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Curbing the DUI offender's self-efficacy to drink and drive: A laboratory study

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ABSTRACT

Background: People arrested for driving under the influence of alcohol (DUI) are at high risk to reoffend. One reason for this high rate of recidivism among DUI offenders is that these individuals systematically underestimate the degree to which alcohol impairs their ability to drive. This study compared perceived and objective driving ability following alcohol and performance feedback in drivers with and without a history of DUI.

Method: Adult drivers with (n = 20) and without (n = 20) a history of DUI arrest attended two dose challenge sessions where they received 0.64 g/kg alcohol or placebo, completed a simulated driving task, and provided measures of subjective impairment. They attended a third retesting session where they received feedback that they were impaired by alcohol. They received 0.64 g/kg alcohol and their objective and perceived driving ability was retested.

Results: Both groups showed significant impairment of driving performance following 0.64 g/kg alcohol compared to placebo. DUI offenders rated themselves as less impaired than controls. After performance feedback, self-reported impairment during the alcohol retest increased for DUI offenders but not for controls. There was no effect of performance feedback on objective driving ability.

Conclusions: These results support the notion that under alcohol DUI offenders characteristically perceive themselves as better able to drive than non-offenders. These perceptions can be tempered by performance feedback. To the extent that perceived ability to drive safely after drinking contributes to DUI and its recidivism, feedback geared towards lowering this self-efficacy could reduce willingness to engage in this behavior.

1. Introduction

Approximately one-third of the people who are arrested for driving under the influence of alcohol (DUI) in the United States are repeat offenders (NHTSA, 2015). These high rates of recidivism cannot be entirely attributed to alcohol dependence (Shaffer et al., 2007); instead, there appear to be enduring characteristics of DUI offenders maintaining this pattern of maladaptive decision-making. Drawing on self-efficacy theory (Bandura, 1977), we propose here that DUI offenders persist in driving while impaired because they systematically underestimate the degree to which alcohol impairs their ability to drive. We also propose that this underestimation of impairment can be corrected during later drinking episodes using personalized driver performance feedback that challenges such beliefs.

Motivated behavior is guided by expectations of how one will perform in a given situation. This basic premise is the foundation of self-efficacy theory (Bandura, 1977), which posits that individuals' initiation or persistence in an action are determined primarily by their judgements and expectations concerning their capacity to cope with the demands and challenges of that situation (Maddux, 1995). High self-efficacy also may lead to problematic behaviors, particularly when expectations of one's ability exceed the individual's actual ability (Bandura, 1982). People avoid actions that may result in harm if they do not believe that they can safely cope with the demands of the situations. Prior research on the causes of alcohol impaired driving finds that this decision is associated with perceived impairment such that drinkers who perceive that they are able to drive are likely to do so (Quinn and Fromme, 2012).

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Unfortunately, there is poor correspondence between one's perceived and objective alcohol impairment (Aston and Liguori, 2013). This incongruence may be stronger among DUI offenders due to their heightened levels of impulsivity (Donovan et al., 1990), which is associated with overestimation of ability level (de Bruijn et al., 2006; Shiels and Hawk, 2010).

Along these lines, we have conducted studies to compare objective and perceived behavioral impairment in response to a dose of alcohol in impulsive groups. One line of studies found that a clinical group characterized by impulsivity (i.e., adults with ADHD), rated themselves as less impaired by alcohol than controls despite being equally or more impaired than controls (Roberts et al., 2013; Weafer et al., 2008; Weafer et al., 2009). Another study found that DUI offenders reported regaining their driving ability more quickly following an acute dose of alcohol compared to non-offending controls despite their being no group differences in alcohol elimination rates (Van Dyke and Fillmore, 2014). This is problematic because drivers who underestimate levels of impairment tend take more risks when driving. Our group found a relation between estimated breath alcohol concentration (BrAC) and risky driving such that drivers who estimated having lower BrACs drove in a riskier fashion (Laude and Fillmore, 2016).

If DUI offenders are prone to underestimating their level of impairment, then challenging their underestimation with feedback (i.e., information that their driving was highly impaired by alcohol) should produce a more adaptive perception of their abilities. People estimate their ability to perform a task based on past experiences (Bandura, 1977). For impaired driving, DUI offenders likely consider past referential experiences to inform judgements of their ability to drive after drinking. Research on individual instances of driving after drinking show that a single episode of this behavior is unlikely to result in any appreciable negative outcome (Voas and Fell, 2013). It is estimated that for every DUI arrest that occurs, the driver engages in 200 episodes of driving after drinking (Beitel et al., 2000). Thus, in the vast majority of these instances, there is no significant negative outcome for the driver. The experience of repeated episodes in which driving after drinking yields no adverse consequence could heighten one's self-efficacy to drive safely after drinking and without risk of arrest. As such, heightened self-efficacy could eventually play an important role in maintaining and increasing the frequency of driving while intoxicated, calling attention to its importance as a target for intervention. One method to reduce the likelihood of engaging in specific behaviors is to lower one's self-efficacy to successfully execute the behavior (Bandura and Locke, 2003). One strategy to lower self-efficacy is to provide information, such as negative performance feedback, to indicate a lack of ability to execute the task. Such feedback should reduce an individual's willingness to engage in that behavior in the future.

The current study examined simulated driving performance and subjective perceptions of one's driving ability following 0.64 g/kg alcohol (approximate peak BrAC = 80 mg/100 ml) and placebo in a group of DUI offenders and control drivers. The study also tested the degree to which intoxicated drivers' perception of their driving skill would be lowered after receiving feedback showing that alcohol impairs their driving ability. We reasoned that if DUI offenders overestimated their abilities due to failure to perceive alcohol impairment, then providing information indicating that alcohol impaired their driving performance should reduce their overestimation of ability. We predicted that alcohol would impair driving performance in both groups. Regarding perceived levels of impairment, we predicted that, under alcohol, DUI offenders would report greater ability to drive than controls, and that such overestimation of ability would be reduced after DUI offenders received performance feedback.

2. Method

2.1. Participants

Participants were 20 adult DUI offenders and 20 adult drivers with no prior DUI conviction. We expected to recruit more male DUI offenders than female offenders because more males are arrested for DUI (U.S. DOJ, 2005), so we over recruited males into the control group. Our DUI group included 14 men and 6 women, and our control group included 13 men and 7 women. DUI offenders had at least one alcohol-related DUI conviction in the past five years, whereas control participants had no prior DUI convictions or license revocations. Interested individuals called the laboratory and underwent a telephone screening during which information on demographics, drinking habits, drug use, and physical and mental health was gathered. Individuals reporting any psychiatric disorder, CNS injury, or head trauma did not participate, nor did those reporting dependence on illicit drugs. After being recruited, participants were informed that the study was intended to examine the effects of different doses of alcohol on simulated driving performance as well as other aspects of cognitive functioning.

All volunteers were current consumers of alcohol but were excluded if they reported past or current criteria for alcohol tolerance and withdrawal as determined by the substance use disorder module of the Structured Clinical Interview for DSM-IV (SCID-I; First et al., 2002). All volunteers had to hold a driver's license for the past three years and drove at least once each week. No participant reported using any psychoactive prescription medication. Illicit drug use was assessed by means of urine analysis (ICUP Drug Screen, Instant Technologies). Positive screens for drugs other than tetrahydrocannabinol (THC) during a dose challenge session resulted in rescheduling of that session. Those whose urine tested positive for THC were allowed to continue the session only if they abstained from using THC for at least 24 h prior to the sessions. No female volunteers who were pregnant or breast-feeding participated in the research (Icon25 Hcg Urine test, Beckman Coulter). The research was approved by the University of Kentucky Medical Institutional Review Board. Participants were compensated $130.

2.2. Materials and measures

2.2.1. Driving simulation. A simulated driving task was used to measure driving ability (STISIM Drive, Systems Technology Inc., Hawthorne, CA). This apparatus has been used in prior studies on alcohol-impaired driving (Harrison and Fillmore, 2005). It included foot- pedals and a steering wheel. Participants were instructed to maintain a speed of 55 mph and remain in the middle of the right lane during a 5-mile drive on a meandering rural road and required 10 min to complete.

Criterion measures were standard indicators of driving performance, including lane position standard deviation (LPSD), average speed, standard deviation of speed (speed SD), number of collisions, and number of times crossing the outer edge or center line of the roadway. To calculate LPSD, we measured within-lane position continuously throughout a test. Within-lane position was sampled at each foot of distance during the entire drive, and these data were used on each test to calculate an average within-lane position for each participant. Within-lane deviation was calculated by averaging each driver's deviation from his or her mean position at each foot of the driving test. The within-lane deviation measure is an indicator of the degree of adjustment that a driver implements to maintain a desired position within the lane. LPSD is a sensitive indicator of alcohol impairment of driving ability (Fillmore et al., 2008).

Speed deviation is an indicator of the degree of adjustment that a driver implements to maintain a desired speed. Greater speed devi-