



# Decision-making capacities and affective reward anticipation in DWI recidivists compared to non-offenders: A preliminary study

Sioui Maldonado Bouchard<sup>a,b</sup>, Thomas G. Brown<sup>a,c,\*</sup>, Louise Nadeau<sup>a,b</sup>

<sup>a</sup> Addiction Research Program, Douglas Mental Health University Institute, Verdun, Quebec, Canada

<sup>b</sup> Department of Psychology, Université de Montréal, Quebec, Canada

<sup>c</sup> Department of Psychiatry, McGill University, Montreal, Quebec, Canada

## ARTICLE INFO

### Article history:

Received 21 May 2011

Received in revised form 6 September 2011

Accepted 11 September 2011

### Keywords:

Driving while impaired

Recidivists

Decision making

Driving under the influence

Relapse

Alcohol dependence

Neurocognitive function

## ABSTRACT

**Objectives:** Impaired decision making is seen in several problem behaviours including alcoholism and problem gambling. Decision-making style may contribute to driving while impaired with alcohol (DWI) in some offenders as well. The Somatic Marker Framework theorizes that decision making is the product of two interacting affective neural systems, an impulsive, rapid, amygdala-dependent process for emotionally signalling the immediate negative or positive consequences of an option, and a reflective, longer-lasting, ventral medial prefrontal cortex dependent system for emotionally signalling the future negative or positive prospects of an option. This study tested the hypothesis that offenders who showed disadvantageous decision-making would be at higher risk for recidivism than those who showed more advantageous decision-making. In addition, in line with the Somatic Marker Hypothesis, offenders who showed disadvantageous decision-making would exhibit a distinct pattern of somatic activation compared to offenders who showed more advantageous decision-making.

**Methods:** A sample of 21 DWI offenders with from 2 to 7 past DWI convictions and a reference group consisting of 19 non-offender (N-O) drivers were recruited and administered the Iowa Gambling Task (IGT), as well as evaluated on sociodemographic, driving and alcohol use dimensions. In addition, anticipatory skin conductance response (aSCR) was measured in the 5 s prior to each of a 100 card draws on the IGT. **Results:** Median split of the DWI offender sample based upon overall performance on the IGT yielded two subgroups (IGT-R Hi and IGT-R Lo). **Hypothesis 1** was supported, as the IGT-R Lo group possessed significantly greater frequency of past DWI convictions and severity of past drinking. Descriptive analyses revealed that on the IGT, IGT-R Hi group performed similarly to the N-O reference group while the IGT-R Lo group performed significantly worse. **Hypothesis 2** was not supported.

**Conclusions:** Decision making is a plausible explanatory neurocognitive pathway to severer forms of DWI. The role of emotional processing in DWI risk is uncertain. Subtyping DWI offenders using neurocognitive criteria seems a promising avenue for improving clinically meaningful methods of DWI risk assessment and intervention.

© 2011 Elsevier Ltd. All rights reserved.

## 1. Introduction

Driving while impaired (DWI) by alcohol is a major public health problem. In 2008, alcohol was a factor in more than 32% (i.e., 11,773) of road traffic fatalities in the U.S. and 39.2% (i.e., 1056) in Canada (National Highway Traffic Safety Administration [NHTSA], 2008; Canadian Council of Motor Transport Administrators, 2010). It is also a prevalent and persistent high-risk behaviour. An estimated 15.1% of adult drivers admitted to DWI by alcohol in the past year (Substance Abuse and Mental Health Services Administration

Office of Applied Studies, 2008), while an estimated 44% of convicted DWI drivers will be reconvicted within ten years (NHTSA and National Institute on Alcohol Abuse and Alcoholism, 2005). These are conservative estimates, as they do not account for the many undocumented repeated DWI events. Recidivism is particularly catastrophic, as recidivists are over-represented in crashes and constitute a higher risk for vehicle accidents than first-time offenders (Lapham and Skipper, 2010). In sum, the on-going risks and burden on health associated with DWI necessitate efforts to better grasp its underlying causes to design more effective prevention programs.

The heterogeneity of the DWI population suggests that multiple pathways lead to DWI behaviour (Donovan, 1989; Nochajski and Stasiewicz, 2006). Traditional approaches to explaining DWI recidivism have primarily focussed on two putative pathways,

\* Corresponding author at: 6875 Lasalle Blvd., Perry E-4116, Verdun, Quebec, Canada H4H 1R3. Tel.: +1 514 7616131; fax: +1 514 7623033.

E-mail address: [thomas.brown@mcgill.ca](mailto:thomas.brown@mcgill.ca) (T.G. Brown).