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The Influence of Parental and Peer Drinking Behaviors on Underage Drinking and Driving by Young Men*

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Abstract

Background—Studies have consistently found that parental and peer drinking behaviors significantly influence adolescent drinking behavior and that adolescent drinking has a significant effect on their drinking-and-driving behavior. Building upon these studies, the present article assesses whether parental and peer drinking behaviors have direct and indirect effects on adolescent drinking and driving as well as whether they moderate the effect of adolescent drinking on their drinking-and-driving behavior.

Methods—The assessment is conducted using data collected from the Buffalo Longitudinal Survey of Young Men (BLSYM) with Ordinary Least Squares (OLS) regression analyses.

Results—The data reveal that peer drinking has direct and indirect effects on adolescent drinking-and-driving behavior when adolescent drinking behavior is controlled. It also moderates the effect of adolescent drinking behavior on their drinking and driving. However, parental drinking does not have these direct and interactive effects, although it may have an indirect effect on adolescent drinking and driving via adolescent drinking behavior.

Conclusions—These findings imply that peer drinking behavior should be considered seriously in prevention and intervention for reducing the risk of adolescent drinking-and-driving behavior.

Keywords

parental and peer drinking behaviors; underage drinking and driving

1. INTRODUCTION

Drinking and driving by young people is still a serious public concern in the U.S. Traffic fatalities in alcohol-impaired-driving crashes declined substantially between the early 1980s and the mid-1990s (Pauozzi and Patel 2004), but have remained at a fairly constant level since 1997 (National Highway Traffic Safety Administration [NHTSA] 2008a). As NHTSA

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has reported (2009a), although youths at ages of 15 to 20 years old only accounted for 9% of the U.S. population and 6% of the licensed drivers in 2007, 19% of the fatalities in the U.S. in 2007 were related to crashes by young drivers. About two-thirds of the people killed in fatal young-drivers crashes were the young drivers themselves or the passengers or the passengers of the young drivers. Of the passengers killed riding in vehicles with young drivers, 67% were in the same age group of 15 to 20 years old (NHTSA 2009a).

Drinking is illegal for this age group in the United States, but it is a common behavioral problem among these young people. In 2007, 31% of young drivers in the 15–20 year-old age range who were killed in car crashes had positive blood alcohol concentrations (BACs), with 26% having BACs of .08 g/dL or greater. Also, in 2007, 64% of young drivers at the same age range had been drinking and were unrestrained when they were involved in fatal crashes. Of the young drivers who had been drinking and were killed in crashes, 75% were unrestrained. These facts suggest the importance of preventing and intervening drinking and driving by young people, and effective prevention/intervention should be research-based.

Building upon previous studies of parental, peer, and adolescent drinking behaviors and adolescent drinking-driving, the present study explores whether and how parental and peer drinking behaviors may have effects on adolescent drinking-and-driving behavior. The exploration is conducted using data collected from the Buffalo Longitudinal Survey of Young Men (BLSYM). The age range of respondents in the survey is 16 to 19 years old at the first wave.

2. RESEARCH CONTEXT

It is a consistent finding that parental and peer drinking behaviors have significant impact on adolescent drinking behavior (e.g., Alati, et al. 2005; Ary et al. 1993; Coffelt et al. 2006; Fowler et al. 2007; Guo et al. 2009; Poelen et al. 2009; Scholte et al. 2008; Zhang et al. 1997). Studies have also provided strong evidence that adolescent typical drinking patterns are significantly associated with their drinking-and-driving behaviors (e.g., Bingham and Shope 2004; Lapham et al. 2006; Sabel et al. 2004). Theoretically, if we consider these two findings simultaneously, they may lead to a further research question: “do parental and peer drinking behaviors affect adolescent drinking-and-driving behaviors?” If parental and peer drinking behaviors influence adolescent drinking behavior and adolescent drinking behavior affects their drinking-and-driving behavior, it would be logical to hypothesize that parental and peer drinking behaviors may influence adolescent drinking and driving through their effects on adolescent drinking behavior.

Also, if parents and peers drink heavily and have alcohol-related problems, they are likely to have a high risk of engaging in drinking-and-driving. An adolescent who has such parents or peers is likely to be exposed to their parents’ or peers’ attitudes, values, or behaviors that are prone to drink and driving. This exposing and learning process has been well documented in the literature for other adolescent problem behaviors (see Akers and Jensen 2003 for a comprehensive review of the literature).

The potential influence of parents on adolescent drinking and driving has been recognized in the literature (Beck and Lockhart, 1992; Augustyn and Simons-Morton, 1995). Augustyn and Simons-Morton (1995) provide a rationale that parental drinking may influence adolescent drinking, and thus drinking and driving, but present no direct data or references that have examined this topic. Similarly, the study by Beck and Lockhart (1992) focuses on conceptual models of adolescent drinking and driving that includes parental influences, such as direct control, but does not provide tests of these concepts. Their study suggests that an examination of the influence of parental drinking is an important theoretical aspect in the etiology of adolescent drinking-and-driving behavior. For the potential effect of peer

drinking, Shope et al. (2003) found a significant effect of friends' support for drinking on adolescent drinking and driving among other predictors. Their study demonstrates the importance to further examine the influence of peer drinking behavior on adolescent drinking and driving.

From a practical perspective, parents and peers are also an important issue to be explored. If parental and peer drinking behaviors influenced adolescent drinking and driving, it would be a logical strategy to engage in prevention or intervention programs on parental and peer drinking behaviors in order to reduce the risk of adolescent drinking-and-driving behavior. Drinking and joy riding are usually a group phenomenon among young people. As cited from the National Highway Traffic Safety Administration (2009) above, of the passengers killed riding in vehicles with young drivers who are at ages of 15 to 20 years old, a large percent (about 67%) are in the same age group as the drivers.

The purpose of the present study is to examine the influence of parental and peer drinking behaviors on adolescent drinking and driving by exploring three research questions: (1) Do parental and peer drinking behaviors have direct effects on adolescent drinking-and-driving behavior when adolescent drinking is controlled? (2) Do parental and peer drinking behaviors have indirect effects on adolescent drinking-and-driving behavior via adolescent drinking? (3) Do parental and peer drinking behaviors and adolescent drinking behavior have interactive effects on adolescent drinking-and-driving behavior?

3. DATA AND METHODS

3.1 Data

The data used for this study came from the first wave of the Buffalo Longitudinal Study of Young Men (BLSYM) which was completed in 1993. The BLSYM was a panel study of adolescent substance use and delinquency with a probability sample of 625 males aged 16–19 from the Buffalo area, New York. The sample was recruited by random digit dial (RDD), with screening by a brief questionnaire to over-sample young men at risk for delinquency. Those who scored 3 or more items in the delinquent direction were always invited to participate; the others were recruited at random 1/3 of the time. The RDD recruitment identified 1,505 households with an eligible respondent (i.e., a male aged 16–19) of which 1272 agreed to participate in the screening. Of the 564 who screened positive, 448 (79%) participated and were interviewed. Of the 212 randomized into the study, 177 (83%) participated and were interviewed. The sample contained the full range of individuals in the general population although the survey oversampled those prone to problem behaviors. Face-to-face structured interviews were conducted by trained interviewers at the Research Institute on Addictions (see Table 1 for a brief demographic description of the sample).

This data set was a valuable resource for the study of drinking and driving by male adolescents because it had a wide range of measures (such as peer influences and a measure of drinking and driving that is similar to those used in current national surveys) and included interview data from a family respondent. All of the respondents were underage drinkers at this time (New York's age 21 drinking law went into effect in December 1985) making this a rare opportunity to examine peer and parental influences on underage drinking and driving. Also, the BLSYM data provided a unique opportunity to assess the possible association of parental and peer drinking behaviors and adolescent dinking-and-driving behavior. The survey selected a male sample with an age range of 16 to 19 years old at the first wave. As official statistics shows, young males have much higher rates of alcohol-impaired driving and involvement in fatal crashes related to alcohol-impaired driving (NHTSA 2008b, 2009b).

3.2 Measures

The dependent variable for the study was adolescent drinking-and-driving behavior. The variable was created using a survey item that asks respondents "How many times in the last twelve months have you driven a motor vehicle while feeling the effect of alcohol?" The responses to the item were logged to normalize the distribution for analysis. The logged measure retained the sequence of the range while normalizing the distribution so that the assumption of a normal distribution for tests of significance was not violated. A small constant (.01) was added before calculating the log to avoid any zero values.

The primary independent variables were parental, peer, and adolescent drinking behaviors. The measure of parental drinking was based on information provided by family informants (usually the mothers of the young male respondents). It was created using survey questions about frequency and quantity of drinking malt liquors, beers, wine coolers, fortified wines, wines, and liquors by parents in the past twelve months. We multiplied the frequency and quantity to calculate average alcohol consumption of parents and used a log transformation to normalize the distribution (see Appendix 1 for a detailed description of the survey questions).

Two items were used to measure peer drinking behavior. The young male respondents were asked how many of their friends engaged in the following behaviors in the past twelve months: (1) used alcohol; (2) gotten drunk once in awhile. A 5-point scale was used for these items ranging from 1 = none of them to 5 = all of them. We summed the responses to these items to create an index to represent peer drinking behavior. The standardized alpha coefficient for the index was 0.87. These measures of peer drinking were the result of the respondent's direct observation and overall knowledge of his peer group. It avoided the potential for substantial errors in accuracy that were likely if the respondent were asked to assess the quantity and frequency of peer drinking, because much of this information is not in the realm of the respondent's experiences. The peer items were the assessment of peer drinking behaviors directly from the viewpoint of the respondent; it was this perception of peer behaviors that is actively involved in influencing the respondent's behaviors.

The measure of adolescent drinking behavior was also based on the same survey questions about frequency and quantity of drinking malt liquors, beers, wine coolers, fortified wines, wines, and liquors by the young male respondents in the past twelve months. Using responses to these questions, we also computed the respondents' average alcohol consumption analogous to the parental alcohol consumption variable.

In addition, measures of age, race, and family SES were included as control variables to control for their possible confounding effects on adolescent drinking-and-driving behavior. Age was measured in years and race was a dummy variable coded in the direction of "White." The measure of family SES was created using information of the respondents' family income and their parents' education, weighted equally (see Table 2 for the descriptive statistics of these measures)

Ordinary Least Squares (OLS) regressions were conducted to estimate the direct, indirect, and interactive effects of parental and peer drinking behaviors on young male drinking-and-driving behavior. In analysis of the interactive effects, two interaction terms were created as independent variables, that is, the measure of adolescent drinking behavior with the measure of parental drinking behavior and the measure of adolescent drinking behavior with the measure of peer drinking behavior. They were created by multiplying the measures, respectively.

4. RESULTS

To assess the direct, indirect, and interactive effects of parental and peer drinking behaviors on adolescent drinking-and-driving, Table 3 had three models.[1] The first model assessed whether parental and peer drinking behaviors had significant effects on adolescent drinking and driving without the measure of adolescent drinking. The results indicated that peer drinking behavior significantly affected adolescent drinking-and-driving behavior (Beta = 0.33) while parental drinking behavior had no such effect. The second model added the measure of adolescent drinking behavior into the equation. The results for this model showed that when the effect of adolescent drinking behavior was controlled, peer drinking behavior still had a fairly robust effect on adolescent drinking-and-driving behavior, although the effect reduces (Beta = 0.14). Similarly, parental drinking had no significant effect for this model. Consistent with prior studies, the results indicated a significant effect of adolescent drinking behavior on their drinking-and-driving behavior (Beta = 0.32).

With reference to the results in Table 4 which indicated that peer drinking behavior had significant impact on adolescent drinking behavior (Beta = 0.59), the measure of adolescent drinking behavior mediated a certain amount of the effect of peer drinking behavior on adolescent drinking-and-driving behavior. All these results implied that peer drinking behavior had a direct effect on adolescent alcohol-impaired driving as well as an indirect effect via adolescent drinking behavior.

Also, the results in Table 4 showed that parental drinking behavior had a significant effect on adolescent drinking behavior (Beta = 0.11), which implied that parental drinking behavior might have an indirect effect on adolescent drinking-and-driving behavior via adolescent drinking behavior, although it did not have an direct effect. In addition, the second model in Table 3 also indicated an age effect on adolescent drinking-and-driving behavior. Older respondents were more likely to engage in drinking-and-driving behavior than younger ones. The results in Table 4 also showed significant effects of age and race on adolescent drinking behavior. White and older respondents were more likely to report underage drinking than non-White and younger ones.

Finally, the third model in Table 3 showed that peer and adolescent drinking behaviors had an interactive effect on adolescent drinking-and-driving behavior (Beta = 0.84), which implied that peer drinking behavior moderated the effect of adolescent drinking behavior on their drinking and driving. For respondents with heavy-drinking peers, the relationship between their drinking and drinking-driving behaviors was stronger than those who did drinking, but had no heavy-drinking friends.[2]

5. DISCUSSION AND CONCLUSION

Building upon previous studies, the present study assessed the possible direct, indirect, and interactive effects of parental and peer drinking behaviors on adolescent drinking and driving using data collected from the first wave of Buffalo Longitudinal Survey of Young Men (BLSYM) on substance use and delinquency. Several interesting findings have emerged.

[1]See Appendix 2 for bivariate correlations of the key variables.

[2]The data have a similar measure of parental alcohol-impaired driving based on responses from the family respondents (especially the young men's mothers). We included the measure in the same model and conducted the same analysis. The results showed that the measure did not have any effect on adolescent drinking-driving, and other results remain the same. It is expected because parents are not likely to engage in alcohol-impaired driving when their children are present. Also, drinking and driving among adolescents are likely to be a group phenomenon. Adolescent self-reports of their peers' drinking and driving or their peers' reports of such behavior may be highly correlated with adolescent self-reported their drinking and driving behavior. Consequently, The BLSYM did not develop a measure of peer drinking and driving for analysis.

First, peer drinking has a significant effect on adolescent drinking-and-driving behavior. This finding may provide support for the common observation that drinking and among adolescents are likely to be a group phenomenon. If a young man is surrounded by peers who drink, he is likely to engage in drinking and driving.

Second, peer drinking also has an indirect effect on adolescent drinking-and-driving behavior through adolescent drinking behavior. It also demonstrates the importance of peer drinking behavior in explaining adolescent drinking and driving. Although drinking is illegal behavior for adolescents, an adolescent may drink due to peer pressure, group loyalty, or peer approval and in turn may drive for cruising or recreation. This behavioral mechanism and process appears to be supported.

Third, peer drinking behavior also has an interactive effect with adolescent drinking behavior on adolescent drinking and driving, which indicates that peer drinking reinforces the effect of adolescent drinking behavior on their drinking-and-driving behavior. Respondents who drank and had friends with heavy drinking were more likely to engage in drinking and driving than those who drank, but had no such friends. Once again, this finding also demonstrates a critical role of peer drinking in adolescent drinking and driving. All these findings may imply that peer drinking behavior should be considered seriously in prevention and intervention for reducing the risk of adolescent drinking-and-driving behavior. Although the assessment of peer drinking was based on the respondent's report, the interaction would not have been found if these reports merely correlated with the respondent's own drinking. Future research should also directly measure peer drinking as well as peer drinking and driving so that these variables can be examined in addition to the respondent's perception of peer behaviors.

Compared to the effect of peer drinking, parental drinking has no direct effect on adolescent drinking and driving. This difference may imply a fact that adolescents are more likely to expose to their peers' drinking behavior and related effects than their parents' drinking behavior. Although parental drinking has no direct effect on adolescent drinking and driving, it may have indirect effect because of its significant effect on adolescent drinking behavior. Given that adolescent typical drinking patterns have significant and direct effect on their drinking-and-driving behavior, it would be logical to reduce adolescent drinking behavior through limiting the effect of parental drinking on adolescent drinking.

We close with a few remarks on the limitations of the present study. First, the data used for this study were collected in 1993. Although the data provide a unique opportunity to assess the possible effects of parental and peer drinking behaviors on adolescent drinking and driving as we discussed above, there is still a need to assess the effects using more recent data. It is a common scientific call for research to test and retest theoretical models. Second, the BLSYM over-sampled respondents who were likely to have problem behaviors in order to collect sufficient information on delinquency and other adolescent problem behaviors for analysis. As a result, cautions should be made in generalizing the results to the general adolescent population.

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Appendix 1

Description of measures

1. Alcohol consumption

A. Frequency:

How often respondents usually drank the following 6 types of alcoholic beverages (i.e., malt liquors, beers, wine coolers, fortified wines, wines, and liquors) in the last twelve months

Response categories range from “everyday” to “less than once a month, but at least once in the past 12 months.

B. Quantity:

- How many 12-oz. bottles, cans, glasses or cups of malt liquor (as shown on the picture) respondents had on a typical day when they drank
- How many 12-oz. bottles, cans, glasses or cups of beer (as shown on the picture) respondents had on a typical day when they drank
- How many 12-oz. bottles, cans, glasses or cups of wine coolers (as shown on the picture) respondents had on a typical day when they drank
- How many 4-oz. glasses or cups of fortified wine (as shown on the picture) respondents had on a typical day when they drank
- How many 4-oz. glasses or cups of wine (as shown on the picture) respondents had on a typical day when they drank
- How many mixed drinks or one and one-half ounce shorts of liquor (as shown on the picture) respondents had on a typical day when they drank

Appendix 2

Bivariate correlations of key variables

Variable	Adolescent drinking and driving	Adolescent drinking	Parental drinking	Peer drinking
Adolescent drinking and driving	-----			
Adolescent drinking	0.45*	-----		
Parental drinking	0.07	0.17*	-----	
Peer drinking	0.38*	0.64*	0.08	-----

Note: N = 623.

Table 1

Brief demographic characteristics of respondents at Wav 1

Background Variable	Frequency	%
Age:		
16	180	28.8
17	159	25.4
18	155	25.8
19	131	21.0
Race:		
White	290	46.4
Non-White	335	53.6
Education:		
Less than High School Graduate	105	16.8
Enrolled in High School	348	55.7
High School Graduate	68	10.9
Enrolled in Post High School Trade	27	4.3
Enrolled in College	77	12.3
Family on Welfare:		
No	488	78.0
Yes	137	22.0

Table 2

Descriptive statistics of variables

Variable	Mean	Standard deviation	Min.	Max.
Young male drinking and driving (logged)	0.53	1.14	0.00	4.96
Parental drinking behavior (logged)	0.87	0.79	0.00	3.08
Peer drinking behavior	6.91	2.38	2.00	10.00
Young male drinking behavior (logged)	1.31	0.97	0.00	3.55
Race (White)	0.47	0.50	0.00	1.00
Family SES	2.74	1.49	0.55	9.00
Age	17.38	1.11	16.00	19.00

Notes: N = 623.

Table 3

Parental and peer drinking behaviors and adolescent drinking and driving

	Model1		Model2		Model3	
Variable	**Beta**	***t*-ratio**	**Beta**	***t*-ratio**	**Beta**	***t*-ratio**
Parental drinking	.03	.72	−.01	−.05	----	----
Peer drinking	.33	8.72*	.14	3.07*	----	----
Age	.19	5.09*	.15	4.04*	----	----
Race	.06	1.67	.03	.79	----	----
Family SES	.03	.84	.05	1.35	----	----
Adolescent drinking	----	----	.32	6.67*	----	----
Adolescent drinking × parental drinking	----	----	----	----	−.01	−.16
Adolescent drinking × peer drinking	----	----	----	----	.84	5.40*
R^2	.19		.24		.28	
N	623		623		623	

Notes: Beta = Standardized regression coefficients. Model3 only presents the results for the interaction terms, although all other variables are included in analysis.

* $p < .01$

Table 4

Effects of parental and peer drinking behaviors on adolescent drinking

Variable	Beta	*t*-ratio
Parental drinking	.11	3.67*
Peer drinking	.59	19.18*
Age	.13	4.36*
Race	.11	3.48*
Family SES	−.06	−1.81

Notes: Beta = Standardized regression coefficients. R^2 = .45. N = 623.

* p < .01