

# An Empirical Typology of Persistent Drinking Drivers

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## Abstract

Information on the characteristics of persistent drinking drivers is essential to facilitate efforts to reduce alcohol-related crashes. This study utilized cluster analysis of the Alcohol Use Inventory (AUI) to identify subgroups of persistent drinking drivers ( $n=363$ ). Persistent drinking drivers were defined as individuals with at least two drinking and driving convictions. Clusters were identified by a non-hierarchical technique using the second-level factors of the AUI. Indices suggested the presence of typologies consisting of two and three clusters. For the two cluster solution, the first cluster had scores below the mean and the second cluster scores above the mean on the derivation variables. The three cluster model had a low scoring cluster and high scoring cluster that were more extreme than their counterparts in the two cluster model, with an additional intermediate cluster that had mildly positive scores on all of the derivation variables, except a slightly negative score on obsessed drinking. Differences between the empirical groups were also reflected in statistical differences on relevant measures external to the cluster derivation. These results indicate that persistent drinking drivers are not a homogeneous group, and may be characterized by levels of problem severity.

## Introduction

Although substantial gains have been made in reducing drinking and driving, and associated problems such as crashes and fatalities, the potential for additional progress is much less certain. This situation exists because (1) many of the most potent interventions and policies, such as a mandatory drinking age of 21 in the U.S., have already been implemented, and (2) certain groups of drinking drivers are highly resistant to change (Simpson, Mayhew, and Bierness, 1996). Those drinking drivers who are highly resistant to change are known as hard core, or persistent drinking drivers, terms that may be used interchangeably for most purposes.

Simpson and colleagues (1991, 1996) are the trailblazers in research on hard core drinking drivers. They have developed a working definition of these drivers as "individuals who repeatedly drive after drinking, especially with high BACs (.15 or greater) and who seem relatively resistant to changing this behavior" (Simpson et al., 1996, p.9). One method of operationalizing this definition is to consider repeat DWI (drinking and driving) offenders as persistent drinking drivers. The magnitude of the problem is shown by the substantial proportion of DWI offenders who recidivate, which increases from about one-quarter to over one-third of DWI offenders as the time period for the analysis gets longer (Hedlund, 1995).

Even more disturbing from a public health viewpoint is the involvement of persistent drinking drivers in fatal crashes. Based on an analysis of crash, fatality, and other records,

Simpson and Mayhew (1991) showed that the majority of fatally injured drivers were hard core drinking drivers. In addition, Simpson et al. (1996) estimate that as many as one-third of

fatally injured drivers have a prior DWI conviction, supported by the findings of Bailey (1993) and Simon (1992).

Despite the massive over-representation in fatalities and crashes, there is a dearth of research based on information obtained directly from persistent drinking drivers. Major studies of the drinking, driving, personality, alcohol diagnosis, and other problem behaviors of persistent drinking drivers are needed to better inform prevention and treatment interventions for these persons. Almost nothing is known about possible subgroups of persistent drinking drivers, or the range of alcohol and other problems that characterize this population. This study uses a sample of persistent drinking drivers, as defined by at least two DWI convictions, to develop an empirical typology. The typology is derived by cluster analysis of second-level factors of the Alcohol Use Inventory, a widely used, detailed assessment of alcohol use and related problems. The analysis is one of the first to examine persistent drinking driver characteristics based on detailed interview data with a moderately large sample (n=363).

## **Methods**

**Sample and Measures:** The sample for this study was 363 persons with at least two DWI (any drinking and driving) convictions. The sample was recruited from three sources in Erie County, New York: Erie County Probation Department, Buffalo City Court records, and the Drinking Driver Program. After receiving written informed consent, individual, face-to-face interviews were conducted by trained interviewers in a research setting with private rooms to ensure the confidentiality of the participants. The approximately 2-hour interview assessed a broad array of demographic, alcohol, drug, driving, personality, psychiatric, and treatment items. Broadly implemented and widely accepted techniques were used to assess variables such as the quantity-frequency of alcohol consumption, DSM-III-R alcohol dependence, and psychiatric symptoms. Abbreviations are used to denote measures during the month prior to the last DWI arrest (MPA), the last DWI arrest (PA), and the actual month prior to the interview (LM).

**Analytic Procedures:** Empirical typologies were derived from the second-level scales of the Alcohol Use Inventory (AUI) (Horn, Wanberg, and Foster, 1990). The six second-level AUI scales are combined scores of items with unifactorial loadings as derived by factor analysis of the primary AUI scales. The six scales are enhanced drinking (perceived enhanced functioning), obsessed drinking (style of compulsive drinking), direct disruption (direct dire consequences, e.g., job loss), indirect disruption, anxious concern, and receptive awareness of alcohol problems. The clusters were derived using a non-hierarchical k-means technique (FASTCLUS, SAS, 1985). Derivation variables were transformed to z-scores for the cluster analysis. The number of clusters was determined based on the cubic clustering criterion and the pseudo F indices. Variables external to the cluster derivation procedure were examined for differences between groups to ensure that the groups were not purely artifacts of the cluster technique or derivation variables. Chi-squared was used to examine statistical differences between the clusters for categorical variables, whereas analysis of variance was used for continuous measures.

## **Results**

The results of the cluster analyses are shown in Table 1. The indices for the number of clusters present in the data suggested that interpretation of cluster typologies with two and three groups were appropriate. The two cluster model indicated one cluster with values (based on z-scores) below the mean for the derivation variables and a second cluster characterized by derivation variables above the mean. The three cluster model has a low

scoring cluster and a high scoring cluster that are more extreme than their counterparts in the two cluster model, with an additional intermediate cluster that had mildly positive scores on all of the derivation variables except a slightly negative score on obsessed drinking. These results indicate that substantial variation exists among persistent drinking drivers, and that cluster analysis divides the offenders into groups based on overall alcohol problem severity.

Table 1. Cluster Means for AUI Derivation Variables

Variable	Two Cluster Model <sup>1</sup>		Three Cluster Model <sup>2</sup>		
	Cluster 1 (n=209)	Cluster 2 (n=154)	Cluster 1 (n=140)	Cluster 2 (n=138)	Cluster 3 (n=85)
Enhanced Drk	-.47 (.81)	.64 (.86)	-.74 (.70)	.27 (.80)	.78 (.90)
Obsessed Drk	-.43 (.64)	.59 (1.0)	-.53 (.59)	-.17 (.73)	1.15 (1.0)
Dir. Disrupt.	-.63 (.57)	.85 (.82)	-.82 (.52)	.04 (.55)	1.29 (.74)
I.D. Disrupt.	-.64 (.62)	.86 (.74)	-.86 (.54)	.11 (.60)	1.22 (.70)
Anx. Concern	-.64 (.68)	.88 (.62)	-.95 (.52)	.28 (.65)	1.10 (.55)
Rec. Aware	-.55 (.82)	.75 (.70)	-.83 (.75)	.26 (.70)	.95 (.64)

(SD)=Std. Dev. <sup>1</sup>CCC = 67.02 Pseudo F = 279.01 <sup>2</sup>CCC = 58.14 Pseudo F = 215.93

The demographics of the cluster models are examined in Table 2. The results indicate few differences in demographic factors for the the cluster models. The persistent offenders tend to be white, male, unmarried, and high-school graduates. The only significant difference between the groups is employment status, with full time employment much less common among the more severe clusters. Fewer than 30% of those offenders were employed full time.

Table 2. Demographics by Cluster Models

Variable	Two Cluster Model		Three Cluster Model		
	Cluster 1 (n=209)	Cluster 2 (n=154)	Cluster 1 (n=140)	Cluster 2 (n=138)	Cluster 3 (n=85)
Age	36.6 (9.4)	36.0 (8.6)	36.7 (9.7)	35.9 (8.8)	36.3 (8.3)
Income (\$K)	16.8 (11.7)	14.4 (11.9)	16.9 (11.3)	16.1 (12.8)	13.6 (10.9)
Married (%)	23.9	23.4	20.7	25.4	25.9
Males (%)	88.0	93.4	87.1	89.8	96.4
Race (% white)	84.7	85.1	85.0	85.5	83.5
Educ. (% HS)	79.0	81.8	79.3	80.4	81.1
F.T. Emp. (%)	44.5	28.3 ***	42.8	40.1	25.0 ***

(SD) = Std. Dev. \*\* p ≤ .01

Table 3. Driving and Drinking – Driving by Cluster Models

Variable	Two Cluster Model		Three Cluster Model		
	Cluster 1 (n=209)	Cluster 2 (n=154)	Cluster 1 (n=140)	Cluster 2 (n=138)	Cluster 3 (n=85)
Traf. Viol. (life)	6.6 (8.5)	10.7 (14.3)***	5.9 (7.4)	8.8 (10.7)	11.6 (16.5)***
Total Crashes	1.3 (2.3)	1.8 (3.3)	1.2 (2.4)	1.4 (2.3)	2.2 (3.7)*
Alc. Crashes	.6 (1.1)	1.3 (2.5)***	.5 (.9)	.8 (1.5)	1.7 (2.9)***
Total DWIs (life)	2.9 (1.2)	3.3 (1.6)**	2.8 (1.2)	3.3 (1.5)	3.2 (1.5)**
Drv. Aggress.	3.4 (2.6)	5.4 (3.2)***	3.1 (2.6)	4.6 (3.1)	5.6 (3.1)***

Comp. Speed Drv.	1.4 (1.8)	2.3 (2.3)***	1.3 (1.8)	2.0 (2.1)	2.4 (2.3)***
Tens. Red. Drv.	2.8 (1.7)	3.8 (1.8)***	2.7 (1.7)	3.5 (1.8)	3.9 (1.7)***
Drv. Inhibit.	1.3 (1.2)	1.0 (1.1)**	1.4 (1.2)	1.2 (1.2)	1.0 (1.0)*
Drink-Drive (LM)	1.0 (3.8)	.6 (2.4)	1.0 (3.7)	.8 (3.4)	.7 (2.3)
Drink-Drive (MPA)	7.9 (8.7)	13.3 (10.7)***	7.0 (8.3)	10.0 (9.3)	15.6 (11.2)***
(SD) = Std. Dev.	* = $p \leq .05$	** = $p \leq .01$	*** = $p \leq .001$		

The cluster groups for both models differ significantly on almost every driving or drinking-driving measure (see Table 3). The high severity groups (cluster 2 in the first model and cluster 3 of the three cluster model) are clearly indicated as such by these driving measures. Traffic violations, alcohol-related crashes, and total DWIs are greater among these groups. Compared to the other clusters, the higher severity groups tend to score highly on driving aggression, competitive speed, and tension reduction driving, and lower on the driving inhibition. Drinking and driving in the month prior to the interview did not differ; however, drinking and driving in the month prior to the last arrest was extremely frequent--over thirteen times in a month--for the higher severity groups.

Table 4. Drinking-Related Measures by Cluster Models

Variable	Two Cluster Model		Three Cluster Model		
	Cluster 1 (n=209)	Cluster 2 (n=154)	Cluster 1 (n=140)	Cluster 2 (n=138)	Cluster 3 (n=85)
Drinking PA	6.8 (4.5)	10.6 (7.1)***	6.8 (4.9)	8.2 (4.7)	11.4 (8.3)***
Drinking MPA	2.5 (3.2)	4.8 (3.2)***	2.2 (1.9)	3.2 (2.6)	5.8 (3.2)***
Drinking LM	1.1 (1.8)	.9 (1.9)	1.1 (1.9)	.9 (1.7)	.9 (2.0)
Alc. Dep. Crit.	4.6 (2.1)	7.9 (1.4)***	3.8 (1.9)	6.7 (1.6)	8.4 (1.1)***
Tx. Times	1.4 (1.7)	4.3 (4.2)***	1.2 (1.3)	2.5 (2.8)	5.1 (4.7)***
(SD) = Std. Dev.	* = $p \leq .05$	** = $p \leq .01$	*** = $p \leq .001$		

The higher severity groups reported significantly more alcohol consumption (in ounces of ethanol), immediately prior to the DWI arrest (PA) and in the month leading up to the arrest (MPA) (see Table 4). Note that the levels of consumption reported are prodigious—over 20 drinks were consumed before the arrest by the more severe groups. Corresponding to this high level of consumption is severe DSM-III-R alcohol dependence as shown by the mean number of criteria met. A history of multiple treatment experiences is the norm for the higher severity clusters.

Mean scale scores for psychiatric symptoms are shown for the cluster models in Table 5. Again, the higher severity groups show significantly more psychiatric pathology for all of the scales shown, and for an additional four scales not shown. This indicates that no single dimension of psychiatric problems is responsible for the differences between groups. The level of psychiatric distress reaches clinical significance for the higher severity groups. A score of 1.0 on the Global Severity scale, for example, indicates that the person is either experiencing every symptom assessed at least a little, or that some of the symptoms are found at extremely distressing levels.

Table 5. Psychiatric Symptoms by Cluster Models

Variable	Two Cluster Model		Three Cluster Model		
	Cluster 1	Cluster 2	Cluster 1	Cluster 2	Cluster 3

	(n=209)	(n=154)	(n=140)	(n=138)	(n=85)
Obsess-Comp.	.5 (.5)	1.2 (.7)***	.4 (.5)	.8 (.6)	1.3 (.8)***
Depression	.6 (.5)	1.1 (.8)***	.4 (.4)	.9 (.7)	1.2 (.8)***
Hostility	.3 (.5)	.9 (.8)***	.3 (.4)	.7 (.7)	.9 (.9)***
Paranoid Ideation	.5 (.6)	1.1 (.8)***	.5 (.5)	.9 (.8)	1.1 (.8)***
Psychoticism	.3 (.4)	.8 (.7)***	.3 (.3)	.6 (.6)	.9 (.8)***
Global Severity	.4 (.4)	1.0 (.6)***	.3 (.3)	.7 (.6)	1.0 (.7)***

(SD) = Std. Dev. \*\*\* =  $p \leq .001$

Table 6. Drug Use by Cluster Models

Variable	Two Cluster Model		Three Cluster Model		
	Cluster 1 (n=209)	Cluster 2 (n=154)	Cluster 1 (n=140)	Cluster 2 (n=138)	Cluster 3 (n=85)
MJ (% ever)	87.0	92.9	85.0	92.7	91.8
Cocaine (% ever)	57.2	77.9***	50.7	73.7	78.8***
Heroin (% ever)	18.7	31.2**	19.3	21.7	35.3*
Tot. Drugs (ever)	7.1 (3.1)	8.9 (3.2)***	6.8 (3.0)	8.1 (3.1)	9.2 (3.1)***
Tot. Drugs (last yr)	3.9 (1.6)	4.8 (2.3)***	3.8 (1.6)	4.4 (1.9)	4.8 (2.5)***

(SD) = Std. Dev. \* =  $p \leq .05$  \*\* =  $p \leq .01$  \*\*\* =  $p \leq .001$

Table 6 shows that drug use is quite common among persistent drinking drivers. There were no differences between groups in lifetime marijuana use. However, significantly more offenders in the higher severity groups reported ever using harder drugs such as cocaine and narcotics such as heroin. In addition, the higher severity groups reported more different types of drug use than the other clusters, both ever in their lifetime and in the year before the interview.

## Discussion

The empirical typologies of persistent drinking drivers presented in this paper should be considered a preliminary examination of the possible subtypes of these DWI offenders. Future research on this topic can use these findings as a guide to the substantial differences that exist among persistent drinking drivers. The typologies were derived from variables that measure primarily alcohol use and associated problems. Nonetheless, substantial differences between subgroups were found, although future research may endeavor to utilize a broader array of variables and measurement domains.

Although these typologies are based primarily on the severity of alcohol-related problems, even the less severe groups of persistent drinking drivers are characterized by a rather substantial level of problems in areas such as alcohol dependence, driving records, drug use, and unemployment. The higher severity groups, however, have extreme levels of problem behaviors and pathologies. Their problems are found in an almost unlimited number of domains. Moreover, the proportion of extremely severe cases among the persistent drinking driving population may be quite substantial. In this sample of persistent drinking drivers, the higher severity groups comprised 42% (cluster 2 of the two cluster model) and 23% (cluster 3 of the three cluster model) of the total.

Intensive interventions in multiple areas combined with sanctions to ensure long-term compliance are likely to be necessary to impact persistent drinking drivers, especially the higher severity groups. Given the treatment histories of these offenders, it may be unrealistic

to expect any single intervention to be successful. Multiple interventions with incremental effects implemented over a sustained period of time may have the best chance of altering the highly ingrained lifestyle of the persistent drinking driver. The challenge is daunting for future research to improve our understanding of persistent drinking drivers and to identify and develop modes for successful interventions, including prevention.

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