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Binge Drinking in College

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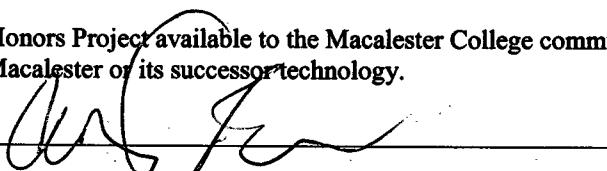
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Binge Drinking in College

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2007

Current research about college students' binge drinking focuses on risk factor in isolation from students' decisions to attend particular colleges. I use data from the Harvard School of Public Health College Alcohol Study to address this gap in the research. Using two-stage regression analysis, I find that students' predisposition to attend college with high rates of binge drinking substantially lessens the impact of several factors thought to correlate with binge drinking My findings suggest that colleges and other interested parties should restructure programs aimed to decrease binge drinking on college campuses, since factors like student attitudes and orientation toward recreational use of alcohol may be consequence of student choice of college, rather than exogenous causes of binge drinking.

I. Introduction

College presidents cite alcohol abuse as the number one problem on campus, which is no surprise since about half of all college students in the US binge drink (Wechsler 1996). Drinking is such a problem for American colleges that one in 17 college students, one in five frequent college binge drinkers, meets the DSM-IV criteria for alcohol abuse (Knight 2002). Due to the prevalence of binge drinking – having five or more alcoholic beverages on one occasion for males and four or more alcoholic beverages on one occasion for females – and associated problems eighty-one percent of colleges now employ a substance abuse official and 61 percent have a task force to deal with substance abuse issues and implement prevention programs (Harvard University School of Public Health 2006). Moreover, the federal government and alcohol producers have committed millions of dollars to support programs to decrease college binge drinking (Myron 2003).

Existing programs to combat excessive drinking on campus focus on student-body activities, groups, attitudes, and other aspects of college life. These programs are ineffective in spite of increased funding, research, and attention by college administrators (Harvard School of Public Health, 2006). In fact, college alcohol problems seem to have worsened: From 1998 to 2001, alcohol-related accidental deaths increased by six percent among college populations and the proportion of college students who reported driving while intoxicated increased from 26.5 percent to 31.4 percent (Hingson 2005). These increasing rates of binge drinking and associated problems suggest that prevention

programs need to change. Currently, these programs assume that changeable aspects of college life lead students to binge drink; however, this assumption may be unwarranted, given the frequency of binge drinking by high school students. Empirical research on this topic should help to redirect public and educational institutions' policies to useful interventions.

Does college life determine the drinking habits of students? Or, do the pre-existing characteristics, drinking habits, and preferences of entering students determine whether or not a student will binge drink in college? Drawing on sociological theories of homophily – that people cluster together based on preferences – and using survey data from the Harvard School of Public Health Alcohol Study, I explore the role that pre existing characteristics (characteristics of a student prior to entering college) play in determining a college students' likelihood of binge drinking. I find that certain pre-college factors – such as how often a student drinks alcohol in high school, how much alcohol a student drinks in high school, how often and how much the student's father drinks alcohol, and whether the student played sports in high school use – influence a student's likelihood to binge drink more than college activities or factors associated with students' peers at college. Through my analysis, I find that these pre-college factors correlate significantly with binge drinking in college. I also find that some college-level factors do correlate (but not as strongly correlated as the pre-college factors) with binge drinking; such as whether the student is a member of a fraternity or sorority, how a student perceives other's attitudes toward drinking, and whether a student participates in community service. The analysis also suggests that students choose colleges based on

their drinking preferences and that this reinforces the climate of drinking at the college they attend. These findings suggest that current prevention programs that focus on the environmental factors of an institution should expand to address the existing preferences and tendencies of incoming students and how those individual attitudes change the overall institutional attitude toward binge drinking.

This article develops in four parts. The first section is a review of previous findings of the relationships between various aspects of college life and binge drinking. This section discusses previous research on the impact of students' individual characteristics and social activities, factors of student populations, and students' pre-existing characteristics upon binge drinking. The second part of the article describes the sampling methodology and data drawn from the Harvard School of Public Health Alcohol Study. Also in this section, I explain how I will obtain my results using a two-stage logistic regression analysis. In the first stage, I evaluate pre-existing traits and how they predispose a person to choose a college with high rates of binge drinking. In the second stage I control for that measure of predisposition to observe two processes: 1.) the influence that measure has on an individual's probability of binge drinking and 2.) whether other college factors that otherwise correlate with binge drinking will remain significant predictors of binge drinking. Third, I present the results of my two-stage analysis describing all significant findings. Finally, I will evaluate the results of my study to explain implications and applications for my research. I will include a discussion about the shortcomings of this article and offer suggestions for further research.

II. Review of the Literature

Binge drinking is a well-known and well studied problem for colleges in the United States. Many studies show correlations between binge drinking and individual activities and student body characteristics of colleges. However, these studies do not account for how individual students choose to attend colleges with particular drinking profiles. In this section of the paper, I first review previous studies of drinking in college, highlighting their main findings about individual and environmental correlates of binge drinking. Then, I draw on the theory of homophily, which argues that like-minded individuals tend to participate in the same activities, choose the same environments, and form peer networks. As such, the patterns of drinking of a college may result from earlier influences on individuals who decide to attend that college based on these patterns of drinking, rather than represent an independent influence of the characteristics of the student body.

Individual Characteristics and Social Activities

Prior research has found many connections between binge drinking and a student's associations and activities. For instance, high rates of binge drinking are prevalent among athletes and sports fans (Nelson and Wechsler 2003, 2001), fraternity and sorority members, highly social students, and students who live with multiple roommates or in a group house (Wechsler et al.1995). Specifically, one study found that residence and membership in a fraternity or sorority is the largest predictor of binge drinking. Sorority members are nearly twice as likely to be binge drinkers as other

college women. Similarly, 75 percent of male fraternity members binge drink, while only 45 percent of male non-fraternity members binge drink (Wechsler 1996). Researchers speculate that fraternity and sorority life, and the other activities above, lead a student to binge drink. However, these studies do not account for the pre-existing characteristics of students that choose these particular activities and so the correlation between binge drinking and certain activities could be because students prone to binge drinking also seek out those specific activities.

On the other hand, female, ethnic minority, religious, married, and older students all tend to binge drink at much lower rates than the average student (Wechsler et al. 1995). Also, students working for pay, engaged in outside community organizations, involved in the arts, or participating in community service are less likely to be binge drinkers (Wechsler 1996; Wechsler et al. 1995). Post-secondary institutions that encourage these activities may reduce many individuals' risk of drinking, and consequently have lower rates of binge drinking. In fact, the effect of these activities extends beyond just the students that actually partake in those activities: one study found that campus communities with high levels of volunteering seem to reduce individuals' risks of binge drinking even after controlling for individual volunteering (Weitzman and Kawachi, 2000). In this case, it appears that just being at a school with high levels of community service reduces the risk of binge drinking for students at that school regardless of whether the student participated or not. However, like the activities that correlate positively with binge drinking, researchers do not account for the type of student that chooses a school with high rates of community service.

Factors of Student Populations

Research shows that student body diversity affects the students' risk of binge drinking. White, male, and underage students, who are most at risk of binge drinking, binge drink significantly less in schools that have more minority, female, and older students than schools with few minority or older students. Also, students who do not binge drink in high school are more likely to start binge drinking at colleges with few minority and older students (Wechsler 2003). While these findings imply that schools with high levels of minority and non-traditional students cause a student to binge drink less they ignore characteristics, preferences, and backgrounds of students that choose to attend a school with high levels of minority and non-traditional students.

School policies and housing options also appear to influence rates of binge drinking. Weschler (2001) found that substance-free residences, where students are prohibited from using alcohol and tobacco products, are associated with less alcohol use and fewer secondhand effects of alcohol in these residence halls. These findings suggest that putting substance-free housing in any campus setting would reduce rates of binge drinking. Yet, this article fails to account for the type of student who chooses to live in a substance-free dorm: someone in a substance-free dorm chooses that residence because they do not wish to drink or be around drinking. I argue that a student choosing to live in a substance-free dorm is less prone to binge drink regardless of the actual policy. Therefore, the causal power of a substance-free policy may not be the policy itself, but its ability to attract students who have a lower propensity to binge drink.

Along the same line, Wechsler found that the overall rate of binge drinking at a college correlates with a student's risk of binge drinking after they arrive at that college (1996). At colleges where over half the student body binge drink, nearly half of students that did not binge in high school report binge drinking in college, and 80 percent of the students that were binge drinkers in high school continue to binge in college. Yet, at colleges with low rates of binge drinking half of the students that binge drank in high school did not binge drink in college, and only 17 percent of students that did not previously binge drink take up binging once in college (Wechsler 1996). As with students who choose to live in substance-free housing particular students (with certain preferences against alcohol use) may choose to attend a school with low rates of binge drinking. Therefore, even before arriving at college the type of student that wants to attend a school with low levels of binge drinking is already less likely to binge drink.

Homophily and the Decision to Attend College

Research shows that people with similar personal preferences and sociodemographic characteristics are more likely to be friends, associates, or spouses than chance predicts, a phenomenon called homophily. Social scientists apply the principles of homophily broadly in studies of social networks and voluntary associations (Mark 1998). Homophily seems likely to be an important factor in students' choice of which college to attend, particularly given the ways in which colleges market themselves to students by emphasizing distinct characteristics. For instance, students that value sporting events as an important leisure activity would be more drawn to a college with sports teams and events. A student that is interested in outdoor activities would most likely attend a school where others value and participate in that same leisure activity. I

argue that given the prevalence of binge drinking as found in previous studies and as portrayed in popular culture, classify drinking as a leisure activity and, consequently, assume that preferences for drinking might define individuals' ideal social networks and ideal college environments (i.e. students who perceive drinking as an important leisure activity will also choose to attend schools where others value and participate in that same leisure activity). That particular preference for drinking will dispose the student to binge drink, not the individual and institutional characteristics attributed with causing binge drinking by current policies and other studies. At the aggregate level, these students' selections may reproduce a high binge-drinking environment.

Research shows that colleges with high rates of binge drinking attract more students who were binge drinkers in high school (38 percent), compared to colleges with low rates of binge drinking (24 percent) (Wechsler, 1996). Although this pattern shows a clear link between pre-existing behaviors and characteristics in high school and attending a college with high rates of binge drinking, no research so far examines how these high-school and adolescent behaviors affect students' behaviors after they are in college. In other words, a students' predisposition to attend a college with high rates of binge drinking may interact with other risk factors of binge drinking. I hypothesize that a student with certain pre-existing characteristics, increases their chances of attending a college with high rates of binge drinking, and of succumbing to binge drinking in college. Furthermore, I hypothesize that the pre-existing characteristics will outweigh the effects of previously identified risk factors for binge drinking in college.

III. Data and Methods

To assess the relative influence of preferences for attending a college with a high levels of binge drinking and contemporary influences on students' drinking behavior, I analyze two processes sequentially. First I analyze how particular individuals choose a college examining if schools' drinking behaviors may influence which students it attracts. Second, I assess the on-going impact of that initial choice with other college influences on drinking behaviors. The first analysis looks at a student's high school activities and characteristics (such as the students' family situation, social activities, and drinking behaviors prior to attending college) in relation to the level of binge-drinking at the college that the student attends. The second analysis examines students' college characteristics and activities through a combination of the individual students' drinking behaviors and social activities in the college setting, as well as the general drinking behaviors and activities of the entire college population.

The data for this study come from the Harvard School of Public Health's College Alcohol Study (CAS). The CAS used a nationally representative survey to obtain student reports about alcohol and substance use, school activities, school policies, and background characteristics. The CAS employed a multi-stage sampling technique, by first selecting a nationally-representative sample of four-year colleges and then randomly sampling students within those schools. Surveys went to 140 different four-year colleges and universities; 70 percent of the surveyed schools are public and 30 percent private,

which approaches the national distribution of full-time 4-year colleges of 68 percent and 32 percent respectively (National Center for Educational Statistics [NCES], 1990).

The CAS data set allows me to analyze a large and representative sample of students from all over the country, something I could not do with interviews or a case study. While the survey data limits me to the only the specific variables collected in the CAS, the large representative sample allows me to generalize my findings to students and colleges all over the US. Also, because of the size and scope of the CAS, I can compare students with a wide range of pre-existing characteristics that attend a wide variety of colleges. With any other form of data I would be limited to a smaller sample population and only a few combinations of background characteristics and types of colleges.

Each school mailed out approximately 225 surveys to a random sample of students, provided by the school registrar. The surveys were timed to avoid spring break at each school to measure typical drinking behaviors on campus and not drinking behaviors during vacation. The study was first conducted in 1993 and since then was repeated at the same 4-year institutions in 1997, 1999, and 2001. Participation was voluntary and responses were anonymous and confidential. I use data from the 2001 survey, which has a response rate of 52 percent (range 22% to 83%) (Harvard School of Public Health 2006). Additional information about the aggregate characteristics of college populations comes from a non-public data set derived from a survey administered to each participating college by the Harvard School of Public Health.

To model the two-stage process of deciding to attend a particular college and the influence of contemporary influences on students' drinking behavior I estimate causal effects of the independent variables in the study with a two-stage regression model using a propensity score. The propensity score is the probability that an individual, with a set of observed characteristics, is a member of a particular group (Winship 1999). In the language of experimental research, the propensity score estimates the likelihood that an individual will be exposed to a treatment – in this case, attending a college with a high level of binge drinking. The first stage of the regression estimates a propensity score for a student to attend a college with a high rate of binge drinking based on a student's high school characteristics. The second stage of the regression uses the propensity score from stage one as a predictor variable in estimating the influences on binge drinking.

Stage One Regression: Do Students Select Schools Based on Drinking Behaviors?

This stage of analysis determines if students with particular characteristics in high school tend to attend colleges with high levels of binge drinking, more than students without those characteristics. This predictive likelihood measure of attending a college with high rates of binge drinking, reveals the correlation between a student's choice of a post-secondary institution and pre-existing preferences and tendencies for alcohol consumption. I then use that measure as a propensity score in the second regression analysis to determine if the factors that otherwise correlate with heavy college drinking correlate differently or not at all after controlling for predictive likelihood of attending a post-secondary institution with high rates of binge drinking. In other words, if students choose their environment and their peer group based on existing preferences for alcohol

consumption then do factors, often believed to augment heavy drinking, really have any relevant effect on students drinking behaviors?

In this first stage, the dependent variable is dichotomous: whether a student attends an institution with a high rate of binge drinking (the school's level of binge drinking is defined and coded by the principal investigator of the Harvard CAS based on the individual survey responses at each school), with yes coded as 1 and no coded as 0. The independent variables for the first stage regression are also dichotomous: if the student drank 3 or more drinks per occasion in high school, if the student's father is a moderate to heavy drinker, if the student was first drunk at less than 17 years old, if the student binge drank more than twice in high school, if the student participated in athletics during high school, if the student drank monthly in high school, and if the student is male (each of these variables is coded as 1 for yes and 0 for no).

Stage Two Regression

For the second stage of analysis, I create another logistical regression using a nested model with a dichotomous dependent variable: whether the student binge drinks in college – yes coded as 1 and no coded as 0. This model describes the impact of individual, institutional, and student body characteristics on a student's binge drinking behavior.

This stage begins with individual – level variables: whether the student is a member of a fraternity or sorority, the student's current living arrangements (in a

fraternity or sorority house, off campus, or on campus), student's valued activities, and student perceptions of attitudes toward binge drinking. I use a series of dummy variables to measure activities that students value based on survey questions asking students to assess the importance of these activities. Students may value any combination of these activities. To measure the importance of students' perception of other students' attitudes toward drinking, I use variables measuring whether a student perceives that his or her peers approve of drinking and driving and whether a student perceives that his or her peers approve of having six or more drinks at a party. Based on previous research, I have hypothesized relations between these variables and binge drinking. (These predictions are summarized in Table 1 on page 13).

I next add in institutional-level characteristics, associated with either increased or decreased levels of binge drinking on campus. The institutional level variables are the gender composition of the college, the prevalence of fraternity/sorority members, and characteristics of the school (public, coed, and commuter campus).

Table 1: Predicted Relationships of Individual and Institutional Variables on Binge Drinking.

Independent Variable	*Relation to Binge Drinking*
Individual Variables (yes = 1; no = 0)	
Member of Fraternity or Sorority	+
Perception that others approve of:	
Drinking and Driving	+
Binge drinking at a party	+
Student lives in:	
Fraternity or sorority house	+
Off-campus housing	+
Student thinks the following is important:	
Attending sporting events	+
Community service	-
Parties	+
Greek life	+
Academics	-
Arts	-
Athletics	+
Institutional Variables	
Percent male	+
Percent member of fraternity or sorority	+
Percent living in fraternity or sorority house	+
Public	+
Coed	+
Commuter	-

Finally, I combine the individual-level variables, institutional-level variables, and the propensity score derived in Stage One, the predictive likelihood of attending a college with a high rate of binge drinking. I hypothesize that after accounting for a student's

predictive likelihood of attending a college with a high rate of binge drinking the degree to which the individual and institutional variables that correlated with binge drinking prior to accounting for the student's predictive likelihood variable will decrease substantially.

IV. Findings

Table 2 presents the descriptive statistics for the variables in the analysis. Table 3 presents the coefficients and standard errors for the seven variables that comprise a propensity score, derived in stage one of my analysis, as well as the variables which I include in stage two of the analysis. For the environmental and individual variables of stage-two, I used CAS survey questions that correspond with previous research of college-level risk factors. For the seven variables that make up the propensity score (a student's propensity to attend a college with high levels of binge drinking) I used the questions in the CAS survey that describe pre-college characteristics and activities. Five of these seven variables I use to predict a students' likelihood of attending a college with a high rate of binge drinking regard the student's high school leisure activities (most of which are drinking behaviors): whether student drank 3 or more drinks per occasion in high school, whether student was first drunk at less than 17 years of age, whether student binge drank more than twice in high school, whether student participated in high school sports, and whether the student drank monthly in high school. The remaining two variables indicate other pre-college risk factors: whether the student is male and whether the student's father is a moderate to heavy drinker. I chose variables that account for a

student's high school drinking habits as a measure of one's personal tendency and preference for drinking prior to attending college. I found that students with tendencies toward drinking in high school tend to choose to attend colleges with high rates of binge drinking. I included the measure of gender within the propensity score because males have higher rates of binge drinking both in college and in high school. Finally, I included a variable to account for the father's drinking habits to assess the student's family's attitude toward drinking. The seven variables are all significantly correlated, both substantively and statistically, with attending a college with a high rate of binge drinking.

Table 4 presents the coefficients and standard errors for three nested logistical regression models predicting individuals' binge drinking. Model 1, which includes only the individual factors, shows a positive correlation between binge drinking and a student being a member of a fraternity or sorority, living in a fraternity or sorority house, living off-campus, perceiving peers approve of binge drinking at a party, and rating parties as important. Deviating from my hypotheses, binge drinking does not correlate with a student perceiving that peers approve of drinking and driving; nor does a student rating attending sporting events, involvement in Greek life, academics, or athletics as important.

Model 2 adds college characteristics to the individual effects. None of these institutional-level variables substantially alter the effects of any of the individual factor variables. Nonetheless, there are significant correlations between institutional characteristics and binge drinking. As I hypothesized, attending a public college and having a larger concentration of male students correlates positively with binge drinking.

The separate dummy variable for co-ed campus is not significant, suggesting that the concentration of male students is not simply a function of different rates of binge drinking at all-female and all-male institutions. Contrary to my hypothesis, the percent of the campus that is a member of a fraternity or sorority is negatively correlated with binge drinking.

Model three adds the propensity score variable derived from the Stage One regression. This variable has a strong, positive association with the likelihood of binge drinking. After controlling for the predictive likelihood variable, both the individual and institutional variables change considerably. As I had hypothesized the effect of several variables decreases: whether the student is a member of a fraternity, whether the student perceives that his or her peers approve of having 6 or more drinks at a party, whether the student rates community service as important, whether the student rates parties as important, the percent of a college that is a member of a fraternity or sorority, and whether the college is a commuter campus. Also in keeping with my hypothesis three variables become statistically insignificant after controlling for the predictive likelihood measure: whether the student lives in a fraternity or sorority house, whether the student lives off campus, and whether the college is public.

Contrary to my hypothesis, two variables have a stronger association with binge drinking after accounting for the predictive likelihood variable. The individual level variables of student rates athletics as important and student perceives his or her peers approve of drinking and driving, which were not statistically significant in Model 1 and

Model 2, become statistically significant in Model 3. In this model, student perceives his or her peers approve of drinking and driving negatively correlates with binge drinking; likewise, student rates athletics as important negatively correlates with binge drinking; both these variables correlate in the opposite direction of my hypotheses.

To illustrate the substantive significance of the propensity score, I estimated the overall predicted probability that a student will binge drink, using the modal and mean values for each of the individual and institutional independent variables. I then set the propensity score value at the 25th, 50th, and 75th percentile to estimate the difference in predictive probability to binge drink in college between a person with a low propensity and a person with a high propensity score. A student with the mean value for all independent variables and a propensity score 25th percentile, has a 30 percent predicted likelihood of binge drinking in college. A student with the mean value for all independent variables and a propensity score in the 50th percentile has a 36 percent predicted likelihood of binge drinking in college. A student with the mean value for all independent variables and a propensity score in the 75th percentile has a 56 percent predicted likelihood of binge drinking in college. A hypothetical student that is a member of a sorority and has a propensity score in the 75th percentile will have a 72 percent predicted likelihood of binge drinking with all other independent variables at the mean value. The same student, a member of sorority, but with the propensity score in the 25th percentile has only a 46 percent predicted likelihood of binge drinking with all other independent variables held at the mean value. No other independent variable has near the impact on a student's predicted likelihood to binge drink.

Model 4 includes an interaction variable to measure the joint effect of a student's perceived importance of parties and the student's propensity score (the measure of a student's predicted likelihood of attending a college with high levels of binge drinking). I combine these two variables to test whether the effect of the propensity score varies based on how important a student perceives parties. This test provides a good means to expand on the theory of homophily, which suggests that students with a preference for drinking will choose to attend colleges with other students that also prefer and partake in drinking. Thus if the homophily theory is correct, one should expect that the effect of one's propensity to attend a heavy drinking campus will be strongest for those students who rate parties as an important social activity. That is, even after controlling for the difference in binge drinking rates between students who rate parties as an important social activity and those who do not, I anticipate that this social preference has an additional effect on those with a higher propensity for attending heavy drinking campuses. Therefore, I hypothesize that a student with a preference to attend a college with high levels of binge drinking will also have a preference for social activities where binge drinking is a norm and therefore place a greater importance on parties. Further, the effect of a how much a student values parties upon a student with a high propensity score will have a magnified effect on the student's predicted probability of binge drinking.

I find that the impact of the effect of rating parties as important is higher for students with a greater propensity to attend a high drinking campus. The impact of one's propensity score and the value one places on parties is magnified when the two variables

are combined rather than measured independently. The new combined variable effects little change on the other variables (individual, institutional, and the propensity score) except that it causes the impact of the single variable of whether a student thinks parties are important to decrease significantly. This suggests that without a high propensity to attend a college with high levels of binge drinking, whether a student values parties has a much smaller effect on the student's predicted probability of binge drinking than Model 3 suggests. The interaction of the two variables, however, has a major effect on a student's likelihood of binge drinking. Table 5 displays the substantive effect of the interaction between the propensity score and a student's perceived importance of parties. This table shows that a student who has low propensity score, in the 25th percentile, and thinks parties are important has a predicted probability of binge drinking of 49 percent. However, a student with the same propensity score who does not think parties are important has predicted probability of binge drinking of only 30 percent. A student with a high propensity score, in the 75th percentile, who thinks parties are important has a predicted likelihood of binge drinking of 75 percent, but the same student who does not think parties are important has only a 57 percent predicted probability of binge drinking. This table shows the drastic impact the joint effect has on a student's risk of becoming a binge drinker.

V. Analysis

Initially, I hypothesized that a student's propensity to attend a college with a high rate of binge drinking would have a significant effect on the student's predicted

probability of binge drinking. Using logistical regression, I created a propensity score to measure the effect a student's propensity to attend a college with a high rate of binge drinking would have on that student's binge drinking habits once in college. Just as I predicted the propensity score substantively and statistically significantly correlated with binge drinking to a higher degree than any of the other independent variables I tested. In summary, the impact of a student's pre-existing traits and characteristics upon entering college outweighs the impact of any individual or institutional risk factors associated with binge drinking in the previous research on this topic.

I also, hypothesized that this propensity to attend a college with a high rate of binge drinking would alter, and in some cases override, the effects of other risk factors and binge drinking. The analysis provides some support for this evidence. For instance, the influence of being a member of a fraternity or sorority, the value a student places on community service, the value a student places on parties, and the percent of the student body that are members of a fraternity or sorority all decrease after accounting for a student's propensity to attend a college with high levels of binge drinking. Further, whether a student lives in fraternity or sorority housing, whether a student lives off campus, and whether an institution is private or public loses any statistical significance after accounting for the propensity score. However, two instances refute that hypothesis. The individual-level variable student perceives that peers approve of drinking and driving, while not statistically significant in Model 1 or Model 2, significantly and negatively correlates with binge drinking after accounting for the propensity score variable. It is possible that groups of people that binge drink develop a social norm

against drinking and driving that does not exist among groups of non-binge drinkers. This phenomenon could be due to high rates of negative life experiences regarding drinking and driving accidents.

The individual-level variable "student perceives athletics as important" is also statistically significant only after accounting for the propensity score. Like the drinking and driving variable, this variable correlates negatively with binge drinking, meaning that after accounting for one's propensity score, participation in athletics decreases a student's risk of binge drinking. This variable may be insignificant without accounting for the propensity score because many students involved in athletics have high propensity scores and skew the data.

The institutional-level variable percent male is significantly positively correlated with binge drinking, with or without accounting for the propensity score. However, contrary to my hypothesis, the effect of this variable increases after controlling for the propensity score. This means that being at a college with a high percentage of male students will increase one's probability of binge drinking more after accounting for a student's propensity score.

VI. Conclusion

Although researchers have studied the causes and correlates of binge drinking in college, no one has yet looked into the effects of students' pre-existing preferences and

characteristics on binge drinking. Throughout my study, I argue that a student that wants to binge drink seeks out certain college environments and activities where drinking is common and acceptable. It is the student's predisposition to drink (developed before entering college) that determines whether the student will drink in college, not the student's college environment or activities. Using a logistical regression analysis of survey data from the CAS, I find that factors influencing students before college influence their propensity to attend a high-binge drinking college and likelihood of binge drinking in college even more than individual and institutional factors existing at college.

After people have reached college age, many have already developed a propensity towards drinking. In my analysis, a person with a high propensity score, even if all other individual and environmental risk factors are held at the minimum, has a high predicted probability to binge drink. According to the data in this study, lowering a student's propensity score is the most effective way to lower a students' probability of binge drinking. Therefore, prevention should start in adolescence when the student is experiencing the components that make-up the propensity score: drinking in high school, participating in high school sports, and witnessing their father's drinking habits.

Although this study suggests that prevention programs in high school or before would be the most effective intervention, these findings are valuable for college-level prevention programs. For colleges that require prevention education programs for "at-risk" students (often defined as athletes and fraternity members) this study offers a more effective model to define "at-risk" students. Instead of targeting students involved in

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particular groups or activities, schools may have better results from prevention programs if they target students with strong propensity to binge drink.

Of course, the propensity score, while the most substantive, is not the only risk factor correlated to binge drinking. Controlling for this propensity shows that a narrower range of college-level factors influence binge drinking, allowing for intervention programs to focus more sharply on the risk factors that actually do matter. Membership in fraternities and sororities and a student's perception of peers exert some influence on a student's likelihood of binge drinking even after accounting for the propensity score, suggesting that college level programs should continue to focus on decreasing drinking behaviors among members of fraternities and sororities and students that value participation in parties. However, students living off-campus or in fraternity housing are not particularly at risk of binge drinking after controlling for the propensity score. Thus, programs targeting those students are ineffective and inefficient.

This study offers a new way to understand causes of binge drinking; however, it is not conclusive due to some methodological limitations. Most importantly, I can not decisively say that students choose their college based on preferences for drinking, I can only make that inference from the survey data. Therefore, this study only reveals that high school drinking behaviors correlate to binge drinking in college, but does not explain why or how students decide to drink in the first place. For instance, the study did not ask about how a student chose their college, would the student have attended their current college if it had been substance-free, or why did the student start drinking

initially. These are important questions that should be asked in any follow up research on this topic.

Future research based on in-depth interviews could also determine how and why students choose a particular college and what role a college's drinking culture might play in this decision. Researchers should also conduct interviews to determine why students begin drinking in high school and how that carries through to college. To really prevent binge drinking in college, we must first examine what leads students to drinking in teen years.

Finally and most importantly, future research needs to determine what types of preventative measures are effective and when in a student's life to take such actions. Using all the previous research on college binge drinking, high school drinking, and the correlates for both respectively, colleges and high schools must design prevention programs for each stage of a student's academic career and then follow through with evaluations of each program.

Table 2: Descriptive Statistics

Variable	Mean
Propensity Score Variables	
Student drank 3 or more drinks per occasion in H.S.	.3721
Father is Moderate drinker	.1956
Student was first drunk at less than 17 years of age	.4636
Student binge drank more than twice in HS	.2879
Student participated in sports in HS	.6496
Student drank monthly in HS	.5572
Male	.36
Independent Variables	
Member of a Fraternity Or Sorority	.12
Perception that others approve of:	
Drinking and driving	.3516
Binge drinking at a Party	.7286
Student lives in:	
Fraternity or Sorority House	.0247
Off-campus housing	.58
Student thinks the following is important:	
Attending sporting events	.2930
Community service	.4123

Parties	.3047
Greek life	.1106
Academics	.9535
Arts	.2712
Athletics	.2711

Institutional Variables

Percent Male	.69
Percent Member of Fraternity or Sorority	.1353
Percent living in Fraternity or Sorority House	.0269
Public vs. Private	.6946
Coed vs. All Women	.9527
Commuter Campus	.1340

Table 3: Estimated Effects of Variables that Comprise a Student's Predisposition
to Attend a Campus with High Levels of Binge Drinking

Independent Variable	B
Student drank 3 or more drinks	$.168^{**}$
per occasion in H.S.	$(.056)$
Father is a Moderate drinker	$.208^{***}$
	$(.050)$
Student was first drunk at less	$.121^{*}$
Than 17 years of age	$(.052)$
Student binge drank more than twice	$.249^{***}$
in H.S.	$(.059)$
Student participated in sports in H.S	$.302^{***}$
	$(.043)$
Gender	$.089^{*}$
	$(.042)$
-2 log likelihood	14206.184
Chi-square	236.449

$^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$
Note: Numbers in parentheses are standard errors. N=10904

Table 4: Estimated Effect of Individual, Institutional characteristics, and Propensity to Attend a College with a High Level of Binge-Drinking on the Dependent variable of whether a student binge drinks (1 = Student binge drinks, 0 = Student does not binge drink)

Independent Variable	Model 1	Model 2	Model 3	Model 4
Individual Variables				
Member of Fraternity	.753***	.790***	.696***	.697***
	(.103)	(.104)	(.112)	(.112)
Perception that others approve of:				
Drinking and driving	-.005	-.002	-.099*	-.100
	(.050)	(.050)	(.054)	(.054)
Binge drinking at a	1.052***	1.023***	.803***	.803***
Party	(.059)	(.059)	(.063)	(.063)
Student lives in:				
Fraternity or Sorority	.493**	.420*	.322	.326
House	(.180)	(.182)	(.193)	(.193)
Off-campus housing	.105*	.144**	.049	.052
	(.048)	(.050)	(.054)	(.054)
(Reference category: Dormitory)				
Student thinks the following is important:				
Attending sporting events	.058	.048	-.005	-.009
	(.055)	(.055)	(.059)	(.059)
Community service	-.587***	-.580***	-.433***	-.431
	(.048)	(.048)	(.052)	(.052)
Parties	1.823***	1.818***	.1.630***	.783*
	(.052)	(.053)	(.056)	(.333)
Greek life	-.204	-.170	-.133	-.137
	(.110)	(.111)	(.120)	(.120)
Academics	-.035	-.056	-.014	-.017
	(.111)	(.112)	(.119)	(.119)
Arts	-.090	-.094	.022	.024
	(.052)	(.052)	(.055)	(.666)
Athletics	.083	.081	-.199*	-.202
	(.056)	(.056)	(.059)	(.060)
Institutional Variables				
Percent Male	_____	.639*	.487	.495
		(.327)	(.347)	(.347)
Percent Member of	_____	-1.136***	-.843*	-.830*
Fraternity or Sorority		(.285)	(.302)	(.302)
Percent living in	_____	1.351	.888	.860

Fraternity or Sorority House		(.746)	(.800)	(.800)
Public vs. Private	____	.106 (.055)	.096 (.059)	.093 (.059)
Coed vs. All Women		-.171 (.172)	-.193 (.182)	-.195 (.182)
Commuter Campus	____	-.415*** (.075)	-.354*** (.080)	-.352*** (.080)
Predicted Likelihood of Attending a High Binge Campus	____	____	12.377*** (.395)	11.783** (.446)
Predicted Likelihood of Attending a High Binge Campus and Student thinks Parties are Important (Combined effect)	____	____	____	2.224*** (.863)
-2 log likelihood	11569.786	11519.252	11816.196	10339.361
Model chi-square	2494.487	2545.021	2248.075	6.767

*p<0.05; **p<0.01; ***p<0.001.

Note: Numbers in parentheses are standard errors. Chi-square statistics compare the models to the previous model. Baseline (intercept-only) -2 log likelihood is N=10904

Table 5: The Predictive Likelihood of a Student Binge Drinking in College based on Different Measures of the Propensity Score and the Interaction of the Propensity Score and a Student's Perceived Importance of Parties

Propensity Score	Student thinks Parties are Important	Student Does Not Think Parties are Important
25th Percentile	49%	30%
50th Percentile	67%	36%
75th Percentile	75%	57%

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