2006-07-19

Alcohol Use and Religiosity Among College Students

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ALCOHOL USE AND RELIGIOSITY AMONG COLLEGE STUDENTS

by

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A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Sociology

Brigham Young University

August 2006

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

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As chair of the candidate's graduate committee, I have read the dissertation of Deena King in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) it illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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ABSTRACT

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Alcohol use among college students is often in the news. Some scholars argue, with literature to support it, that problem drinking in college is just a media-driven myth (Lederman et al. 2004). Yet it is clear that college students do drink, some to excess. Various reasons are cited from alcohol availability to the "freedom" associated with this stage of life. However, very few researchers have attempted to determine whether religiosity affects alcohol use among college students. The purpose of this study was to further examine the combined issues of religiosity and alcohol use among college students. Is excessive use of alcohol during this time of life simply an adult transition issue, as Jackson et al. (2005) contend, or is there more to it? Research seems to point to the fact that religiosity plays a role. The primary hypothesis tested was that students who valued religious activities as part of their college experience would use alcohol less, including binge drinking, than those who did not. The second hypothesis tested was that

students who valued parties and Greek life would use alcohol and binge more than students who did not. The data set used was constructed by the Harvard School of Public Health and included data from 120 four-year colleges and universities from throughout the United States. The analysis supported the hypothesis that religiosity was a factor in reduced alcohol use by college students. College students who valued religious activities drank less than those who did not. The study also supported the hypothesis that students who valued parties and Greek life drank more. The heaviest drinkers were those who valued parties. These results are highly significant given the size of the sample. No other study that looked at religiosity and alcohol use among college students used a sample this large. These results help us to better understand the negative association between religiosity and alcohol use among college students as well as the positive association between parties and alcohol use. They especially help us to formulate strategies that might be considered to alleviate problem drinking during this stage of life.

ACKNOWLEDGMENTS

I would like to thank every professor I had during the past four years of my graduate studies: Vaughn Call, Carol Ward, Lynn England, Stan Knapp, Ralph Brown, Howard Bahr, Renata Forste, Marie Cornwall, Kate Kirkham, John Hoffmann, and David Paulsen. Each one of you taught me things I did not know and helped me to see the world through different eyes. I am grateful to you all.

I would especially like to single out my graduate chair, John Hoffmann, and my graduate committee, Stephen Bahr and Howard Bahr. I thank each of you for the hours and hours you spent supporting me through my studies and for the outstanding help you gave me with this project. I am now a "master" of sociology because of your expert assistance. Thank you.

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Alcohol Use and Religiosity among College Students

INTRODUCTION

Each year the *Princeton Review* comes out with its annual college rankings. It rates colleges on criteria including politics, school administration, quality of life, academics, and "parties." Partying includes two opposing categories, "Party On" and "The Party Has Left the Building." The latter category includes a group of schools that have been classified as "stone cold sober," such as Brigham Young University and Wheaton College. Two "party on" classifications include "lots of beer," such as Washington and Lee University and the University of Wisconsin-Madison and "lots of hard liquor," such as, again, Washington and Lee University and Tulane University.

Alcohol use and heavy drinking by college students is often in the news. Some scholars argue, with literature to support it, that problem drinking in college is just a media-driven myth (Lederman et al. 2004). Nevertheless, numerous studies have looked at this problem. A review of sociological literature looking at college students and various descriptors related to 'alcohol use' resulted in approximately 200 references. Issues addressed included binge drinking, alcohol use and academic performance, prevention, and gender differences (Aertgeerts, et al. 2002, Lugo 2004, Madison-Colmore, et al. 2003). A review of psychology, family science, and health literature revealed even more references regarding college drinking. Very few sociologists, however, have attempted to determine whether religiosity affects alcohol use among college students. This is interesting considering the fact that two of the *Princeton Review's* top three "stone cold sober" schools in 2006 have religious affiliations.

Recognition of some of the characteristics of young people who are in college, some away from home for the first time, has led some researchers to argue that excessive drinking by college students has more to do with this stage of life transition than college itself. (One researcher has labeled this period in life "emerging adulthood" (Arnett 1998).) White et al. (2005), for example, tested the hypothesis that college students drank more than their non-college peers and experienced more negative consequences as a result. They found that while there were similarities and differences between college students and their non-college peers with regard to alcohol use, there was no significant difference in quantity and frequency of drinking between college students and their non-college counterparts. Jackson et al. (2005) also found that non-college students drank as excessively as college students. However, Crowley (1991) determined that college students drank more than high school drop-outs and high school graduates, but also noted that non-college students drank more on a daily basis than college students. These researchers argued that this variance was due to "social class life style differences" rather than college.

Young Adults and Religion

Arnett and Jensen (2002) argued that young adults formed their spiritual and religious beliefs "independently with little influence from their parents or religious institutions." This resulted in a wide diversity of beliefs that were highly individualized. Moreover, they classified young adult beliefs into four different categories, including atheist, deist, liberal Christian, and conservative Christian. In addition, those who were not members of a particular category still gave religious issues a lot of thought. Arnett

and Jensen contended these young adults actually worship in a "congregation of one" because they observed their beliefs by themselves "in the privacy of their own hearts and minds."

Barry and Nelson (2004) asserted that the university is one place where young adult behavior can be explored. In a study which looked at 18-20-year-olds at a private university affiliated with The Church of Jesus Christ of Latter-day Saints (i.e. "The Mormons"), a private Jesuit University, and a public university, they explored the role religion played in the lives of young adults and found that that the students at the public university had not settled on their religious beliefs and had not felt that they had "achieved" adulthood yet. The Catholic students were much the same. The Mormons, however, seemed to be working towards adopting their respective beliefs rather than exploring them and saw themselves as in the process of achieving adulthood to a greater extent than those attending the other schools. This study is especially relevant to the issue of religiosity and alcohol use among young adults because it took a cursory look at alcohol use across the three groups. One result was of particular interest. When asked if they avoided becoming drunk, 20% of Catholic students and 31% of public university responded "Very True," while 97% of the Mormon student's avoided becoming drunk. This statistic suggests that belonging to a religion, any religion, may not be a determining factor in alcohol use. Rather the beliefs and prescriptions of a particular religion may be what determine alcohol use (Ghunney et al. 1999).

Adolescents, Religion and Alcohol Use

Although the focus of this study was college students, it was also important to consider studies of adolescents, religion, and alcohol use, because many younger college students are still considered adolescents. Several studies noted that the level of religiosity among adolescents was significantly associated with alcohol use: Those who reported higher levels of religiosity tended to abstain more and drink less than other adolescents (Hadaway et al. 1984, Amoeteng and Bahr 1986, Cochran 1992, Chadwick and Top 1993, Free 1994, van Hulst and Madray 1997, Rodell and Benda 1999, Brown et al. 2001, Mason and Windle 2002, and Marsiglia et al. 2005). Kutter and McDermott (1997) found there was actually a positive relationship between religious proscriptiveness of alcohol use and binge drinking among adolescents who had used alcohol. They observed that the highest incidence of binge drinking was reported by adolescents who were affiliated with proscriptive religious groups, but that the lowest incidence of alcohol use was among adolescents who considered participation in proscriptive religious groups as very important. Despite this paradox, they concluded that religious affiliation may be an important vehicle for drug education.

Several theories are relevant in the literature on alcohol use in adolescence, early adulthood, and among college students. One theory involves variation in social control and social bonds. This theory states that any social mechanism that prevents people from deviating from social norms constitutes a social control or bond (Burcu 2003). Thus, social controlling aspects of society include positive family relationships, educational achievement, involvement in conventional activities, and participation in religious activities. Lo and Globetti (1993) used a theoretical model of personal control that

develops as a result of social control. They asserted that personal control systems develop as young people are exposed to social beliefs and ideas. In particular, they maintained that college drinking patterns are a result of exposure to positive and negative experiences during their first drinking experience. They tested this hypothesis by looking at alcohol use by black college students in the Deep South. They found that parental normative guidance and family religious affiliation – two social control variables - constrained problem drinking during the college years. Normative guidance was defined as those students whose parents were present or whose parents knew the adults present during the student's first drinking experience. Students who received such guidance were less likely to engage in problem drinking during college. Additionally, students whose families belonged to a religion that discouraged drinking were also less likely to have drinking problems during college.

Another study looked at how family social support affected drinking among adolescents. Mason and Windle (2001) concluded that family social support – defined by a 20-item measure that included statements such as "My family gives me moral support" and "My family comes to me with problems" – influenced other variables including religiosity, peer alcohol use, and education. Religiosity was measured by asking participants to rate how important their religion was to them and how often they attended church services. Family social support positively affected religiosity which in turn negatively affected alcohol use.

Another popular concept involves the social context of the drinking environment. Social context is characterized by Stark (1996) as "communities where a majority of the people are 'fill-in-the blank.'" Stark fills in the blank with "religious," but this argument

could easily be extended to drinkers, delinquents, or any other number of categories. Mooney et al. (1991) looked at “drinkers” and theorized that there is more drinking by college age students in an area that is noted for drinking. They compared “drinks per drinking occasion” and “drinks per month” in two areas—one in a Louisiana community that was a known drinking culture and another in Iowa that was not. There was modest support for this theory—students in Louisiana drank slightly more than those in Iowa. However, when non-drinkers were removed in the Iowa sample, the means for both variables went up—there were more abstainers in Iowa. The evidence suggested that this was due to religious beliefs—more students in Iowa had Protestant parents than in Louisiana.

Engs et al. (1990) assessed cultural factors by comparing U.S. and Canadian college students. They stratified their sample into four groups: Catholic, Protestants allowed to drink, Protestants not allowed to drink, and Jews. They concluded that “social context” equaled culture and that, the U.S. “melting pot”—where individuals “socially interact and merge into the fabric of American society” versus the Canadian “mosaic”—where different groups tend to “maintain their cultural identities”—had an effect on alcohol use by members of religious groups that were less cohesive. They found that U.S. students consumed more alcohol than Canadian students in all categories with one notable exception. Protestants whose religion prohibited drinking drank less than all the other U.S. and Canadian religious categories of drinkers.

Stark (1996) argued that religious social context is a key factor. He found a strong negative correlation between delinquency among adolescents (including drinking and drug use) and the strong religious context in the east (where the communities are

highly religious), and a weak negative correlation in the weak religious context in the west (where the communities are not highly religious). He admitted, however, that region was not the best measure of religious climate. Cochran and Akers (1989) found that when religious standards condemned a particular act, alcohol use was minimized. They attributed this finding to religious social context and religious social control, but argued it had little to do with the overall environment. In fact, they found very little support for the "moral communities" hypothesis. Rather, the direct beliefs and norms of the religious group affected the propensity to use alcohol regardless of the general religious climate.

Another group of studies viewed religiosity as a key aspect of social control (Poffenberger et al. 1958, Kliger 1994, Nowicka 1996, Bonta 1996, and Riegel 2000). McIntosh et al. (1982) found that religiosity was one of the more powerful social controls with respect to drug use. However, as the frequency of drug use increased, all social controls, including religion, had less influence. Free (1994), in an exploration of social control and drug use, found that religiosity and religious conservatism were negatively correlated with alcohol use, marijuana use, and polydrug use. He concluded that religious participation functions as a social control that attenuates drug use.

Religiosity has also been conceptualized as a social learning mechanism. Social learning theory postulates that behaviors are learned via social connections, such as parents and peers (Bandura 1977). Evans and Dunn (1995), in a study of 157 college students, found considerable support for the application of social learning theory principles to the drinking practices of college students. In a cogent description of social learning and drug use, Hunsberger (1983) wrote, "When applied to religion the theory

argues that religious attitudes and behavior are learned, typically being transmitted within families and specific religious groups." He goes on to note that Roof and Hoge (1980) found that some elements of social learning theory were supported in their study of church involvement in America. It appeared that some religious groups, such as conservative Protestants, were able to obtain deeper commitments from their members than other groups. O'Conner, Hoge, and Alexander (2002), in a study that looked at church activity of a group of 38-year olds who were first studied at age 16, found that social learning theory was important in explaining both personal and church involvement through the years. O'Conner and Perreyclear (2002) found that social learning in the form of religious services and meetings at a South Carolina prison was an important factor in the process of offender rehabilitation because as religious involvement increased, the number inmate infractions decreased.

College Students, Religion and Alcohol Use

In the few studies that focused primarily on college students and alcohol use, no particular theory was dominant. A few studies considered religiosity indirectly in relation to alcohol use among college students, but they did not find a connection primarily because that was not the primary focus of the study (DeBruyn 2002, Roberts, Koch, and Johnson 2000, Ginn et al. 1998, Hughes and Dodder 1995). For instance, Debruyn (2002) focused on a "sense of coherence" and its respective relationship to religiosity and alcohol rather than the relationship between the latter two variables and Roberts et al. (2000) focused on self-efficacy and how it affected religiosity and alcohol use.

Forthun et al. (1999) used arousal theory to explore whether college students who are most likely to engage in risk behaviors such as alcohol use are less likely to belong to a religious group. Arousal theory posits that some people are "predisposed" to risky behavior, including substance use, because of "suboptimal neurological arousal" (Ellis 1987) which causes them to seek sensate experiences. Forthun et al. attempted to explain the relationship between religiosity and "sensation seeking" (Schall et al. 1992) and how each, together and independently, influenced legal and illegal substance use. Religiosity was measured by asking about respondents' religious affiliations and how often they participated in church activities. The researchers found that sensation seeking had no impact on a person's religiosity or alcohol use, but that religiosity was an independent predictor negatively associated with alcohol use. Their results supported those of previous studies that religiosity has a negative correlation with risky behaviors, including substance use (Cochran and Ackers 1989).

Perkins (1985) found that "strength of faith," using a five point scale ranging from not important at all to the most important thing in life, negatively predicted alcohol consumption, but that it ranked third behind "friend's attitudes" and "fraternity membership." Slicker (1997) explored the reasons why college students do not drink by dividing the sample into four groups based on consumption level. The results showed that "light drinkers" cited religious-moral reasons for not drinking more often than any other category of drinkers. A study by Patock-Peckham et al. (1998) showed that students with no religious affiliation drank more than others. The researchers concluded that intrinsic religiosity— how much a person's ego is involved with the tenets of religion—played an important role in minimizing drinking behavior, particularly for

Protestants. In addition, college women who attended church regularly were more likely to abstain from drugs and alcohol than occasional church-goers (Humphrey, Leslie, and Brittain 1989).

In summary, the literature seems to indicate support for the theory that religion provides both a social control and a source of social learning. Religion helps college students avoid alcohol because they do not wish to violate the norms or social controls established by their faith or their parents' faith. Yet these norms have been taught by and socialized through their involvement in their religious group. The process by which parents and other family members socialize children to follow the dictates of their religion affects their later propensity to use alcohol. Thus, it appears that religion affects current use of alcohol among college students because (1) they have learned the norms of their religious groups and (2) they have internalized the norms of these groups and continue to subscribe to them. Even if these norms do not prohibit alcohol use, they seem to lead to more temperate use and diminish the likelihood of excessive alcohol consumption, such as binge drinking.

RESEARCH QUESTION AND HYPOTHESIS

Based on previous literature, it appears that among college students there is a consistent negative association between religiosity and alcohol use (Perkins 1997, Slicker 1998, Humphrey et al. 1989, Patock-Peckham et al. 1998, Barry and Nelson 2005). An important question is whether additional research on this question will replicate previous findings. This is important because all the earlier studies of alcohol use among college students had limitations. One was sample size. Patock-Peckham et al.'s (1998) study included 263 cases, Humphrey et al.'s (1989) study used 1,097 cases, and Barry and

Hansen (2005) sampled 445 students from three schools. Kutter et al.'s (1997) assertion that proscriptive religions result in more incidents of adolescent binge drinking than moderate or non-proscriptive religions was based on a sample that included only 238 respondents from two Midwestern cities. While these samples are not insignificant, a much larger sample could provide additional insight.

The purpose of this study was to examine further the relations among college students, religiosity, and alcohol use. Is excessive use of alcohol during this time of life simply an adult transition issue, as Jackson et al. (2005) contend, or is there more to it? Research seems to suggest that religiosity plays a role. When young people move away from the influence of their parents and guardians, they are theoretically free to explore different lifestyles and behaviors. This study explored whether college students who valued religious activities tended to drink less than those who did not. I also compared the frequency of drinking among those who valued Greek life and parties to determine if these values help uncover additional patterns of drinking among college students. Finally, I examined whether religious affiliation affected student drinking behavior as suggested by the fact that two of the *Princeton Review's* top three "stone cold sober" schools are associated with religious organizations.

Using data from 14,000 respondents from 120 colleges and universities I tested the following hypothesis: students who see religion as an important part of their college experience use alcohol less than others because many religious students hold beliefs that discourage the use of alcohol. In other words, those who are religious drink less. Although I do not fully adjudicate between the social learning and social context theoretical positions, I suggest that the religious beliefs and values that some college

students internalize as part of their maturation reduce general drinking behavior and problematic forms of use, such as binge drinking. On the other hand, some students come to see activities such as academics, partying, or membership in a fraternity or sorority as important (Cashin et al. 1998; Harrington et al. 1999; Read et al. 2002; Lederman et al. 2004). I expected these students, especially those who thought parties or Greek life were important activities, to drink more than others, supporting Hagan's (1991) finding that a significant part of adolescent party subculture is drinking.

One additional issue is that some students who value fraternity and sorority life and attend parties also value religious activities. Therefore, I hypothesized that religion and partying, Greek life and partying, and religion and Greek life interacted to affect alcohol use. In particular, those who valued partying or belonging to a Greek organization and valued religion drink less than those who valued Greek life or parties but did not value religion.

Before beginning the analysis, it is important to address one facet of alcohol use. In the literature, one drink each day for 30 days is normally considered to be a different behavior than 6 drinks in a row on 5 different occasions in the same 30-day period. Yet, both frequency measures equal an average of 30 drinks per month. By definition, five or more drinks in a row is considered binge drinking; thus, in addition to average alcohol use, I also considered binge drinking (Young et al. 2005). Therefore, I hypothesized that students who saw religion as an important part of their college experience were less likely to binge-drink.

METHODS

Data

I used a data set from the Harvard School of Public Health containing data from 120 U.S. four-year colleges and universities. The sample is very large and nationally representative. The data were collected in 1999 using mail-back questionnaires from students randomly selected based on their school size. The response rate was 59% and over 14,000 responses were coded. However, there is one limitation—data collected on religious affiliation was overly broad (the categories were None, Catholic, Protestant, Jewish, Islam, and Other). Nevertheless, this data set was chosen because it included detailed information on alcohol use and measures of the importance of religious activity versus other activities that students thought important to their college experience.

Measures

The two dependent variables measured average 30-day drinking and binge drinking. The first dependent variable was based on the following constructed variable that was included in the data set: "Average number of drinks in the past 30 days." This variable combined the last time students drank with the number of occasions they drank and how much they drank on those occasions. For the purpose of this study, this variable was rounded to the nearest whole number.

A frequency distribution (not shown) indicated that 4,652 (32.9% of respondents), or almost a third of the sample, did not use any alcohol in the previous 30 days and only 18, or .1%, used it 320 times (the maximum). Because this variable clearly did not follow a normal distribution, I took the natural logarithm to normalize it. The descriptive statistics for the transformed variable are shown in Table 1.

Table 1. Descriptive Statistics of 30-day alcohol use (logged)

	Mean	Standard Deviation	Minimum	Maximum
Log of Average number of drinks last 30 days*	1.889 (5.613)	1.639 (4.15)	0.00	5.89 (360.405)

*n=13,921

Note: Numbers in parentheses equal EXP(mean)-1

The mean of 1.889, as shown in Table 1, indicated that, on average, college students drank approximately 5.613 drinks over a 30 day period with a minimum of 0 drinks to a maximum of 5.89, or 360.405 drinks. The standard deviation was 1.64, or 4.155 drinks.

The second dependent variable, binge drinking, was based on a question that asked, "Think back over the past two weeks. How many times have you had five or more drinks?" There were six response categories: None (1), Once (2), Twice (3), 3 to 5 times (4), 6 to 9 times (5), and 10 or more times (6). The mean for the binge drinking variable was 1.897 (between "None (1)" and "Once (2)").

The three main independent variables were based on a question that assessed how much students valued certain activities during their college years. It read, "How important is it for you to participate in the following activities at college?" Nine activities were listed. Students were asked to respond to each activity using a 4-point scale: Very Important (1), Important (2), Somewhat Important (3), Not at all Important (4). Table 2 provides an overview of the "important activities," including frequencies. As shown, the most valued activity at college was "Academic Work." It had the largest frequency of "Very Important" (10,666) responses and also of combined "Very Important" and "Important" (13,546) responses.

Table 2. Frequencies of Valued College Activities

Rank	"Very Important"	"Very Important" plus "Important"
1	Academic Work (10,666)	Academic Work (13,546)
2	Religion (3,011)	Community Service (6,341)
3	Athletics (1,733)	Religion (5,886)
4	Community Service (1,602)	Parties (4,915)
5	Arts (1,528)	Attend Sports Events (4,744)
6	Attend Sports Events (1,369)	Athletics (4,148)
7	Parties (1,318)	Arts (3,830)
8	Greek Life (632)	Political (2,218)
9	Political (436)	Greek Life (1,679)

It is notable that in the "Very Important" category, religion came in a distant second, behind academic work and ahead of parties and Greek life. The combined frequency for "Very Important" and "Important" showed community service second and religion third, both ahead of parties and Greek life, which came in last.

Three activities were of interest in this study: "Parties," "Fraternity or sorority life" (Greek life), and "Religion." The variables that measured these activities constituted the three primary independent variables. The question, "How important is it for you to participate in religious activities?" has been successfully used in previous studies as a measure of private religiosity (Bahr, Maughan, Marcos, and Li 1998; Thomas 1997). In addition, Bahr et al. (1998) found that this measure correlated well with how often a person attended religious services.

Each of the above variables, Greek, Religion, and Parties, was recoded so that "Not at all Important" was coded as 1 and "Very Important" was coded as 4. This made the interpretation of coefficients simpler. If parties were important, a positive association with the number of drinks was expected: the more a student valued parties, the more

drinks they were expected to have. If religion was important, a negative association was expected: as the student valued religion more, less drinking was expected to result.

Control variables were age in years, race, religious denomination, and gender. Race was measured as White, Black/African American, Asian/Pacific Islander, and Native American Indian/Native Alaskan/Other. The omitted reference category was White students. Religious denomination in which a student was raised in was coded as None, Catholicism, Judaism, Islam, Protestantism, and Other. The omitted reference category was None. Gender was coded as male (0) and female (1). One additional control variable, the importance of academics, was added because initial frequencies showed this activity ranked as most important to the students who participated in this study. Scores ranged from "Not at all Important" (coded as 1) and "Very Important" (coded as 4).

Several factors that could have influenced the proposed associations were taken into consideration. First, the data set captured demographic data on each student as well as drinking behavior of parents and family attitudes towards alcohol. This information was important because family attitudes may tap into social learning in the family and have an impact on how Greek life/religion/parties affect alcohol use in college. The following variables were considered: family feelings about alcohol use and the father's and mother's alcohol use. It turned out that neither of these variables noticeably influenced how the three primary independent variables affected alcohol use so they were not included in the model.

Second, it was possible that young adulthood alone has a significant influence on alcohol use and Greek life/Parties/Religion. Do students drink more than they did in high

school because they are no longer as dependent on parents and guardians? Will alcohol use in high school affect the association between valued activities and current levels of alcohol use? The data set included a variable on how often the student drank in high school ("During your last year in high school, how often did you drink alcohol during a typical month?"). Responses ranged from "Never" (codes as 1) to 40 or more times (coded as 7).

Third, there was also the possibility that a college's religious affiliation might influence the results. Consequently, the schools were classified into two categories: no religious affiliation (coded 0) and religious affiliation (coded 1).

Fourth, as mentioned earlier, there was the concern that there might be an interaction among the variables that assess participation in religion, parties, and Greek life. Therefore, three two-way interaction variables were created from these three variables and included in the model. Only the religion-parties and the Greek life-parties interactions proved significant.

Fifth, the data set included the following question: "If you choose not to drink at all or limit your drinking, how important are each of the following reasons for you?" Eighteen reasons were listed including "drinking is against my religion," "drinking is against my values," "my friends don't drink," and "drinking is bad for my health." These were measured on the four-point scale ranging from very important to not at all important. These variables measure dimensions of social control, social context, and social learning attributes and are likely to affect Greek life/Parties/Religion and why students may choose to limit their drinking. Each of the above variables was recoded so that "Not at all Important" (coded as 1) and "Very Important" (coded as 4). If "against

my religion" was important, there should be a negative association with alcohol use. When all eighteen reasons were tested one-by-one in the models, only the "drinking is against my religion" and "drinking is against my values" variables had a noticeable effect on the three primary independent variables as they related to alcohol use.

Sixth, it is possible that school policy influenced the results. Some schools have much stricter alcohol use policies than others. The data set included a question that asked about the school's policy on alcohol use on campus. The responses ranged from "don't know" (coded 6) to "alcohol prohibited for everyone" (coded as 1). These were recoded so that "don't know" was 1 and "prohibited" was 6. This variable did not noticeably influence how the constituent variables affected alcohol use so it was not included in the final models.

Finally, it was possible that underlying a student's choice to limit alcohol use was a negative attitude towards alcohol use in general; this might have influenced how Greek life/Parties/Religion affected alcohol use. The data set included several questions that measured positive or negative attitudes toward alcohol use. These variables are listed in Table 3.

Table 3. Questions Used to Create the Latent Variable "Negative Attitude towards Alcohol"

B1. Do you think alcohol use is a problem for students on your campus? (Recoded: 1=Not a problem; 2=A minor problem; 3=A problem; 4=A major problem.)
B15. To what extent do you support or oppose the following possible school policies or procedures? (Recoded: 1=Strongly Oppose; 2=Oppose; 3=Support; 4=Strongly Support.)
a. Prohibit kegs on campus
b. Offer alcohol-free dorms
d. Ban advertisements of alcohol availability at campus events and parties
g. Enforce the alcohol rules more strictly
h. Crack down on drinking at sororities and fraternities
j. Crack down on under-age drinking

These variables were recoded so that negative attitudes were scored high rather than low. For example, if a student felt alcohol was a "major problem," the response was recoded to a 4 instead of a 1. Then, each of these responses was combined based on a factor analysis to create a variable "Negative Attitudes towards Alcohol Use." The *alpha* for this factor was .85.

Table 4 presents the descriptive statistics for all the variables used in this study.

Table 4. Descriptive Statistics

Dependent Variables (run separately):	N	Mean	Std Dev	Min	Max
Average number of drinks in the last 30 days (not logged)	13921	21.399	39.329	.00	360.00
Average number of drinks in the last 30 days (logged) [1]	13921	1.889 (5.613)	1.639 (4.15)	0.00	5.89 (360.405)
How many times in the past two weeks a student had five or more drinks in a row	14070	1.897	1.295	1	6
Independent Variables:					
Importance of fraternity or sorority life (Greek)	13990	1.397	0.813	1	4
Importance of parties	14004	2.168	0.939	1	4
Importance of religion	14025	2.313	1.134	1	4
Control Variables:					
Importance of Academics	14021	3.717	0.557	1	4
Age	14086	20.879	2.128	15	25
Gender	14071	0.387	0.487	0	1
Male	*8620*				
Female	*5451*				
Race/Ethnicity	13797	1.461	0.942	1	4
White	*10757*				
Black/African American	*812*				
Asian/Pacific	*1141*				
Native Amer./Alaska/Other	*1087*				
Religious Denomination	13812	3.3157	1.69834	1	6
None	*1921*				
Catholic	*5092*				
Jew	*419*				
Islam	*123*				
Protestant	*5600*				
Other	*657*				
Additional Control Variables:					
Using alcohol is against a student's religion	13956	1.559	0.99	1	4
Using alcohol is against a student's values	13957	1.883	1.137	1	4
Negative attitudes towards alcohol factor	13474	.000	1.00	-2.702	1.701
Does school have a religious affiliation?	14138	.150	.357	0	1
Yes	*2121*				
No	*12,017*				
Occasions student drank in high	13993	2.193	1.373	1	7

school					
Interaction Terms					
Greek*Party	13964	1.00	16.00	4.948	3.273
Religion*Party	13934	1.00	16.00	3.221	2.886

[1]*Note*: Numbers in parentheses equal EXP(mean)-1

Analysis

First, using the natural logarithm of average 30-day drinking and the binge drinking variable, I analyzed all means by religious denomination, religious affiliation of the school, Greek life, Parties, and Religious activities. This analysis showed evidence that religiosity had a negative relationship with alcohol use, both 30-day and binge drinking, but that further analysis was necessary.

Next, I analyzed the bivariate associations between the key independent variables and both dependent variables by estimating Pearson's correlations with average 30-day drinking and gamma coefficients – which are appropriate for ordinal variables – with binge drinking. Again, there was evidence of a negative relationship between alcohol use, including binge drinking, and religiosity, but again, further analysis was needed.

Subsequently, negative binomial regression models were estimated to determine the unique association between the key variables and frequency of alcohol use. A count distribution of the raw data indicated that the dependent variable, "Average number of drinks in the past 30 days" was overdispersed ($s^2=39.329^2=1{,}546.77 > 21.399$; see Table 4). A way to compensate for the problems presented by overdispersion is to use a statistical technique designed to address this type of non-normality. Therefore, in addition to estimating Pearson's correlations, a negative binomial regression model was estimated because it is designed to address overdispersion, analyze count variables, and address events that are not independent.

In order to learn more about average 30-day drinking, I estimated three primary and two secondary negative binomial regression models. The first included the three independent variables discussed above. The second included the independent variables plus the following control variables: age, gender, "values academics," race/ethnicity, and religious denomination. Two secondary models were constructed to look at how each of the two variables, "against my religion" and "against my values," influenced the second model independent of all other effects. The third negative binomial regression added the Greek*Party and Religion*Party interaction variables, the negative attitudes towards alcohol variable, whether the college has a religious affiliation, how often the student drank alcohol in high school, and the two variables representing reasons a student may not drink, "against my religion" and "against my values."

Finally, the same primary and secondary models as the negative binomial regression models were estimated to analyze the binge drinking variable. As discussed above, this variable had only six possible outcomes. Because these responses were ordinal in nature, a negative binomial regression was no longer appropriate. Therefore, an ordinal logistic regression model was used. This approach was preferable because it is designed specifically to deal with ordinal outcomes (Hoffmann 2005).

RESULTS

Bivariate Associations

Table 5 shows the frequency of 30-day alcohol use (logged) by religious denomination and by the religious affiliation of the college/university. The actual (untransformed) averages are shown in parentheses under the means.

Table 5. Natural logarithm of average number of drinks in last 30 days and binge drinking, by religious denomination

	Average 30-day Drinking			Binge Drinking		
Religion	**Mean**	**N**	**Std Dev**	**Mean**	**N**	**Std Dev**
None	1.853 (5.379)	1898	1.567	1.808	1921	1.216
Catholic	2.204 (8.061)	5030	1.620	2.101	5083	1.36
Jew	2.133 (7.44)	417	1.567	2.017	418	1.365
Islam	0.702 (1.018)	122	1.272	1.244	123	.772
Protestant	1.695 (4.447)	5525	1.643	1.784	5582	1.253
Other	1.408 (3.088)	645	1.547	1.616	654	1.151
Total	1.896 (5.659)	13637	1.638	1.899	13781	1.295

Note: Numbers in parentheses equal EXP(mean)-1

As shown in Table 5, three groups of students who were raised in a religion -- Islam, Protestant, and Other -- drank less and binged less than the overall average. Two groups, Catholic and Jew, drank more and binged more than average. Those who were not raised in a particular religion drank and binged just below the average.

Tables 6 through 8 show the mean frequency of alcohol use (logged) and binge drinking by how much a student valued Greek life, parties, and religious activity.

Table 6. Natural logarithm of average number of drinks in the last 30 days and binge drinking, by importance of Greek life

Valued Activity: Greek life	Average 30-day Drinking			Binge Drinking		
	Mean	N	Std Dev	Mean	N	Std Dev
Not at all	1.788 (4.977)	10607	1.61	1.801	10719	1.236
Somewhat	1.839 (5.29)	1537	1.635	1.901	1561	1.277
Important	2.368 (9.676)	1035	1.627	2.315	1043	1.436
Very Important	2.961 (18.317)	625	1.643	2.838	630	1.557
Total	1.891 (5.626)	13804	1.639	1.897	13953	1.296

Note: Numbers in parentheses equal EXP(mean)-1

Table 7. Natural logarithm of average number of drinks in the last 30 days and binge drinking, by importance of parties

Valued Activity: Parties	Average 30-day Drinking			Binge Drinking		
	Mean	N	Std Dev	Mean	N	Std Dev
Not at all	0.811 (1.25)	3803	1.167	1.19	3864	0.621
Somewhat	1.684 (4.387)	5152	1.455	1.645	5201	1.069
Important	2.736 (14.425)	3568	1.473	2.499	3591	1.391
Very Important	3.56 (34.163)	1297	1.389	3.343	1311	1.45
Total	1.892 (5.633)	13820	1.639	1.898	13967	1.295

Note: Numbers in parentheses equal EXP(mean)-1

Table 8. Natural logarithm of average number of drinks in the last 30 days and binge drinking, by importance of religious activities

Valued Activity: Religion	Average 30-day Drinking			Binge Drinking		
	Mean	N	Std Dev	Mean	N	Std Dev
Not at all	2.183 (7.873)	4460	1.6	2.024	4493	1.343
Somewhat	2.191 (7.944)	3578	1.65	2.113	3625	1.393
Important	1.913 (5.773)	2844	1.582	1.883	2868	1.248
Very Important	1.062 (1.892)	2958	1.447	1.462	3001	1.013
Total	1.89 (5.619)	13840	1.639	1.898	13987	1.296

Note: Numbers in parentheses equal EXP(mean)-1

In the case of Greek life, the mean of 2.96 indicated that on average, college students who thought Greek life was "very important" were expected to drink approximately 18.317 drinks over a 30 day period and to binge at 2.838 (between "Once (2)" and "Twice (3)"); for those who thought "parties" were "very important" the average 30-day drinking was 34.16 and binge drinking was 3.343 (between "Twice (3)" and "3 to 5 times (4)"); for those who thought religious activity was "very important" the average was 1.89 for 30-day use and 1.462 for binge drinking (between "None (1)" and "Once (2)").

Overall, the means indicated that there was a difference in alcohol use that depended on a students' religious affiliation. There was also a difference that depended on the religious affiliation of the school. These means also indicated there was a connection between types of activities valued and alcohol use, including binging—the students who valued religious activities reported less drinking in the last 30 days and

fewer binges. Two procedures were chosen to analyze this issue further—Pearson's correlations and gamma coefficients.

First, I computed Pearson's correlations among the 30-day alcohol variable and the three independent activities variables—religion, Greek life, and parties. It indicated that there was a positive correlation between Greek life and parties and average number of drinks in the last 30 days and a negative correlation between average number of drinks and religious activity. The results are outlined in Table 9.

Table 9. Correlations between activities and average number of drinks in last 30 days

Activity	Log of Average number of drinks last 30 days
Greek life	.159*
Parties	.539*
Religion	-.239*

*p<.001

I then computed gamma coefficients to estimate the bivariate associations among the three independent variables and the number of times a student binge drank in the past two weeks. It also indicated that there was a positive correlation between Greek life and parties and the number of times a student binged and a negative correlation between religious activity and binging. The results are outlined in Table 10.

Table 10. Gamma coefficients between activities and number of times binge drank in last two weeks

Activity	Number of times binge drank in past two weeks	Std Error
Greek life	.258*	.014
Parties	.652*	.007
Religion	-.207*	.010

*p<.001

Average 30-day Alcohol Use

Again, more analysis was needed, so several negative binomial regression models were estimated. The results of the first two negative binomial regression models were similar in direction to the Pearson's correlation results. Greek life and parties both had a positive relationship with alcohol use while religion had a negative relationship. These results showed that when testing just the main independent variables those students who valued religious activities drank less as their interest in religious activities increased. This continued to be true when controlling for "values academics," age, race, general religious denomination, and gender. The results of the initial negative binomial regression models are shown in Table 11.

Table 11. Negative binomial regression models predicting the number of drinks in the past 30 days

	Independent Variables Only			Independent Plus Controls		
Variables	**Coef.**	**Std Err**	**P>|z|**	**Coef.**	**Std Err**	**P>|z|**
Intercept	1.376	.0495	0.001	.944	.194	0.001
Values Greek Life	.105	.0179	0.001	.112	.018	0.001
Values Parties	.892	.0165	0.001	.845	.017	0.001
Values Religion	-.339	.0135	0.001	-.302	.014	0.001
Control Variables:						
Values Academics				-.222	.026	0.001
Sex				.472	.029	0.001
Age				.047	.007	0.001
Race[1]						
Black				-.873	.065	0.001
Asian/Pacific				-.901	.055	0.001
Native				-.223	.055	0.001
Amer./Alaska/Oth.						
Religion Raised In[2]						
Catholic				.292	.047	0.001
Judaism				-.130	.090	0.147
Islam				-.627	.165	0.001
Protestant				.121	.047	0.009
Other				.063	.078	0.416

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

As mentioned above, the data set included responses to the question, "If you choose not to drink at all or limit your drinking, how important are each of the following reasons for you?" Table 12 shows that when "against my religion" was added to the second model, it had a coefficient of -0.307. The addition of "against my religion" caused the "values religion" coefficient to decrease from -0.302 to -0.202, while the

"values parties" coefficient only decreased from 0.845 to 0.82, and "values Greek life" only increased from 0.112 to 0.117. When "against my values" was added, it had a coefficient of -0.483 and its effects were even more notable, particularly on religion and parties. The "values Greek life" only decreased from 0.112 to 0.125, similar to the change when "against my religion" was added. However, the "values religion" coefficient decreased from -0.302 to -0.167 and the "values parties" coefficient decreased from 0.845 to 0.759. In brief, clearly these two reasons influenced average 30-day drinking. Students who chose to limit their consumption of alcohol because it was against their religion or against their values affected the "parties" and "religion" influence with "drinking is against my values" having the largest affect.

Table 12. Negative binomial regression models with "Against Religion" and "Against Values" added

	Add "Against my Religion"			Add "Against my Values"		
Variables	**Coef.**	**Std Err**	**P>|z|**	**Coef.**	**Std Err**	**P>|z|**
Intercept	1.505	0.193	0	2.04	0.186	.001
Values Greek Life	0.117	0.018	.001	0.125	0.017	.001
Values Parties	0.82	0.017	.001	0.759	0.017	.001
Values Religion	-0.202	0.015	.001	-0.167	0.014	.001
Control Variables:						
Values Academics	-0.251	0.026	.001	0.474	0.028	.001
Sex	0.481	0.029	.001	0.474	0.028	.001
Age	0.038	0.007	.001	0.026	0.007	.001
Race[1]						
Black	-0.79	0.065	.001	-0.726	0.064	.001
Asian/Pacific	-0.871	0.055	.001	-0.791	0.054	.001
Native Amer./Alaska/Oth.	-0.181	0.055	0.001	-0.128	0.053	0.016
Religion Raised In[2]						
Catholic	0.242	0.047	.001	0.234	0.046	.001
Judaism	-0.228	0.09	0.011	-0.276	0.087	0.002
Islam	-0.304	0.165	0.065	-0.169	0.161	0.293
Protestant	0.132	0.047	0.005	0.104	0.046	0.022
Other	0.14	0.078	0.074	0.175	0.077	0.022
Against my…						
Religion	-0.307	0.017	.001			
Values				-0.483	0.014	.001

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

Once these measures were identified, a third and final model was run which controlled for "against my religion," "against my values," the negative attitudes towards alcohol factor, whether or not the school had a religious affiliation, and the Greek*Party

and Religion*Party interactions. The results of this final model are presented in Table 13. With these variables, the coefficients for Greek life and parties changed dramatically from the second model, from 0.112 to 0.344 and from 0.845 to 0.470, respectively. When all the control variables and interactions were added to the model, the "values religion" coefficient remained about the same level as that found in the second model. Overall, the religion effect was consistent in the first, second, and final models where multiple control and interaction variables are present, with coefficients of -0.339, -0.302, and -0.274 respectively.

Table 13. Negative binomial regression model with all control variables and interactions

	Independent Plus All Controls and Interactions		
Variables	**Coef.**	**Std Err**	**P>|z|**
Intercept	-.184	.211	0.381
Values Greek Life	.344	.051	0.001
Values Parties	.470	.040	0.001
Values Religion	-.274	.032	0.001
Control Variables:			
Values Academics	-.064	.023	0.006
Sex	.243	.027	0.001
Age	.079	.007	0.001
Race[1]			
Black	-.618	.060	0.001
Asian/Pacific	-.736	.052	0.001
Native Amer./Alaska/Other	-.218	.049	0.001
Religion Raised In[2]			
Catholic	.187	.042	0.001
Judaism	-.251	.081	0.002
Islam	-.258	.155	0.097
Protestant	.161	.043	0.001
Other	.157	.071	0.028
Additional Controls			
Against Religion?	.044	.021	0.034
Against Values?	-.370	.017	0.001
Negative Attitudes towards Alcohol Factor	-.552	.018	0.001
Religious Affiliation N/Y?	-.113	.037	0.002
Monthly Alcohol Use in High School	.305	.010	0.001
Interactions			
Greek/Party	-.097	.018	0.001
Religion/Party	.076	.013	0.001

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

When the coefficients were converted into percentages using the following formula (100 * [EXP (B)-1]), interpretation became easier. The results of this formula interpret the percentage change in the odds of the dependent variable that is associated with a one-unit change in the independent variable (Long 1997). See Table 14 for the percentage change results.

Table 14. Percent Change Expected in Average 30-day Drinking with One Unit Change in "How Important" Each Valued Activity Is

Valued Activity	Independent Variables Only %Change	Independent Plus Controls % Change	Independent Plus Additional Controls and Interactions % Change
Greek life	11.071	11.851	41.058
Parties	144.000	132.798	59.999
Religion	-28.752	-26.066	-23.967

For example, controlling for the other variables in the model, for every one-unit increase in how important parties were to a student, the average 30-day drinking was expected to increase by 132.80%. Controlling for the other variables in the model, for every one-unit increase in how important religious activity was to a student, the average number of drinks in 30 days was expected to decrease by -26.07%.

Therefore, controlling for all the other variables in the model, each one unit increase in how much students valued religious activities during college is associated with a reduction of -23.97% in the average number of drinks consumed. Each one unit increase in how much student's valued parties during college is associated with an increase of 60% in the average number of drinks in the last 30 days.

The results of the interactions were not as expected. It was hypothesized that the Greek*Party interaction would be associated with more alcohol use, whereas the Religion*Party interaction would be associated with less use. The opposite was true in both cases. See Table 13.

What might be happening with these interactions could be analyzed further using predicted values. The predicted events indicated that, among students who felt parties were not at all important, as the value of Greek life increased from not at all important to somewhat important, predicted 30-day drinking went down slightly. When the value of Greek life increased to important, predicted drinking increased slightly; but when the value increased to very important, predicted drinking doubled over the not at all important predicted value. Table 15 shows these values. It also provides evidence that students who see parties as very important drink about the same no matter how much they value Greek life. This was an indicator of how much influence "values parties" had on drinking behavior.

Table 15. Predicted number of drinks a student will have in the past 30-days for students who value Greek life and Parties.

	Parties Not at All Important	**Parties Very Important**
Greek Life Not at All Important	5.589	99.974
Greek Life Very Important	11.332	100.257

Table 16 shows that when the religion interaction was analyzed further using predicted values, the results indicated that students who felt neither religion nor parties were important drank, on average, about 10 drinks over the past 30 days. Those who felt parties were not important and religion was important drank less in a 30-day period—

only about 2 drinks on average. In the "parties are very important" category, there was also a gradual decrease in predicted drinking from 109 to 85 as the importance of religion increased. However, drinking was still high in all cases. As with Greek life above, this was an indicator of how much influence "values parties" had on drinking behavior.

Table 16. Predicted number of drinks a student will have in the past 30-days for students who value Religion and Parties.

	Parties Not at All Important	**Parties Very Important**
Religion Not at All Important	9.790	108.702
Religion Very Important	1.826	84.620

It does not seem to matter whether Greek life or religion is valued; in either case students who valued parties drank a lot—over 100 drinks in a 30-day period. It does not seem to matter whether Greek life or religion is valued; in either case students who valued parties drank a lot—over 100 drinks in a 30-day period. However, it appears that for those who valued religion, as their value of parties increased, alcohol use increased a lot—almost 46 times. But for those who valued Greek life this same increase was only 8 times. This was not what was expected.

Finally, two control variables are worth noting—"against values" and "negative attitudes towards alcohol use." The "negative attitudes towards alcohol" variable had a coefficient of -.552 and the "drinking is against my values" had a coefficient of -.370. Each one-unit increase in "negative attitudes towards alcohol" was associated with a 42.42% decrease in the average number of drinks in 30 days. The percentage decrease for a one-unit increase in "drinking is against my values" was expected to be -30.93%.

Despite the presence of these two variables, however, each one-unit increase in valuing religious activities was associated with a 23.97% decrease in alcohol use.

Binge Drinking

The results of the ordinal logistic regression were similar to the negative binomial regression results with one significant difference. As shown in Table 17, in the "independent variables only" model and the model controlling for academics, sex, age, and race, "values religion" had a significant effect on the binge-drinking variable. For instance, the coefficient for "values religion" was -0.324. Using the percent change formula and controlling for the other variables in the model, for every one unit increase in how important religion is to a student, the number of times a student had five or more drinks in a row was expected to decrease by -28.97%.

Table 17. Ordinal logistic regression model of binge drinking in the past two weeks

	Independent Variables Only			Independent Plus Controls		
Variables	**Coef.**	**Std Err**	**P>|z|**	**Coef.**	**Std Err**	**P>|z|**
Values Greek Life	0.179	0.021	0.001	0.210	0.022	0.001
Values Parties	1.247	0.022	0.001	1.224	0.024	0.001
Values Religion	-0.342	0.017	0.001	-0.324	0.019	0.001
Controls						
Values Academics				-0.181	0.034	0.001
Sex				0.646	0.038	0.001
Age				0.022	0.010	0.026
Race[1]						
Black				-1.412	0.120	0.001
Asian/Pacific				-1.207	0.090	0.001
Native Amer./Alaska/Oth.				-0.457	0.074	0.001
Religion Raised In[2]						
Catholic				0.472	0.061	0.001
Judaism				-0.210	0.117	0.071
Islam				-1.128	0.327	0.001
Protestant				0.197	0.063	0.002
Other				0.083	0.112	0.457

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

As with the 30-day alcohol dependent variable, this binge-drinking model looked at the question, "If you choose not to drink at all or limit your drinking, how important are each of the following reasons for you?" Again, the "drinking is against my religion" and "drinking is against my values" variables had a noticeable effect on binge drinking. Table 18 shows that when "against my religion" was added, it had a coefficient of -0.293 and caused the "values religion" coefficient to decrease from -0.324 to -0.292, while the "values parties" coefficient only decreased from 1.224 to 1.204, and "values Greek life"

remained basically unchanged from .210 to .209. When “against my values” was added, it had a coefficient of -0.591 and its effects were even more notable, particularly on “values religion.” The “values Greek life” variable remained basically unchanged from .210 to .212, and the “values parties” coefficient decreased from 1.224 to 1.107, also showing little effect. However, the “values religion” coefficient decreased from -0.324 to -0.149, showing a smaller effect. In brief, when it came to binge drinking, clearly these two reasons that students may have chosen to limit their drinking influenced the association between religion and binge drinking, particularly the variable “drinking is against my values.”

Table 18. Ordinal logistic regression model with "Against Religion" and "Against Values" Added

	Add "Against my Religion"			Add "Against my Values"		
Variables	**Coef.**	**Std Err**	**P>|z|**	**Coef.**	**Std Err**	**P>|z|**
Values Greek Life	0.209	0.022	0.001	0.212	0.022	0.001
Values Parties	1.204	0.024	0.001	1.107	0.024	0.001
Values Religion	-0.222	0.021	0.001	-0.149	0.02	0.001
Controls						
Academics Important	-0.194	0.034	0.001	-0.179	0.034	0.001
Sex	0.649	0.039	0.001	0.669	0.039	0.001
Age	0.019	0.010	0.052	-0.006	0.010	0.560
Race[1]						
Black	-1.332	0.121	0.001	-1.323	0.122	0.001
Asian/Pacific	-1.166	0.090	0.001	-1.064	0.091	0.001
Native Amer./ Alaskan/Other	-0.438	0.074	0.001	-0.424	0.075	0.001
Religion Raised In[2]						
Catholic	0.427	0.062	0.001	0.430	0.062	0.001
Judaism	-0.286	0.117	0.015	-0.273	0.118	0.021
Islam	-0.704	0.332	0.034	-0.480	0.335	0.152
Protestant	0.234	0.063	0.001	0.246	0.064	0.001
Other	0.124	0.113	0.274	0.188	0.114	0.100
Against my…						
Religion	-0.293	0.029	0.001			
Values				-0.591	0.024	0.001

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

However, when the additional interactions and control variables were added to the third and final model, several variables were no longer significant, including the "values religion," "school religious affiliation, yes/no" and "religious activity/parties interaction" variables. In addition, the "against my religion" reason for not drinking variable

remained significant, but the coefficient was positive—0.164, and not negative as it was with 30-day drinking. See Table 19.

Table 19. Ordinal logistic regression model with all control variables and interactions

	Independent Plus Interactions & Controls		
Variables	**Coef.**	**Std Err**	**P>|z|**
Values Greek Life	0.501	.080	.001
Values Parties	1.021	.061	.001
Values Religion	-0.060	0.058	**0.297**
Controls			
Academics Important	-0.110	0.036	0.002
Sex	0.537	0.041	0.001
Age	0.018	0.011	0.106
Race[1]			
Black	-1.168	0.124	0.001
Asian/Pacific	-0.943	0.095	0.001
Native Amer./Alaskan/Other	-0.384	0.079	0.001
Religion Raised In[2]			
Catholic	0.377	0.065	0.001
Judaism	-0.318	0.123	0.010
Islam	-0.618	0.346	0.074
Protestant	0.226	0.067	0.001
Other	0.155	0.119	0.193
Interactions and Other Controls			
Against Religion?	0.164	0.039	0.001
Against Values?	-0.433	0.033	0.001
Neg Att/Alcohol	-0.646	0.028	0.001
Relig Affil N/Y?	-0.104	0.059	**0.076**
Occasion HS Used Alcohol	0.369	0.015	0.001
Interactions			
Greek/Party	-0.109	0.027	0.001
Religion/Party	-0.011	0.021	**0.612**

[1] "White" is the omitted reference category
[2] "None" is the omitted reference category

Again, when the coefficients were converted into percentages, interpretation became easier. For example, controlling for several other variables, for every one unit increase in how important parties were to a student, the number of times a student binged was expected to increase by 240.08%. Controlling for several other variables, for every one unit increase in how important religious activity was to a student, the number of times a student binged was expected to decrease by 27.675%. See Table 20.

Table 20. Percent Change Expected in How Many Times a Student will Binge Drink with a One Unit Change in "How Important" Each Valued Activity Is

Valued Activity	Independent Variables Only %Change	Independent Plus Controls % Change	Independent Plus Additional Controls and Interactions % Change
Greek life	19.602	23.368	65.037
Parties	247.989	240.076	177.597
Religion	-28.965	-27.675	***

***Not significant

As with average 30-day alcohol use, the results of the binge drinking interactions were not as expected. It was hypothesized that the Greek*Party interaction would be associated with more binge drinking, whereas the Religion*Party interaction would be associated with less. In this case, the Religion*Party interaction was not significant and the Greek*Party had a slight negative effect with binging. See Table 19 above.

Again, these interactions may be analyzed further using predicted probabilities. The predicted probabilities indicated that, for students who felt parties were very important, as the value of Greek life increased from not at all important to important,

predicted probabilities for binge drinking 3-5 times in the past two weeks went down slightly—until the very important category was reached at which time the predicted probability increased. Table 21 shows there was evidence that students who saw Greek life as very important but who did not value parties binged 3-5 times in a two week period three times more than students who thought both activities were not important. However, students who thought parties were very important, no matter how much they valued Greek life, binged about the same. This is yet another indicator of how much influence "values parties" has on drinking behavior.

Table 21. Predicted probabilities that a student has binged 3-5 times in the past two weeks for students who value Greek life and Parties.

	Parties Not at All Important	**Parties Very Important**
Greek Life Not at All Important	.021	.352
Greek Life Very Important	.064	.369

DISCUSSION

It has been theorized that excessive use of alcohol during the college years is an adult transition issue (Jackson et al. 2005; White et. al. 2005). The results of this study do indicate that the "freedom" attached to young adulthood may play a role. If a student used alcohol in high school, for every one unit increase in "occasions used" there was a (100 * [exp (-0.305)-1]) or 35.66% increase in the average number of drinks in 30 days (Table 13). Nevertheless, it should be noted that this study included approximately 14,000 'young adults' and yet a significant group of these adults had not had a drink in the past 30 days—4,652 or approximately one third of the sample. In addition, average 30-day alcohol use for the entire sample was only 5.42, or a little more than one drink a

week. Moreover, only 27.1% of the respondents reported that they had binged once a week or more (5 or more drinks in a row). This shows that a large majority of this age group are not involved in excessive drinking.

Past research also pointed to the fact that religiosity plays a role in alcohol use during the college years. It has already been determined there is likely a negative relationship between religiosity and alcohol use among this age group (Perkins 1997, Slicker 1998, Humphrey et al. 1989, Patock-Peckham et al. 1998, Barry and Nelson 2005). The purpose of this study was to determine whether or not additional research would replicate these earlier findings. Yet, the purpose was also to determine whether the values that students held, in particular whether they Greek life or parties, affected their use of alcohol.

The results supported the primary hypothesis. College students who valued religious activities drank less than those who did not. The Pearson's correlation, the gamma coefficients, the negative binomial regressions, and two of the three ordinal logistic regressions all indicated that "values religion" had a negative effect on average 30-day alcohol use and binge drinking. Except for the final ordinal logistic regression model, these results were consistent even when other control variables and interactions were considered. These findings are in harmony with Forthun et al.'s (1999) conclusion that religiosity is an independent predictor of substance use, including alcohol. It also supports Kutter et al.'s (1997) conclusions for adolescents and Patock-Peckham's (1998) conclusions for college students that there is a negative association between alcohol use and religiosity.

There was also some evidence that social context mattered. While the 'religious affiliation yes/no' variable was not significant in the final binge-drinking model, it was negative and significant in the final average 30-day drinking model. Students who attended schools that had religious affiliations drank less than those who did not. This result occurred regardless of the alcohol policy promulgated by the school. Nevertheless, the religious affiliation of a school had no effect on binge drinking, perhaps because binge drinking can be viewed as an extreme form of alcohol use and as being fueled by an addiction to alcohol. By this stage, the addiction may overpower the religious values and other choices of the individual drinker as suggested by McIntosh et al. (1982).

The fact that three of the religion variables, value religious activities, religious affiliation yes/no, and religion*party, ceased to be significant in the final ordinal logistic regression model on binge drinking supports McIntosh et al. (1982) finding that as frequency of substance use increased, all social controls, including religion, are less influential.

The three independent activities also imply social context. Part of the reason people sometimes value certain activities is because of the other people who share those interests. They like the kind of people who do those things and/or they value their company.

Whereas the frequencies in the Harvard data showed that a significant number of college students drank little or no alcohol, many others drank a lot, particularly those who valued parties. Thus, as hypothesized, there was a positive association between students who valued parties and Greek life and alcohol use, including binging (Cashin et al. 1998;

Harrington et al. 1999; Read et al. 2002; Lederman et al. 2004). My findings do not support the argument that pervasive drinking by college students in general is a media myth (Lederman et al. 2004) because it is clear that there is a subculture of drinkers. Compared to other variables, the party indicator had the largest positive coefficients in both models—.470 for 30-day drinking and 1.021 for binging. This is similar to what was found among adolescents by Hagan (1991)—drinking is a common behavior of those who identify with a party subculture.

These findings support Lederman et al.'s assertion that the media is only focused on a small group of college students and is missing the overall picture. But "partiers" did not make up the largest "subculture" in college. Less than one-tenth of the students (1,318) considered parties to be "very important" compared to over twice that number (3,011) who considered religious activities to be "very important." Even when the "very important" and "important" frequencies were combined, religious activity still outranked parties as being more important to college-age students. The partying subculture is only a small percentage of the overall student population. Overall, the non-drinkers and light drinkers make up the majority of the college population. It appears that the majority of college students are not "partiers" or "heavy drinkers" (Burns et al. 1991).

One item requires some attention. Two interesting results occurred because of the inclusion of the interaction effects, Greek*party and religion*party. One is the religion*party interaction. If a student valued religious activities *and* parties, the interaction had a positive effect on the 30-day alcohol use variable, with a coefficient of .076. Those who valued parties, yet also valued religion, tended to drink more than those who did not value religion. Religious partiers drank more. Conversely, the Greek*party

interaction had a negative relationship with 30-day drinking. This indicates that those who valued both "Greek Life" *and* parties actually drank slightly less than those who only valued parties (see Tables 15 and 16). This apparent phenomenon should be analyzed in future studies.

Overall, given the limitations in sample size and number of campuses of the other studies that looked at alcohol use among college students either directly or indirectly, these are significant findings. The size of this data set, 14,000 cases and 120 campuses, make it very clear that the three independent variables that were tested have relationships with alcohol use, including binge drinking. Students who valued religious activities as part of their college experience drank less. Students who valued Greek life drank more and those who valued parties drank the most. Thus, this analysis strongly affirms previous findings that religiosity has a negative relationship with alcohol use. In addition, Hagan's (1991) assertion that subcultures matter is also supported. As young people mature, it appears they begin to take on identity attributes that are consistent with the culture they have chosen to be a part of. This includes monikers such as "drinker," which seems to be prevalent in the party subculture, and "non drinker," which is a chosen characteristic of many religious subcultures.

POLICY IMPLICATIONS

The social costs of alcohol abuse are high (Harwood 1992). Previous literature on college alcohol policies have emphasized such interventions as raising prices, controlling alcohol availability on campus and in the surrounding community, stricter enforcement, and stricter state alcohol control policies (DeJong and Lanford 2002, Knight, Harris and Sherritt 2003, Williams, Chaloupka and Wechsler 2005, Nelson et al. 2005). None

discuss religion. Yet as discussed above, several studies have shown that religious activity has a clear negative relationship with alcohol use, including binge drinking. This study supported those findings. Previous analyses of personality and social functioning also provide considerable evidence that religious involvement is negatively correlated with behavioral problems, including underage alcohol use and alcohol abuse (Bergin 1991). In fact, one of the most enduring alcohol recovery groups in history, *Alcoholics Anonymous* (AA), acknowledges the power of "God" in individual lives by incorporating the belief "in a power greater than ourselves" in step two of its twelve step recovery program. In total, God and spirituality are woven into over half of AA's twelve steps. One researcher noted that individuals who participated in AA for 27 weeks or more, with subsequent involvement, had better long-term alcohol-related outcomes after 16 years than those who received professional treatment alone. This difference appeared to be due to participation in AA (Moos and Moos 2006). Fagan (1996) cited numerous studies which showed that religion had positive social effects not only in preventing alcohol and drug abuse, but in promoting better health, marriages, families, education, wealth, and decreasing crime. Moreover, religious affiliation and regular church attendance were near the top of the list for most people in explaining their own happiness (Mookherjee 1994). Results of this analysis also support Slicker's (1997) suggestion that alcohol abuse prevention and intervention programs should target the beliefs of the drinker because, as theorized, belief matters for students making decisions about whether to use alcohol. All of these findings, combined with the evidence presented in this study, indicate that religious participation can have positive societal effects—in this case by reducing alcohol use and abuse. Thus, one possible policy avenue to explore is how

university counselors could consider appropriate ways to facilitate some kind of religious participation among students who have drinking problems.

This, however, could be seen as only one alternative. If organized religion is not an alternative that a student or college would consider, there is also the option of further examining exactly what the social learning and social controls of religious activity are to determine whether or not any of these techniques might be applied outside a religious context. This might be possible given the fact that when asked why a student might choose not to use alcohol, "drinking is against my values" had a higher coefficient than "drinking is against my religion." What "values" do students who do not drink hold that come from religious learning? Are they health-related? Social? Intrinsic? Once these values are uncovered, there may be ways to develop anti-drinking messages or support groups without tying these activities to religion.

LIMITATIONS

One weakness of this study is that I did not take an in-depth look at peer drinking, who a student may or may not drink with, other social learning variables, and family background. These factors could possibly affect the key relationships in this study. For example, students who value parties are likely enmeshed in social networks that encourage and reinforce alcohol use. Thus, assessing their peer relationships may help us understand how they come to value partying and their drinking habits.

In addition, the Harvard data did not ask enough questions to allow an in-depth look at religiosity. Chadwick and Top (1993) in their study of a group of religious-affiliated adolescents found, like Patock-Peckham, that intrinsic religiosity among adolescents had an effect on behaviors such as alcohol use. Does this extend to young

adults, especially those who are exposed to substantial alcohol use in colleges? Is it intrinsic religiosity that accounts for the "values religious activities and "drinking is against my values" interaction?

Another limitation was the data set did not include detailed information on the religious denomination of each student. The categories were broad and did not allow for an in-depth look at whether or not specific denominations might be responsible for the negative relationship with alcohol use.

FURTHER RESEARCH

In addition to some of the factors listed in the limitations section, additional research should analyze race, ethnic, and gender differences. How does "values religion" interact with these characteristics? Moreover, would these results apply to other forms of drug use among college students?

Furthermore, while these results did not fully test social control, social learning, or social context theories, they suggest there may be elements of each that are worth exploring in further research. For example, the results support the hypothesis that religious students drink less because they hold beliefs that discourage the use of alcohol. When "drinking is against my religion" was added to both the average 30-day drinking and the binge drinking constituent models (Tables 13 and 19), the coefficients were negative—-0.307 and -0.293, respectively. Why? Do they choose not to drink so they will not be "cast out" or because they want to conform or for other personal reasons? These results seem to support the idea that religious beliefs and values are internalized as part of maturation into adulthood and this reduces general drinking behavior and binge drinking. This is because when "drinking is against my values" was added to both types

of models (Tables 13 and 19), their respective coefficients were larger than the coefficient associated with the "against my religion" variable. In other words, general values concerning drinking appear to have a stronger effect than values that focus on one's current perceptions about religion and alcohol use.

Additionally, when the model was estimated with both variables ("drinking is against my religion" and "drinking is against my values") one at a time, the "values religious activities" variable's coefficient was reduced significantly. This could be because there is a relationship between "values religious activities" and the social control tenets of that religion (the "thou shalt nots") as well as an interaction between "values religious activities" and values in general. The fact that the most significant reduction in the religious activity variable occurred when the "against values" variable was added may indicate that despite the 'social learning' that takes place in many religions, eventually the choice to not drink alcohol transcends those teachings and is inculcated into the individual as a personal value with societal consequences. After entering young adulthood and as part of the "identity exploration" facet of that period, students choose to make "non-drinker" a permanent part of their identity (Arnett 2005).

Also, as mentioned, intrinsic religiosity could not be measured. There are measures that differentiate between external and intrinsic religiosity (Allport and Ross 1967; Chadwick and Top 1993). Including these in future research might shed further light on the association between "values religious activities" and "drinking is against my values." This would help clarify and focus current theory on the impact intrinsic religiosity has on alcohol use and abuse and how this impact may be strengthened. While results such as those presented here support the idea that religiosity can attenuate risky

behaviors, it is important for sociologists to understand the intrinsic link in order to better support policies that can benefit the college experience and society as a whole.

CONCLUSION

It appears that alcohol use by college students may be linked to young adulthood, especially if a student drank in high school. Students who drank in high school appear to drink more in college. However, the primary purpose of this study was to look at the influence religion has on alcohol use. This study showed that religiosity is a consistent factor in reducing alcohol use, including binge drinking. The large sample size and national breadth give a great deal of support to the hypothesis college students who value religious activities will drink less than those who did not. In addition, when asked to explain why a student may choose not to drink, the option "drinking is against my religion" was cited as a significant reason. Despite the fact that this study did not specifically test social learning, social control, or social context theories, the results indicate future study is warranted because elements of each theory can be extrapolated from the results presented.

This study also supported the hypothesis that students who valued parties and/or Greek life drank more. These findings were also significant. The results showed that those who valued parties consistently drank the most.

Overall, this study substantiated the hypothesis that religiosity has a negative relationship with alcohol use among college students. Since very few studies address this connection, this research is an important contribution to the literature, particularly because of the size and breadth of the data set and the fact that it focused not simply on outward manifestations of religion, but rather on whether students valued religion. These

results help us to better understand alcohol use among college students, the characteristics of the students who drink, and the role religion, Greek life, and parties play. They also help us to understand strategies that might be considered to alleviate problem drinking during this stage of life.

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