Strategies for Avoiding Driving While Intoxicated and Riding With Intoxicated Drivers in At-Risk Barroom Drinkers

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Abstract
An important question regarding the efficacy of alternative transportation in preventing DWI and Riding with Intoxicated Drivers (RID) is whether at-risk drinkers actually use such risk reduction strategies. Previous research by the current authors showed that users of designated drivers (DDs) and free safe (taxi) rides (SRs) tend to be heavy drinkers, plus they report higher levels of DWI and RID than other drinkers. In a related study, relative to moderate and light drinkers, heavy drinkers also reported more DWI and RID plus more or an equivalent amount of behavior to avoid DWI and RID. The current study examines this issue further in a sample of 364 barroom drinkers. Heavy drinkers were more likely than other drinkers to report DWI, and as likely as moderate drinkers and more likely than light drinkers to report RID. Heavy drinkers also reported more DWI occasions than light drinkers, as much DWI as moderate drinkers, and more RID than moderate or light drinkers. Heavy drinkers were more likely than any other drinkers to have used SRs, and were as likely to report DD use and other behaviors to avoid DWI and RID as moderate drinkers and more likely than light drinkers. Although heavy drinkers report using DDs as often as moderate drinkers and more than light drinkers, they reported using an array of behaviors to avoid DWI much more often than any other drinkers. They also use alternatives to RID as often as moderate and more often than light drinkers. Since heavy drinkers drink to intoxication outside of the home more often than other drinkers, we examined the proportion of DWI occasions relative to the number of occasions where respondents used alternatives to avoid DWI. Heavy drinkers reported an equivalent proportion of DWI relative to avoidance behaviors (.30) as did moderate (.28) or light (.28) drinkers. In summary, since heavy drinkers, who are highly overrepresented in DWI and RID behavior, are also as or more likely than are other drinkers to engage in behaviors to avoid DWI and RID and do so more often, future research would benefit from examining why these at-risk drinkers engage in DWI and RID on some occasions but not others. Future prevention efforts may also benefit from reinforcing safe choices, and removing barriers to making safe choices.

Introduction
An important question regarding the efficacy of alternative transportation programs in preventing DWI and Riding with Intoxicated Drivers (RID) is whether at-risk drinkers actually use such risk reduction strategies to avoid DWI and/or RID. If users of such programs are instead those with moderate to low risk for DWI or RID, then programs that promote behaviors such as the use of Designated Drivers (DDs) or Safe Rides (SRs) may only minimally impact the drinking driving problem (DeJong & Wallack, 1992). Several prior studies by the current authors, as part of a project funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) on the
effectiveness of alternative transportation in preventing DWI, have suggested that at-risk drinkers do utilize such programs to prevent DWI. In an examination of users of DDs, for example, Caudill et al. (2000) reported that DD users drink more often outside the home, achieve higher Blood Alcohol Concentration (BAC) levels when drinking outside the home, and are more likely to be rated as heavy drinkers on Cahalan et al.'s QFV index (1969). DD users were also more likely to report driving after drinking and riding with intoxicated drivers (RID). Clearly, those most at-risk for DWI were shown to be using DDs to prevent DWI. In addition to using DDs, DD users were shown to engage in an array of other behaviors to avoid DWI. In a related study of free safe (taxi) ride (SR) users, Caudill et al. (in press - a) similarly revealed that SR users tended to be heavy drinkers. In addition to using SRs to prevent DWI, SR users were also more likely than other drinkers to use DDs. In spite of their efforts to prevent DWI, SR users still reported more DWI and RID than did non-SR users. In a third study, Caudill et al. (in press - b) found that heavy drinkers were also more likely than other drinkers to serve as DDs for their drinking companions. DDs, however, were still more likely to report driving after drinking and RID, even though they were found to drink less often outside of the home than other drinkers. In summary, users of DDs and SRs and those serving as DDs tend to be heavy drinkers. However, in spite of engaging in such behavior to prevent DWI, DD and SR users and DDs themselves were still more likely to report DWI and RID than were other drinkers.

Because of the findings cited above, the authors conducted a follow-up study that compared the risk and risk avoidance behavior of heavy drinkers relative to moderate and light drinkers on the QFV index (Caudill et al., 1999). Heavy drinkers assessed in barroom settings were more likely than other drinkers to report DWI and RID behavior. They also reported more occasions of DWI behavior than did other drinkers and an equivalent amount of RID behavior as moderate drinkers and more than light drinkers. In examining risk avoidance behavior, heavy drinkers were as likely as moderate drinkers and more likely than light drinkers to use DDs to avoid DWI. They were also more likely than other drinkers to use SRs to avoid DWI. Finally, heavy drinkers used DDs and SRs more often. An examination of a community-based sample as assessed by random digit dial computer-assisted telephone interviews (CATIs) revealed similar findings, but also suggested that heavy drinkers were as likely as other drinkers to engage in an array of other behaviors to avoid DWI, plus they did so more often. Due to small sample size of heavy drinkers in the CATI sample, some of the planned analyses on DWI risk avoidance, and all of the comparisons on RID risk avoidance were impossible to conduct.

The current study was designed to further examine DWI and RID risk and risk avoidance behavior in a sample of 364 barroom drinkers. Items regarding DWI and RID risk avoidance assessed via CATI in the above-mentioned study (Caudill et al., 1999) were added to our barroom surveys. In addition, since heavy drinkers drink to the point of intoxication outside of the home more often than other drinkers, the current study includes an examination of the percentage of DWI behavior relative to drinkers' use of DWI risk avoidance behavior to control for the differential opportunity heavy drinkers have to engage in DWI risk avoidance.

**Methods**

**Context of Data Collection.** Data for this paper were collected from a representative sample of 364 barroom customers in April, 1999, 30 months after an alternative transportation program was introduced. The alternative transportation program was implemented in Frederick, Maryland and included three central elements: a free safe rides (SR) program using taxis; a designated driver program; and an extensive promotional campaign.

**Selecting a Generalizable Community.** To test the potential generalizability of study findings
to other American communities, we compared demographic characteristics (i.e., sex, race, marital status, educational level, income and age) for Frederick to other communities of similar size across the country using 1990 Census data. Findings showed that only one variable was found to differ relative to urbanized area averages. The median income for Frederick was significantly higher ($38,283, p < .05) than that of the national sample ($26,804). Thus, with this minor exception, Frederick is clearly representative of urbanized areas nationally.

**Context of Barroom Surveys.** The surveys were administered on one Saturday evening in 18 of 30 eligible drinking establishments. Sampling was restricted to barrooms, and to barroom areas in restaurants, so the respondents would consist largely of heavier drinkers who are more likely to drink and drive, and thus were an important target group for the study intervention. Since 12 establishment owners either could not be reached or refused to participate, each of the 30 settings was categorized on the basis of size of the establishment and average age of their clientele. No differences were found on the basis of either variable between participating versus non-participating establishments.

**Conduct of Barroom Surveys.** Customers were recruited for the study when they first entered each establishment to limit the amount of pre-assessment drinking by respondents. Teams of at least two trained survey administrators were assigned to each establishment and approached every customer as they entered. If individuals approached were interested, they were asked a series of screener questions which required that participants were at least 21 years of age or older, had lived in Frederick County for at least 12 months, had driven a motor vehicle in the last 12 months, and had consumed an alcoholic beverage in the last 12 months for other than religious purposes. Of the customers approached, 70% agreed to complete the screener questions. Of those screened, 63% were eligible for the survey. The predominant reason for customer ineligibility was that they did not live in the county. Ninety percent of eligible customers completed a written questionnaire that took approximately 10 to 15 minutes to finish. In exchange for completing a survey, customers were offered a five-dollar coupon redeemable for non-alcoholic merchandise in the establishment such as food and soft drinks.

**Barroom Survey Content.** The barroom surveys requested information about the following major content areas: socio-demographics; alcohol use; items used to compute respondents= usual blood alcohol concentration levels (BACs) in different contexts, such as when they drink outside the home in general, or on occasions when they use a DD or SR; items indicative of alcohol use problems; measures of drinking and driving and DWI behavior; riding with intoxicated drivers (RID); and other behaviors customers may use to avoid DWI and RID. The timeframe for DWI and RID behaviors examined was the last 12 months.

A generalized form of the Quantity-Frequency-Variability Index (QFV; Cahalan et al., 1969) was used to measure the extent of alcohol use. For this measure, respondents were asked questions about their usual patterns of drinking, regardless of beverage type. The QFV measure places respondents into one of the four following drinking habits categories: infrequent, light, moderate or heavy drinkers.

**Results**

As depicted in Table 1, heavy drinkers were more likely than other drinkers to report DWI behavior. They also reported an equivalent amount of DWI relative to moderate drinkers.

<p>| Table 1: Alternatives to DWI and RID of Frederick Barroom Respondents Based on Cahalan Drinker Categories |  |  |</p>
<table>
<thead>
<tr>
<th>Characteristics (past 12 months)(^\text{11})</th>
<th>Heavy Drinker</th>
<th>Moderate Drinker</th>
<th>Light/Infrequent Drinker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drove while feeling intoxicated(^*) (n = 357) H&gt;M&gt;L</td>
<td>56% (N=85)</td>
<td>34% (N=37)</td>
<td>12% (N=11)</td>
</tr>
<tr>
<td>Times drove intoxicated of those who drove intoxicated (\Theta) (n = 133) H&gt;L</td>
<td>7.71 (SD=13.89)</td>
<td>3.68 (SD=4.35)</td>
<td>2.18 (SD=1.78)</td>
</tr>
<tr>
<td>Rode with driver respondent thought was intoxicated(^*) (n = 350) H=M&gt;L</td>
<td>49% (N=71)</td>
<td>40% (N=44)</td>
<td>12% (N=11)</td>
</tr>
<tr>
<td>Times rode with driver respondent thought was intoxicated (\Theta) (n = 126) H&gt;M=L</td>
<td>10.69 (SD=16.11)</td>
<td>4.55 (SD=8.07)</td>
<td>2.73 (SD=1.56)</td>
</tr>
<tr>
<td>Used a DD(^*) (n = 349) H&gt;M&gt;L</td>
<td>73% (N=110)</td>
<td>61% (N=66)</td>
<td>34% (N=30)</td>
</tr>
<tr>
<td>Times used a DD of those who used a DD (\Theta) (n = 206) H=M=L</td>
<td>9.33 (SD=14.38)</td>
<td>7.06 (SD=13.11)</td>
<td>2.23 (SD=1.38)</td>
</tr>
<tr>
<td>Used a safe ride(^*) (n = 353) H&gt;M=L</td>
<td>11% (N=17)</td>
<td>5% (N=5)</td>
<td>0% (N=0)</td>
</tr>
<tr>
<td>Times used a safe ride of those who used a safe ride (\phi) (n = 22)</td>
<td>6.35 (SD=11.70)</td>
<td>1.20 (SD=.045)</td>
<td>(\phi)</td>
</tr>
<tr>
<td>Used any Alternative to DWI (N = 338)(^*) H&gt;M&gt;L</td>
<td>143 (95%)</td>
<td>94 (90%)</td>
<td>55 (66%)</td>
</tr>
<tr>
<td>Times used any alternative to DWI of those who used an alternative to DWI (N = 254), (\Theta) (^*) H&gt;M&gt;L</td>
<td>27.37 (38.87)</td>
<td>18.48 (37.01)</td>
<td>4.65 (5.01)</td>
</tr>
<tr>
<td>Used any Alternative to RID (N = 301)(^*) H&gt;M&gt;L</td>
<td>87 (66%)</td>
<td>47 (53%)</td>
<td>25 (31%)</td>
</tr>
<tr>
<td>Times used any alternative to RID of those who used an alternative to RID (n = 287), (\Theta) H&gt;L</td>
<td>23.65 (27.44)</td>
<td>10.24 (9.54)</td>
<td>6.62 (8.43)</td>
</tr>
</tbody>
</table>

\* p < .05; ** p < .01; *** p < .001
\(\Theta\) Analyses conducted on inversely transformed data to normalize distributions.
\(\phi\) Insufficient N for the analyses

\(^\text{11}\) In the case of categorical variables, such as whether respondents drove while intoxicated, post hoc group comparisons are from follow-up Chi Square tests used with Bonferoni adjustments. In the case of interval variables, such as the number of times respondents drove while intoxicated, the results are from Bonferoni post-hoc follow-up tests conducted on one way ANOVAs using inversely transformed data to normalize distributions.

and more than lights. In examining RID, heavy drinkers were as likely to report RID behavior
as moderate drinkers and were more likely than lights. Heavy drinkers reported engaging in more RID behavior, however, than either moderate or light drinkers.

In examining the use of DDs to avoid DWI, a central emphasis in the intervention trial, heavy drinkers were as likely as moderate drinkers to report using DDs and both groups were more likely to do so than light drinkers. Heavy and moderate drinkers reported an equivalent amount of DD use and both reported more DD use than light drinkers. In examining the use of SRs as a risk avoidance behavior, heavy drinkers were more likely to report using SRs than any other drinkers and they did so more often (the later variable, however, couldn’t be analyzed due to the small N=s for moderate and light drinkers).

In order to examine the extent to which heavy drinkers, relative to others, engage in DWI risk avoidance behaviors in general, a summary score was created which included an array of behaviors to avoid DWI. These behaviors included using a DD, using a SR, using a bus, paying for a cab, staying until the effects of alcohol wore off, going home with a driver who had less to drink, walking home, and staying overnight. As depicted in Table 1, heavy drinkers were as likely as moderate drinkers and both groups were more likely than light drinkers to engage in DWI risk avoidance behaviors. In examining the frequency of DWI risk avoidance behavior, however, heavy drinkers engaged in more such behavior than did any other drinkers and moderate drinkers did so more often than light drinkers.

Because heavy drinkers drink to the point of intoxication when outside the home more often than do other drinkers - hence have more opportunities to engage in DWI risk avoidance behavior, a variable was created to examine the amount of DWI behavior drinkers reported relative to the number of occasions where they reported engaging in specific behaviors to avoid DWI. The frequency of DWI behavior was divided by the number of DWI occasions plus the number of occasions individuals reported where they drank to the point of intoxication when outside of the home but engaged in behavior to avoid DWI. In comparing heavy, moderate and light drinkers, no differences between groups were revealed on this measure. Heavy drinkers engaged in DWI behavior, relative to risk avoidance behaviors, just as often (.30) as did moderate (.28) or light (.28) drinkers. Conversely, they engaged in DWI risk avoidance behaviors just as often (70% of the time) as did moderate (72%) or light (72%) drinkers. Similarly, to examine the extent to which heavy drinkers, relative to moderate and light drinkers, engaged in RID risk avoidance behaviors, a summary score was created for RID. This summary score included took a bus, used a SR, paid for a cab, had someone else drive who had less to drink than the driver, decided to drive the car yourself, stayed with the driver until they became less intoxicated, walked home and stayed overnight. As depicted in Table 1, heavy drinkers were as likely as moderates to engage in RID risk avoidance behaviors and both groups were more likely to do so than light drinkers.

In examining the frequencies of RID risk avoidance behavior, heavy drinkers engaged in such behavior more often than light drinkers, and moderate drinkers did so just as often as those in both other groups.
Discussion

One of the critical questions regarding the efficacy of alternative transportation programs in preventing DWI and RID risk behavior is whether at-risk drinkers actually use these alternatives to prevent DWI and/or RID behavior. Several prior studies by the current authors have shown that users of designated drivers (DDs) and safe rides (SRs) do tend to be heavy drinkers (Caudill et al., in press - a; Caudill et al., 2000). A related study also showed that drinkers who serve as DDs for their drinking companions tend to be heavy drinkers (Caudill et al., in press - b). Although drinkers who used DDs and SRs tended to be heavy drinkers, these same individuals were found to still exhibit more DWI and RID behavior than did other drinkers. Due to these findings, a fourth study was conducted to specifically examine the DWI and RID risk and risk avoidance behavior of heavy drinkers (Caudill et al., 1999). Findings showed that heavy drinkers were more likely, relative to moderate and light drinkers, to engage in specific behaviors to avoid both DWI and RID, yet they were still more likely to engage in DWI and RID behaviors. The current findings, based on a randomly selected sample of 364 barroom drinkers, showed that heavy drinkers were as or more likely than moderate drinkers and more likely than light drinkers to engage in an array of behaviors to avoid both DWI and RID. In spite of heavy drinkers clear attempts to avoid such risk behavior, they were still found to be more likely to engage in DWI and RID risk behavior and were likely to do so more often than other drinkers. Since a critic of alternative transportation programs, such as the use of DDs or SRs, as a means of successfully reducing risk for DWI and/or RID could argue that these programs are used more by heavy drinkers because they have more of an opportunity to use them and that perhaps they use them a smaller percentage of the time than do other drinkers, we specifically examined the percentage of DWI reported by all drinkers relative to the extent to which they engaged in behaviors to avoid DWI. Heavy drinkers were shown to engage in DWI risk avoidance behaviors just as often as other drinkers, namely 70% of the time that they drink to intoxication outside of the home. Since heavy drinkers drink to intoxication outside of the home more often than do other drinkers, this accounts for a very large proportion of DWI behavior that is successfully prevented by these behaviors.

Although heavy drinkers have been shown to use alternative transportation programs to reduce DWI and RID risk behavior, they have also been shown to still exhibit a large amount of DWI and RID behavior on other occasions. Since 95% of heavy drinkers and 90% of moderate drinkers, for example, were shown to engage in behaviors to avoid DWI on some occasions, yet 56% of heavy drinkers and 34% of moderate drinkers still report DWI, future research would clearly benefit from determining why at-risk drinkers engage in DWI and RID behavior on some occasions but not others. Future prevention efforts may also benefit from reinforcing safe choices and removing barriers to drinkers making safe choices more often.

References


