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Prospective Associations of 12th-grade Drinking Intensity and Age 19/20 Driving-related Consequences

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Abstract

Purpose—To examine driving-related consequences associated with levels of drinking intensity among a national sample of young adult drinkers.

Methods—Data come from a nationally representative sample of 12th graders sampled annually in 2005–2014 with subsamples surveyed at age 19/20. Multivariable logistic regressions examined associations of 12th-grade drinking intensity (0–4, 5–9, 10–14, and 15+ drinks in a row) with driving consequences at age 19/20.

Results—Twelfth-grade binge drinkers (compared to non-binge drinkers) were more likely to experience negative driving consequences at age 19/20. Among binge drinkers, 15+ drinkers (compared to 5–9 drinkers) in 12th grade had increased risk of negative drinking consequences at age 19/20.

Conclusions—These results suggest that while underage binge drinkers are at an increased risk for having driving consequences, those who engage in higher-intensity drinking are at even greater risk for these consequences. High-intensity drinkers may require additional screening or intervention to reduce future driving-related consequences.

Keywords

high-intensity drinking; drinking intensity; driving consequences; young adulthood

INTRODUCTION

Alcohol-impaired driving accounts for approximately 10,000 traffic-related deaths in the US annually [1]. Young people are at particularly high risk of being in an alcohol-related collision. At all levels of blood alcohol concentration, younger drivers (ages 16–20) are more likely than older drivers (ages 21–35) to be involved in a crash [2].

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Binge drinking (five or more drinks on a single occasion) is a strong risk factor for alcohol-impaired driving. Among US high school students, 85% of drinking and driving incidences occur among binge drinkers [3]. Ten percent of high school binge drinkers report driving after drinking alcohol in recent weeks [4]. Higher levels of binge drinking may confer higher degrees of risk. High-intensity drinking, at 10+ and 15+ drinks per occasion, is now recognized as an especially serious threat to public health [5, 6]. High-intensity drinkers are at increased risk for negative consequences including alcohol poisoning [7], violence, and blackouts [8] – but risk for negative driving consequences is not yet known.

The current study examines the prospective association between levels of drinking intensity in 12th grade and risk for driving-related consequences one or two years later, using longitudinal data from a national sample of young adult drinkers. While research shows that 12th-grade drinking intensity is strongly associated with drinking intensity in young adulthood [9], the future consequences associated with 12th-grade drinking intensity are less clear. By investigating multiple levels of alcohol consumed, the current study allows for a rigorous test of drinking intensity as a marker for future negative consequences.

METHODS

Sample

Data stem from the Monitoring the Future (MTF) study, which surveys a nationally representative sample of approximately 15,000 12th graders (at modal age 18) each year. A subsample is followed up at modal age 19/20, half at modal age 19 (one year after high school) and the other half at modal age 20 (two years after high school). Baseline questionnaires in 12th grade are self-administered in school and individuals are invited to respond to follow-up surveys via mail. The Monitoring the Future study is approved by the University of Michigan Institutional Review Board.

The current study included a sample of students who completed the 12th-grade survey in 2005–2014, reported any past-12 month alcohol use in 12th grade, and were followed up at modal age 19/20. The sample was then limited to the random one-sixth of 12th-grade respondents who received questions about high-intensity drinking. The final sample of respondents who provided pertinent data for this study in 12th grade and at age 19/20 was 1,087 (52.8% female, 68.3% white). Weights were used to adjust for attrition.

Measures

Twelfth-grade drinking intensity. Three items assessed binge drinking and drinking intensity: During the last two weeks, how many times (if any) have you had…5 or more [10 or more, 15 or more]… drinks in a row?' Binge drinking was defined as consuming 5+ drinks in a row in the last two weeks. Four groups of drinking intensity were created based on a maximum of 0–4 drinks, 5–9 drinks, 10–14 drinks, or 15 or more drinks in a row during the last two weeks

Age 19/20 driving consequences. We assessed two self-reported driving outcomes. Individuals were asked: "During the last 12 months, how many accidents [tickets] have you had while you were driving (whether or not you were responsible)?" and "How many of

these accidents [tickets] occurred after you were drinking alcoholic beverages?" Individuals were coded as having *any ticket/collision* vs. none and any *alcohol-related ticket/collision* vs. none.

Analysis

We first examined the association between 12th-grade binge drinking and the two outcomes of a ticket/collision and an alcohol-related ticket/collision while controlling for sociodemographics (*sex, race [white vs. all other]*, and *parent(s) college degree[degree vs. else]*), 4-year *college plans* (definitely will graduate vs. else), and the number of average weekly *driving miles* (0 [reference], 1–50, 51–100, >100 miles) measured in 12th grade. We then examined how varying degrees of drinking intensity were related to the two driving outcomes at age 19/20.

RESULTS

Descriptives (unweighted)

Over half the sample (68%) reported 0–4 drinks, 11–14% reported having 5–9 and 10–14 drinks, and 7% reported 15+ drinks in a row in the past two weeks. At age 19/20, 38% reported any ticket/collision and 2% reported an alcohol-related ticket/collision in the past year.

Driving consequences

Table 1 presents the prospective associations (odds ratios) of 12th-grade drinking intensity with driving consequences at age 19/20 adjusting for sociodemographic factors and miles driven. Twelfth-grade binge drinkers (5+ drinks) were significantly more likely than non-binge drinkers (0–4 drinks) to have any ticket/collision one or two years later and had four times greater odds of an alcohol-related ticket/collision. Those who reported having 15+ drinks/occasion were more likely than 5–9 drinkers to have any ticket/collision and had about 10 times greater odds of having an alcohol-related ticket/collision at age 19/20.

CONCLUSIONS

This study demonstrates binge drinking levels are linked to varying degrees of driving risk one to two years earlier. First, it replicates previous research [3] on binge drinking and greater risk for adverse driving consequences including alcohol-related tickets and collisions. Second, it shows that underage binge drinkers (5+ drinks), already at increased risk for significant driving consequences, are at even greater risk for these consequences one or two years later if they engage in high-intensity drinking (15+ drinks). While we did not find a significantly greater risk for 10–14 drinks group, the estimate suggests a positive association that may not have reached significance due to lack of power.

Those who engage in high-intensity drinking may need additional or different intervention and resources to reduce future driving-related consequences [5]. Universal policy interventions such as graduated driver's licenses and increasing the drinking age to 21 have been instrumental in greatly reducing rates of driving while under the influence of alcohol

among younger drinkers. Additional interventions and screening aimed at high-intensity drinkers who have the greatest risk of driving-related consequences may be key to reducing rates further. New, enhanced, or modified strategies may be needed to engage this high-risk group.

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References

1. Department of Transportation (US), National Highway Traffic Safety Administration (NHTSA). [Accessed December 14, 2016] Traffic Safety Facts 2014 Data: Alcohol-Impaired Driving. 2015. http://www-nrd.nhtsa.dot.gov/Pubs/812231.pdf
2. Zador PL, Krawchuk SA, Voas RB. Alcohol-related relative risk of driver fatalities and driver involvement in fatal crashes in relation to driver age and gender: an update using 1996 data. J Stud Alcohol. 2000; 61:387–395. [PubMed: 10807209]
3. Centers for Disease Control and Prevention. Vital signs: drinking and driving among high school students aged >/=16 years - United States, 1991–2011. MMWR Morb Mortal Wkly Rep. 2012; 61:796–800. [PubMed: 23034588]
4. O'Malley PM, Johnston LD. Drugs and driving by American high school seniors, 2001–2006. J Stud Alcohol Drugs. 2007; 68:834–842. [PubMed: 17960301]
5. Hingson RW, White A. Trends in extreme binge drinking among US high school seniors. JAMA Pediatr. 2013; 167:996–998. [PubMed: 24042186]
6. Patrick ME. A call for research on high-intensity alcohol use. Alcohol Clin Exp Res. 2016; 40:256–259. [PubMed: 26842244]
7. National Institute on Alcohol Abuse and Alcoholism. [Accessed January 15, 2017] Alcohol Facts and Statistics. 2015. http://pubs.niaaa.nih.gov/publications/AlcoholFacts&Stats/AlcoholFacts&Stats.pdf
8. US Surgeon General, Department of Health and Human Services. [Accessed January 13, 2017] Surgeon General's Call to Action to Prevent and Reduce Underage Drinking. 2007. http://www.surgeongeneral.gov/topics/underagedrinking/
9. Patrick ME, Terry-McElrath YM. High-intensity drinking by underage young adults in the United States. Addiction. 2017; 112:82–93.

IMPLICATIONS AND CONTRIBUTION

Those who engage in high-intensity drinking are at particularly heightened risk, relative to lower-intensity binge drinkers, for future negative driving-related consequences. New, enhanced, or modified strategies may be needed to engage this high-risk group and further reduce the public health impact from driving-related consequences.

Table 1

Prospective Association of 12th-grade drinking intensity with age 19/20 driving consequences *N*=1,087 (weighted)

	Binge Drinking		4-Level Drinking Intensity	
	Any ticket/collision	**Alcohol-related ticket/collision**	**Any ticket/collision**	**Alcohol-related ticket/collision**
12th-grade Predictors	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
5+ drinking	**1.27 (1.01, 1.59)***	**4.00 (1.95, 8.20)***	------	------
Drinking intensity				
0–4 drinks[a]	------	------	0.76 (0.57, 1.01)	0.65 (0.18, 2.27)
5–9 drinks[b]	------	------	Ref.	Ref.
10–14 drinks[c]	------	------	0.75 (0.49, 1.13)	2.40 (0.59, 9.73)
15+ drinks[d]	------	------	**1.63 (1.01, 2.63)***	**10.31 (2.86, 37.19)***
Driving miles				
None	Ref.	Ref.	Ref.	Ref.
1 to 50	**2.42 (1.74, 3.37)***	0.63 (0.19, 2.12)	**2.45 (1.76, 3.40)***	0.74 (0.22, 2.54)
51 to 100	**3.38 (2.40, 4.75)***	1.38 (0.45, 4.21)	**3.52 (2.50, 4.95)***	1.62 (0.53, 5.02)
>100	**4.03 (2.85, 5.71)***	1.61 (0.54, 4.81)	**4.09 (2.89, 5.79)***	1.35 (0.44, 4.09)
Female	**0.63 (0.52, 0.78)***	0.64 (0.30, 1.36)	**0.64 (0.52, 0.79)***	0.96 (0.43, 2.16)
White	0.85 (0.68, 1.06)	0.75 (0.35, 1.60)	0.83 (0.67, 1.04)	0.72 (0.33, 1.57)
Parent(s) college degree	**0.78 (0.63, 0.95)***	1.52 (0.73, 3.16)	**0.79 (0.64, 0.97)***	1.72 (0.80, 3.70)
4-year college plans	0.91 (0.74, 1.13)	0.57 (0.28, 1.17)	0.90 (0.73, 1.11)	0.50 (0.24, 1.05)

NOTE: OR = odds ratio, CI = confidence interval,

*pvalue<0.05; Ref. = reference group;

[a] $N_{unweighted}$=74,

[b] $N_{unweighted}$=156,

[c] $N_{unweighted}$=115,

[d] $N_{unweighted}$=76