Cognitive and Behavioral Preoccupation With Alcohol in Recidivist DUI Offenders

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ABSTRACT. Objective: A high proportion of individuals convicted of driving under the influence (DUI) are repeat offenders. Efforts have sought to identify specific factors underlying DUI recidivism. Of particular interest is the role that alcohol-related cognitions might play in the development and escalation of alcohol use. The present study investigated the degree to which preoccupation with, and attentional bias to, alcohol are heightened among repeat DUI offenders. **Method:** Three groups of participants (recidivist DUI offenders, first-time offenders, and controls; $n = 20$ per group) performed a visual probe task to measure attentional bias and completed questionnaires regarding their cognitive and emotional preoccupation with alcohol and drinking habits. **Results:**

Recidivist offenders displayed a significantly heightened alcohol attentional bias and reported greater preoccupation with alcohol compared with both first-time offenders and controls. By contrast, none of the groups differed with regard to the self-reported quantity and frequency of their consumption. **Conclusions:** Factors reflecting preoccupation with alcohol have utility for differentiating recidivist offenders from both first-time offenders and nonoffenders. These findings highlight the value of moving beyond self-reported assessments of drinking patterns toward assessing specific cognitive and behavioral characteristics that can improve our understanding, assessment, and treatment of the problem of DUI recidivism. (*J. Stud. Alcohol Drugs*, 75, 1018–1022, 2014)

ALCOHOL-RELATED TRAFFIC FATALITY and injury are major public health problems. More than one third of individuals who are convicted of driving under the influence (DUI) are repeat offenders (Fell, 1995; Nochajski and Stasiewicz, 2006). Thus, efforts have been made to identify reliable, predictive characteristics of drivers likely to reoffend in order to develop intervention programs that will decrease such high recidivism rates. To date, theories concerning causes of DUI recidivism have focused on drinking habits and drinking-related problems of repeat offenders. Indeed, recidivist offenders have been characterized by patterns of heavy, frequent alcohol consumption (Brinkmann et al., 2002; Lapham et al., 1997; Nochajski et al., 1994). As such, intervention efforts have been developed with a primary focus on reducing alcohol consumption.

Although heavy episodic drinking is common among recidivist offenders, there are limitations to relying solely on self-reported drinking patterns as a predictor of DUI recidivism. Several studies have failed to identify alcohol dependence, blood alcohol concentration (BAC) at the time of arrest, or other biomarkers of excessive alcohol use as reliable predictors of DUI recidivism (e.g., C'de Baca et al., 2001; Cavaola et al., 2007; Couture et al., 2010; Portman et al., 2010). Moreover, self-report data garnered from DUI offenders are widely recognized as being problematic, as many offenders are unwilling to accurately report their drinking

because of fears that it will lead to court-mandated treatment (Lapham et al., 2002, 2004; Vingilis, 1983). Thus, although it is likely that drinking habits contribute in some degree to DUI and its recidivism, they may be insufficient indicators of who will reoffend.

Recent efforts have sought to identify specific factors underlying the propensity to continue drinking and driving despite negative consequences in some individuals. Of particular interest might be the role of implicit alcohol-related cognitions on the development and escalation of alcohol use. Alcohol-related cognitions are considered a contributing factor to the initiation and escalation of drinking (Tiffany, 1990). The Cognitive and Emotional Preoccupation scale (CEP) from the Temptation and Restraint Inventory (TRI; Collins and Lapp, 1992) reflects thoughts about the temptation to drink (e.g., "At times do you find yourself unable to stop thinking about drinking?"). Studies have shown that drinkers with higher CEP scores report greater weekly consumption and drinking-related problems compared with those with lower scores (Collins et al., 2000). Moreover, individuals with higher CEP scores consume more alcohol when given ad lib access (Collins et al., 1996; Marcinski et al., 2005) and report a greater craving for alcohol after consuming an initial "priming" dose (Fillmore, 2001).

In addition to self-report inventories, there are also behavioral indices of drinkers' preoccupation with alcohol. Studies of attentional bias examine the degree to which alcohol-related images become the focus of drinkers' attention to the exclusion of non-alcohol-related images (see Field and Cox, 2008, for a review). In the context of alcohol research, attentional bias is manifested as greater time spent attending to alcohol images than neutral images, and studies have reliably shown heightened bias in heavier drinkers compared with

Received: May 28, 2014. Revision: July 2, 2014.

This research was supported by National Institute on Alcohol Abuse and Alcoholism Grants R01 AA021722 and F31 AA021028.

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lighter drinkers (e.g., Field et al., 2007; Miller and Fillmore, 2010; Sharma et al., 2001).

Evidence that recidivist DUI offenders display cognitive and behavioral biases toward alcohol could help explain why they find it difficult to refrain from drinking before driving despite a history of negative consequences (i.e., punishment for a previous DUI offense). The present study aimed to determine whether cognitive preoccupation and attentional bias to alcohol are heightened among repeat DUI offenders. The study examined first-time and repeat DUI offenders, along with a group of control drivers with no history of DUI. A single DUI offense may be a result of "bad luck" or represent a one-time scenario, whereas committing multiple DUIs likely reflects a lack of control over drinking. Thus, it was important to include groups of first-time and recidivist offenders. Compared with controls and first-time offenders, it was hypothesized that recidivist offenders would be characterized by greater preoccupation with alcohol and attentional bias to alcohol cues.

Method

Participants

Sixty adults between ages 21 and 45 years ($M_{\text{age}} = 29.9$, $SD = 6.4$) participated in the study. Equal numbers of participants ($n = 20$) were recruited according to their DUI history as follows: (a) controls with no history of DUI offense, (b) first-time offenders with a single DUI offense, and (c) repeat offenders with two or more DUI offenses. We expected more men in the recidivist group, as data estimate the ratio of male to female offenders as 4:1 (National Highway Traffic Safety Administration, 2010). Thus, the recidivist DUI group was recruited first, and indeed, comprised four times as many males as females (16:4). Therefore, we oversampled for males in the control and first-time DUI groups so that all groups comprised 16 men and 4 women.

Volunteers were recruited by flyers, posters, and newspaper/online advertisements seeking adults for studies of drinking habits and cognitive functions. Inclusion criteria required that volunteers reported some alcohol consumption over the past 3 months (i.e., no abstinence), and they had to have a history of holding a valid driver's license. Volunteers were asked about past-month drug use. Two controls reported regularly smoking cigarettes in the past month compared with 11 first-time offenders and 12 recidivists. Seven controls, seven first-time offenders, and nine recidivists reported past-month marijuana use. Last, one recidivist offender reported using a sedative in the past month.

DUI criteria

First-time DUI offenders had to receive a single DUI conviction in the past 5 years, and recidivist DUI offenders had

to receive two or more convictions within a 5-year period, with the most recent conviction occurring within the past 5 years. The mean number of DUI convictions in this group was 2.8 ($SD = 1.4$), with a range of 2 to 7 convictions. Last, control subjects must have had no history of any arrests/convictions for DUI. All DUI convictions were verified by state district court records.

Materials and measures

Temptation and Restraint Inventory (Collins and Lapp, 1992). The scale of interest in this study is the nine-item CEP scale, which assesses the frequency of preoccupation with daily temptations to drink. Higher scores indicate greater cognitive and emotional preoccupation with alcohol.

Visual probe task. Attentional bias to alcohol-related cues was measured by a visual probe task used in previous research (Miller and Fillmore, 2011). The task was operated using E-Prime experiment generation software (Psychology Software Tools, Pittsburgh, PA) and was performed on a Tobii T120 eye tracker (Tobii Technology, Sweden). A trial consisted of the presentation of two pictures (alcohol and neutral, non-alcohol-related images) for 1000 ms. Upon offset of the picture pair, a target probe (X) appeared on either the left or right side of the screen in the same location as one of the previously presented images. Participants looked at the pictures while they were on the screen and responded as soon as the probe was presented by pressing one of two response keys on the keyboard indicating on which side the probe appeared. Task stimuli consisted of 10 pairs of matched alcohol-related and neutral images. Alcohol-related images depicted a solitary image of an alcohol beverage, and neutral images consisted of a nonalcoholic drink (e.g., a can of beer matched with a can of soda). The 10 image pairs were presented four times each. The amount of time (ms) fixating on the alcohol-related and neutral image in each trial was assessed, with greater fixation time on alcohol images indicating attentional bias to alcohol.

Alcohol use. Participants completed the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 1989) and provided self-reports of their typical weekly frequency of drinking and number of drinks consumed per occasion.

Driving characteristics. Subjects reported their typical driving habits: the number of months they have held a driver's license, the frequency of traffic violations, and number of DUI offenses.

Testing procedure. Individuals who responded to advertisements participated in a telephone screening interview to provide information about their DUI history, drinking and other drug use, and general health status. Volunteers who met the criteria were invited to participate in a single laboratory session conducted in the Human Behavioral Pharmacology Laboratory of the Department of Psychology. On arrival, they provided informed consent and supplied urine

TABLE 1. Background characteristics for controls, first-time offenders, and recidivist offenders

Measure	Control (a) <i>M (SD)</i>	First-time (b) <i>M (SD)</i>	Recidivist (c) <i>M (SD)</i>	Group comparisons		
				a vs. b	a vs. c	b vs. c
Age, in years	31.4 (6.3)	27.3 (5.0)	31.1 (7.2)			
PDHQ frequency	2.2 (0.4)	2.3 (0.3)	2.3 (0.4)			
PDHQ drinks	3.2 (1.9)	4.8 (2.0)	4.6 (3.0)			
AUDIT	6.3 (0.8)	11.8 (1.3)	15.4 (1.9)	*	*	
Years licensed	15.8 (7.3)	9.5 (4.9)	9.7 (6.1)	*	*	
Driving frequency	5.9 (1.8)	5.7 (1.8)	4.2 (3.0)		*	
Driving distance	16.4 (13.8)	29.6 (64.4)	28.3 (31.6)			
Tickets	2.2 (1.6)	1.2 (1.1)	3.8 (3.3)	*	*	
Crashes	1.1 (1.1)	1.6 (1.5)	2.2 (2.6)			
Last DUI	—	16.6 (15.9)	17.3 (12.4)			
CEP	21.6 (12.0)	27.8 (16.1)	39.9 (19.1)		*	*
Attentional bias						
Fixation neutral	352.8 (75.9)	339.3 (88.0)	284.1** (84.4)			
Fixation alcohol	359.3 (78.0)	324.0 (83.8)	338.3** (85.4)			

Notes: PDHQ frequency = number of drinking occasions per week; PDHQ drinks = typical number of drinks consumed per drinking occasion; AUDIT = total Alcohol Use Disorders Identification Test score; driving frequency = number of driving days per week; driving distance = typical number of miles driven each day; tickets = total number of tickets for traffic violations, not including driving under the influence (DUI) offenses; crashes = total number of crashes in which the subject was the driver; last DUI = time in months since most recent DUI; CEP = total score on the Cognitive and Emotional Preoccupation scale from the Temptation and Restraint Inventory. Asterisks (*) indicate a significant difference between the two groups ($p < .05$). Attentional bias = Mean fixation times to neutral and alcohol-related images in ms. Single asterisks (*) indicate a significant difference in fixation time between neutral and alcohol-related images within each group ($p < .05$). Double asterisks (**) indicate a significant difference between fixation times to neutral versus alcohol-related images within each group ($p < .01$).

samples, which were tested for a range of drug metabolites (On Trak Teststiks, Roche Diagnostics Corporation, Indianapolis, IN). Breath samples (Intoxilyzer, Model 400; CMI, Inc., Owensboro, KY) were also provided to verify a zero BAC. Those who tested positive for recent drug use or who had a BAC above zero were excluded from participating. Participants performed a shortened practice version of the visual probe task and completed questionnaires concerning drinking habits and driving history. Last, they performed the full-length visual probe task, were paid, and were debriefed. All analyses were performed using Systat (Version 13) statistical software package for Windows (Systat Software, Inc., San Jose, CA).

Results

Background characteristics

Forty-seven participants identified themselves as White, 10 identified as African American, 1 as American Indian, and 2 participants reported "other." Table 1 presents mean ages, drinking habits, and driving history for the three groups. One-way analyses of variance (ANOVAs) revealed no significant group differences in age, typical quantity (drinks), and frequency of drinking, $ps > .08$. A one-way ANOVA of AUDIT scores revealed significant group differences, with both of the DUI groups scoring higher than controls. With regard to driving history, the table shows group differences in the number of years licensed, with controls holding a

license longer than both first-time and recidivist offenders because of the periods of time in which the two DUI groups had their licenses revoked. There was also a significant group difference in weekly driving frequency and in the number of traffic tickets participants received (Table 1).

Table 1 also shows the time since last DUI offense in months for the first-time and recidivist groups. Both groups received their most recent DUI (or only DUI in the first-time offending group) less than 2 years ago, and there was no difference in the time since DUI between the groups.

Cognitive and Emotional Preoccupation

The table also lists the groups' CEP scores. A one-way ANOVA confirmed a significant group difference in scores, $F(2, 57) = 6.8, p < .01, \eta^2_p = .19$. Recidivist offenders had significantly higher CEP scores compared with both controls and first-time offenders.

Attentional bias

Last, Table 1 displays the mean fixation times to neutral and alcohol-related images in each of the groups. A 3 (group) $\times$ 2 (image) ANOVA revealed no main effects of group or image on fixation times, $ps > .08$. There was a significant Group $\times$ Image interaction, $F(2, 57) = 6.0, p < .01, \eta^2_p = .17$, with longer fixation times to alcohol-related images compared with neutral images in the recidivist DUI group. Individual paired t tests compared fixation times to

neutral versus alcohol-related images for each group. For recidivist offenders, fixations were significantly longer toward alcohol-related images versus neutral images, $t(19) = 3.4$, $p < .01$. By contrast, there were no differences in fixation times toward alcohol versus neutral images for either first-time offenders or controls, $ps > .3$.

Discussion

This study assessed underlying characteristics that may serve as antecedents of drinking in recidivist DUI offenders. The study showed that the recidivist DUI group self-reported a greater cognitive preoccupation with alcohol and displayed a heightened level of attentional bias toward alcohol-related cues compared with first-time offenders and controls. Importantly, first-time offenders and controls did not differ from each other on either of these two measures. In addition, there were no differences among the three groups in the quantity and frequency of drinking. Taken together, the current findings suggest that factors reflecting preoccupation with alcohol have specific utility in differentiating recidivist offenders from both first-time offenders and nonoffenders.

The finding that recidivist offenders did not report heavier, more frequent drinking compared with nonoffenders and those with a single DUI is consistent with some previous reports that have failed to identify a reliable relationship between drinking patterns and DUI offenses (e.g., C'de Baca et al., 2001; Cavaola et al., 2007; Couture et al., 2010; Portman et al., 2010). Both DUI groups did score higher on the AUDIT compared with nonoffenders. However, the AUDIT was unable to differentiate between first-time and repeat offenders in this sample. In contrast to the drinking habits measures, levels of cognitive and emotional preoccupation as well as attentional bias to alcohol were successful in distinguishing recidivists from first-time offenders. These measures are thought to reflect an increase in the incentive salience of alcohol-related cues, and several theoretical models suggest that such an increase in the salience elicited by drug-related cues has an important, causal role in drug-seeking behavior (Goldstein and Volkow, 2002; Jentsch and Taylor, 1999; Wiers et al., 2007). Thus, the problem of recidivism might not be an issue of the amount or frequency of consumption, but rather the stimulus control that alcohol/alcohol-related cues have over repeat offenders, resulting in a compulsion to drink in unfavorable contexts, such as when the drinker had not intended to drink or had planned to drive. As such, these characteristics might explain why this group continues to drink and drive in spite of previous serious, personal costs.

There are some limitations of this study to consider. First, it is recognized that a number of the first-time offenders will go on to become repeat offenders, and as such, they are not an entirely orthogonal group. However, we took care to assess DUI histories over the same time span in subjects

with comparable driving experiences so that all groups had comparable opportunities to offend or re-offend. To this end, we also ensured that the amount of time since the most recent DUI did not differ between the first-time and recidivist groups, increasing the likelihood that the differences observed among the groups reflect underlying and enduring behavioral or cognitive dysfunction related to DUI, as opposed to circumstantial factors. Another limitation concerns the modest sample size of the groups. Although the sample size is small compared with those in other studies of DUI offenders, the group differences we observed on measures of alcohol-related cognitions were marked, indicating that there is much to be learned from expanding the cognitive and neuropsychological assessment of DUI offenders in larger-scale studies. Last, traditional assessments of attentional bias (such as that used in this study) can only be performed in a laboratory, limiting the feasibility of testing larger samples and using the measure as an assessment tool. However, developments in eye tracking, including portable (i.e., laptop) assessment devices, are increasing the practicality of including this technology in both research and assessment/intervention. Moreover, the paper-and-pencil assessment of CEP was also successful in differentiating between first-time and recidivist offenders, and the size of this effect was large (i.e., $\eta^2_p = .19$) and comparable to that of the attentional bias measure (i.e., $\eta^2_p = .17$), suggesting that this might also be a practical tool for research and assessment of these groups.

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