Gender Differences in the Psychosocial Correlates and Longitudinal Predictors of Drinking and Driving in Young Adults

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Background
According to the most recent U.S. national survey, carried out in 2002, nearly 27 percent of young adults aged 18 to 25 reported that they had driven under the influence of alcohol in the past year [1]. In the overall sample, a greater percentage of men than of women reported driving after drinking in the past year (18.8% versus 9.9% among those aged 12 or older). Drinking and driving, while still more common among men than women, is engaged in by increasing numbers of women [2]. It is thus increasingly important to determine whether the risk factors for drinking and driving are the same or different for women as for men. There have been relatively few studies, however, that have compared the genders to determine if different variables were required to explain variation in their involvement in drinking and driving.

Objectives
This paper will examine data from a large survey sample of young adult men and women drivers in order to determine whether there are gender differences in the psychosocial and behavioral correlates of self-reported drinking and driving. Both cross-sectional and longitudinal data will figure in these analyses.

Methodology
The present investigation relied upon data from a 3-wave longitudinal study of drinking and driving behavior carried out between 1989 and 1992 on a statewide sample of licensed drivers sampled from the driver history records of the Colorado State Division of Motor Vehicles [3]. Drivers were stratified by gender, age (18-20 vs. 21-24), area of the state (Denver metro, Northeast, Southeast, and Western Slope), and moving violation status (none, non-alcohol/drug moving violations, driving while intoxicated [.05<BAC<.10], and driving under the influence). Twice as many men as women were selected. Participants were solicited by mail. Questionnaires were mailed to those who agreed to participate. Participants received $15USD for completing the Wave-1 questionnaire and $25USD for completing each of the Wave-2 and Wave-3 annual questionnaires. Wave-1 questionnaires were returned by 2721 drivers (61% of those with good addresses). Wave-2 questionnaires were returned by 2129 drivers, and Wave-3 questionnaires were returned by 1880 drivers (69% of those in Wave-1). At Wave 1, participants had the following characteristics: 62% were men, 38% were women; 37% were 18-20 years old, 29% were 21-22 years old, and 34% were 23-25 years old; 84% were European-American, 11% were Hispanic-American, 2% were African-American, 2% were American Indian, and 2% were Asian American. Only young adult drivers who were drinkers were examined in the present analyses (Wave 1: 1547 men and 829 women; Wave 2: 1194 men and 701 women; Wave 3: 1041 men and 633 women).

The 18-page mail questionnaires assessed a large number of variables drawn from Problem Behavior Theory (PBT), a social-psychological framework developed by Richard and Shirley Jessor [4,5] encompassing variables from three explanatory systems—the Personality System, the Perceived Environment System, and the Behavior System.
Explanatory variables reflecting PBT included measures of psychosocial conventionality-unconventionality and of behavioral conventionality-unconventionality. Six measures of psychosocial conventionality-unconventionality were assessed. These are the following: Value on Achievement, a 4-item measure of the personal importance of positive job evaluations and advancement ($\alpha=.74$); Intolerance of Deviance, a 10-item measure of the rated wrongness of behaviors such as stealing, lying, property destruction and aggression ($\alpha=.79$); Religiosity, a 5-item measure of the personal importance of religion as a guide for daily living ($\alpha=.90$); Parent-Friends Compatibility, a 3-item scale of the similarity of parent and friend values and goals ($\alpha=.77$); Parent vs. Friends’ Influence, a 3-item measure of the respondent’s reliance on friends rather than parents for advice in making decisions ($\alpha=.64$); and Social Support for Drinking and Drug Use, a 5-item measure of perceived friends’ approval and models for involvement in drinking and marijuana use ($\alpha=.70$). Six measures of behavioral conventionality-unconventionality were assessed, including: Delinquency, a 9-item measure of the frequency of involvement in the past six months in stealing, lying, property destruction, and aggression ($\alpha=.72$); Smoking, a 4-item measure of number of cigarettes smoked per day, smoking first thing in the morning, and chain smoking ($\alpha=.94$); Problem Drinking, a 3-component measure reflecting alcohol intake, drunkenness, and negative consequences of drinking ($\alpha=.83$); Marijuana Use, a 4-item scale reflecting ever experience, feeling the drug’s effects, recent use, and access to a supply ($\alpha=.72$); Other Drug Use, an 8-item measure of the frequency of use of a variety of drugs other than marijuana (uppers, downers, tranquilizers, hallucinogens, crack, powder cocaine, heroin, and other narcotic drugs) in the past six months ($\alpha=.66$); and Risky Driving, a 20-item measure of the frequency of speeding, passing, turn, right of way, control signal, and following violations in the past year ($\alpha=.92$). All of the alpha reliabilities reported are from Wave-1 and are similar across all three waves.

In addition to the measures of PBT, other variables important in the field of driving research were included: Risk-taking, 4-item scale of self-image as a risk-taker ($\alpha=.76$); Risky Sport Preferences, a 14-item measure reflecting either interest in trying or experience in sports such as hang gliding, white-water rafting, rock climbing, and other risky sports popular in Colorado ($\alpha=.81$); Risky Sport Involvement, a 14-item measure of the frequency with which respondents currently participate in these same sports ($\alpha=.72$); Impulsivity, a 3-item measure of acting before thinking ($\alpha=.58$); Aggressiveness, a 6-item scale reflecting enjoyment of arguments and a tendency to insult others when provoked, as well as a tendency to employ physical measures when angered ($\alpha=.73$); and Irritability, a 4-item measure of impatience with other people, ease of becoming irritated, and feeling like a powder keg ready to explode ($\alpha=.67$).

Lastly, proximal measures focused directly on aspects of drinking-driving were assessed, including: Intolerance of Drinking-Driving, a 2-item measure of the rated wrongness of driving after drinking various amounts ($\alpha=.73$); Perceived Risks of Drinking-Driving, a 2-item measure of the rated probability of getting caught or being in an accident when drinking and driving ($\alpha=.84$); Positive Functions of Drinking-Driving, a 5-item measure of the personal importance of reasons to engage in driving after drinking, such as the hassle involved in getting home another way, and not wanting others to think you couldn’t handle your liquor ($\alpha=.76$); Negative Functions of Drinking-Driving, a 5-item measure of the personal importance of reasons not to engage in drinking and driving, such as worry that others might think poorly of them or fear of getting stopped by the police ($\alpha=.62$); and Social Support for Drinking-Driving, a 2-item measure of friends’ approval and models for driving after drinking ($\alpha=.66$).
Drinking and driving was assessed by a series of five questions that were combined into a summary index. These questions asked how many times in the past year respondents had: 1) driven within an hour or so after drinking 1 or 2 beers or other alcoholic drinks; 2) driven within an hour or so after drinking 3 or more beers or other alcoholic drinks; 3) driven when they felt high or light-headed from drinking; 4) driven when they knew their drinking had already affected their coordination; and 5) drank in the car while they were driving. At each wave, reported frequencies on these items were truncated at 100, and individual respondent means were computed as summary scores ($\alpha= .94$ in all three waves).

Given their lesser involvement in drinking and driving, young adult women should have more conventional scores than men on the psychosocial and behavioral measures of PBT, as indicated by higher scores on Value on Achievement, Intolerance of Deviance, Religiosity, and Parent-Friend Compatibility, and lower scores on all of the other PBT measures. We also expect that they will have lower scores than men on Risk-Taking, Aggressiveness, and Irritability, and that they will have lower scores than men on the Positive Functions of Drinking-Driving and Social Support for Drinking-Driving, and higher scores than men on Intolerance of Drinking-Driver, Perceived Risks of Drinking-Driving, and Negative Functions of Drinking-Driving. In contrast, we do not expect any significant differences between the genders in the magnitude of the correlations of these variables with drinking and driving.

**Results and Analyses**

This section reports on results in four areas of potential gender differences: in the frequency of involvement in drinking and driving behaviors; in the levels on the potential risk factors for drinking-driving; in the cross-sectional correlates of drinking and driving; and in the longitudinal predictors of drinking and driving.

In each of the three waves of cross-sectional data, young adult men engaged in drinking and driving significantly more frequently in the past year than did young adult women. This was true for all five component behaviors and for the summary score in all three waves ($17 t$-values were significant at $p < .001$, one at $p < .01$, two-tailed).

Gender differences in the means on the 23 psychosocial and behavior measures were examined as well. In each of the three waves, $t$-tests were performed on these dependent variables with gender as the independent variable. Levene’s test was computed to determine whether the $t$-test assuming equal or unequal variances should be examined in each case. There were statistically significant differences at the $p < .001$ level (two-tailed) on 19 of the 23 variables examined, all except Value on Recognition, Smoking, Impulsivity, and Irritability. In all cases, mean differences on these psychosocial and behavior variables were in the direction expected (see above).

Despite these mean differences, gender differences in the significance of the correlations with drinking-driving were relatively rare. Of the 23 psychosocial and behavioral variables, all but Value on Achievement, Parent-Friends Compatibility, and Irritability correlated significantly with drinking-driving when age, ethnic/racial background, and driving exposure (miles driven per year) were statistically controlled through the use of partial correlation. Correlation coefficients were compared between genders by using Fisher’s $r$ to $z$ transformation and then computing the $z$-test in each case. Statistically significant differences ($p < .05$) were found in only 8 (12%) of the 69 cross-sectional comparisons (3 waves by 23 variables).
The 8 instances in which the cross-sectional correlations with drinking-driving differed significantly between women and men were the following. In the Wave-1 data, four of 23 \( z \)-tests were statistically significant: for Intolerance of Deviance (\( z = 2.34, p < .05 \)), Intolerance of Drinking-Driving (\( z = 3.27, p < .01 \)), Negative Functions of Drinking-Driving (\( z = 2.95, p < .01 \)), and Social Support for Drinking-Driving (\( z = 2.32, p < .05 \)). In all four cases, the coefficient for the men was significantly larger than the coefficient for the women. In the Wave-2 data, two of \( z \)-tests reached significance: for Cigarette Smoking (\( z = -2.01, p < .05 \)) and for Problem Drinking (\( z = -5.43, p < .001 \)). In both instances, the coefficient for the women was significantly larger. Lastly, in the Wave-3 data, two of the \( z \)-tests were significant: for Problem Drinking (\( z = -2.36, p < .05 \)) and for Negative Functions of Drinking-Driving (\( z = 2.63, p < .01 \)). The directions of both of these Wave-3 differences were consistent with the results in the earlier waves, suggesting that problem drinking bears a stronger relation to drinking and driving for women than for men, and that the negative functions of drinking-driving are more strongly related to the behavior for the men than for the women.

Longitudinal analyses examined gender differences in the antecedent predictors of later drinking and driving (W1-W2, W2-W3, and W1-W3). Of the 23 explanatory variables, 17 correlated significantly with later drinking-driving for both genders across all intervals (exceptions were Value on Recognition, Religiosity, Parent-Friends Compatibility, Parent-Friends Influence, Risky Sport Involvement, and Irritability). Similar to the cross-sectional results, there were few gender differences in the magnitude of the correlations with later drinking and driving. Only 5 (7%) of the 69 \( z \)-tests were statistically significant. In the analyses predicting Wave-2 drinking-driving from Wave-1 variables, there were only two significant \( z \)-tests out of 23 comparisons: Problem Drinking correlated more strongly with Wave-2 drinking-driving for the women than for the men (\( z = -4.28, p < .001 \)), while Intolerance of Drinking-Driving correlated more strongly for the men than for the women (\( z = 2.79, p < .01 \)). In the analyses predicting Wave-3 drinking-driving from Wave-2 variables, there was just a single significant gender difference in correlations: Problem Drinking correlated with later drinking-driving more strongly for the women than for the men (\( z = -3.00, p < .01 \)). Lastly, in the analyses predicting Wave-3 drinking-driving from Wave-1 variables, there were just two significant gender differences: Irritability correlated more strongly with drinking-driving for the women than for the men (\( z = -2.02, p < .05 \)), as did Positive Functions of Drinking-Driving (\( z = -2.00, p < .05 \)). While the coefficient for Problem Drinking was larger for the women than for the men, it was not significantly larger (\( z = -1.58, p > .05 \)).

**Discussion**

These analyses of three waves of data from a statewide sample of young adult drivers found that the women drove less often after drinking than did the men, a result that has been found in other samples. Analyses of a variety of psychosocial and behavior measures drawn from PBT also showed that these young adult women were less unconventional (more conventional) than the young adult men, consonant with their known lower level of involvement in drinking and driving. Most importantly, these analyses found that there were few differences between the genders in the magnitude of the correlations of these variables with drinking-driving, either in the cross-sectional or in the longitudinal data. This finding is particularly noteworthy given that a very conservative measure of similarity was employed (statistical tests of the equality of the correlation coefficients).

An important limitation of the present analyses is their reliance on self-report measures of both drinking and driving and of the psychosocial and behavior variables. It is possible that they correlate more strongly here than they would have if they had been derived from
different or multiple sources. This limitation, however, would most likely influence the correlations for both genders in the same manner, and ought not to have systematically attenuated differences in the correlations between the male and female respondents. A second limitation of the analyses is that these data were collected between 1989 and 1992. The stability of gender differences among young adults in their daily drinking and binge drinking from then to now [6], however, argues that similar results might well be found in more recent data sets. A third limitation of these data is that they were collected from a state-wide sample of licensed drivers rather than from a nationwide sample. It would therefore be important to replicate these findings on a nationally representative sample of young adults. Lastly, it is important to note that these findings may not generalize either to younger adolescent drivers or to older adult drivers. Additional research is needed to determine whether the present lack of gender differences in the correlates of drinking-driving extends to these other population groups as well.

The inclusion in the research of such a large array of psychosocial and behavior measures and its reliance on three waves of cross-sectional data and three intervals for longitudinal prediction within a statewide sample of young adult drivers serve to reduce the likelihood of inappropriate conclusions regarding gender differences in the correlates and predictors of drinking and driving in young adulthood.

Conclusions
Despite the fact that young adult women drive after drinking less often than young adult men, and that they exhibit attitudes, perceptions of their social environment, and behaviors that implicate lower levels of proneness for involvement in drinking and driving, there are generally few differences between the genders in either the cross-sectional correlates or longitudinal predictors of drinking and driving. The only consistent difference was that problem drinking in these young adult women was more strongly related to their involvement in drinking and driving than it was among the young adult men. These results have two major implications. The first is that interventions for men and women need not focus on modifying different risk factors. The second is that interventions to reduce drinking-driving among young adult women need to pay particular attention to attenuating the linkage between their drinking and their driving, and that reductions in their problematic drinking should have a somewhat greater impact on their drinking and driving than it would have for young adult men.

References