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Journal

Traffic Injury Prevention, 18(6)

ISSN

1028-6586

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Publication Date

2017-08-18

DOI

10.1080/15389588.2017.1285022

Peer reviewed

HHS Public Access

Author manuscript

Traffic Inj Prev. Author manuscript; available in PMC 2017 September 01.

Published in final edited form as:

Traffic Inj Prev. 2017 August 18; 18(6): 566–572. doi:10.1080/15389588.2017.1285022.

Drinking and driving and perceptions of arrest risk among California drivers: Relationships with DUI arrests in their city of residence

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Abstract

Objective—Addressing drinking and driving remains a challenge in the U.S. The present study aims to provide feedback on DUI in California by assessing if drinking and driving behavior is associated with the DUI arrest rates in the city in which the driver lives; if this is through perceptions that one can get arrested for this behavior; and if this differed by those drivers who would be most affected by deterrence efforts (those most likely to drink outside the home).

Methods—This study consisted of a 2012 roadside survey of 1,147 weekend nighttime drivers in California. City DUI arrest rates for 2009–2011 were used as an indicator of local enforcement efforts. Population average logistic modeling was conducted modeling the odds of perceived high arrest likelihood for DUI and drinking and driving behavior within the past year.

Results—As the DUI arrest rates for the city in which the driver lives increased, perceived high risk of DUI arrest increased. There was no significant relationship between either city DUI arrest rates or perceived high risk of DUI arrest with self-reported drinking and driving behavior in the full sample. Among a much smaller sample of those most likely to drink outside the home, self-reported drinking and driving behavior was negatively associated with DUI arrests rates in their city of residence but this was not mediated by perceptions.

Conclusion—The results of the present study suggest that perceptions are correlated with one aspect of DUI efforts in one's community. Those who were more likely to drink outside the home could be behaviorally influenced by these efforts.

Keywords

deterrence; drinking and driving; DUI; enforcement; risk perception

INTRODUCTION

In the U.S., alcohol policies and demographic changes have contributed to reductions in alcohol-related traffic crashes during the 1980s and 1990s (Voas and Fell 2011; McCartt et al. 2010). While all of these policies are still in place today, drinking and driving remains a significant problem (Voas and Fell 2011; Williams 2006). Deterring drinking and driving behavior often relies on laws that penalize this behavior, enforcement of these laws, and the perception that the laws will be enforced (i.e. one will be detected for this behavior) (Bertelli and Richardson 2008).

In the U.S., detection of drinking and driving is low (Yao et al. 2016; Voas and Fell 2016). An estimated 1.4 million drivers are arrested for driving while intoxicated (DWI) or driving under the influence (DUI) each year. However, research indicates that this represents only 1% of alcohol-impaired driving episodes (Fell and Voas 2013). Low exposure may be a limitation for impacting risk perceptions that one can be detected for drinking and driving (Voas and Fell 2016).

Recent literature on how enforcement activities are associated with drinking and driving consequences is mixed. A study of several states found that per capita DUI arrests were negatively related to impaired driving fatal crashes with a stronger association in urban (vs. rural) areas (Yao et al. 2016). A study conducted in the south found that county-level DUI arrest rates (an average of 3.38 per 1000 drivers) did not impact DUI crash rates (Dula et al. 2007).

The findings with drinking and driving behavior, a precursor to crashes, are also mixed. A National Roadside Survey of intercepted drivers in 2007 found that area-level DUI arrest rates were negatively related to drinking and driving (Fell et al. 2015). A different national survey of the driving age population found the perception of arrest likelihood, and not actual enforcement in the participant's state, was associated with the propensity to drink and drive (Bertelli and Richardson 2008). In Maryland, county-level citation rates were not correlated with behavior but correlated with risk perceptions of getting caught for drinking and driving (Beck et al. 2009). Even among the small body of evidence that DUI arrests are predictive of reductions in alcohol impaired fatal crashes, this relationship varies and the effect sizes are small (Yao et al. 2016).

Addressing drinking and driving remains a challenge in the U.S. It can be socially accepted and drinking and driving may go undetected. There are new cohorts of drivers entering the system who may respond differently to the perceived risks associated with this behavior. There can be variation in how people respond to deterrence based on their own risk

perceptions and patterns of behavior (Bertelli and Richardson 2008). The present study aims to provide feedback on driving under the influence (DUI) in California. This study is unique from many behavioral surveys because it surveys a relevant segment of the population (weekend nighttime drivers). Based on national fatal crash data, almost half of alcohol-impaired drivers involved in fatal crashes were driving on weekend nights (National Highway Traffic Safety Administration 2010), when social drinking is common. The primary objective of the present paper is to identify if drinking and driving behavior is associated with the DUI arrest rates in the city in which the driver lives; if this is through perceptions that one can get arrested for this behavior; and if this differed by those drivers who would be most affected by deterrence efforts (those most likely to drink outside the home). It is expected that DUI, enforcement efforts for DUI, and perceptions of the problem vary at geographic levels (e.g. by jurisdiction, county) (Beck et al. 2009; Kuhns et al. 2012) and that people are most familiar with the environment in which they live. However, it should be noted that the arrest rate is only a crude indicator of enforcement intensity and can reflect the size of the DUI problem in a community.

METHODS

The present study is nested within a broader project, which consisted of a roadside survey in 9 communities. The overall objective of the broader, primary project was to estimate the prevalence of substance use and driving among California weekend nighttime drivers. This study took place June–August 2012 and is the most recent California Roadside Survey.

Study procedures

Nine jurisdictions within the northern (Eureka, Redding, and San Rafael), central (Modesto, Fresno), and southern (Ontario, Gardena, Anaheim, Chula Vista) regions of California were selected in collaboration with the California Office of Traffic Safety (OTS). Data were collected from a random sample of 1,375 weekend nighttime drivers.

Data collection occurred on Friday and Saturday nights from 10 pm to midnight and from Saturday and Sunday morning 1am to 3 am. For 8 jurisdictions, data collection occurred over one weekend. In Modesto the data collection occurred over 2 weekends. Vehicles were randomly selected from the flow of traffic at select locations near well-lit parking lots by a uniformed police officer. Driver participation was voluntary and anonymous, and this was indicated with road signs at the parking lot entrance. Police officers were present to assist with traffic control but were not part of the research effort. Respondents were surveyed by trained data collectors and police officers were requested to not speak to any drivers concerning the study. If police officers were questioned, they said, “Please pull in to learn more.” If a driver refused before pulling into the survey site, the officer thanked them and directed them to continue on to the roadway. Drivers who were willing to participate pulled into the survey area where an interviewer greeted the driver using a consent script.

The survey operations were approved by an IRB which required the utilization of an Impaired Driving Protocol when necessary. As part of this protocol, data collectors were trained to detect impaired/intoxicated drivers using a 3-level system (level 1= no signs of substance use, level 2= signs of use but no intoxication, and level 3= signs of use and

intoxication (Lacey et al. 2011; Lacey et al. 2012). The protocol is in place to address the need for alternative transportation for alcohol-impaired drivers.

Drivers who agreed to participate were given a $20 cash incentive and an Information Sheet that contained information about the study, stated the rights of participants, and provided contact information for the Principal Investigators and for the Chair of the Institution Review Board. Drivers who declined participation were given a piece of candy along with Information Sheet that described the research and provided contact information. Both Information Sheets included language that warned participants of the risks associated with driving after any drug usage or alcohol consumption (Lacey et al. 2012).

Survey

Trained survey teams obtained anonymous data on alcohol and drug use with the following survey instruments: verbal interview questions, preliminary breath-testers (PBTs) and self-administered paper-and-pencil surveys. A breath sample was collected using the Mark V Alcoviser™. The PBTs stored the results internally without displaying the results. The results were downloaded after completion of each night's data collection. The PBT result and survey forms were linked with an assigned case number (Lacey et al. 2012).

Study population

To be included in the study, drivers had to be at least 16 years of age, able to speak English or Spanish, not in emotional or physical distress that would prevent them from giving informed consent, not driving a commercial vehicle, and understand that they were being asked to voluntarily participate in a research study. The 1,375 weekend nighttime drivers that consented to participate in the roadside survey represented 81% of the eligible population that were invited to participate and entered the study site. In this sample of weekend, nighttime drivers, 1,287 answered questions about their perceptions of risk including the perceived arrest risk associated with alcohol-impairing driving question. Of these, 1,147 (89%) provided valid residential ZIP Codes in California (ZIP Codes outside of California were excluded) and complete demographic information and constitute the analysis cohort for this paper.

There were no differences by race and sex for the drivers who refused compared to those who agreed to participate in the survey. Those who chose to participate were somewhat younger than those who refused. However, this difference was not statistically significant (Lacey et al. 2012). Among the 1371 who completed the alcohol screener, 78 did not reported the key risk perception for the present analyses. Comparing Census 2010 data of the California driving (age 16+) and adult age (18+) populations, the survey participant characteristics, and those who were *missing* the key risk perception:40% vs. 39% vs. 27% were female; 60% vs. 55% vs. 36% were White; 6% vs. 9% vs. 9% Black; 14% vs. 11% vs. 16% were Asian or Pacific Islander; 26% vs 44% vs. 37% were age 21–34; and 33% vs. 45% vs. 51% Hispanic or Latino.

Subsample—It has been estimated that at least half of impaired drivers or impaired arrested drivers had their last drink in a licensed establishment and that there is a positive

association with establishment density and drinking and driving (Dunaway et al. 2011; Gruenewald et al. 2002; Voas and Fell 2010). Therefore, analyses were also conducted for a subset of drivers most likely to drink outside their home when drinking alcohol. This was determined from a question, “When you drink, how likely will it be somewhere other than your home?” Participants had the option of reporting: very likely (n=158), likely, somewhat likely, and not at all likely. Among this subset, 10.1% reported past year drinking and driving.

Variables

Outcomes—The primary outcome is the perception that it is very likely that one could be arrested for driving impaired (perceived high risk of DUI arrest). Participants were asked: “How likely do you think it is that a person drinking and driving could be arrested for impaired driving?” Participants had the option of responding: very likely, likely, somewhat likely, and not at all likely. Answers were coded on a 4-point Likert scale and recoded so a higher score indicated higher agreement with this statement. Treated as a continuous variable it is positively correlated with city DUI arrest rates (r=0.10, $p<0.01$). A majority (66%) perceived it was very likely that one could be arrested for driving impaired. This variable was then dichotomized and coded 1 for high agreement with the statement above and 0 for lower agreement with the statement above (20% responded likely, 12% responded somewhat likely, and 2% responded not at all likely). Other surveys have dichotomized risk perceptions for being detected for drinking and driving as almost certain or very likely vs. other responses (Beck et al. 2009). A secondary outcome was past-year drinking and driving. Participants were asked: “In the past 12 months, did you ever drive after drinking enough that you might be considered to be legally under the influence of alcohol?”.

Predictor—A key predictor is the DUI arrests per 100,000 population for years 2009–2011 for each participant’s residential city. DUI arrests per population, can be viewed as “a measure of the intensity of traditional impaired-driving enforcement based on police traffic-patrol procedures” (Fell et al. 2014). It is expected that DUI, enforcement efforts for DUI, and perceptions of the problem vary at geographic levels (e.g. by jurisdiction, county) (Beck et al. 2009; Kuhns et al. 2012). Other researchers have hypothesized that people have a local frame of reference for these issues (Beck et al. 2009). Meaning, people consider the issues in the environments in which they live and observe on a regular basis.

We evaluated each participant’s residential city (which may not be the same city as the study site). To determine the residential city for each respondent, the residential ZIP Codes provided were merged to Census ZIP Code Tabulated Areas (ZCTAs) and then ZCTAs were related to Census Place data using ArcGIS 10 (ESRI, Redlands, CA). Places are incorporated places, such as, cities and towns and the statistical counterparts of unincorporated places. If more than one place was associated with a ZCTA, the place with the most area overlap with the ZCTA of interest was assigned. These data were then merged to local DUI arrest data by city and county.

City-level DUI arrests were obtained from the California Office of Traffic Safety. These data represent DUI arrests on city streets and are used to evaluate and adjust local DUI

enforcement activity. These data are from the Department of Justice and reporting is voluntary. For the 170 cities, the mean rate of DUI arrests was 571 per 100,000 population (of the cities included in the present analyses) and with a standard deviation of 671. The median was 424 (range 0–3464). For the same time period, the proportion of injury and fatal crashes that were DUI were negatively correlated with DUI arrest rates ($r=-0.26$, $p<0.001$). The DUI arrest rate variable was analyzed as a log transformed variable per other studies ((Fell et al. 2014) (log of (rate+1)).

Covariates—Socio-demographic characteristics include age, sex, race, Hispanic ethnicity, and education. Additional characteristics include alcohol- and driving- related variables. Drinking and driving is more common among binge drinkers, heavy drinkers, and those who are alcohol dependent (Bergen et al. 2012; Birdsall et al. 2012; Dunaway et al. 2011). A 15-item Alcohol Use Disorder (AUD) survey was administered and has been validated for use in roadside surveys (Furr-Holden et al. 2009). The correlations between the 15-item survey and a telephone survey of related outcomes were 0.3, 0.6, and 0.7 for abuse, dependence, and binge drinking, respectively. The following alcohol use patterns were explored separately: blood alcohol content (BAC) level at the time of survey, binge drinking frequency, and alcohol use disorder status (none, dependence, abuse). Indicators of abuse include questions about the interference of alcohol with relationships, work, school, and safety. Indicators of dependence include questions about alcohol tolerance. For binge drinking frequency, respondents were asked “In the past year, how often did you have six (five for a woman) or more drinks on one occasion?” BAC, as determined by breath, was also collected at the time of survey and was categorized as a blood alcohol content >=0.05 vs. <0.05. Although a BAC of 0.05 is not the legal limit, it is considered to be high enough to alter judgment and reaction times (Centers for Disease Control and Prevention 2011). Driving categories were based on average annual miles driven by the participant and were collected as: below average, average (15,000 miles per year), or above average. A dummy variable was created for above average vs. average and below.

Analyses

To evaluate whether city DUI arrest rates were related to individual-level perceptions while controlling for individual-level characteristics that may bias risk perceptions, population average logistic models were produced with age, sex, race and/or ethnicity, and education included in most models. In the smaller sample of participants most likely to drink outside the home, there were race groups that did not binge drink and race was not included in that final model. The most statistically relevant drinking behavior measure, as determined from bivariate analyses, was also included. General estimating equation or population average models are frequently used for nested data. For the present analyses, dependence among respondents for the same city is treated as a nuisance and robust standard errors are produced. Probabilities are averaged and the effects are interpreted across groups (i.e. cities). To test whether the effects of objective measures of city DUI arrest rates and drinking and driving behavior were mediated by perceptions of high risk of DUI arrest, indirect effects were computed using the product of coefficients approach and the standard errors were produced using bootstrapping methods (Enders 2011; Kenny 2008; Kenny 2009). The standard errors for the direct and indirect effects are obtained through bootstrapping (500

replications were implemented). All analyses were conducted using Stata 12 (Stata Corp, College Station, TX).

RESULTS

Descriptive

The 1,147 participants resided in 170 California cities. The number of participants per city ranged from 1 to 182 with an average of 6.7 participants per city. Frequency distributions for categorical variables and means and standard deviations for continuous variables are shown in Table 1. In this sample, the average age was 33, 40% were female, 44% were Hispanic, a majority of participants were White (57%), nearly a quarter had at least a college degree (23%), a third of respondents reported driving more than average, 65% did not binge drink in the past year, 17% were alcohol dependent, and 4% reported drinking and driving in the past year.

Bivariate

Bivariate population average logistic regression results are shown in Table 2 for the odds of perceived high risk of DUI arrest. Across cities, middle age was associated with an increased odds; Hispanics had an increased odds compared to non-Hispanics; a college education or higher had a decreased odds compared to less education; and infrequent binge drinking had a decreased odds compared to never binge drinkers. With every 10% increase in the DUI arrest rate there was an estimated 9% increase in perceived high risk of DUI arrest.

Multivariable

The multivariable population average logistic regression results are also shown in Table 2 for the odds of perceived high risk of DUI arrest. The first model includes just the participant characteristics. The second model includes the variables in model 1 plus the DUI arrest rate in the city in which the participant lives. Across cities and controlling for other covariates in the model (model 2), Hispanics had an estimated 1.6 times the odds compared to non-Hispanics; respondents with a college education or higher had an estimated decreased odds of 35% compared to those with less education; those with infrequent binge drinking had an estimated decreased odds of 36% compared to non-binge drinkers; and with every 10% increase in the DUI arrest rate there was an estimated 6% increase in the odds of perceived high arrest likelihood.

To examine whether the relationship between the DUI arrest rate in the city in which the driver lives and the driver's drinking and driving behavior were mediated by perceived high risk of DUI arrest, analyses were conducted for the 1144 respondents who reported drinking and driving status for the past year and for a subset that, when drinking alcohol, were most likely to drink outside the home (n=158). For the full set (n=1144), the proportion of the total mediated effect was 0.02. Based on the bootstrap results, the indirect and direct effects were not significant. Among the subset that were most likely to drink outside the home (n=158), the proportion of the total mediated effect was 0.002. Based on the bootstrap results, the indirect effect was not significant and the direct effect of the city DUI arrest rate on perceived high risk of DUI arrest was significant.

The results of the bivariate and multivariable population average logistic regression analyses for drinking and driving among those most likely to drink outside the home when drinking, are shown in Table 3. The results indicate, across cities and controlling for respondent characteristics, frequent binge drinking had an estimated 41 times the odds (95% CI 3.5–471.1, $p<0.01$) of drinking and driving compared to never binge drinkers. In addition, with every 10% increase in the DUI arrest rate in the city of residence, the odds of past-year drinking and driving were 23% lower.

DISCUSSION

This study provides some feedback on drinking and driving in California. Among this sample of weekend, nighttime drivers in California in 2012, 66% perceived high risk of arrest for drinking and driving and 4% reported drinking and driving in the past year. For cities included in this analysis, the average city DUI rate was 571 per 100,000 population. As the DUI arrest rates for the city in which the driver lives increased, perceived high risk of DUI arrest increased as anticipated. There was no significant relationship between either city DUI arrest rates or perceived risk of DUI arrest with self-reported drinking and driving behavior in the full analysis sample. However, among a much smaller sample of those most likely to drink outside the home, self-reported drinking and driving behavior was negatively associated with DUI arrests rates in their city of residence; however, this was not significantly mediated by perceptions of DUI arrest risk.

Nationally and at county-levels, only a quarter to a third perceive a risk of being caught for drinking and driving (Beck et al. 2009). This perception may reflect one’s awareness of enforcement efforts. A national survey of the driving age population reports that 30% of participants had seen a sobriety checkpoint in the past year (Moulton et al. 2010). Enforcement, and likely perceptions, vary by geographic location. In this sample of California weekend nighttime drivers, 66% perceived that it was highly likely to be arrested for drinking and driving. The higher reports, compared to national reporting, may be due to the nature of the study conditions or differences in study samples. It may be that assessing perceptions in close proximity to the activity of driving on a weekend night, when drinking and driving is more common, increases the perception of risk. In the present study, the DUI arrest rates in the city of residence were positively and significantly correlated with drivers’ perceptions of DUI arrest risk.

While this indicator of enforcement was associated with perceptions, DUI arrest rates only appeared behaviorally related among those drivers who are most likely to drink outside the home. Some theories of deterrence suggest that there will be variation in how people respond to laws while other theories of deterrence assume that the effect will be similar across all populations (Bertelli and Richardson 2008). The results of this study of weekend nighttime drivers suggest that city DUI arrest rates are associated with behavior among those most likely to be concerned about enforcement. This may help to explain some of the differences across studies. In addition, among this smaller sample, males (Bergen et al. 2012; Gruenewald et al. 1996) and frequent binge drinkers (Bergen et al. 2012; Birdsall et al. 2012) continue to be more likely to drink and drive.

Implications

One possible explanation for the positive correlation between DUI arrest rates and perceptions of DUI arrest risk is that participants were aware of the arrests in their communities; however, arrest rates may also reflect the size of the DUI problem. Therefore, participants may have developed these risk perceptions through other means. Despite this limitation, the present findings suggest that people may have a local frame of reference for traffic safety-related issues. Further, in the present study, places with more city DUI arrests per population, there were proportionally fewer DUI injury/fatal crashes. While this is cross-sectional, this association is consistent with other research (Yao et al. 2016) and the decreased self-reported driving behavior among those most likely to drink outside the home.

Limitations

There are limitations to this research. First, this was not a representative sample of the California adult population. Weekend, nighttime drivers were intercepted in 9 communities in California. Second, while enforcement represents a 3-year period prior to the survey, it is a limited measure of enforcement intensity. In addition, these data are reported voluntarily and differences can be due to a variety of factors and may be combined with outreach. Visibility efforts (e.g. media campaigns) and DUI rates were not assessed as part of this effort. Further, risk perceptions may vary by situation (e.g. where and when one is traveling). Third, there is the possibility that the very act of being asked to participate in this study influences one's perception of risk. However, this would apply to everyone in the study. We found a significant, positive relationship with DUI arrest rates and perceptions of high DUI arrest risk. Finally, some analyses were conducted on a small subset of the data.

Acknowledgments

The main study was a collaborative effort of the California Office of Traffic Safety, the University of California at Berkeley Safe Transportation Research and Education Center, and the Pacific Institute for Research and Evaluation and was funded as a part of the California Traffic Safety Program through the support of the California Office of Traffic Safety and the National Highway Traffic Safety Administration. Dr. MacLeod was supported by Award Number T32AA007240, Graduate Research Training on Alcohol Problems, from the National Institute on Alcohol Abuse and Alcoholism. The content is solely the responsibility of the authors and does not necessarily represent the official view of the National Institute on Alcohol Abuse and Alcoholism, the National Institutes of Health, the State of California Business Transportation and Housing Agency, the U.S. Department of Transportation, or the National Highway Traffic Safety Administration. The authors would also like to thank the three anonymous reviewers for their helpful comments on earlier versions of this manuscript.

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Table 1

Participant characteristics, The California Roadside Survey 2012 (n=1147)

	Mean	SD
Age	33.1	13.5
	N	%
Sex: Female vs. Male	457	39.84
Ethnicity: Hispanic vs. Non-Hispanic	504	43.94
Race		
White	651	56.76
Black	95	8.28
Asian	127	11.07
Other	274	23.89
Education		
Less than HS	78	6.80
Trade School Certificate	38	3.31
High School Graduate	230	20.05
Some College/Associate	533	46.47
Bachelor's Degree	154	13.43
Graduate Degree	114	9.94
Annual driving		
More than average	375	32.69
Average (15k)	407	35.48
Less than average	346	30.17
Alcohol use disorder		
None	851	74.19
Dependence	196	17.09
Abuse	26	2.27
Binge frequency		
Never	745	64.95
<Monthly	237	20.66
Monthly	93	8.11
Weekly or more	33	2.88
Drank too much to drive in the past 12 months	49	4.27
BAC at survey >=0.05	26	2.27

Note: Percentages do not sum to 100 due to missing

Traffic Inj Prev. Author manuscript; available in PMC 2017 September 01.

Table 2

Modeling the odds of perceived high risk of DUI arrest, The California Roadside Survey 2012 (n=1147)

	Bivariate				Model 1				Model 2			
	OR	**95% CI**		***p***	**OR**	**95% CI**		***p***	**OR**	**95% CI**		***p***
Participant characteristics												
Age												
<21	1.36	1.00	1.85	0.05	1.16	0.82	1.66	0.39	1.15	0.81	1.62	0.44
21–<35	ref				ref				ref			
35–<50	1.29	1.00	1.66	*	1.20	0.93	1.56	0.17	1.20	0.93	1.55	0.17
50+	0.93	0.68	1.27	0.66	0.86	0.63	1.18	0.35	0.88	0.65	1.19	0.41
Sex: Female vs. Male	1.24	0.97	1.59	0.09	1.19	0.94	1.51	0.13	1.19	0.94	1.50	0.15
Ethnicity: Hispanic vs. Non-Hispanic	1.51	1.12	2.04	**	1.48	1.02	2.16	*	1.42	1.00	2.03	0.05
Race												
White	ref				ref				ref			
Black	0.98	0.65	1.48	0.93	1.12	0.70	1.78	0.63	1.07	0.69	1.67	0.77
Asian	0.80	0.54	1.18	0.26	0.95	0.65	1.38	0.78	0.91	0.62	1.35	0.65
Other	1.24	0.86	1.79	0.25	0.98	0.65	1.47	0.93	0.97	0.64	1.48	0.89
Education: college+ vs. <college	0.60	0.47	0.78	***	0.65	0.51	0.83	**	0.65	0.51	0.82	***
Binge frequency												
Never	ref				ref				ref			
<Monthly	0.65	0.48	0.89	**	0.64	0.44	0.92	*	0.64	0.45	0.92	*
Monthly or more	0.90	0.55	1.47	0.68	0.87	0.53	1.44	0.60	0.85	0.51	1.42	0.54
Unknown	0.65	0.33	1.26	0.20	0.64	0.32	1.26	0.20	0.65	0.33	1.27	0.21
Alcohol use disorder status												
None	ref											
Dependence	0.78	0.55	1.10	0.84								
Abuse	1.10	0.45	2.65	0.15								
Unknown	0.89	0.56	1.43	0.64								
Blood alcohol content at survey												
<0.05	ref											
>=0.05	0.59	0.29	1.23	0.16								

	Bivariate				Model 1				Model 2			
	OR	95% CI		*p*	OR	95% CI		*p*	OR	95% CI		*p*
Unknown	2.03	0.61	6.68	0.25								
Residential city DUI arrest rates per 100,000 population (log)	1.08	1.02	1.13	**					1.06	1.02	1.12	**

* $p<0.05$

** $p<0.01$,

*** $p<0.001$

Table 3

Modeling the odds of past year drinking and driving among those most likely to drink outside the home, The California Roadside Survey 2012 (n=158)

	Bivariate				Multivariable			
	OR	**95% CI**		**p**	**OR**	**95% CI**		**p**
Participant characteristics								
Age	0.98	0.93	1.03	0.42	1.02	0.94	1.10	0.69
Sex: Female vs. Male	0.10	0.01	0.77	<0.05	0.13	0.01	1.42	0.10
Ethnicity: Hispanic vs. Non-Hispanic	0.85	0.27	2.67	0.27	1.14	0.34	3.89	0.83
Race								
White	ref							
Black	0.0004	0.0001	0.0016	<0.001				
Asian	0.39	0.05	3.45	0.40				
Other	0.29	0.07	1.27	0.10				
Education: college+ vs. <college	1.06	0.37	2.99	0.92	0.91	0.28	2.96	0.83
Binge frequency								
Never	ref				ref			
<Monthly	3.06	0.42	22.16	0.27	4.95	0.37	65.57	0.23
Monthly or more	21.83	4.03	118.22	<0.001	40.72	3.52	471.07	<0.01
Unknown	6.11	0.58	64.20	0.13	13.41	0.74	243.82	0.08
Perceived high risk of DUI arrest vs. lower	0.72	0.20	2.51	0.60	1.08	0.32	3.61	0.90
Residential city DUI arrests per 100,000 population (log)	0.77	0.60	0.99	<0.05	0.77	0.60	0.99	<0.05