

# **THE CONSEQUENCES OF ALCOHOL CONSUMPTION FOR DRINKING AND NON-DRINKING STUDENTS**

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## **THE CONSEQUENCES OF ALCOHOL CONSUMPTION FOR DRINKING AND NON – DRINKING STUDENTS**

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Many college students experience negative effects of alcohol consumption; however, most research examines these consequences for students who drink. There are relatively few studies that consider the consequences of others' drinking for students who abstain from alcohol consumption. In this study, I investigate whether other students' alcohol consumption negatively influences the academic and social lives of non-drinking college students. I examine the "second hand effects" of alcohol with a scale measure of the negative consequences of drinking. This scale includes the following problems: study or sleep disruption, verbal abuse, property damage, and sexual assault. I examine associations between this scale and three outcomes: grades, dissatisfaction with school, and anxiety about grades. Method: The variables measured in the study were drawn from a nationally representative sample of students, Wechsler's Harvard College Alcohol Study 2001 (n = 10, 904 from 119 universities). Multiple regression models were used to assess relationships between the negative consequences of others' drinking and outcome variables, independent of important controls (e.g., age, gender, and race). As well, comparisons were used to assess whether these relationships differed for abstainers relative to drinkers. Results: Students who drink alcohol (n = 8,453) and those who abstain (n = 2,286) do not experience equally the negative consequences of their peers' alcohol consumption; instead, the relationship between experiencing second hand effects of alcohol consumption and lower academic record and greater dissatisfaction with life at school are more pronounced for students who abstain. Conclusion: The consequences of college drinking are not limited to individual college drinkers, but may extend to their non-drinking peers. Indeed, college students who abstain from alcohol appear to suffer more from their peers' drinking, compared to students who drink. College alcohol programs should extend their focus from drinkers to abstainers and develop intervention strategies that will promote health and well-being for both groups.

## Introduction

On college campuses across America, alcohol related culture is entwined in school customs, social norms, and the academic institution itself. Although the majority of college undergraduates are below the legal drinking age, alcohol continues to be widely used on most college campuses today. The consequences of heavy or “binge” drinking pose serious risk for drinkers, but also for those in the immediate environment (Wechsler et al. 1994). Heavy drinking has been associated with physical or sexual assault, criminal violations, and unsafe sexual activity (Wechsler et al. 1994). Heavy alcohol use has also been linked to adverse health consequences including vehicle accidents, injuries, and accidental deaths. In research on college students, heavy drinkers have been found to have lower academic grades, miss class, and to fall behind in school work most often. According to the National Institute on Alcohol Abuse and Alcoholism, about four out of five college students drink alcohol (NIAAA 2004a). Half of all college students who consume alcohol, drink heavily.

The majority of existing research on college drinking has focused on the consequences for the student who actively consumes alcohol; yet, virtually all college students experience the effects of college drinking – whether they drink or not. Although heavy drinkers invite negative consequences for themselves, many of the problems involve others. These secondary consequences include vehicle injuries, verbal disputes, and property damage (Wechsler et. al. 1994). Existing research has shown that families of alcoholics are negatively affected by the drinker and may become victims of violent assault (Leonard 1993). Carnegie Foundation (1990) found that alcohol abuse is also related to campus crime.

This study seeks to examine the “second hand effects” of alcohol for two distinct categories of college students: students who abstain from alcohol consumption and those who actively drink. These second hand effects may include: having a serious argument, experiencing

study or sleep disruption, and/or sexual assault (refer to methodology section for more detail). I examine associations between these secondary consequences of college drinking with multiple regression models of three outcome variables: grades, overall satisfaction with life at school, and anxiety about grades. I examine the consequences of peers' drinking independent of demographic and background controls (e.g., age, race, gender, parents' drinking). The variables measured in this study were drawn from a nationally representative sample of students, Wechsler's Harvard College Alcohol Study (CAS) 2001 (n = 10, 904 & 119 universities).

My study is important because it examines the relationship between secondary drinking effects and a student's college experience. I contribute to existing literature by drawing comparisons between students who abstain from alcohol to those who actively drink in regards to their social and academic trajectories while in college. Previous research has highlighted a positive relationship between student drinking level and the experience of secondary drinking effects (Wechsler et al. 1995). Also, students attending colleges or universities with higher incidences of heavy drinking are more likely to experience these second hand effects. However, current research has not shown how non-drinking students' academic experiences are affected by their peers' drinking. My results show that students who drink alcohol and those who abstain do not equally experience the negative consequences of their peers' alcohol consumption; instead, the relationship between experiencing second hand effects of alcohol consumption and lower academic grades and greater dissatisfaction with life at school is more pronounced for students who abstain.

The secondary effects of heavy drinking can transform the college environment from a jovial academic setting to one where the quality of life is degraded and academic scholarship is weakened. My research is beneficial to college alcohol programs and suggests that they should

modify interventions strategies to promote health and well-being for both groups on college campuses.

Below I define my research question and hypothesis. I provide a concise review of current material relating to the structure of post-secondary education highlighting the role of alcohol across college campuses. I examine how colleges systematically accommodate the “party” scene that influences the prevalence of alcohol consumption on campus. I then summarize existing research regarding a student’s academic achievement and satisfaction at a college or university.

The methodology section of my thesis describes in more detail the 2001 College Alcohol Study. This section describes the variables used in the study, how the survey was administered, to who the survey was administered, and the processing of data. The methodology section includes the types of regression models used in this study. My findings are presented in the results section and are divided according to each outcome variable: grades, satisfaction with life at school, and anxiety about grades. I conclude my thesis by discussing the implications of my research.

## Research Questions

My study examines the negative consequences of peers' drinking behavior for the academic and social outcomes of college and university students. It also compares the consequences for two distinct sub-groups: students who drink and those who abstain. The main questions of this study are:

- (1) How extensive are second-hand effects of drinking among college and university students?
- (2) Are problems more pronounced for students from a particular subgroup? Are they worse for males compared with females? Do students belonging to a racial minority group suffer to a greater extent from their peers' drinking behavior in comparison to Caucasian students? Do abstainers suffer more relative to drinkers?
- (3) Does exposure to the second-hand effects of drinking have similar consequences for grades, anxiety about grades, and satisfaction for all university students or do these differ for abstainers or drinkers?

## Literature Review

### *The Structure of Higher Education*

An extensive literature documents the prevalence of alcohol and its related consequences in U.S. universities and colleges. Wechsler and colleagues (1994) found that about two in five students (44%) attending 4-year colleges drink alcohol at a high level and that binge drinking was widely accepted. Moreover, many students begin drinking heavily while attending college: Wechsler et al. (1994) found that approximately, one out of four students who did not drink heavily in high school started drinking to excess in college (also see Turrisi et al. 2006). For many students, drinking is a social norm and an integral part of higher education (Chauvin 2012).

Understanding college drinking requires an examination of the “experimental core of college life” – the time between college entry and exit (Burawoy 2009) and a consideration of alcohol’s role as part of the structure of the university. Universities are complex organizations; Clark Kerr, former chancellor of the University of California–Berkeley described post–World War II American Universities as “multiversities” that attempt to satisfy a broad range of constituencies that include local taxpayers, the institutional budget, state laws, and the U.S. government (Carr and Kefalas 2009). According to Hamilton and Armstrong (2013), four year residential colleges have long depended financially on the patronage of upper and middle class, pre - dominantly white families. The influence of this group has increased in recent years because of the state’s declining financial support for post-secondary education. As a result, tuition now accounts for the biggest share of revenues (Brint 2012) and many public universities have increased the proportions of students who either generate more tuition dollars or who require the least financial aid and thus cost the university the least (Armstrong and Hamilton 2013). This type of selective admission favors the portion of affluent, white students who require

less financial support than their minority counterparts (Armstrong and Hamilton 2013). As a result, institutions are forced to provide the social experiences desired by this constituency.

### *The Party Scene*

Colleges have implicit “pathways,” that students fall into depending on a variety of factors such as ethnicity and socio-economic status (Armstrong and Hamilton 2013). One pathway, the “party pathway,” centers on alcohol consumption and is more popular among students who are socially-oriented and affluent. Students in this group are not seeking social mobility through college, in comparison to their minority counterparts. The majority of these students have enough cultural, social, and economic capital from their parents to secure a stable career following graduation (Armstrong and Hamilton 2013). These students enroll in large state schools for social aspects of college, such as athletics or partying events rather than for academic reasons (Armstrong and Hamilton 2013).

Universities and colleges indirectly support alcohol consumption and the “party scene,” by catering to the organizations where these are most common, most notably, Greek organizations (Cashin et al. 1996). Cashin and colleagues (1996) found that 46% of 4-year post-secondary institutions have fraternity and/or sorority systems. According to Armstrong and Hamilton (2013), there is an institutionalized partnership between Greek chapters and many post-secondary schools as many Greek organizations donate to the university, mostly by way of wealthy alumni or philanthropic events. In addition, many large state universities allow predominantly white Greek chapters to own valuable property on and near campus, which affords these organizations a measure of power unlike any other student organization (Armstrong and Hamilton 2013). Greek housing is generally owned by the national organization or local chapter

and not by the university. This limits Greek organizations vulnerability to legal sanctions for hosting large parties or being cited for underage drinking (Armstrong and Hamilton 2013).

University resources allow Greek society to dominate the social life on campus. As a result, most college students are encompassed within an atmosphere centered upon drinking and partying (Cashin et al. 1996). Even if students were willing to socialize without alcohol, universities offer few opportunities. For example, students who are below the drinking age have few options for dancing other than fraternity parties. Many university-sponsored events also reduce coed interaction, because they are often viewed as “uncool” (Armstrong and Hamilton 2013). In an ethnographic study of college women, Armstrong and Hamilton (2013) observed how students who were non-Greek affiliated often struggled in forming and maintaining social relationships in their first year in college. The difficulty in forming relationships was pronounced for students who refused to consume alcohol or attend parties and social ties were sometimes severed when one person actively engaged in the party scene while the other abstained.

#### *Consequences for the Drinker*

Research on college alcohol consumption has found that heavy drinkers are at an increased risk for drinking-related problems such as criminal violations, injuries, and engaging in unplanned sexual activity (Wechsler et al. 1994). Presley and colleagues (1993) found that heavy drinkers missed more classes and had poorer grades. Excessive drinking may also have long-term health consequences such as liver failure or cirrhosis, and increases the odds of an alcohol overdose (Eigen 1991).

*Overview of Second Hand Effects*

Excessive drinking in college may also have negative effects for others. Individuals that are affected from second hand effects of alcohol may include administrators, families, neighborhood residents, and students (Leonard 1993). Colleges with higher reports of alcohol abuse have higher crime rates and the communities in which they are located often have higher alcohol-related auto accidents and property damage (Carnegie Foundation 1990). Wechsler et al. (2002) found that people who lived near college campuses were more likely to report lower neighborhood quality as a result of second hand effects of alcohol from noise, vandalism, and disturbances such as public urination.

Other students may be particularly vulnerable to second-hand effects of other's drinking, especially those who live on campus, and thus are in the institutionalized environment 24 hours a day (Wechsler et al. 1994). Wechsler et al. (1994) found that 66% of respondents in the 1993 College Alcohol Study had experienced at least one of eight adverse consequences from other students' drinking (e.g., experienced an unwanted sexual advance) and that students who belonged to a Greek organization were at a higher risk of experiencing secondary effects. Students who consume alcohol on a regular basis also experienced more adverse consequences of other students' drinking, compared to both moderate drinkers and to abstainers. Additional analyses that focused on the level of drinking at a school (low, mid, and high level) and found that abstainers and moderate drinkers at high-drinking level schools were more likely than students at lower-drinking level schools to experience problems as a result of the drinking behavior of their peers. The odds of experiencing at least one of eight problems was 3.6 to 1 when students at high drinking level schools were compared to their counterpart at lower drinking level schools (Wechsler et al. 1994).

This pattern is independent of gender, parental education, race, Greek affiliated, lived in alcohol – free dormitory residence, and the respondents’ drinking experience in their last year of high school (Wechsler et al. 1994).

### *Academic Achievement*

Most research on drinking and college academic performance report that students with higher GPAs reported consuming less alcohol than students who reported lower GPAs. Preseley et al. (1994) found that respondents in the CORE survey, with a GPA of “A” drank an average of 3.3 alcohol drinks per week, students with a “B” drank 4.8 drinks, students with a “C” drank 6.1 drinks, and students with a “D” or “F” drank 9.0 drinks per week. Engs et al. (1996) came to a similar conclusion in a study that used the Student Alcohol Questionnaire (SAQ): students who had low GPAs were more likely to be heavy drinkers. This relationship was consistent for students in each academic year.

Pascarella et al. (2007) found that students who consumed excessive alcohol at a higher frequency also experienced a greater deficit in their academic performance. The negative academic effects of binge drinking persisted in the presence of confounding influences such as sex, race, family background, year in school, high school experiences, academic major, and place of residence. Moreover, there was no easily identifiable group who were most at risk academically from binge drinking: excessive alcohol consumption had negative academic consequences for a broad spectrum of undergraduate students.

Two studies that use data from the College Alcohol Study (CAS) concluded that drinking affects GPA both directly, through its effect on cognitive ability, and indirectly, through study habits (Woalver 2002; Pascarella et al. 2007). Powell et al. (2004) also found an association between alcohol use and study habits in their comparative study of first year and upper-level students. They found that each additional drink an upper-class student consumed increased the

likelihood of missing a class by 9% and getting behind in school work by just over 5%.

Research by Rau and Durand (2000) underscores the difficulty in assessing the causal direction of the relationship between drinking and academic performance. They found that students who received higher grades also placed a high value on academic performances and consumed little to no alcohol. In comparison, students who gave less priority to academics and who did not believe in daily studying consumed more alcohol.

In a study that examined gender differences, Engs et al. (1996) found that males drank to excess more than females did, and that they experienced more academic problems such as lower GPA. However, Walover (2007) found that the impact of binge drinking on academics is essentially the same for both genders. Although men and women consume different amounts of alcohol, study differently, and have different average GPAs, they experienced similar decreases in grades for excessive alcohol consumption.

Other studies, however, have not found evidence of an association between excessive alcohol consumption and academic performance. Paschall and Freisthler (2003) conducted a cross-sectional, single institutional study and concluded that heavy alcohol use and drinking opportunities do not have an important effect on academic performance while in college. Similarly, Wood et al.'s (1997) longitudinal study also found no association between problem drinking and academic performance once control variables were introduced. Both studies acknowledged that drinking alcohol may cause a student to miss class or perform poorly on an exam, but they argued that these alcohol-related problems may not ultimately affect students' grade point average. There are many possible reasons other than alcohol use for students to have lower GPAs including the following: higher academic demands than high school; lack of interest in a course; unwillingness to study; and personal factors (Paschall and Freisthler 2003). In other

words, other non–alcohol related factors may be more influential in determining students’ academic performance and GPA.

Overall, the body of evidence concerning the impact of excessive alcohol consumption or “binge drinking,” on college academic performance is inconsistent. In part, this may be due to differences in research design and analysis (Pascarella et al. 2007). Some studies are cross-sectional, others longitudinal, and the studies vary in the extent to which they incorporated control variables for confounding influences.

### *Overall Satisfaction in College*

Most studies on college student satisfaction use satisfaction surveys (e.g., CIRP, SSI, NSSE) to measure student perceptions of the college experience (Billups 2008). Research has shown that a students' positive perception of academic programs and personal affiliations with peers and faculty contribute to feelings of “student–centeredness” (Elliot 2003). Students who feel accepted at their institution are more likely to stay in school and feel satisfied with their overall experience.

Existing literature is fairly limited to explaining the relationship between college drinking and a students’ satisfaction with life at school. Chauvin (2012) examined social motives to college drinking and found that students actively participate in drinking to elevate their social status and thus are more likely to be satisfied with life at their university. Alcohol may serve as a gateway for student satisfaction while in college by promoting a higher social status. Cashin et al. (1998) found that Greek affiliated students are more likely to be satisfied with life at school. This may in part be due to the high social status for members of Greek organizations. These organizations themselves are well–known for excessive alcohol consumption.

Previous research indicates that a number of factors contribute to a student's satisfaction with college or university. For example, Elliot and Healy (2001) highlighted eleven dimensions that relate to students' satisfaction with life at school, including the quality of classroom interactions, the rigor of the curriculum, social interactions between peers and faculty, and a feeling of "fitting in," within the college culture. Borden (1995) found that students who were able to connect with a faculty member early in their first two years of college were more satisfied and were more likely to complete their degree. Institutions with higher graduation rates also had higher satisfaction ratings on survey questions that measured the relationship between students and faculty. Pascarella (1980) found a positive correlation between the quality of interaction between a student and faculty member, and the student's commitment to their academics and institution. The higher quality of the relationship with a professor decreases the possibilities for student withdrawal from the university. Academic advising also plays an important role in student success influencing their positive perception of college. Students who received meaningful academic advising were able to make connections with their program of study and eventual career goals (Noel 1978). Advising staff and faculty play an important role in student satisfaction by serving as influential mentors, guiding students on academic challenges and working toward their career aspirations (Lamport 1993).

Factors outside of the academic setting of the university also impact a student's overall satisfaction with life in college. The extent to which students are involved in personal and social growth contributes to satisfaction (Billups 2008). Students who are actively engaged in social interaction involving group activities share a more positive view of their university (Billups 2008). If students are able to identify with peers it bolsters the college experience. Armstrong and Hamilton (2013) found a positive correlation between the number of close friends and satisfaction with life at college: as the number and quality of relationships with friends increases,

the perception of college becomes more positive. In their ethnographic research on college women, they found that the students who actively engaged in the party scene were “happier,” than students who found other outlets. They observed that women who refused to attend parties or drink alcohol had a smaller group of friends, were isolated from peers, and overall, were less satisfied with life at school. In comparison, Cashin et al. (1998) found that members of Greek organizations, where the extent of drinking is high, had a higher overall satisfaction with life at school than those students who were not Greek affiliated. Finally, Peters (1988) found that student experiences off-campus were just as important to student satisfaction as the educational component of attending a college or university.

*Academic and Social Outcomes of Peer Drinking Behavior*

The studies reviewed above suggest that college drinking plays a specific role within college environments, and that certain groups are more at risk for harmful drinking behavior than others. However, to date, studies have not examined how other students’ alcohol consumption negatively influences academic and social outcomes, and how these effects may be heightened for non-drinking students. Although students who abstain from alcohol consumption are not likely to be within a close proximity of alcohol, the structure of the institution or the influence of peer networks may heighten these secondary consequences for this particular group.

## Hypotheses

- (1) When exposed to second-hand effects of peers' drinking behavior, college or university students who abstain from drinking experience a greater decrease in their academic grades compared to students who actively participate.
- (2) Exposure to the second-hand effects of peers' drinking behavior will diminish the satisfaction of attending a university or college to a greater extent for students who abstain from alcohol compared to those who drink.
- (3) When exposed to second hand effects of peers' drinking behavior, students who abstain from alcohol consumption are more likely to have anxiety over their academic grades in comparison to students who drink.

## Research Methodology

### *Overview*

The data for this study are from the 2001 Harvard School of Public Health College Alcohol Study. This study is the most recent in a series of large-scale, nationally representative surveys of college drinking, educational experiences, and overall health. The studies were conducted by Henry Wechsler, a researcher at Harvard University. In its entirety the College Alcohol Study consists of four surveys from 1993, 1997, 1999, and 2001 and involve more than 50,000 students and 120 universities (Wechsler and Nelson 2008). The four surveys constitute a broad cross-section of U.S. 4 year colleges and universities.

### *Selection of Universities/Colleges*

The sampling frame for the 1993 study was drawn from the American Council on Education's list of four-year colleges (the 2014 list has more than 5,000 colleges or universities). These institutions are accredited by one of the six regional bodies covering the United States (Wechsler et al. 1994). One hundred and seventy nine colleges and universities were originally selected for the sample; however, the sampling procedures for selecting universities and colleges for the 1993 survey are not clear. In his first publication regarding the College Alcohol Study, Wechsler and colleagues (1994) reported that the sample was selected using probability proportionate to enrollment size, but it is unclear how the proportions were determined. Other research describes the sample as being drawn with a nested sampling technique (Ward and Gryczynski 2009). It is therefore, unclear how institutions were originally selected.

The original sample contained few women-only colleges and few colleges with less than 1000 students so 10 all-women colleges and 15 colleges with enrollments of less than 1000 students were added (Wechsler et al. 1994). Nine colleges were subsequently dropped from the

sample because the structure of the institution was deemed inappropriate for a comparison with other schools. The dropped institutions included military schools, allied health schools, and seminary schools. One hundred forty colleges and universities (72% response rate) of the corrected sample size of 195 institutions agreed to participate (Wechsler et al. 1994).

#### *Follow-up studies*

The same sample of universities used in 1993 was used in the follow-up surveys (1997, 1999, and 2001); however, the total number of participating colleges varied from year to year. In the 1993 survey 140 schools participated, while in 2001 only 119 participated (85% response rate from 1993 sample). Several institutions were dropped from the original 140 selected institutions because they did not provide the random sample of students in a timely manner or did not have a high enough response rate to warrant remain in the study (Eisenberg and Wechsler 2003).

In the 1993 study, participating colleges were located in forty states and the District of Columbia (Wechsler et al. 1994); in the 2001 survey, thirty-eight states as well as the District of Columbia were represented (Chauvin 2012). Approximately two-thirds of the institutions in the sample were public, while the remaining one-third were private (Wechsler et al. 1994). The majority of schools were located in a suburban setting, while the remaining were in small towns or rural settings (Wechsler et al. 1994). It is unclear whether the sampling frame of universities and colleges was stratified based on public/private institutions or school location (suburban/rural). Women only colleges made up less than five percent of the sample and predominantly black institutions made up approximately four percent (Wechsler et al. 1994).

### *Sampling of Students*

The designers of the study provided specific guidelines to aid college and university administrators in selecting a random sample of students. All full-time undergraduate students were eligible for the study (i.e., from 1<sup>st</sup> year to graduating students). The guidelines called for a random sampling of students using probability proportionate to the size of the college or university sampled. A random sampling point was designated and students were selected based on each university's registry (Wechsler et al. 1994). For example, every xth student was selected from the registry starting from the initial random sampling point. In the 1993 study the majority of participating institutions—127—provided a sample of 215 students, whereas the remaining 13 institutions each provided 108 students. Twelve of the smaller sample schools are from the oversample of colleges.

### *Mailing System*

The researchers dropped students from the sample if they were on a leave of absence, had withdrawn from school, or if the institution had provided an incorrect address. In the 1993 survey, 28,709 students were mailed a 20 page self-report survey (Wechsler et al. 1994). The survey was mailed to participants in early February with a June return deadline. Students received a total of four mailings from the study: the initial questionnaire, a reminder postcard, a second questionnaire, and a second reminder postcard. An unknown number of students may have not had their questionnaires delivered. The study assured students that their participation was voluntary and that their responses were confidential. It used several lottery-based financial incentives to encourage the timely completion of the survey: a \$1000 award for students who returned the survey within one week, and one \$500 award and ten \$100 awards for students who sent back the survey within the five month deadline (Wechsler et al. 1994).

In the 1993 study, just over 60% of students (n=17, 592) returned a completed survey (Wechsler et al. 1994). Of those who returned their surveys, approximately 88% sent it back within two months; another 10% completed them by the end of the third month; and the remaining 2% of students returned their surveys toward the end of the five-month deadline. Student response rates varied by college from approximately 60% to 80% and only six colleges had a response rate lower than 50% (Wechsler et al. 1994). In the 2001 study, 10, 904 students completed the survey (Chauvin 2012).

### *Questionnaire Descriptive*

The College Alcohol Study was designed similarly to an earlier large-scale epidemiological study on drinking (Wechsler et al. 1994). It surveys students' use of alcohol and other types of drugs and their involvement in organizations, Greek life, and athletics. The survey questions range from individual alcohol usage, students' perception of drinking, to consequences of peers' drinking behavior (Wechsler et al. 1994). In the study, an alcoholic drink was defined as 12 ounces (360 mL) of beer, four ounces (120 mL) of wine, 12 ounces of wine cooler, or a shot (1.25 oz [37 mL]) of liquor straight or in a mixed drink (Wechsler et al. 1994).

### *2001 College Alcohol Study Sample Characteristics*

This analysis presented below uses data from (10, 904) undergraduate students at 119 United States 4-year institutions. The sample includes more women (55%) than men (45%), primarily because of the inclusion of all women colleges. The sample is predominantly white (72%), an attribute that coincides with the United States Department of Education report that about 80% of undergraduates at 4-year institutions are white or non-Hispanic. About 13% of the sample reported that they were involved in Greek life and 15% of students described themselves as college athletes. Approximately 43% of students reported living on campus in a dormitory, fraternity/sorority, or apartment. Respondents reported that more fathers than mothers drank

moderately or more (29% versus 11% respectively). About two-thirds of respondents said that their families generally approved of some (at least infrequent) alcohol use. Approximately 44% of the students surveyed engaged in binge drinking (the same percentage as reported this in the first national survey in 1993).

### *Measures*

#### *Dependent variables*

The study examines three dimensions of academic life. The first, academic achievement, is measured with a question that asked about the respondents' overall, average grade for the current year. There were seven possible responses: (1) = C or lower, (2) = C+ (3) = B-, (4) = B, (5) = B+, (6) = A-, and (7) = A. The second dimension, the importance of academic work, is measured with responses to a Likert-style question that asked students directly about the "importance" of their school work. Responses to this item were recoded to create a dichotomous measure (0= Not Important 1= Important) because the variable had a bimodal distribution with few students choosing answers that fell in between the ends of the answer continuum. The final dimension, satisfaction, is measured with another Likert-style question that asked about "satisfaction with life at school." This variable was also recoded into a dichotomous measure (0 = Dissatisfied, 1= Satisfied).

#### *Independent variable*

The key independent variable in this study, problems related to other students' drinking, is a scale based on responses to eight questions. Answers to these questions are strongly correlated ( $\alpha = .766$ ) and thus can be used to create a scale. The questions asked students how frequently since the beginning of the school year, they had experienced the following problems "because of other students' drinking"; been insulted or humiliated; had a serious argument or quarrel; been pushed, hit, or assaulted; had your property damaged; had to "babysit" or take care

of another student who drank too much; had your study or sleep interrupted; experienced an unwanted sexual advance; or had been a victim of sexual assault or date rape. There were four response categories for each question: (1) = not at all, (2) = once, (3) = 2-3 times, (4) = four or more times.

### *Control Variables*

The following variables were included as controls: age; gender; race; religious affiliation; year in school; member in Greek life (fraternity or sorority); and drinking behavior at the end of high school and in college. Age is measured with nine responses: (0) = 17, (1) = 18, (2) = 19, (3) = 20, (4) = 21, and (5) = 22 or over. Gender is a dichotomous variables (0 = male, 1 = female) and race is measured by a set of dummy variables, with white as the comparison group (74%). Religious affiliation was measured as a dichotomous variable (0 = religious, 1 = nonreligious). Year in school is based on five responses: (1) = first year, (2) = second year, (3) = third year, (4) = fourth year, and (5) = fifth year or beyond. A dichotomous measure distinguishes student who were members in a fraternity or a sorority from those who did not have this affiliation (0 = Yes, 1 = No). The variable, “drinking behavior in high school,” is based on responses to the following question: “How often did you drink alcohol during a typical month during your last year in high school?” Students selected one of seven possible answers: (1) = Never, (2) = 1 – 2 occasions, (3) = 3 – 5 occasions, (4) = 6 – 9 occasions, (5) = 10 – 19 occasions, (6) = 20 – 39 occasions, and (7) = 40 or more occasions. Drinking while at college is measured with a dichotomous variable that distinguishes students who abstained from those who classified themselves as a light, moderate, or heavy drinker (0 = Abstainer, 1 = Drinker).

Two measures of parent attributes were also included: drinking and education. Parents’ drinking was based on five responses: (0) = abstainer, (1) = infrequent drinker, (2) = moderate drinker, (3) = heavy drinker, and (4) = problem drinker. Parents’ education was also based on

five responses: (1) = less than high school, (2) = high school diploma, (3) = some college, (4) = four year college or more.

### *Data Analyses*

All statistical analyses were carried out using the current version of Stata. Multivariate regression models were used to assess the relationships between the consequences of friends' drinking for the three outcomes described above: grades, satisfaction with life at school, and importance of academic work. Three equations were estimated for each outcome variable: the first focuses on main effects, whereas the second and third analyses examine separately patterns for compare abstainers and for drinkers in order to examine the extent to which one's own drinking conditions the consequences of friends' drinking. Ordinary least squares regression was used to examine grades and logit regression was used to examine overall satisfaction with life at school and the importance of academic work.

## Results

### Univariate Analysis

[See Figures 1 & 2]

As described in Figure 1, approximately 76% of students in the sample classify themselves as light to moderate drinkers, whereas 21% of students choose to abstain from alcohol consumption. Figure 2 highlights the gender distribution and indicates that females comprise the majority of the sample (64%), in comparison to males (36%).

[See Figures 3 & 4]

Figures 3 and 4 provide information on age and ethnicity. The average age of students in the sample is 20.82 and about half of respondents are not of legal drinking age. The ethnicity distribution indicates that the sample is composed mostly of Caucasians (approximately 74%) with the rest of the sample identifying as Asian (8%), African American (7%), Hispanic / Latino (8%), or another ethnicity (4%).

[See Table 1.1]

Table 1.1 provides means and standard deviations for the variables used in this study. The variable, “Problems related to other students’ drinking” has an average response of 1.42. This indicates that, on average, students had experienced at least “once” a negative consequence as a result of their peers’ drinking behavior (see methodology section). The average self-reported grade among respondents is a “B” to a “B<sup>+</sup>” grade. The great majority of respondents, 95%, view participation in academic work as “Important,” and 88% said they were satisfied with life in college. The mean for parents’ drinking indicates that the majority of parents were not heavy drinkers (only 12% of parents were classified as heavy drinkers). The mean for parents’ education, indicates that the average student lived in a family in which at least one parent had

“some college or technical schooling beyond high school.” The mean for drinking while in high school indicates that the average student drank on one or two occasions during a typical month in high school. The mean for drinking while at college suggests that the average student was a light to moderate drinker. Lastly, 12% of students who responded to the survey reported some Greek affiliation and 15% had an affiliation with a religion.

### **Distribution of Secondary Drinking Effects**

[See Table 1.2]

The second-hand effects students experienced the most frequently were having to take care of a drunk student (50%), having study or sleep disrupted (44%), and being insulted or humiliated (28%). According to the results in Table 1.2, for each secondary consequence of peer drinking, students who consume alcohol, experience more negative effects relative to abstainers; yet, a sizable proportion of the latter report that they also experience negative consequences of other students' drinking.

[See Table 1.3]

The distribution of secondary drinking effects by ethnicity illustrates that Caucasian students experience more negative consequences from their peers' drinking behavior in relation to minority groups. Although for one secondary consequence, “Found Vomit in the Residence Area,” both Caucasian and African American students experience a similar rate of negative occurrences.

[See Table 1.4]

The distribution of secondary drinking effects between males and females is not skewed toward one group. Males and females equally experience an insult or humiliation as a result of their peers' drinking behavior. Females more often have had to "baby – sit" a student who was drunk, but males experience more occurrences of property damage on average.

### **Multivariate Analysis**

Three sets of three multivariate equations were estimated to assess the relationships between experiencing negative consequences of peers' drinking behavior and students' academic grades, satisfaction with school and the importance of academic work. The first equation illustrates the main effect of experiencing secondary consequences of peer drinking on one of the three outcome variables. The remaining two equations assess these relationships separately for abstainers and drinkers.

[See Table 1.5]

Equation 1.1 in Table 1.5 presents the main effect of experiencing problems with friends' drinking behavior on academic grades. The unstandardized coefficient for experiencing secondary drinking effects ( $b=-.22$ ) highlights a negative relationship with grades: as exposure to the negative consequences of peers' drinking behavior increases, the effect is a decrease in academic grades. This coefficient is statistically significant at the .05 level. Thus, in general, students, whether they actively participate in alcohol consumption or abstain, experience a decrease in academic grades as exposure to the second-hand effects of peers' drinking behavior increases. This association is significant even after holding constant important control variables.

For comparison, the unstandardized coefficients were translated to beta coefficients for all three

equations. The standardized or “beta,” coefficient for exposure to second-hand effects of peers drinking (equation 2.1) is -.06 suggesting that the effect is small to moderate in size.

It is worth noting that a number of other variables are also statistically significant in this equation. Gender was coded as a dichotomous variable (0 = female 1=male) and shows a negative relationship with academic grades ( $b = -.09$ ). Thus, males experience lower academic grades on average than females. Also, both academic year and grades increases in a positive relationship ( $b=.07$ ). For ethnicity, racial minority students experience lower average grades relative to whites. Parental factors were also assessed in this equation. As parents’ education increases, academic grades increases ( $b=.08$ ).

[See Figures 5 & 6]

Equations 1.2 and 1.3 divide the sample into two groups: abstainers and drinkers. For abstainers equation 1.2 indicates that the beta coefficient is -.09 for experiencing problems with peers’ drinking behavior thus highlighting a negative relationship. In comparison, the beta coefficient for students who drink is -.05 for the same variable. The beta coefficient for abstainers is 1.6 times the size than for students who drink and the difference between the two coefficients was analyzed using a chi-square test. The result indicates that the difference is statistically significant at the .05 level, but only with a one tailed test ( $\text{Chi}^2 = 2.80$  &  $\text{Prob} > \text{Chi}^2 = .09$ ). The amount of variance in grades explained by the variables in the model was also assessed. For the entire sample,  $R^2$  equals 6%; for abstainers it is 10% and for drinkers, 5%. Thus, the model explains more of the variance for abstainers relative to drinkers. This result is consistent with the hypothesis that the effect for experiencing negative consequences of peers’ drinking on grades is worse for abstainers.

[See Table 1.6]

Table 1.6 reflects the relationship between exposure to the negative consequences of peers' drinking behavior and students' satisfaction with school. Equation 2.1 is limited to main effects. The logistic regression model in the table provides parameter estimates in the form of unstandardized coefficients which can be transformed to odds ratios. The results from equation 2.1 indicated that a one unit increase in experiencing negative consequences in peers' drinking behavior, decreased the expected odds of student satisfaction by about 23%. This effect is statistically significant at the .05 level and is net of control variables.

[See Figure 1.7]

Several other associations in equation 2.1 are also statistically significant and are worth mention. A one unit increase in student approval of drinking behaviors increases the expected odds of student satisfaction by 55% and a one unit increase in individual student drinking behaviors increases the expected odds of student satisfaction by 27%. Students who reported a Greek affiliation are 75% more likely to be satisfied with their life in college. However, prior research also finds that compared to other students, Greek members have higher incidences of binge drinking and experience a higher rate of secondary drinking effects (Wechsler et al. 2002). A one unit increase in the number of close friends a student also increases the expected odds of student satisfaction by about 44%. Not surprisingly, racial minority students are more likely to be dissatisfied with life at their college or universities relative to Caucasian students. To provide an example, African American students are 48% more likely to be dissatisfied with their college experience. Lastly, the other statistically significant variable is parents' level of drinking. A one unit increase in parents' drinking level decreases the expected odds of student satisfaction by 20%.

Equations 2.2 and 2.3 divide the analysis into the two groups of interest, abstainers and drinkers. For students who abstain, a one unit increase in experiencing negative consequences of peers' drinking behavior decreases the expected odds of student satisfaction by 44%, whereas for drinkers it decreases by only 18%. This result is consistent with the hypothesis that the effect of experiencing negative consequences of peers' drinking behavior on student satisfaction is worse for abstainers.

The difference between the two beta coefficients discussed in equation 2.2 and 2.3 were analyzed using a chi-square test. The results indicates that the difference is statistically significant at the .05 level for a two-tailed test ( $\text{Chi}^2 = 4.21$  &  $\text{Prob} > \text{Chi}^2 = .04$ ). The amount of variance in satisfaction explained by the variables in the model was also assessed. For the entire sample, the Pseudo  $R^2$  equals 7%; for abstainers it is, however, more than twice that for drinkers at 13% and 6% respectively.

[See Table 7]

Table 1.7 examines the relationship between exposure to the negative consequences of peers' drinking behavior and students' views regarding the importance of academic work. Equation 3.1 focuses on main effects between two variables and equations 3.2 and 3.3 examine moderation effects involving drinking status. The table provides parameter estimates in the form of unstandardized logit regression coefficients that can be transformed to odds ratios. The results reveal that the association between experiencing secondary drinking effects and the importance of academic work is significant only for abstainers (see equation 3.2). For these students, a one unit increase in experiencing negative consequences of peers' drinking behavior increases the expected odds of rating academic work as important by 74%.

The difference between the two beta coefficients discussed in equation 3.2 and 3.3 were analyzed using a chi-square test. The results are significant at the .05 level, but only with a one –

tailed test ( $\text{Chi}^2 = 3.06$  &  $\text{Prob} > \text{Chi}^2 = .08$ ). The amount of variance in rating academic work explained by the variables in the model was also assessed. For the entire sample, the Pseudo  $R^2$  equals 4% for abstainers and 5% for drinkers.

## **Discussion**

This is the first college alcohol study that examines the relationship between secondary drinking effects and a students' college experience. This study focused on determining the extent of second-hand effects of drinking on two student groups: abstainers and drinkers. It examined whether problems were more pronounced for students from a particular subgroup or gender and if minority students are more adversely affected from their peers' drinking behavior in comparison to Caucasian students. Lastly, this study investigated whether the exposure of secondary drinking effects have similar consequences for the grades, social satisfaction, and rating of academic work for all university students, or whether these differed for abstainers and drinkers.

The study's findings indicate that problems associated with high levels of student drinking on college campuses can adversely affect all students. For example, secondary consequences of peers' drinking behavior do not appear to favor one gender over another. Although Caucasian students experience more negative effects of second-hand consequences of peer drinking, relative to minority groups, a sizable proportion of the latter also report they also experience negative consequences of other students' drinking.

Although all students are negatively affected by their peers' drinking behavior, students who abstain from alcohol consumption are more adversely affected in regards to their social and academic trajectories. Two statistically significant findings suggest that the relationships

between experiencing second-hand effects of alcohol consumption and lower academic grades and greater dissatisfaction with life in college are more pronounced for students who abstain.

### **Limitations of the study**

A number of factors may affect the validity of the findings and should be noted. A possible limitation of this study is the lack of temporal order between experiencing negative consequences of peers' drinking behavior on academic grades, satisfaction with life in college, or anxiety about grades. A student may already have low academic grades before experiencing problems with friends' drinking. These students may have poor study habits or take harder classes and they may gravitate toward social groups who actively participate in risky drinking behavior. Thus, the study's results cannot be used to infer a causal relationship between peers' drinking behavior and the outcome variables.

The study is also limited because the data do not include a measures of academic grades in high school and these may differ dramatically for students who abstain relative to Student dissatisfaction with life in their college may be affected adversely by a variety of factors related to their family structure, financial situation, and/or peer group that may also contribute to associating with drinking peers.

Self-report data are another potential limitation. Although the survey was anonymous, some students may have been reticent about reporting the extent of their drinking behavior or their experience of second hand-effects. An extension of the research should include observational data in order to understand more completely the factors that influence student drinking.

Its limitations notwithstanding, this study has many positive attributes. The 2001 College Alcohol Study is a nationally representative sample of college students in the United States. Most previous studies on college drinking have been conducted on single college campuses and

have not used random–sampling of students. Also, several important controls were included in each multivariate analysis in determining whether an association exists between peers' drinking behavior and each outcome variable.

### **Implications of the research**

This analysis clearly shows an association between the negative consequences of peers' drinking behavior on academic grades and satisfaction with life at school. The consequences of college drinking are not limited to serious risks for the drinker, but may adversely affect others in the college environment. The findings, if validated by other research, have a number of implications for college programs and responses to heavy drinking. University programs for alcohol prevention and misuse ought to address the needs of students who abstain, since they constitute majority sizable minority of the student population. The secondary effects of alcohol consumption of college campuses can transform the college environment from one of a jovial academic setting to one where the quality of student life is degraded and scholarship is undermined.

Figure 1

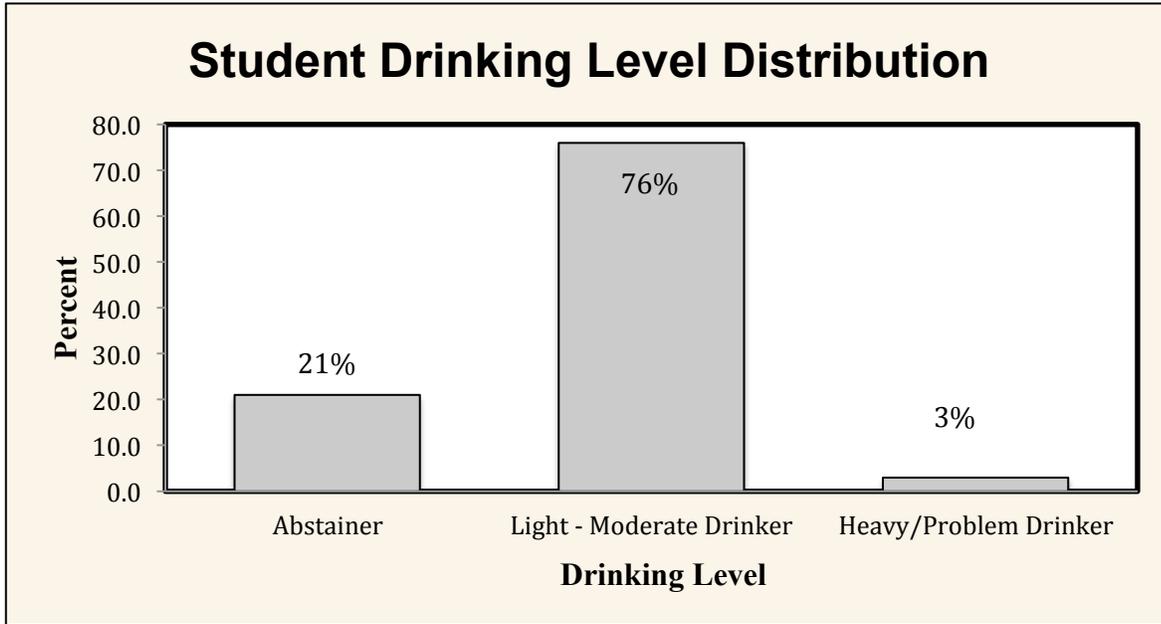
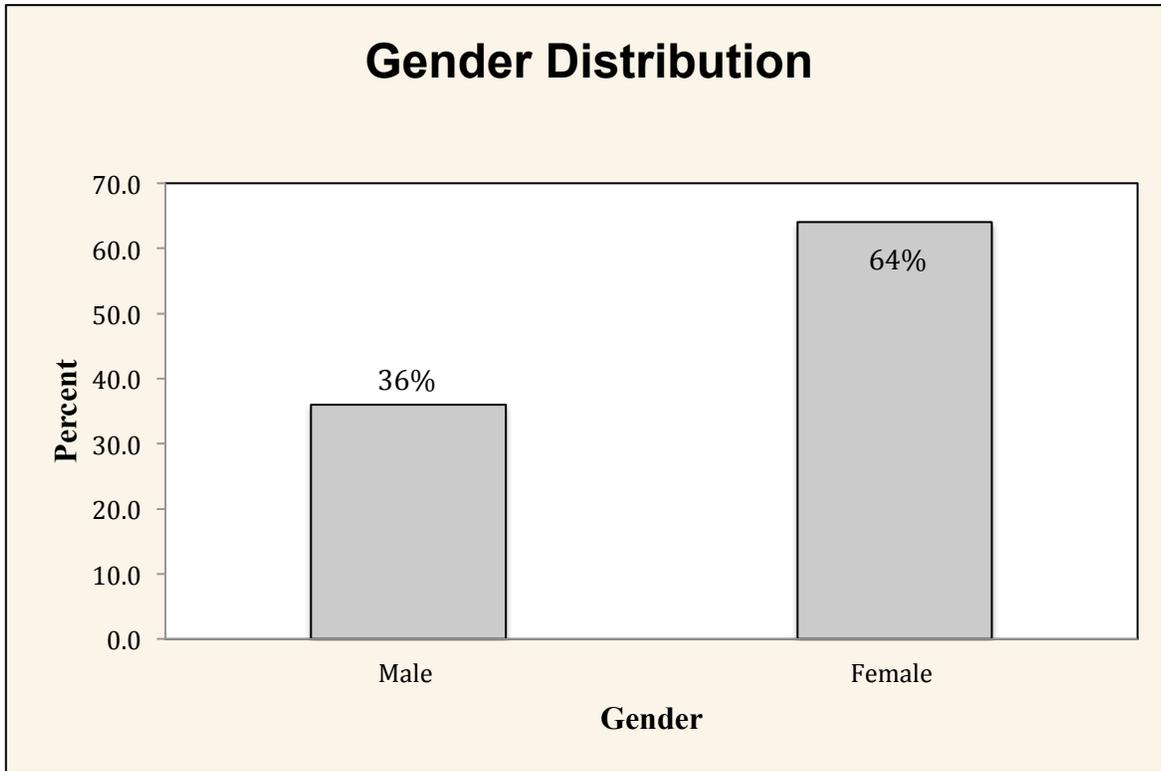


Figure 2



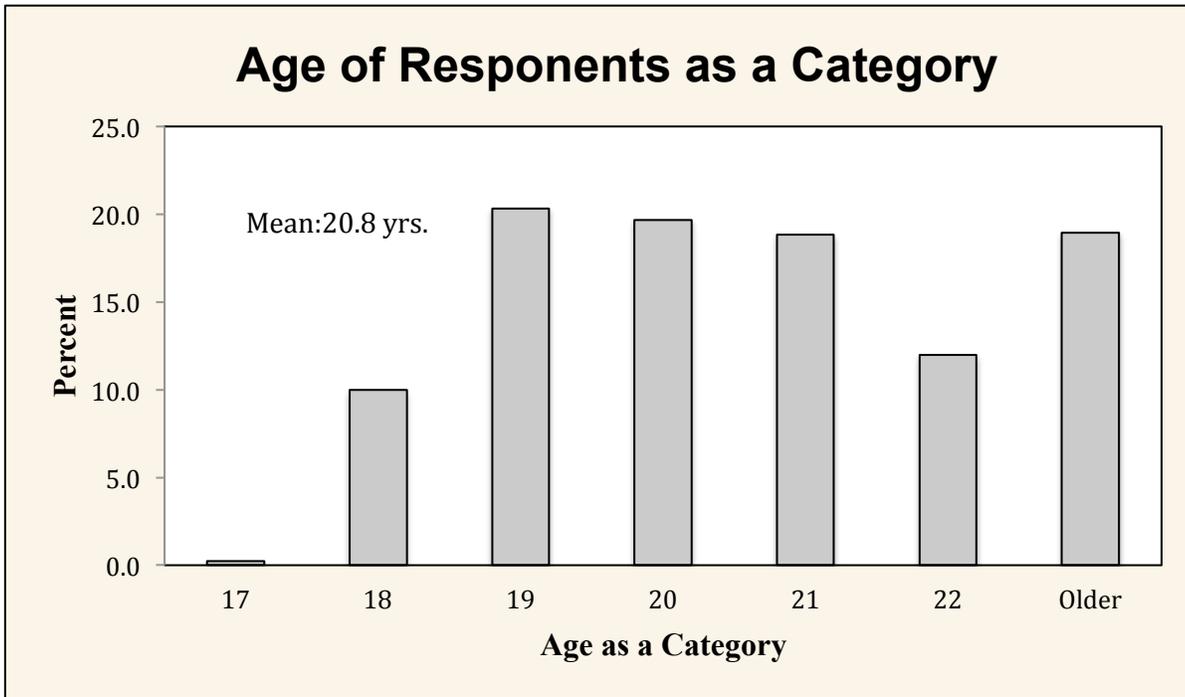


Figure 4

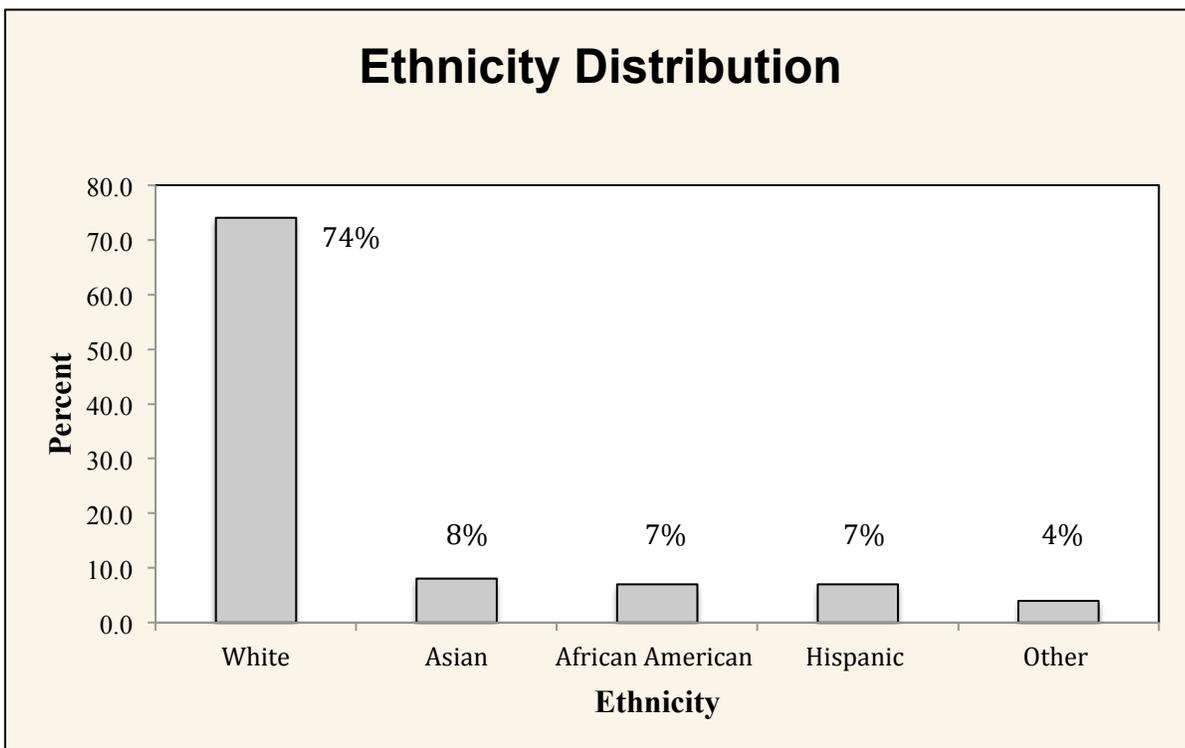


Figure 5

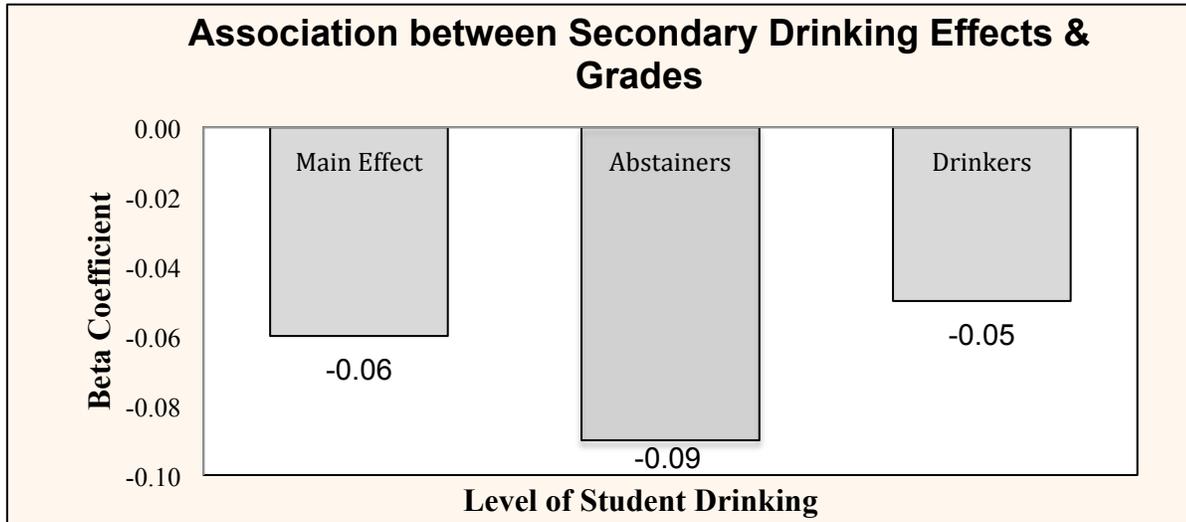


Figure 6

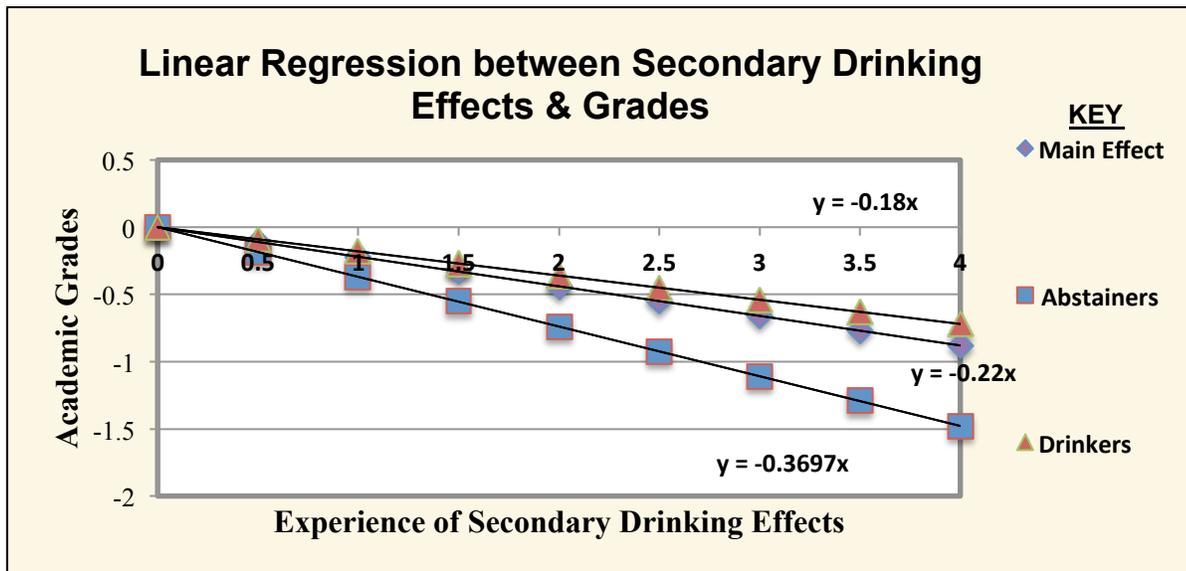
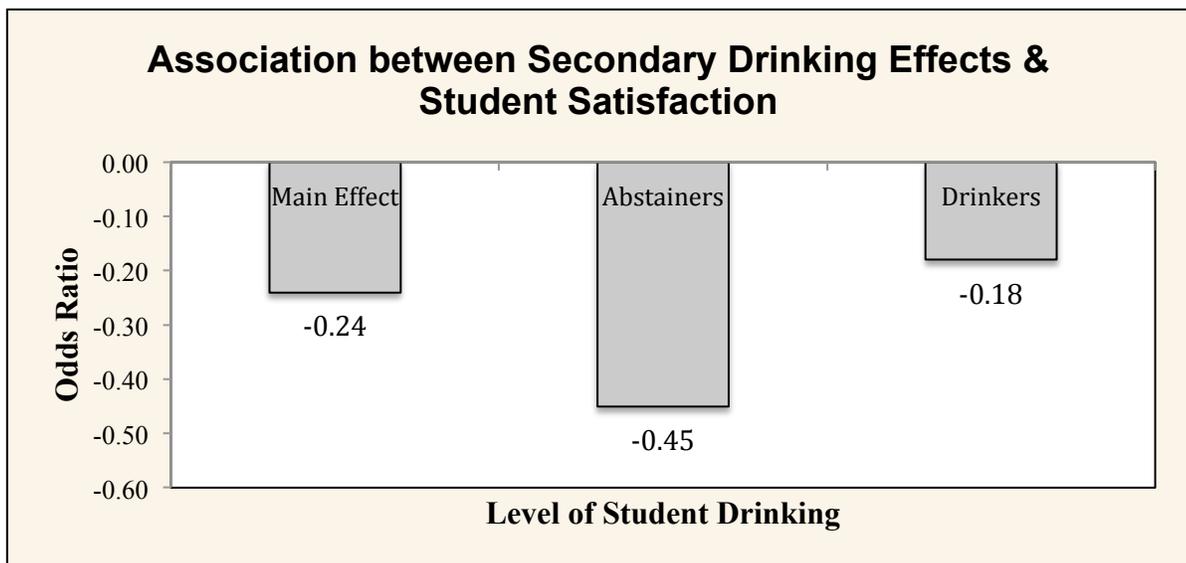


Figure 7



**Table 1.1 Descriptive Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>
Problems related to other students' drinking	1.42	0.46
Average Grade	4.73	1.66

<b>Variable</b>	<b>Percent</b>	<b>Std. Dev.</b>
Importance of Academic Work	95.00	0.21
Satisfaction with Life at School	88.00	0.33
Greek Affiliation	12.00	0.33
Religious Affiliation	15.00	0.35
High school drinks per month	2.17	1.41
Age	20.8	2.04
Parents' Drinking	0.12	0.33
Parents' Education	3.40	0.82
Level of Student Drinking	0.22	0.41

### Distribution of Secondary Drinking Effects

**Table 1.2 Distribution of Secondary Drinking Effects by Student Drinking Level**

<u>Consequence of Peer Drinking</u>	<u>Response Category</u>	<u>Drinkers</u>	<u>Abstainers</u>	<u>Total</u>
<b>Been Insulted or Humiliated</b>	No	n=5,895 70%**	n=1,919 80%**	n=7,784 72%
	At Least Once	n=2,567 30%**	n=469 20%**	n=3,036 28%
	Total	n=8,432	n=2,388	n=10,820
<b>Had a Serious Argument</b>	No	Drinkers n=6,154 73%**	Abstainers n=2,058 86%**	Total n=8,212 76%
	At Least Once	n=2,278 27%**	n=332 14%**	n=2,610 24%
	Total	n=8,432	n=2,390	n=10,822
<b>Been Pushed Hit or Assaulted</b>	No	Drinkers n=7,353 87%**	Abstainers n=2,226 93%**	Total n=9,579 89%
	At Least Once	n=1,076 13%**	n=164 7%**	n=1,240 11%
	Total	n=8,429	n=2,390	n=10,819

<b>Had Property Damage</b>		Drinkers	Abstainers	Total
No		n=7,050 84%**	n=2,108 88%**	n=9,158 85%
At Least Once		n=1,363 16%**	n=279 12%**	n=1,649 15%
		n=8,413	n=2,387	n=10,8
<b>Had to "baby-sit" a student who drank</b>				
No		n=3,595 43%**	n=1,777 74%**	n=5,372 50%
At least Once		n=4,837 57%**	n=609 26%**	n=5,446 50%
Total		n=8,432	n=2,386	n=10,818
<b>Had an Unwanted Sexual Advance</b>				
No		n=6,199 74%**	n=2,106 88%**	n=8,305 77%
At Least Once		n=2,228 26%**	n=282 12%**	n=2,510 23%
Total		n=8,427	n=2,388	n=10,815
<b>Had their Study or Sleep Disrupted</b>				
No		n=4,533 54%**	n=1,548 65%**	n=6,081 56%
At Least Once		n=3,885 46%**	n=837 35%**	n=4,722 44%
Total		n=8,418	n=2,385	n=10,803

**Found Vomit in the residence area**

No	n=5,899 70%**	n=1,873 78%**	n=7,772 72%**
At Least Once	n=2,518 30%**	n=514 22%**	n=3,032 28%
Total	n=8,417	n=2,387	n=10,804

**Been Victims of Sexual Assault**

No	n=8,270 98%**	n=2,366 99%**	n=10,636 98%
At Least Once	n=162 2%**	n=21 1%**	n=183 2%
Total	n=8,432	n=2,387	n=10,819

\*\* p value  $\leq$  .05 (Statistically Significant)

**Table 1.3 Distribution of Secondary Drinking Effects by Ethnicity**

<u>Consequence of Peer Drinking</u>	<u>Response Category</u>	<u>White</u>	<u>African American</u>	<u>Asian</u>	<u>Native American / Other</u>
<b>Been Insulted or Humiliated</b>	No	n = 5, 714 70% **	n = 632 80% **	n = 677 81% **	n = 731 76% **
	At Least Once	n = 2, 499 30% **	n = 159 20% **	n = 160 20% **	n = 212 22% **
<b>Had a Serious Argument</b>	No	n = 6,057 74% **	n = 648 82% **	n = 718 86% **	n = 756 80% **
	At Least Once	n = 2, 158 26% **	n = 143 18% **	n = 119 14% **	n = 187 20% **
<b>Been Pushed Hit or Assaulted</b>	No	n = 7, 260 88%	n = 691 87%	n = 755 90%	n = 839 89%
	At Least Once	n = 952 12%	n = 99 13%	n = 82 10%	n = 105 11%
<b>Had Property Damage</b>	No	n = 6, 833 83% **	n = 725 92% **	n = 742 89% **	n = 821 87% **
	At Least Once	n = 1, 363 17% **	n = 66 8% **	n = 93 11% **	n = 122 13% **
<b>Had to "baby - sit" a student who drank</b>	No	n = 3, 751 46% **	n = 545 69% **	n = 508 61% **	n = 541 57% **
	At Least Once	n = 4, 462 54% **	n = 245 31% **	n = 328 39% **	n = 402 43% **

**Found Vomit in the Residence Area**

No	n = 5, 827 71% **	n = 600 76% **	n = 596 71% **	n = 717 76% **
At Least Once	n = 2, 372 29% **	n = 191 24% **	n = 241 29% **	n = 224 24% **

**Had their Study or Sleep Disrupted**

No	n = 4, 377 53% **	n = 520 66%**	n = 536 64% **	n = 637 66% **
At Least Once	n = 3, 823 47% **	n = 268 34%**	n = 301 36% **	n = 315 33% **

**Had an Unwanted Sexual Advance**

No	n = 6, 169 75% **	n = 614 78% **	n = 722 86% **	n = 767 81% **
At Least Once	n = 2, 040 25% **	n = 176 22% **	n = 115 14% **	n = 176 19% **

**Been Victim of Sexual Assault**

No	n = 8, 046 98%	n = 775 98%	n = 820 98%	n = 920 98%
At Least Once	n = 128 2%	n = 15 2%	n = 17 2%	n = 22 2%

\*\* p value  $\leq$  .05 (Statistically Significant)

**Table 1.4 Distribution of Secondary Drinking Effects by Gender**

<u>Consequence of Peer Drinking</u>	<u>Response Category</u>	<u>Female</u>	<u>Male</u>
<b>Been Insulted or Humiliated</b>	No	n = 5, 023 72%	n = 2, 780 72%
	At Least Once	n = 1, 947 28%	n = 1, 104 28%
<b>Had a Serious Argument</b>	No	n = 5, 353 77% **	n = 2, 883 74% **
	At Least Once	n = 1, 617 23% **	n = 1, 003 26% **
<b>Been Pushed, Hit or Assaulted</b>	No	n = 6, 324 91% **	n = 3, 282 85% **
	At Least Once	n = 646 9% **	n = 601 15 % **
<b>Had Property Damage</b>	No	n = 6, 040 87% **	n = 3, 143 81% **
	At Least Once	n = 914 13% **	n = 737 19% **
<b>Had to "baby - sit" a student who drank</b>	No	n = 3, 365 48% **	n = 2, 023 52% **
	At Least Once	n = 3, 605 52% **	n = 1, 859 48% **

**Found Vomit in the Residence Area**

No	n = 5, 235 75% **	n = 2, 563 66% **
At Least Once	n = 1, 725 25% **	n = 1, 314 34% **

**Had their Study or Sleep Disrupted**

No	n = 3, 885 56%	n = 2, 219 57%
At Least Once	n = 3, 072 44%	n = 1, 661 43%

**Had a Unwanted Sexual Advance**

No	n = 5, 130 74% **	n = 3, 201 82% **
At Least Once	n = 1, 835 26% **	n = 682 18% **

**Been Victim of Sexual Assault**

No	n = 6, 840 98%	n = 3, 830 99%
At Least Once	n = 126 2%	n = 57 1%

\*\* p value  $\leq$  .05(Statistically Significant)

Table 1.5 Ordinary Least Squares Regression, Academic Grades

Variables	Equation 1.1			Equation 1.2			Equation 1.3		
	Coef.	<u>Main Effect</u> Robust Std. Err.	t	Coef.	<u>Abstainers</u> Robust Std. Err.	T	Coef.	<u>Drinkers</u> Robust Std. Err.	t
Experience of secondary drinking effects	-0.22	0.04	-5.26**	-0.37	0.10	-3.79**	-0.18	0.04	-4.03**
Number of high school drinkers per month	-0.07	0.01	-5.54**	-0.09	0.05	-1.88	-0.07	0.01	-5.19**
Student approval of drinking behaviors	0.03	0.03	0.98	-0.01	0.06	-0.11	0.04	0.04	1.00
Age	0.01	0.01	0.54	-0.01	0.03	-0.24	0.01	0.02	0.76
Gender	-0.34	0.04	-9.39**	-0.32	0.08	-4.17**	-0.34	0.04	-8.62**
Year in School	0.10	0.02	4.68**	0.09	0.05	2.04**	0.10	0.02	4.39**
Greek Affiliation	0.02	0.05	0.40	0.18	0.14	1.26	0.00	0.05	0.02
Number of close friends	-0.01	0.01	-0.98	0.00	0.02	-0.21	-0.01	0.01	-1.02
Hispanic	-0.53	0.07	-7.86**	-0.78	0.14	-5.47**	-0.46	0.08	-6.10**
Asian American	-0.30	0.07	-4.55**	-0.39	0.12	-3.20**	-0.27	0.08	-3.20**
African American	-1.06	0.07	-14.32**	-1.24	0.12	-10.48**	-0.97	0.09	-11.29**
Other Ethnicity	-0.27	0.10	-2.72**	-0.24	0.19	-1.30	-0.29	0.11	-2.58**
Religious Affiliation	-0.02	0.05	-0.33	-0.20	0.12	-1.74	0.02	0.05	0.45
Parents' Education	0.17	0.02	7.55**	0.16	0.04	3.62**	0.17	0.03	6.58**
Parents' Drinking Behavior	-0.04	0.05	-0.82	-0.12	0.12	-0.97	-0.03	0.06	-0.46
Student Drinking Level	0.30	0.05	6.43**						
_cons	4.37	0.30	14.59	5.35	0.59	9.13	4.20	0.34	12.24
Number of obs	9195.00			1854.00			7307.00		
F( 15, 1838)	37.71			14.19			26.99		
Prob > F	0.00			0.00			0.00		
R-squared	0.06			0.10			0.05		
Adj R-squared	N/A			0.10			0.05		
Root MSE	1.60			1.56			1.61		

\*\* p value  $\leq 0.05$  (Statistically Significant)

**Table 1.6 Logistic Regression, Student Satisfaction with Life at School**

Variables	Equation 2.1 <u>Main Effect</u>			Equation 2.2 <u>Abstainers</u>			Equation 2.3 <u>Drinkers</u>		
	Coef.	Robust Std. Err.	z	Coef.	Robust Std. Err.	z	Coef.	Robust Std. Err.	z
Experience of secondary drinking effects	-0.27	0.07	-3.59**	-0.58	0.18	-3.29**	-0.20	0.08	-2.41**
Number of high school drinkers per month	-0.06	0.02	-2.43**	0.02	0.09	0.26	-0.07	0.03	-2.68**
Student approval of drinking behaviors	0.44	0.07	6.07**	0.66	0.14	4.70**	0.34	0.08	4.02**
Age	0.11	0.03	4.17**	0.16	0.06	2.54**	0.10	0.03	3.35**
Gender	-0.26	0.07	-3.87**	-0.13	0.17	-0.76	-0.29	0.07	-3.84**
Year in School	-0.01	0.04	-0.24	-0.07	0.10	-0.74	0.00	0.04	0.08
Greek Affiliation	0.56	0.12	4.66**	0.39	0.34	1.13	0.59	0.13	4.60**
Number of close friends	0.36	0.02	16.89**	0.42	0.05	8.70**	0.35	0.02	14.83**
Hispanic	-0.10	0.13	-0.74	0.21	0.33	0.63	-0.15	0.14	-1.06
Asian American	-0.40	0.12	-3.17**	-0.48	0.25	-1.89	-0.36	0.15	-2.47**
African American	-0.65	0.12	-5.55**	-0.76	0.22	-3.51**	-0.62	0.14	-4.56**
Other Ethnicity	-0.34	0.17	-2.01**	-0.91	0.31	-2.95**	-0.11	0.20	-0.55
Religious Affiliation	-0.12	0.09	-1.32	-0.17	0.22	-0.77	-0.10	0.10	-1.06
Parents' Education	-0.04	0.04	-0.08	0.06	0.09	0.70	-0.03	0.05	-0.55
Parents' Drinking Behavior	-0.22	0.10	-2.28**	-0.44	0.23	-1.90	-0.18	0.10	-1.76
Student Drinking Level	0.24	0.10	2.66**						
_cons	-1.77	0.09	-3.13	-3.02	1.31	-2.30	-1.32	0.63	-2.08
Number of obs	9383.00			1897			7450		
Wald chi2(15)	498.67			173.1			352.4		
Prob > chi2	0.00			0			0		
Pseudo R2	0.07			0.1328			0.0624		

\*\*p value  $\leq$ .05 (Statistically Significant)

Table 1.7 Logistic Regression, Importance of Academic Work

Variables	Equation 3.1			Equation 3.2			Equation 3.3		
	Coef.	<u>Main Effect</u> Robust Std. Err.	z	Coef.	<u>Abstainers</u> Robust Std. Err.	Z	Coef.	<u>Drinkers</u> Robust Std. Err.	z
Experience of secondary drinking effects	0.25	0.15	1.68	1.01	0.44	2.27**	0.15	0.15	1.01
Number of high school drinkers per month	-0.13	0.04	-3.19**	-0.23	0.12	-1.92	-0.11	0.04	-2.87**
Student approval of drinking behaviors	0.07	0.11	0.62	-0.10	0.19	-0.52	0.19	0.14	1.42
Age	-0.09	0.04	-2.19**	-0.04	0.09	-0.43	-0.08	0.04	-1.96**
Gender	-0.60	0.11	-5.41**	-0.55	0.26	-2.15**	-0.60	0.12	-4.96**
Year in School	0.01	0.06	0.17	0.04	0.14	0.27	-0.03	0.06	-0.40
Greek Affiliation	0.65	0.22	3.00**	-0.30	0.48	-0.62	0.77	0.24	3.22**
Number of close friends	0.07	0.03	2.12**	-0.03	0.08	-0.32	0.11	0.04	2.80**
Hispanic	-0.23	0.19	-1.17	-0.50	0.43	-1.16	-0.13	0.22	-0.62
Asian American	-0.68	0.18	-3.79**	-0.55	0.38	-1.47	-0.79	0.20	-3.87**
African American	-0.02	0.23	-0.09	-0.29	0.39	-0.73	0.06	0.28	0.22
Other Ethnicity	-0.63	0.25	-2.55**	-0.62	0.55	-1.12	-0.63	0.27	-2.31**
Religious Affiliation	-0.14	0.14	-1.02	-0.32	0.36	-0.90	-0.08	0.16	-0.51
Parents' Education	0.19	0.06	3.03**	0.10	0.14	0.70	0.23	0.07	3.30**
Parents' Drinking Behavior	0.10	0.17	0.62	-0.38	0.38	-1.00	0.18	0.18	0.98
Student Drinking Level	0.12	0.15	0.79						
_cons	4.15	0.90	4.65	3.59	1.92	1.87	3.68	0.97	3.81
Number of obs	9257.00			1875.00			7406.00		
Wald chi2(15)	144.71			24.80			120.70		
Prob > chi2	0.00			0.05			0.00		
Pseudo R2	0.04			0.04			0.05		

\*\*p value  $\leq .05$  (Statistically Significant)

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