describes the use of alcoholic beverages by people in your household when you were growing up? (1)

Drinking was disapproved of; alcohol was not present; (2) Alcohol was seldom drunk but occasional drinking was okay; (3) Alcohol was drunk on special occasions (celebrations); (4) Light or moderate drinking, but no drunkenness; (5) Moderate to heavy drinking, with occasional drunkenness; (6) Regular heavy drinking with frequent drunkenness; (7) One or more adults in your home were treated for alcoholism".

The significance of the canonical correlations will be evaluated using 0.05 as the level of significance. The inspection of each correlation for level of significance is necessary so that it can be determined if a relationship exists beyond one merely of chance. After the weak correlations are eliminated, a discriminant analysis will be run. This procedure is appropriate as it is designed to predict group membership (e.g. binge drinking group) based on a set of variables (e.g. gender, grade point average). The discriminant analysis will be used to test the hypotheses related to research question one. Research question one queries, which demographic variable(s) and/or social variable(s) is/are the best independent predictor(s) of binge drinking?

In order to answer research question two, "What are the most common reasons for undergraduate drinking?" descriptive statistics including measures of central tendency and dispersion (e.g. the means and standard deviations, frequencies, percentages) will be calculated with regard to the 17 optional reasons for drinking. These reasons are as follows: (a) to relax or relieve tension; (b) to have a good time with friends; (c) to get drunk; (d) to fit in with a group one likes; (e) to get away from one's problems or troubles; (f) because of boredom; (g) to relieve depression; (h) to get through the day; (i) to get to sleep; (j) to enhance sexual pleasure or opportunity;

(k) to increase enjoyment of music or food; (l) because one likes the taste; (m) because it's the thing to do; (n) because one feels better when drinking; (o) to help one be less shy with others; (p) to celebrate at ceremonial occasions; (q) other.

Finally, in order to answer research question three, " What is the relationship between students' reasons for drinking and binge drinking?" canonical correlation analysis will be conducted. Canonical correlation is an appropriate choice as it calculates the relationship between two pairs of variables (i.e. particular reason for drinking and binge drinking behavior) (Hays, 1994). The canonical variate for the outcome variable will be binge drinking behavior. In the survey, the binge drinking variable is Item 11 (coded OVER 5**)** and it reads, "Over the last <u>two weeks,</u> how many times have you had five or more drinks in a row? (1) None; (2) Once; (3) Twice; (4) 3 to 5 times; (5) 10 or more times". The other canonical variate (e.g. the independent variable) will vary with each correlation calculated so as to conclude with 17 canonical correlations (each time using a different variable (e.g. REASON1, REASON2). The 17 variables and their corresponding survey items are listed below:

REASON 1-17 Items 16a-16q are prefaced by the following question: What have been your MOST IMPORTANT reasons for drinking alcoholic beverages? (Circle all that apply)

REASON 1 Item 16a, "To relax or relieve tension".

REASON 2 Item 16b, "To have a good time with my friends".

REASON 3 Item 16c, "To get drunk".

REASON 4 Item 16d, "To fit in with a group I like".

REASON 5 Item 16e, "To get away from my problems or troubles".

REASON 6 Item 16f, "Because of boredom, nothing else to do".

REASON 7 Item 16g, "To relieve depression".

REASON 8 Item 16h, "To get through the day".

REASON 9 Item 16i, "To get to sleep".

REASON 10 Item 16j, "To enhance sexual pleasure or opportunity".

REASON 11 Item 16k, "To increase my enjoyment of music or food".

REASON 12 Item 16l, "Because I like the taste".

REASON 13 Item 16m, "Because it's the thing to do".

REASON 14 Item 16n, "Because I feel better when I'm drinking".

REASON 15 Item 16o, "To help me be less shy with others".

REASON 16 Item 16p, "To celebrate at ceremonial occasions".

REASON 17 Item 16q, "Other_____".

The significance of the canonical correlations will be evaluated using 0.05 as the level of significance. The inspection of each correlation for level of significance is necessary so that it can be determined if a relationship exists beyond merely one of chance. If significance is found, the weak correlations will be eliminated, and a discriminant analysis will be run. This procedure is appropriate as it is designed to predict group membership (e.g., binge drinking group) based on a set of variables (e.g., I drink to celebrate at ceremonial occasions).

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