

USCLAP Project Submission  
Risk Factors for Teen Alcohol Use

12/22/17

Abstract

Teen alcohol consumption is a hot political topic in the United States and though illegal, occurs frequently. In this paper, a 2013 federal survey on substance abuse and mental health survey is analyzed to determine risk factors that correlate to usage of alcohol in teenagers through chi-squared and ANOVA tests. We find that (a) parental homework help correlates with ever having consumed alcohol ( $p < 0.001$ ), (b) perceived peer usage correlates to occasions using alcohol in the last year ( $p < 0.001$ ), and (c) average grade correlates to first age of alcohol use ( $p < 0.001$ ). Through analysis of determining factors, we hope that lawmakers and families can more readily understand and consider risk factors that will affect teens, and use this to take measures to prevent or reduce teen alcohol use, and inform litigation.

## Introduction

Our primary research question was: what influences so many US teenagers to consume alcohol? We were interested in this topic because we are aware that alcohol use among teenagers is prevalent, despite the fact that it is illegal and knowingly harmful. We hoped to better understand what factors motivate teens to drink, or contribute to a drinking lifestyle. We chose our variables based on cited risk factors in various studies as well as variables we thought may have potential associations with alcohol use ("Alcohol use disorders, depression, and low self-esteem among ED-treated older adolescents," Kelly, 2004; "Adolescent alcohol exposure: Are there separable vulnerable periods within Adolescence?" Spear, 2015; "Individual risk factors for adolescent substance use," Swadi, 1999). Based on this research, we considered risk factors such as parental guidance, peer pressure, and grades in school.

We looked at how these variables may have affected whether or not a teen has ever tried alcohol, at what age they first used alcohol, how much they consumed in a year, and how recently they have used alcohol. Factors like this can help give an idea as to which groups of teens are most at risk for substance abuse. This is important to study because alcohol and drugs are dangerous for young people to use, can put their lives at risk, and can potentially interfere with brain development. Even though it is technically illegal for teenagers to consume alcohol, many still do it, so by understanding how the environment affects risk among students, campaigns to reduce drug and alcohol usage could be more effectively targeted. We hypothesized that external stressors in a student's life (depression, familial support, income, performance in school) may have an effect on their age of first drinking, recency of alcohol use, and frequency of alcohol use.

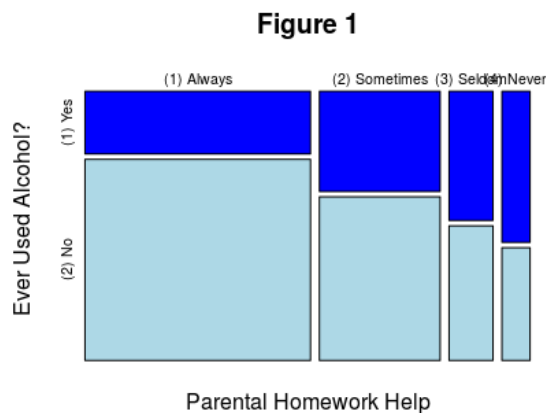
## Methods

Our data set is from the National Survey on Drug Use and Health from 2013. This was a survey funded by the U.S. federal government regarding demographics information, general health, and drug use. It surveyed people of all ages, but we chose to focus on 12-17 year olds, our target population which included 17,000 individuals across six variables. We looked at three explanatory variables and three response variables. Our explanatory variables were: average grades in the grading period (A, B, C, D), parental homework help (always, sometimes, seldom, never), and portion of acquaintances who drink (all, most, few, none). For our response variables, we measured whether or not students have consumed alcohol in the past (yes or no), on how many occasions they had used it in the last year (0 to 365), and the age at which they first drank alcohol (0 to their current age).

We use chi-squared testing for comparison of a binary response by multiple explanatory variables, and ANOVA tests for differences between numeric responses by categorical explanatory variables.

## Results

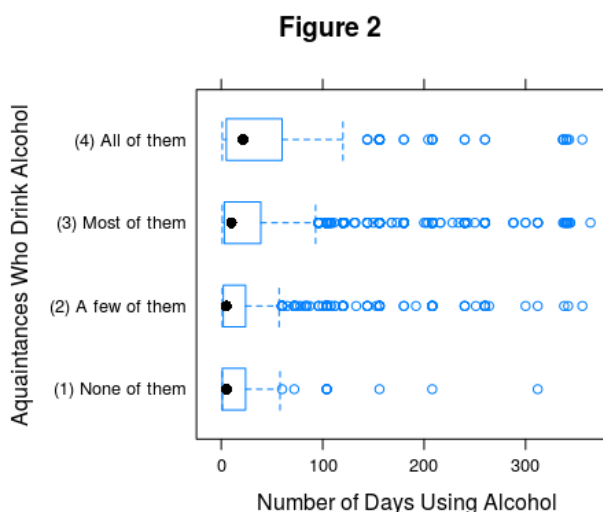
Our first question was whether or not parental involvement in students' lives was a factor in alcohol use. We decided to use parental frequency of homework help as an indicator of this, because it shows involvement in a significant aspect of the students life, as well as encouragement of



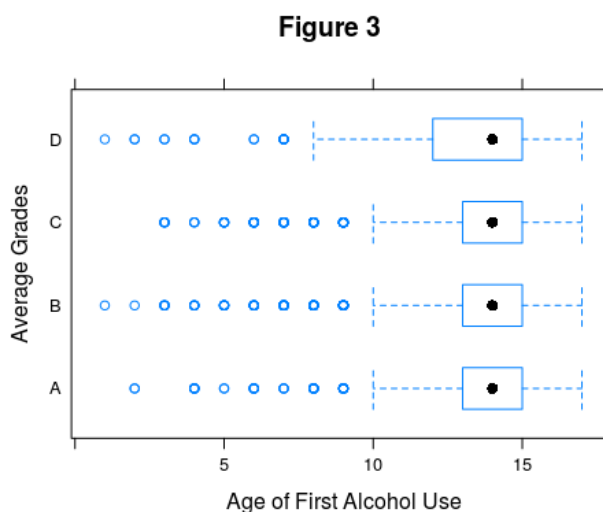
positive values. There was a statistically significant decrease in use of alcohol across all groups of increasing parental involvement (figure 1), with a  $\chi^2 = 875$  on 3 degrees of freedom with a  $p < 0.001$ . We conclude that helping with homework is associated with a healthy underlying family lifestyle, and hypothesize that it can reduce purposeful deviant behaviors such as alcohol consumption.

To test whether peer's drinking - or knowing more people who drink - influenced drinking, we performed an ANOVA test to see whether or not the total number of days using alcohol in year depends on how many other students the teen knows who drink. Students responded to this question with "all", "most", "a few", or "none" in reference to the proportion of people the student knew who consumed alcohol. The results

of our F-test showed significant evidence, with  $F = 26.1$  on 3 and 4003 degrees of freedom with  $p < 0.001$ , of a relationship between mean days of alcohol consumption and how many people a student knows who drink (fig. 2). Most significantly, we saw from the Tukey HSD model that there were highly significant differences between all groups. This supported our hypothesis that the more people a student knows who drink, the more drinks they are likely to have consumed in the past year. In accordance with these results, we can be 95% confident that the true difference in days drinking between those whose acquaintances all drink and those whose have no acquaintances that drink is between 17.670 and 44.517 days drinking per year. This suggests that the more students you know who drink, the more likely you are to have drunk more in the past year.



We were also interested in the relationship between grades and alcohol consumption (fig. 3). We performed an ANOVA test and a subsequent Tukey analysis after our ANOVA test indicated statistical significance ( $F = 15.18$ ,  $p < 0.001$ ). We analyzed the differences between the mean ages at which students first tried alcohol categorized by most recent grades and found significant relationships between all groups except between C's and D's. We found that students in our sample who had an average grade of an 'A' the previous semester tried alcohol an average of about 0.82 years later than students who scored an average grade of D the previous semester. Furthermore, we are 95% certain that the true difference in age for first trying alcohol between A-students and D-students is between .44 years and 1.14 years later for A-students.



Through further evaluation, we also found that a significant difference in the number of days per year that students consume alcohol and their grades ( $F=66$ ,  $p<0.001$ ). Through an ANOVA comparison of days drinking between each grade group, we found that each decrease in letter grade corresponds to an increase in days that alcohol is consumed each year. We are 95% confident that an A-student drinks on between 9.5 and 15.4 occasions fewer than a D-student.

### Discussion

Our findings that parents who more frequently helped their children with homework seemed to align with our hypothesis that greater parental involvement in a student's life leads to less alcohol consumption. In future research, we would be interested to study how the number of parents in the household affects this relationship, and whether non-parental figures who helped students with homework may demonstrate a similar relationship. We also found that the more people a student knows who drink, the more likely they themselves are to consume alcohol. We speculated that this association likely had a relationship to peer pressure, the pressure one may feel to do things that their friends do to fit in in the friend group. However, it also may be that people with similar habits sometimes develop friendships based off of their similar interests.

One important point is that due to the observational nature of the survey, we are not able to comment on causation. We believe it would be interesting and useful to construct an experimental study to determine if any of these results could be replicated there, and causation could be attributed. We hypothesize that there are relationships in both directions for all three of our analyses - for instance that grades affect alcohol consumption, as well as alcohol consumption affects grades. In future research, it would be interesting to see how the converses of our observed relationships hold.

Based on our research, it seems that some of the most effective ways of reducing teen alcohol use is to provide a nurturing home environment, and encourage students to focus on academics. Acquaintances and friends seem to make a big impact, but this is harder to control or impact from an outside role. The question beyond the research becomes: how necessary is it to regulate teen alcohol usage institutionally or governmentally, how much of the responsibility is on the parents and students, and how dangerous truly is alcohol with proper education and precaution?

### Bibliography

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