Driver Characteristics as a Function of DWI History

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Keywords:
alcohol, DWI, drinking drivers, hard-core drinking-driver

Body of paper:

Abstract

Successful prevention and rehabilitation efforts for DWI offenders are contingent on the creation of deterrence and intervention programs that distinguish between different types of persistent drinking-drivers. The current study (n=642) used ordinal and multinomial regression to determine relevant characteristics for comparisons between first vs. second, and second vs multiple (3 or more) DWI offender groups. Results from the ordinal logit modeling suggested linear relationships for the following: age, test refusal, driving infractions, crashes, attitudes concerning DWI, internal locus of control, family history for DWI, and score on the action subscale for the stages of change. The multinomial regression found seven significant and six marginal effects for the first vs. second comparison, and nine significant and seven marginal effects for the second vs. multiple comparison. The only common measures were locus of control and driving inhibition. The results suggest that second and multiple offenders do not necessarily have similar characteristics. Furthermore, the fact there were a number of characteristics that appeared to distinguish between the second and multiple offenders suggest there is a potential for early identification of the persistent drinking-driver.

Introduction

Persistent drinking-drivers account for a sizeable number of crashes and fatalities. Fell (1) used the FARS data to estimate the contribution of persistent drinking-drivers to the fatality rates within the U.S. He found that persistent drinking-drivers were 4.1 times more likely to be involved in a fatal alcohol-related crash than first-time offenders. Furthermore, while the FARS data indicated that 1 in 8 fatal crashes involved a persistent drinking-driver, the data severely underestimated the actual number of persistent drinking-drivers involved in fatal crashes because they were based on only a 3-year window for prior drinking-driving convictions. Simon (2) found that when convictions were retained for 10 years on driver records, the involvement of persistent drinking-drivers in fatal crashes increased from 13% to 35%.

Simpson (3), in discussing the persistent drinking driver, suggests that estimates of how many individuals actually continue to drink and drive after their first drinking-driving conviction is underestimated. He agrees with Simon that the percent of fatally injured drivers with prior DWI convictions is closer to 35 or 40%. Simpson further estimates that 65% of fatally injured drinking drivers or 30-35% of all drivers killed each year are persistent drinking drivers. In addition, the author suggests that 15-20% of all drivers injured are persistent drinking drivers. Furthermore, individuals with a prior DWI that were involved in a fatal crash were much more likely to have been drinking (85% vs. less than 50%) than those with no prior DWI arrest or conviction (3).

The high rate of alcohol-involved crashes and the rates of problem drinking and drug use among the persistent drinking-driver population indicate the importance of identifying individuals who are at risk for continued drinking-and-driving incidents. Targeting the persistent drinking-driver is consistent with national policy and with recommendations from many experts in the field. In attempting to discover characteristics that could be used to identify the persistent drinking-driver prior to development of serious substance-related problems, researchers have considered the number of offenses with no information on personality (4) or considered personality characteristics but have looked at only first versus multiple offenders (5). The current study assessed a broad range of characteristics considering differences between first, second and multiple DWI offenders.

Methods

Sample: The sample was obtained from recruitment through Buffalo City Court records, Erie County Probation Department, and the Drinking Driver Program (DDP). The entire sample was recruited using pamphlets distributed to the DWI offenders by probation officers, the DDP staff, or mailed directly to them (court sample). The mean age of the sample was 34 (SD=10.1), with the sample being mostly male (86%) and white (84%). The majority of the sample was never married (51%), with 26% being separated, divorced or widowed. While 50% of the sample had gone beyond high school and only 17% did not have a high school degree, only 56% were employed. No information is available from non-responders to allow for a comparison between those individuals that elected to participate and those that did not. Thus, results may reflect a sample that may not be fully representative of court cases, probation, or the DDPs. However, the sample was selected to ensure inclusion of the full diversity of DWI offenders and the sample is quite similar to state and national DWI offenders characteristics.

The breakdown into first, second, and multiple offenders was primarily based on self-report. However, Department of Motor Vehicles driver abstracts were obtained for a subsample of 446 participants. When the sample was categorized according to the number of DWI offenses (first arrest, two arrests, or three or more arrests) based on official records and self-reports, the resulting Kappa was only .359. However, the problem was not with underestimation, as only three individuals reported fewer arrests than were on their abstracts. The major issue was with over-reporting. But the issue is not problematic because the DMV abstracts are cleared after ten years and do not contain out of state arrests or arrests that resulted in no conviction. Furthermore, while pleas to non-alcohol-related charges are no longer permitted in New York, some of the arrests that were originally for DWI may have been officially changed to a lesser charge. Therefore, the use of self-report drinking-driving offenses may be more representative

than what might appear on the abstract, especially because the interview was confidential. Since information was missing on some of the measures, comparisons were made between first (n=287) and second offenders (n=157) and second and multiple offenders (n=199).

Measures:

Demographic Characteristics: A broad assessment of demographics (e.g., age, education, employment, marital status, gender, etc.) was included.

Alcohol-Related Measures: To measure drinking style, consequences, perceived benefits, and concerns, the general alcoholism score of the Alcohol Use Inventory, or AUI (6) was used.

Family History for Alcohol/Drug Problems: We used the family history questions from the Research Diagnostic Criteria to assess familial alcoholism (7).

Drug Use: Lifetime drug use was assessed using a procedure similar to that used in the National Household Survey.

Victimization: A history of victimization experiences during adulthood was obtained, including sexual and physical assaults.

Criminal History: A series of questions pertaining to arrests and convictions for charges other than DWI were used to assess the criminal history of the DWI offenders.

Driving: Official Department of Motor Vehicles records and a self-report of driving incidents were used to assess driving skills.

Psychiatric Severity: The nine dimensions of the Symptom Checklist-90 Revised (SCL-90-R) was used to measure psychiatric severity (8).

Sociopathy and/or Anti-Social Personality: The 53-item Socialization Scale of the California Psychological Inventory (9) was used to measure sociopathy.

Sensation Seeking: The general scale of the Sensation Seeking Scale (SSS) Form V was used to assess the respondents risk taking propensities (10).

Locus of Control: Levenson's (11) Internal, Powerful Others, and Chance scales were used to assess the respondents locus of control.

Social Desirability: A five-item measure developed by Hays et al. (12) was used to check for socially desirable response sets.

Self-Esteem: A modified version of Rosenberg's (13) measure of self-esteem was used to assess self-concept.

The Stages of Change: The stages of change scale developed by DiClemente (14) was used to assess current potential motivation for changing drinking behavior.

Driving and Drinking-Driving Measures: The driving-related attitude measures developed for use with DWI populations by Donovan (15) were used to assess respondents driving attitudes.

The respondents' knowledge of drinking-driving laws and the amount of alcohol needed to be consumed to reach proscribed levels were assessed through questions asking (1) the blood alcohol levels for driving while impaired and driving while intoxicated (using New York State statutes); (2) the number of drinks required in one hour to reach .10 BAC in a 160-pound man; and (3) the number of bottles of beer that equal a 1-ounce shot of liquor.

Results

The ordinal logit analyses indicated potential linear relationships for ten measures, with an additional six measures showing marginal trends. Surprisingly, none of the consumption or alcohol involvement measures, or criminal history measures for crimes other than DWI showed significant relationships with number of DWI offenses. However, as the number of DWI offenses increased, the age, number of traffic violations, number of crashes, and likelihood of

refusing the breath test increased, and the number of locations visited on the night of the arrest decreased (all $p < .05$). Additionally, as the number of offenses increased: the likelihood increased that the individual had a family member that was arrested for a DWI; scores on the action subscale for the stages of change measure increased; attitudes about changing behavior because of a DWI became more positive; scores on the internal locus of control subscale decreased; and knowledge concerning the equivalence of beer to liquor decreased (all $p < .05$). Finally, marginal relationships ($p \leq .10$) suggested that as the number of DWI offenses increased, the individual was more likely to: be a male; score lower on the interpersonal sensitivity subscale of the SCL-90; score higher on the paranoid ideation subscale of the SCL-90; believe they could drink more in a 4-5 hour period and still drive; get involved in risky behaviors; and have used more drugs.

If the relationships are linear in nature, we would expect that many of these same characteristics would distinguish between first and second offenders, and second and multiple offenders. A multinomial regression was performed using the same measures as were used in the ordinal logit analysis (see Table 1). The analysis identified seven measures that significantly ($p < .05$) discriminated between the first and second offenders, and six measures that showed marginal trends ($p \leq .10$). Of the significant differences, five of the seven variables were related to driving or drinking and driving behaviors and perceptions. Compared to the first offenders, second offenders showed more positive attitudes concerning the seriousness of a DWI, expressed more emotions regarding driving inhibitions, reported more crashes, drank at fewer locations, and indicated being able to drive safely after more drinks than the first offenders. The second offenders tended to take more health risks and scored lower on the powerful others scale of locus of control. The marginal findings complement these results by showing more breath test refusals, more drinks to reach legal intoxication, more drug use, more drinking with strangers, and higher sensation seeking among the second offenders. However, the second offenders scored higher on the maintenance scale of the stages of change, suggesting that more second offenders than first offenders have been in treatment.

The multinomial contrast between the second offenders and multiple (three or more) offenders identified nine significant ($p < .05$) and seven marginal ($p \leq .10$) differences. Second offenders tended to be younger than multiple offenders. Differences based on measures of driving and drinking and driving-related behaviors and perceptions were commonly found to be significant, similar to the findings for the first versus second offender analysis. In contrast to multiple offenders, second offenders scored higher on the driving inhibition scale, but were less likely to refuse a breath test, had fewer crashes and violations, and less likely to have a family member with a DWI. Rounding out the significant findings, the second offenders scored higher on social desirability, were more anxious, and scored lower on the action scale of the stages of change than the multiple offenders.

The marginal findings for the second versus multiple offender comparison showed substantial personality differences. The second offenders scored higher than the multiple offenders on sensation seeking and internal locus of control. However, the multiple offenders scored higher on paranoid ideation and external locus of control (e.g., chance, powerful others) than the second offenders. The second offenders were more likely to be married and less able to correctly estimate the beer to liquor equivalency.

Table 1: Significant and Marginal Effects from Multinomial Regression

Multinomial regression — Number of obs = 643; Wald chi2(108) = 251.45; Prob > chi2 = 0.0000; Log likelihood = -472.26217; Pseudo R2 = 0.3118

Offender Status	Relative Risk Ratio	Robust Std. Err.	z	P>|z|	[90% Conf.	Interval]
Second Vs. First						
Dwi att	.887712	.0501711	-2.107	0.035	.8089072	.9741933
sss tot	.961288	.0234510	-1.618	0.106	.9234779	1.000646
powerful	1.056879	.0178645	3.273	0.001	1.027900	1.086676
drivinhb	.748305	.0835256	-2.598	0.009	.6227919	.8991130
hlth risk	.685487	.0882542	-2.933	0.003	.5546624	.8471679
refusal	.585146	.1711101	-1.833	0.067	.3617193	.9465788
tot crash	.776668	.0730326	-2.688	0.007	.6653690	.9065840
safe drnks	.925309	.0291326	-2.466	0.014	.8786095	.9744899
dwi drnks	1.666412	.5055214	1.683	0.092	1.011760	2.744652
drugs ever	.920495	.0432080	-1.765	0.078	.8520984	.9943813
mainten	.966547	.0172449	-1.907	0.057	.9385935	.9953322
strangers	.479566	.1832720	-1.923	0.054	.2557708	.8991797
# loc	.388409	.1476850	3.085	0.002	1.165553	1.653876
Second Vs. Multiple						
Age	1.077921	.0190768	4.240	0.000	1.046995	1.109761
Nev mar	1.956921	.7450301	1.763	0.078	1.046186	3.660477
Soc des	.772099	.0963293	-2.073	0.038	0.628853	0.947977
SSS	.956031	.0250258	-1.718	0.086	0.915740	0.998094
par ideat	1.104464	.0666709	1.646	0.100	1.000068	1.219756
anxiety	.884174	.0492847	-2.208	0.027	0.806713	0.969073
internal	.958133	.0237848	-1.723	0.085	0.919798	0.998065
powerful	1.032177	.0192277	1.700	0.089	1.001030	1.064293
chance	1.033644	.0198750	1.721	0.085	1.001465	1.066858
driv inhb	.768882	.0951237	-2.124	0.034	0.627311	0.942404
refusal	2.573490	.7620443	3.192	0.001	1.581225	4.188429
traf viol	1.045239	.0142811	3.238	0.001	1.022011	1.068995
tot crash	1.118789	.0627578	2.001	0.045	1.020181	1.226929
fam hx dwi	2.034483	.5908004	2.446	0.014	1.261860	3.280174
beer/liq	.566319	.1885217	-1.708	0.088	0.327538	0.979177
action	1.035050	.0159278	2.239	0.025	1.009180	1.061583

Discussion

The results from the ordinal logit analysis would suggest that there are some characteristics that are linearly related to the number of DWI offenses. A surprising result is the lack of significant effects for alcohol consumption, alcohol involvement, and criminal history for crimes other than DWI. Instead, a number of personality and personal characteristics appeared to be more critical in distinguishing between offender groups. The multinomial regression results suggest that while some relationships are in fact linear (refusal, crashes), others are quadratic in nature (driving

inhibition, sensation seeking, powerful others), while some appear to have a threshold level. This suggests that using a strictly linear approach may miss measures that could potentially be of use in identifying persistent drinking drivers. It is also encouraging to note that there were a number of indicators that discriminated between the second and multiple offenders, suggesting that these two groups are distinct. This finding also suggests that it may be possible to intervene before a second offender becomes a multiple offender. As an initial step, we have identified some markers that could be used in an index fashion to identify the persistent drinking driver. These need to be further validated for use in a screening or assessment context.

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