

# Only sometimes do the best laid plans go awry: Investigating the relationship between drinking intentions and drinking behavior

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## Abstract

Episodes of binge drinking often precede incidences of drunk driving. The research described below examined the relationship between the drinking plans that individuals made before visiting bars and their blood alcohol concentrations (BACs) upon return. Specific focus was placed on factors that might moderate the relationship between drinking plans and behavior. Of particular interest were those who consumed more alcohol than they anticipated.

Participants included 953 United States residents sampled crossing into, and returning from, bars and nightclubs in Tijuana, Mexico. Data on drinking intentions and drinking history were collected from participants as they entered Tijuana. BACs and other indicators of drinking behavior were collected upon their return. Those driving home intended to, and in fact appeared to, succeed in drinking less. Factors that significantly moderated that relationship between drinking plans and drinking behavior are discussed. Both gender and binge-drinking history were determined to be important factors in determining the correspondence between intentions and actions.

## Introduction

Binge drinking is common among young people in the United States. Though there is some variability in the definition of *binge drinking* (cf., Centers for Disease Control and Prevention, 1996; Gfroerer, Wright, & Gustin, 1996; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994), it is usually defined as five or more drinks on one occasion. Five or more drinks would be sufficient for most people to reach or exceed a BAC of between .08 and .10, the amount associated with driving under the influence (DUI) in the United States. Much of the progress in reducing alcohol-related crashes among youths is attributed to the age-21 drinking limit, which has been in place in all 50 states since 1988 (Toomey et al., 1996). Wagenaar (1993) reviewed research on the impact of the minimum legal drinking age law and concluded that it had been effective in reducing consumption among the effected underage group.

However, despite an overall reduction in consumption, binge drinking has continued among youths and young adults. The National Household Survey Data from 1995 (Gfroerer, Wright, &

Gustin, 1996) indicate that binge-drinking behavior peaks between ages 21 and 25, though it is difficult to determine exactly where the peak is from these data as the age interval reported changes above age 25. Regardless, there is evidence of relatively high binge rates for those under the legal drinking age. Over 25% of those aged 18 to 20 reported drinking five or more drinks on at least one occasion within 4 weeks of the survey. Almost 15% of those aged 16 to 17 had recently had a binge-drinking experience.

In the United States, binge drinking for young people seems to occur when there is (1) access to sufficient alcohol, (2) reduced parental supervision, and (3) an appropriate peer-social environment. For residents of U.S. cities bordering Mexico, all three conditions are met in the bars and nightclubs across the border. There, alcohol is available legally for those over 18, and it is extremely cheap. Further, many of those visiting Mexican bars perceive, rightly or wrongly, that the social restraints on behavior are far less restrictive in Mexico than in the United States. Finally, because literally thousands of young Americans stream across the border to drink every weekend night in Mexico, the peer environment is present to facilitate heavy drinking.

Tijuana, Mexico, which shares the border with the U.S. city of San Diego, California, is the largest of the border binge-drinking locales. The consistency of the stream of U.S. binge-drinking crossers makes it an ideal place to study such behavior to gain an understanding of the motivations and social factors that contribute to binge drinking (Lange & Voas, in-press). An ongoing survey of young San Diego residents has been in place for over two years to monitor the effectiveness of a community intervention program, Operation Safe Crossing, designed to reduce the problem of cross-border binge drinking.

One of the unique aspects of this survey is that young people are recruited immediately before a potential binge-drinking experience. Thus, we can measure the drinking plans of young people. Further, by matching those intentions with measures obtained upon return to the United States, we can investigate the role of factors that may moderate the relationship between drinking intentions and relative drinking quantities. Factors such as peer influence, drinking history, and driving requirements may cause more or less drinking than planned.

Analysis of these surveys can be useful in understanding the following questions:

1. What are the factors that predict a motivation to binge drink?
2. What factors predict returning from Tijuana with high BACs?
3. What factors predict drinking more or less than reportedly planned

## **Materials and Methods**

### Subjects

We successfully recruited 1,953 pedestrian participants as they headed south into Tijuana on Wednesdays, Fridays, and Saturdays between 10 PM and 1 AM. Because young people heading into Tijuana tend to arrive in groups, whole groups were recruited to participate. Only groups containing at least one San Diego resident and one person aged 18 to 30 were permitted to participate. No crossers under aged 18 were permitted to participate. Further participants had to plan to return to the United States by 6 AM (4 AM on Wednesdays). There were 1,396 (54%) male participants who returned and provided a breath sample.

However, only 953 of the participants had fully completed the questionnaire or were part of groups of more than one (necessary conditions for the HLM statistical procedure)

### Selection

Groups of crossers were selected at random, using a procedure similar to those used at roadside surveys (e.g., Lange, Lauer, & Voas, 1999). When interviewers were ready, the next group to cross a taped-line placed on the sidewalk was approached and asked to participate. A money-order incentive of \$10 was offered to encourage participation, though all potential participants were assured that their compliance was strictly voluntary. About 43% of those approached and eligible agreed to participate.

### Procedures

Groups were recruited according to the selection procedure described above on the on U.S. side of the border as they approached the gates demarcating the border. Upon consent, the groups were asked to complete a self-administered questionnaire and then were asked to provide a breath sample for an alcohol breath test. No names were recorded in order to maintain the anonymity of the participants. The breath-test devices were programmed to store the results of the test internally and did not display the BAC of the participant. Instead, test code numbers were used to match the internally stored results with the questionnaire.

Participants were instructed that if they checked in with our staff stationed on the U.S. side of the border crossing (Tijuana to San Diego), they would receive a \$10 money order. Participants were fitted with a hospital-style identification bracelet with their subject code number. This was used to verify their qualification for the \$10 incentive fee and was further used to match their arrival data with data gathered from them upon their return.

Upon their return, additional questions about their experiences in Mexico were asked, and a second alcohol breath test was requested. About 74% of those participating in the *arrival* portion of the survey returned and completed the *returning* portion of the survey.

### Instruments

A 55-item self-administered questionnaire was given to participants recruited arriving at the border, before their Tijuana drinking experience. The questionnaire covered the following domains: demographics, drinking history, drinking plans, expectations regarding their group's drinking, and ratings of San Diego and Tijuana bars. A CMI Intoxilyzer SD400 handheld alcohol breath-test device was used to measure participants' BACs. Upon the participants' return, a brief 16-question interview was conducted focusing mainly on the participants' experiences in the bars of Tijuana. A second breath test was then administered using the same breath-test instrument.

### Analyses

Because participants were recruited within existing groups, it was necessary to control for group-level effects on the dependent variables to identify individual-level relationships. The SAS PROC MIXED procedure was therefore used to test all relationships reported here. Further, as

drinking behaviors tend to be different for men and women, each analysis was run separately by gender.

## Results

### Predicting drinking intentions

Participants rated their intended drinking on a 4-point scale labeled sequentially as follows: *none*, *slightly buzzed*, *a little drunk*, *very drunk*. Inspection of the results indicated that there were functionally no differences between those expecting to get *a little drunk* versus *very drunk*. Therefore, those categories were combined for all analyses reported here. Three predictors were simultaneously modeled with interactions: binge-drinking history, driver status, and expected group drinking. One of the strongest predictors of drinking intentions was driver status. Those who reported upon arrival at the border that upon their return they would be driving home had intentions to drink less than those who would be returning passengers (men:  $F(1, 232)=42.85$ ,  $p<.01$ ; women:  $F(1, 232)=25.13$ ,  $p<.01$ ). This was true for both the men and women sampled.

Another predictor of drinking motivations was past binge-drinking experience. Those who reported having consumed five or more drinks on at least one occasion within the past 4 weeks were more likely to intend to get drunk on this occasion (men:  $F(1, 274)=52.97$ ,  $p<.01$ ; women:  $F(1, 232)=24.05$ ,  $p<.01$ ).

Finally, when asked how drunk the participant expected their friends would get, their response seemed to predict their own drinking intentions (men:  $F(2, 232)=10.64$ ,  $p<.05$ ; women:  $F(2,232)=3.61$ ,  $p<.05$ ). Generally, the more they thought their friends would drink, the more they reported they themselves would drink.

There was one significant interaction for both the men and women sampled, which had been predicted. Expectations of group drinking and driver status interacted on drinking plans (men:  $F(2, 232)=3.63$ ,  $p<.05$ ; women:  $F(2, 232)=6.28$ ,  $p<.01$ ). However, the nature of the interaction was only in the expected pattern for women. As expected, when women were to be the drivers, their drinking plans were unaffected by their expectations of their friends' drinking. However, for men, drinking plans were not disassociated from their friends' drinking plans even when they were the drivers (see Figure 1).

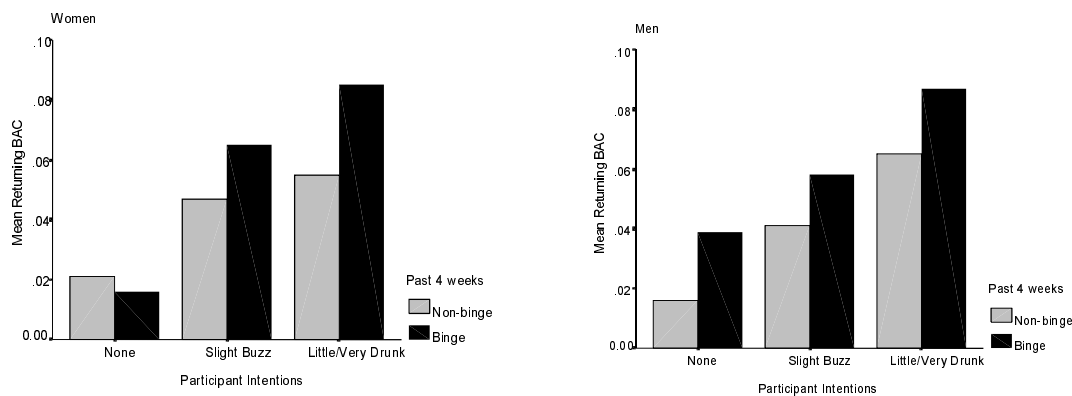


Figure 1. Planned alcohol consumption is related to both driving status and expectations of friends' drinking

### Relating intentions with BACs

That people varied on their drinking intentions was important because there was a strong relationship between participants' plans for drinking and their resulting BACs. Simultaneously predicting returning BACs from binge-drinking history and drinking plans including an interaction term, the following results were obtained.

Intentions to drink strongly related to returning BACs for both men and women (men:  $F(2, 275)=25.23, p<.01$ ; women:  $F(2, 233)=27.71, p<.01$ ). Further, a history of binge drinking also predicted higher returning BACs (men:  $F(1, 275)=13.69, p<.01$ ; women:  $F(1, 233)=6.74, p<.05$ ). Women with a history of binge drinking were particularly likely to return with high BACs. In fact for women, there was a significant interaction between history of binge drinking and drinking plans, making their effects more than additive ( $F(2, 233)=3.19, p<.05$ ). This was not the case for men ( $F(2, 275)=0.12, p>.05$ ; See Figure 2). Note that the *average* BAC of those intending to get drunk, with a history of binge drinking is greater than .08, which is above the *per se* legal limit for adult drivers in California.



**Figure 2. Intentions and a history of drinking are associated with returning BACs**

### Factors leading to unintended drinking

There were, of course, instances of returning BACs well above that expected based upon reported plans. A variable was created by first grouping participants by their reported drinking plans, then calculating the difference between their returning BAC from their constructed group mean. This was done separately for men and women. As before, binge-drinking history, expected drinking of friends, and intentions to drive including interactions were modeled simultaneously predicting this new variable. For women, only a history of binge drinking predicted returning with a BAC higher than average ( $F(1, 234)=13.41, p<.01$ ). Two possible explanations are readily apparent. First, for these women, the definition of *slight buzz*, or *drunk* may include a higher absolute BAC than for less experienced drinkers. Second, it is possible that these women are more prone to being swayed by the social situation; therefore, they actually drink more than planned.

For men, both a history of bingeing and plans to drive were significant predictors of returning with BACs that varied from expected. Men who returned as drivers had BACs that were lower than others who planned on drinking the same amount ( $F(1, 276)=21.14, p<.05$ ). As with women, a history of binge drinking predicted BACs that were higher than planned. Again, this could be due to tolerance effects or the malleability of these particular participants' behavior to the situation. No interactions were observed, and expectations about friends drinking did not relate to drinking-plan deviation for either men or women.

## **Discussion**

It is interesting that men and women differ with respect to many of the factors that affected returning BACs and drinking plans. That men drank less than expected when they were drivers is perhaps an indication that their drinking is more situationally determined than women. For women, acting as drivers appears to have altered reported plans to drink regardless of the situation, and they appeared to be more likely to stick with those plans. Men, on the other hand, may have found themselves needing to deviate from their plans as they considered their future role as drivers. That women were perhaps demonstrating a greater degree of forethought with respect to drinking plans may explain why women appear to be more successful in applying the concept of designated drivers (e.g., Kelley Baker, Lange, & Voas, 1999).

That previous binge drinking experiences also predicts higher returning BACs is another indication that behaviors persist. However, this study does not resolve conclusively whether past binge drinkers are merely more susceptible to the facilitative environment, or whether they are demonstrated heightened motivations to drink. One indication that the latter is true is that those with a history of binge drinking reported intentions to drink more. However, also found in these analyses was that a history of binge drinking predicted higher returning BACs relative to those expected based upon prior intentions. So perhaps those who have previously engaged in binge drinking are both more motivated to drink and are more likely to be influenced by others' heavy drinking. Further research is clearly needed to adequately separate these potential causes.

When we consider youth drinking, it is important to remember that for many young people, drinking is often, if not most of the time, a planned event. It rarely results from unexpected situations that thrust alcohol on unprepared youth. Instead, young people, at least in the United States, often seek out conditions where adult supervision is lacking, where alcohol is readily accessible, and where there are sufficient peers to create a facilitative social environment. Because binge drinking is at least partially a planned event for young people, it is important to study it from both the environmental as well as the person-centered perspectives.

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