Drinking Locations and Drinking-Driving Among Underage Drinkers

Mann, R.E. [1,2] , Stoduto, G. [1] , Adlaf , E.M [1,2] , Seles, B. [3] and Pavic, B. [1]

1- Centre for Addiction and Mental Health, Toronto, Ontario, Canada

2- Department of Public Health Sciences, University of Toronto, Toronto, Ontario, Canada

3- Department of Psychology, University of Toronto, Toronto, Ontario, Canada

Robert Mann, 33 Russell Street, Toronto, Canada M5S 2S1

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Abstract

This study examines adolescents' drinking locations, commonalities among these locations, and the possible importance of these locations for understanding adolescent drinking-driving, riding with a drinking-driver and collision involvement. The data were obtained from a survey of 570 adolescent drivers aged 16-18. Participants identified the locations in which they had consumed alcohol in the past 12 months. Principal components analysis of the drinking location data indicated the presence of four drinking-location factors, which were labelled Party Drinking, Sociable Drinking, Home Drinking, and Vehicle Drinking. Logistic regressions indicated that the likelihood of drinking driving, riding with a drinking driver, and collision involvement were significantly affected by drinking location factors, after demographic factors were controlled for. However, the contributing drinking location factors differed depending on the outcome measure involved.

Introduction

Although efforts to prevent drinking driving and other alcohol-related problems among youth have noted some successes (e.g., 1,2), alcohol-related collisions remain one of the major causes of fatalities and injuries among young people. Among adults, significant advances in understanding drinking problems have occurred by taking into account the situations in which consumption occurs. For example, on-premise consumption at certain types of licensed establishments (taverns, bars) is more likely to be associated with drinking-driving and other harms than consumption in other places such as restaurants or at home (3). This has lead to the development of various policies and programs to reduce these harms. Server training programs, in which owners of licensed establishments and individuals who serve alcohol in these locations are trained in

responsible beverage service (e.g., detecting signs of intoxication, restricting the numbers of drinks served to individuals, offerring alternatives to alcohol where appropriate) have been developed and widely implemented over the past decade. Evaluations of these programs demonstrate that they can be successful in preventing excessive consumption and related harms (e.g., 4, 5).

Studies examining adolescent drinking and drinking-driving have begun to examine drinking locations (e.g., 6, 7, 8, 9). As yet, however, little information exists about specific drinking locations and harms for adolescents. One study examined bush parties as a drinking location among Ontario adolescents (10). A large portion of adolescents in high school reported attending bush parties, and many reported driving after drinking or riding with a drinking driver there. The present study was designed to extend this perspective, by providing information on a range of drinking locations in adolescents, commonalities among these drinking locations, and the relationships of these locations with alcohol-related harms.

Method

Students in four secondary schools in north-eastern Ontario and three in the southern region of Ontario participated between December, 1995 and May, 1996. The schools in both regions served a mix of urban and rural students. Participating schools were selected based on a willingness to participate and to allow additional information to be collected in the future.

Surveys were administered to all students in grades 11 and 12 in participating schools who had an Ontario Graduated Licence (the Graduated Licence is the first licence granted to new drivers, and is held for two years before the individual is able to apply for a regular licence). Those who returned completed questionnaires (750) comprised 68.4% of eligible respondents. Participants who reported no alcohol consumption in the past 12 months, or who had reached the legal drinking age of 19, were then excluded from the analyses. The resulting sample of 570 underage drinkers with a Graduated License was 56.7% male and an average of 16.7 years. When asked if they had been a passenger at least once in the past 12 months with a driver who had had too much to drink, 32.8% responded yes; 21.4% reported driving after drinking alcohol at least once, and 11.9% reported being involved in at least one collision while driving, in the past year.

The questionnaire took approximately 30 minutes to complete and included measures of driving behaviour, use of different modes of transportation, alcohol and drug use, drinking-driving behaviour and related measures such as riding with drinking-drivers, as well as relevant attitudinal, knowledge and demographic measures. The drinking location measures asked participants if they had consumed any alcohol in the past 12 months in any of the following locations: Bar/tavern/pub, Restaurant, Own home, Someone else=s home, Wedding, Dance, Dance Club, House Party, Keg Party, House Party with Admission fee, Bush Party, Rave, Public Event (e.g., concert), Outdoors (e.g, camping, fishing), In a Vehicle, and Other Places.

Results

In order to determine whether there were any commonalities in drinking locations, the drinking location data were subjected to principal components analysis and varimax rotation. This resulted in four factors with eigenvalues greater than 1. This four factor solution accounted for 54.9% of the variance. The factor loadings are presented in

Table 1, and locations with a factor loading greater that .5 are highlighted for interpretative purposes. The locations that loaded most strongly on the first factor were drinking at a keg party, drinking at a house party with admission fees, drinking at a bush party and drinking at a rave. This factor was labelled Party Drinking. The second factor is most strongly related to drinking at dance clubs, restaurants or at bars/taverns/pubs. This factor was labelled Sociable Drinking. Three measures reflecting drinking at ones' own home or at acquaintances' homes load highly on the third factor. This factor was

Table 1: Rotated Factor Loadings.

	Rotated Factors			
Drinking Location	Factor 1 - Party Drinking	Factor 2 - Sociable Drinking	Factor 3 - Home Drinking	Factor 4 - Vehicle Drinking
Bar/tavern/pub	.203	**.584**	.227	.269
Restaurant	.093	**.680**	.062	.090
Own home	-.012	.091	**.545**	.047
Someone else=s home	-.005	.075	**.772**	-.010
Wedding	.165	.461	.073	-.264
Dance	.182	**.526**	.396	.074
Dance Club	.104	**.768**	.029	.117
House Party	.241	.108	**.650**	.139
Keg Party	**.592**	.288	.141	.098
House Party with Admission fee	**.678**	.209	.071	-.061
Bush Party	**.601**	.034	.346	.269
Rave	**.701**	.045	-.111	-.078
Public Event (e.g., concert)	.495	.199	.289	.334
Outdoors (e.g, camping, fishing)	.344	.163	.450	.263
In a Vehicle	.123	.218	.120	**.654**
Other Places	-.017	-.024	-.035	**.772**

thus labelled Home Drinking. The locations loading most strongly on the fourth factor were drinking in a vehicle and drinking in locations other than the 15 identified in the question. This factor was labelled Vehicle Drinking. Factor scores on each of these factors were then calculated for all participants using regression procedures.

The potential contributions of the drinking location factor scores to measures of drinking driving behaviour and collisions were examined with logistic regression analyses, in which selected demographic and attitudinal variables were also included. The dependent measures for these analyses were whether or not the person reported riding with a driver they thought was impaired in the past year, whether or not the person reported driving after any drinking in the past year, and whether or not the

person reported being involved in any collisions while driving in the past year. The results of the regression analyses are summarized in Table 2. The determinants of

Table 2: Logistic Regressions Predicting Riding with a Drinking Driver, Driving after Drinking, and Collision Involvement.

	Riding With a Drinking Driver		Driving after drinking any alcohol		Involved in a collision while driving	
	Odds Ratio	Confidence Interval	Odds Ratio	Confidence Interval	Odds Ratio	Confidence Interval
Age	1.26	0.89-1.79	2.09	1.39-3.13	2.56	1.59-4.14
Gender	0.49	0.32-0.75	0.99	0.60-1.64	.55	0.31-0.98
Urban/Rural	0.75	0.61-0.92	1.05	0.83-1.33	0.91	0.68-1.21
Frequency of Driving	0.99	0.99-1.00	1.00	1.00-1.01	1.00	1.00-1.01
Kilometers Driven	1.00	1.00-1.00	1.00	1.00-1.00	1.00	1.00-1.00
Region	.71	.43-1.18	0.41	0.22-0.76	1.11	0.56-2.19
Sensation Seeking	1.14	1.02-1.29	1.02	0.89-1.17	1.03	0.88-1.21
Alcohol Problems	1.16	.98-1.38	1.17	0.98-1.43	0.70	0.53-0.92
Number of Drugs Used	1.21	0.99-1.46	1.14	0.92-1.41	1.06	0.83-1.37
Factor 1 - Party Drinking	1.11	0.89-1.40	1.21	0.94-1.56	1.37	1.02-1.85
Factor 2 - Sociable Drinking	1.27	1.03-1.56	1.21	0.95-1.53	0.93	0.69-1.24
Factor 3 - Home Drinking	1.69	1.32-2.17	1.70	1.26-2.29	1.03	0.76-1.40
Factor 4 - Vehicle Drinking	1.36	1.10-1.68	1.48	1.18-1.87	1.76	1.34-2.31
Constant	-4.27		-15.19		-18.31	
Hosmer-Lemeshow Goodness-of-fit	$\chi^2_8 = 8.72$, p = .367		$\chi^2_8 = 5.48$, p = .706		$\chi^2_8 = 9.00$, p = .342	

whether or not participants reported being a passenger with a driver that had had too much alcohol to drink were gender, urban or rural place of residence, sensation seeking, and Sociable Drinking, Home Drinking and Vehicle Drinking. Females, those who reported living in a rural place of residence, and those who reported higher levels of sensation seeking were more likely to report riding with a driver who had had too much to drink, as were those with higher scores on Sociable Drinking, Home Drinking and Vehicle Drinking. Significant determinants of whether or not the participants reported any driving after drinking in the previous year were age, driving frequency, kilometers driven, region, Home Drinking and Vehicle Drinking. Older participants, those reporting more frequent driving and driving greater total distances, living in the south of the province and higher scores on both factors increased the likelihood of reporting driving after drinking. The determinants of collision involvement in the past year included age, frequency of driving, total kilometers driven, alcohol problems, Party Drinking and Vehicle Drinking. Older drivers, those who drive more frequently and

over longer distances, have lower alcohol problem scores, and have higher scores on the two factors increased the chances of collision involvement.

Discussion

Our data revealed potentially important commonalities in the 15 drinking locations we examined. The four factors identified (Party Drinking, Sociable Drinking, Home Drinking, and Vehicle Drinking) have face validity, and the regression analyses identified all four factors as important determinants of drinking driving behaviours and collisions in the previous year. These observations suggest that drinking at a larger number of locations is a powerful predictor of drinking driving and riding with a drinking driver, but they also indicate that the factors which were significant predictors differed for each of the three dependent measures examined. Vehicle drinking was a significant predictor of all three measures. Thus this pattern of alcohol consumption would seem to hold the most potential for harm overall. Home drinking and sociable drinking, but not party drinking, predicted riding with a drinking driver. Home drinking predicted driving after drinking, while party drinking predicted collision involvement.

These observations support the proposition that drinking contexts can provide important information on adolescents' drinking-driving and related problems. However, there are more than one potential pathways by which these drinking location effects could occur. First, they could be related to risk-taking lifestyles. Thus, the association between the Vehicle Drinking factor and collision risk may be due to individuals with higher risk-taking propensities being more likely both to drink in vehicles and drive more dangerously. Such a pathway would be suggested by problem behaviour theory and similar models of collision risk (e.g., 11). However, the observation that Factor 1 and 4 scores were significant determinants of collision risk even when sensation seeking and driving exposure were controlled for suggests more unique contributions to collision risk which could be related to the specific situations themselves. For example, young people who drink in a vehicle are more likely to be impaired while driving and thus more likely to have collisions. The differing pathways by which these effects might occur could thus have very different implications for prevention efforts.

References

1) Mann RE, Smart RG. Can school alcohol education programmes contribute to declines in drinking among students? Drugs: Education, Prevention and Policy 1997; 4: 131-137.
2) Mann RE, Anglin LM. Alcohol availability, per capita consumption, and the alcohol-crash problem, In; Wilson RJ, Mann RE, editors, Drinking and Driving: Advances in Research and Prevention. Guilford Press, New York, 1990, pp 205-225.
3) Graham, K. and West, P. Alcohol and crime: Examining the link. In; Heather N, Peters TJ, Stockwell T, editors, Handbook of Alcohol Dependence and Alcohol-Related Problems, in press, John Wiley and Sons, Sussex, England.
4) Gliksman L, McKenzie D, Single E, Douglas R, Brunet S, Moffatt K. The role of alcohol providers in prevention: An evaluation of a server intervention programme. Addiction 1993; 88; 1195-1203.
5) Saltz R, Stranghetta P. A community-wide responsible beverage service program in three communities: Early findings. Addiction 1997; 92: S237-S249.
6) Beck K H. The social context of drinking among high school drinking drivers. Amer J Drug Alcohol Abuse 1987; 13:181-198.

7) MacKinnon DP, Pentz MA, Broder BI, MacLean MG. Social influences on adolescent driving under the influence in a sample of high school students. Alcohol, Drugs and Driving 1994;10: 233-241.
8) Plant MA, Bagnall G, Foster J. Teenage heavy drinkers: Alcohol-related knowledge, beliefs, experiences, motivation and the social context of drinking. Alcohol and Alcoholism 1990; 25**:** 691-698,.
9) Vegega ME, Klitzner MD. Drinking and driving among youth: A study of situational risk factors. Health Education Quarterly 1989;16: 373-388.
10) Stoduto G, Adlaf EM, Mann RE. Adolescents, bush parties and drinking driving. J Stud Alcohol 1998; 59: 544-548.
11) Donovan JE, Jessor R. Adolescent problem drinking: Psychosocial correlates in a national sample study. J Stud Alcohol 1978; 39: 1506-1524.