Drinking and driving: a bivariate examination of select correlates of drunk driving among adolescents

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Drinking and Driving: A Bivariate Examination of Select Correlates of Drunk Driving among Adolescents

Linda Cirillo
Nevada State College

Abstract
Using the 2009 YRBS data set, this study examined bivariate correlations between select correlates of drunk driving among adolescents. Results show statistically significant correlations between age at first drink, binge drink, and marijuana use and drunk driving. While there has been a slight downward trend in reported incidents of current drinking and driving among adolescents (CDC, 2012), the social, emotional, and economic costs to families and communities remain high. For these reasons, there is a continued need for education of drinking impairment with adolescents to emphasize that driving is a privilege not a right and can have detrimental consequences when combined with alcohol.

Introduction

According to the Centers for Disease control and Prevention (2010), just over 8% of U.S. adolescents reported drinking and driving at least once in the past 30 days. This statistic is indicative of a significant social problem among youth in this country. The National Highway Traffic Safety Administration (NHTSA) reported that in 2010 drunk driving accidents cost $132 billion annually. A significant portion of those costs are attributed to young drivers, especially those who are first exposed to alcohol at an early age. For example, approximately 20% of adolescents aged 15-20 years who were involved in fatal and motor vehicle crashes had been using alcohol prior to the accident (NHTSA, 2010).

Teenagers endanger not only their lives but those of others by getting behind the wheel of a vehicle while they are drunk. Of a total of 15,425 respondents, 8.2% admitted to driving drunk in the previous 30 days before the survey which is approximately 1,265 students. Further, the survey indicates that not all of them were legally old enough to drive. The concern is that teenagers are taking unnecessary risks with their lives and the lives of others who share the road.

The goal of this research is to answer the following research question and hypothesis:

Research Question: What factors are associated with drunk driving among adolescents?

H1: The younger the age at first drink, the more likely an adolescent will report drunk driving in the past 30 days.

H2: Adolescents who report drinking 5 or more drinks in a row in a couple of hours (binge drink) are more likely to report drunk driving in the past 30 days.

H3: Adolescents who report greater marijuana use in the last 30 days are more likely to report drunk driving in the past 30 days.

According to Leadbeater, Foran, and Grove-White (2008) whom conducted a qualitative study focused on adolescent’s behaviors rural and urban, influenced by adults and peers with drinking and driving. Participants were (n=2594) between grades 10 and 12, with a mean age of 16 years and 2 months. Fifty percent were girls from seven public high schools in urban (n=994) and rural communities (n=1600) on Vancouver Island in British Columbia, Canada with a wide range of socio-
economic groups, similar in average GPA and graduation rates. Limitations include a constricted number of questions asked on the questionnaire, clarification as to whether these behaviors were exhibited when driving alone, driving with a peer or an adult. Further limitations include a narrow age range of youth drivers, using the word “ever” in the questionnaire, lack of assessment as to what is perceived as impairment to drive, and an unclear definition of what a youth’s perception of safety is. This study suggests that additional awareness needs to happen for adolescents, so that they can make more informed decisions, learn to say no to those who offer rides while intoxicated, and find alternatives to safe rides home.

Nygaard and Grube’s (2005) study was conducted in nine counties of the San Francisco Bay area and included an age range of 15-20 years old (n= 614). Participants were asked if they were drunk drivers or passengers of drunk drivers in the past 12 months. Candidates selected for this study were those who admitted to driving after drinking at least three drinks at one occasion during the last 12 months in a telephone survey. Participants included a total of 44 adolescents, 29 male, 26 Caucasians, 3 African-American, 8 Hispanics, 7 Asian-Americans and others. Limitations included a one year delay in the initial interview, accounting for those who refused to be interviewed, were not traceable, moved out of the area, or were paid to participate. This investigation examined options available to a drunk teenager, including whether parents reported a willingness to pick up their adolescents in the middle of the night after drinking. Adolescents reported not exercising the option to call their parents for a ride and, instead, taking their chances either driving under the influence or riding with someone who was under the influence.

The study that was conducted by Firestone, Price, Villarreal et al. (2006) evaluated an underage drinking and driving prevention program. They conducted a study pre and post simulated motor vehicle accident: “Shattered Dreams” that was caused by an adolescent drunk driver. The results of the “accident” were simulated and involved cooperation of the community, school, parents and participants. Pre and post questionnaires were administered approximately four weeks before and four weeks after the program to seniors at a northeast San Antonio high school. The total of 349 seniors completed the pre-program questionnaire with an overall of 60% response (n=209). Participants included 53% females (n=111) and 66% white non-Hispanic (n=138) with a mean age of 17.2 years. Of the original sample (n=349) who participated in the pre-program questionnaire, only 191 or 33% completed the post program questionnaire. Measures were not included to assess change in self-report drinking and driving among students prior to and after the program. Results show that participants did not demonstrate increased knowledge from pre to post questionnaire regarding underage drinking laws. This information is applicable in understanding how information is delivered and perceived by adolescents regarding drinking and driving.

Stein, Colby, Barnett, et al. (2006) focused on the effects of motivational interviewing versus relaxation training for incarcerated adolescents on driving under the influence after release from incarceration. The sample was recruited at a state juvenile correctional facility in the Northeast and included an age range of 14-19 years old. The screening criteria included that the year prior to incarceration
adolescents drank regularly (at least monthly), or binge drank at least once; had drank in four weeks before the offense for which they were incarcerated, or drank four weeks before being incarcerated. All 125 candidates qualified for the sample (n=105). Participants included 27.6% Hispanics (n=29), 34.3% African American (n=36), 32.4% white (n=34), and 5.7% other (n=6). Average age was 17.06 years. Limitations included use of the state’s sole juvenile correctional facility and charges ranged from simple truancy to murder. Those that were newly incarcerated were more receptive to intervention because of the recency of being incarcerated and their emotional state. Mood and depression were also considered as the participants who were depressed were predicted to drink more than those who were not depressed. Adolescents were paid for participating and completing the interview within one week of the scheduled date. This information is applicable in that motivational interviewing, rehabilitation, and education of drinking and driving after incarcerated could create a different outcome and behavior for the participant after being released from incarceration.

Among students nationwide, the percentage of having driven a car when they had been drinking alcohol did not change significantly during 1991-1997 (16.7%-16.9%) and then decreased during 1997-2001 (16.9%-8.2%) (CDC, 2010). While there has been a slight downward trend in reported incidents of current drinking and driving among adolescents (CDC, 2012), the social, emotional, and economic costs to families and communities remain high. For these reasons, the purpose of this study is to examine risk factors thought to be significantly correlated with drunk driving among a national sample of high school students.

**Methods**

The Youth Risk Behavior Surveillance Survey (YRSBB) is a cross-sectional ongoing survey that is conducted biennially and administered to U.S. students who are enrolled in grades 9-12. The questionnaire is self-administered and students provide their answers anonymously. Students take the survey on a voluntary basis and are not compensated for taking it. The target population includes both public and private schools in 50 states and District of Columbia. In 2011, a total of 47 states and 15,425 qualified questionnaires were part of the survey.

**Measurement**

*Outcome variable.* Drunk driving is an ordinal level variable that asks adolescents: During the past 30 days, how many times did you driven a car or other vehicle when you had been drinking alcohol? (0 times; 1 time; 2 or 3 times; 4 or 5 times; 6 or more times).

*Predictor variables.* The following items are predicted to be significantly related to drunk driving among adolescents: How old were you when you had your first drink of alcohol other than a few sips? (I have never had a drink of alcohol other than a few sips; 8 years old or younger; 9 or 10 years old; 11 or 12 years old; 13 or 14 years old; 15 or 16 years old; 17 years old or older). During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours? (0 days; 1 day; 2 days; 3 to 5 days; 6 to 9 days; 10 to 19 days; 20 or more days). During the past 30 days, how many times did you use marijuana? (0 times; 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times).
Results

Sample Characteristics

Table 1 below indicates that 49% of the sample was male. Also, 70% of adolescents report that they were not of Hispanic origin. Table 1 results also show that 10% were age 14, 22% were age 15, 25% were age 16, 25% were age 17 and 15% were age 18 or older. Also 25% were in 9th grade, 23% were in 10th grade, 24% were in 11th grade, and 25% were in 12th grade. Also, 1% were American Indian/Alaska Native, 5% were Asian, 17% were Black or African American, 1% were Native Hawaiian/Other, 42% were White, 19% were Hispanic/Latino, 11% were Multiple-Hispanic, and 3% were Multiple-Non-Hispanic.

Chi-Square Analysis

Age at first drink: Table 2 shows a significant correlation between age of first drink and drunk driving ($\chi^2 = 1231.25; \ p < .001$). The distribution of percentages across the categories of age of first drink is consistent. The percentage of age at first drink increases from 11-12 years old and 13-14 years old for adolescents who reported driving drunk from 1 time to 6 times or more. The percentages start to drop for age of first drink at 15-16 years old but significantly drop for 17 years old or older from 1 time to 6 times or more. Observed values were higher than expected values across all drunk driving categories except at higher age categories (15-16 years and 17 or more years) for driving drunk 4 or more times.

Binge Use: Table 3 shows a significant correlation between current binge drinking and drunk driving ($\chi^2 = 5767.81; \ p < .001$). The distribution of percentages across categories of current binge drinking is inconsistent. For example, percentages are fairly consistent from 0 days binge drinking to 1 day for adolescents who report binge drinking one time and 2-3 times, and 6 times or more. There is a percentage increase of more than double from 0 days to 1 day in adolescents who report binge drinking 4-5 times, however, there is no change between day 1 and day 2 for those who reported 4-5 times of driving drunk. Those adolescents who reported binge drinking 10-19 days and reported driving drunk 6 or more times were the highest percentages increase at just over 40%. Observed values were higher than expected for categories of binge drinking and drunk driving with the exception of 0 days binge drinking, which had lower than expected values across all drunk driving categories.

Marijuana Use: Table 4 shows a significant correlation between current marijuana use and drunk driving ($\chi^2 = 2339.33; \ p < .001$). The distribution of percentages across categories of current marijuana use is inconsistent. For example, there is a percentages drop from 0 days marijuana use to 1-2 days across drunk driving categories. The percentage of current marijuana use decreases from 1-2 days to 3-9 days for adolescents who report drunk driving one time. The percentages increase, however, from 1-2 days to 3-9 days for adolescents who report drunk driving 2 or more times. The percentages drop again from 3-9 days to 10-19 days across all drunk driving categories. Finally across all drunk driving categories, percentages again increase from 10-19 days to 20-39 days. For all categories of marijuana use, observed values were higher than expected values across drunk driving categories, excluding 0 days/never drank and drove.
Discussion

The purpose of this study was to examine select risk factors thought to be associated with drunk driving among sample adolescents. The results for this research come via secondary data analysis from the CDC’s 2009 YRBS data set. The variables thought to be significantly associated with drunk driving include age at first drink (of alcohol), binge drinking, and recent marijuana use. Findings indicate statistically significant bivariate relationships between each predictor variable and drunk driving.

Specially, chi-square results show higher observed values than expected for marijuana use across all drunk driving categories, excluding 0 days/never drank/drove. For age at first drink of alcohol, observed values were higher than expected, except at older age category of 15-16 years and 17 and older years for drunk driving 4-5 times and 6 or more times where observed values were lower than expected. Finally, for binge drinking, observed values were lower than expected for 0 days binging across all categories of drunk driving. For all other binge and drunk driving categories, the observed values were higher than expected.

The importance of the results of this study can be applied for policy and procedures in education by counselors, teachers and parents. This study reflects that adolescents need to be educated at a young age, as the trend shows that some are as young as 8 when first exposed to alcohol. Educating adolescents at a young age as to the results of permanent damage to both their own life and to those of others should be reinforced early in hopes of curbing peer pressure and choices that can have life changing results. In addition, this study reflects that there is a percentage of adolescents that not only drive drunk, but are not old enough to obtain a license. No matter how small the percentage is, the fact that it happens at all is to be considered when educating not only the adolescents but also the teachers and parents as well.

Limitations of the study include the fact that the YRBS is a cross-sectional study and cannot establish causation. Though my hypotheses were supported by the findings reported in the YRBS, it would have been interesting to examine items related to whether the student had family members or siblings with binge drinking and marijuana use problems, as well as if there was a history in the family of alcohol and marijuana abuse. Future research should consider questions regarding the area in which the student lived, whether it was rural, urban or suburban, to test if there is a significant difference between those geographic areas and underage driving. Strengths of this study include a large national sample (n=16,410), the study is conducted on a bi-annual basis, it is anonymous which reinforces adolescents to be more honest and covers a large variety of questions regarding risk behavior that is prevalent in today’s society and schools.

A study conducted by Piastrelli et al., 2011, focused on high school students views and attitudes of drinking and driving. The sample of students (n=302) answered questions about drinking and their attitudes towards drinking. Students showed an overall disapproval about their friends binge drinking, 49.7%. The majority of the students, 76.5% would try and prevent another student who had been drinking (one to two drinks) from driving. 18% of the students showed either no concern when it came to binge drinking or felt that it was acceptable.
Additionally, the students in this study, 63.2% indicated a willingness to talk to their friends about dangerous drinking behaviors, but not as likely to discuss it with their parents (44.0%), and even less likely to discuss it with teachers or school counselors (19.5%). It was noted that there was a possibility that early education programs may have been influential in the attitudes of these students, therefore making early education a possible factor of increasing student attitudes against drinking and driving. The authors found that after an educational program was introduced to these students, the after affect was that students were more apt to not want to drink and drive, as well as to intervene with other students who were in unsafe situations due to drinking.

Though students were found to not wanting to speak to an adult regarding drinking and driving, they did indicate a willingness to discuss the issues with their fellow students. Even if talking to only other students helps just one student from drinking and driving, it is a step in the right direction to getting adolescents off the road when drinking, and promote a more conscious behavior in adolescents.

The study suggests that talking to adolescents needs to start at a younger age, as in elementary school, and that it needs to continue through high school at the very least. Talking should include not just drunk driving, but the results of it, and what a person will have to live with, as well as the punishment rendered by the law. It should contain facts, stories (first-hand accounts whenever possible), literature, pictures, video and anything else that will get an adolescents attention to not just hear what their parents and teachers are saying but to actually understand it and to make better decisions when faced with the reality of whether or not to drive drunk.

References


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<th>Observed</th>
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<td>22.9%</td>
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<tr>
<td>5.4%</td>
<td>1.6%</td>
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</tr>
<tr>
<td>80.8%</td>
<td>1.9%</td>
<td>28.9%</td>
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</table>

Table 1: Chi-square Results for Age at First Drink and Drink Driving (n=16,121)
### Table 1. Chi-square Results for Age at First Drink and Drunk Driving (n=16,121)

<table>
<thead>
<tr>
<th>Drunk Driving</th>
<th>Never</th>
<th>8 yrs or &gt;</th>
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<th>11-12 yrs</th>
<th>13-14 yrs</th>
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<td>0 times</td>
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<td>838</td>
<td>715</td>
<td>1320</td>
<td>3208</td>
<td>2920</td>
<td>593</td>
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<td>108</td>
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<td>37.7</td>
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</tr>
<tr>
<td>Observed</td>
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<td>25</td>
<td>20</td>
<td>24</td>
<td>38</td>
<td>20</td>
<td>2</td>
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<td>9.1</td>
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<td>6 or more times</td>
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\[ \chi^2 = 1231.25 \quad ***p<.001 \]
Table 3. Chi-square Results for Marijuana Use and Drunk and Drunk Driving (n=16,121)

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<tr>
<th>Drunk Driving</th>
<th>0 days</th>
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<th>3-9 days</th>
<th>10-19 days</th>
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<td>0 times</td>
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<tr>
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<td>1 time</td>
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<td>81</td>
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<td>2-3 times</td>
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<td>22.8%</td>
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<tr>
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\( \chi^2 = 2339.33 \quad ***p<.001 \)