

Driving while impaired recidivism: Putative neurocognitive recidivism and remediation



**Team In Transdisciplinary Studies In
DWI Onset, Persistence, Prevention
And Treatment**



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Plan

- ❑ Neurocognitive findings in recidivists
- ❑ Qualitative and quantitative data on non-adherent DWI offenders
- ❑ Brief intervention (20-30 minutes!)
- ❑ What can it mean for Interlock?

Neuropsychology of DWI

- Repeat offenders appear at risk
 - Neurotoxicity of alcohol abuse
 - Increased risk of head trauma
- Neurocognitive impairments could contribute to problem persistence and intervention compliance and outcomes
 - In alcoholism, impairments negatively influence treatment engagement and outcomes
 - In DWI
 - Recidivism is problematic
 - 50% offenders fail to participate in programs
 - Only 2 previous (but suggestive) studies

Research Questions

- **DWI offenders more prone to exhibit neurocognitive deficits?**
 - **In which domains?**
- **Relationship between severity of impairment and frequency of past DWI convictions?**
- **Relationships between deficits and potential causal factors?**
 - **Alcohol misuse**
 - **Head trauma**



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Neurocognitive characteristics of DUI recidivists

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Abstract

Individuals who drive under the influence (DUI) of alcohol may be at greater risk for neurocognitive impairment because of their exposure to multiple sources of neurological risk. This could contribute to the persistence of DUI behaviour and influence the effectiveness of remedial interventions. The objectives of this study were to clarify the neurocognitive characteristics of DUI recidivists and the nature of potential impairments, and to explore relationships between these characteristics and the frequency of past DUI convictions. One hundred male recidivists were evaluated for visuospatial constructional abilities and visual memory, verbal fluency, attention skills, cognitive flexibility, spatial planning, and verbal and movement inhibition. Results indicated that a majority of recidivists showed signs of neurocognitive impairment on several dimensions. Impairment was most marked on visuospatial constructional abilities and visual memory. In contrast to previous studies, no participants were found to have impulse control problems. Measures of memory and cognitive efficiency were significantly associated with the frequency of past convictions. Finally, exploratory analyses of two potential sources of impairment, alcohol exposure and head trauma, suggested the role of excessive alcohol use as the most obvious associated factor. Overall, the findings indicate that neurocognitive impairments are a common feature in recidivists and may contribute to DUI persistence. Development of a DUI-specific neurocognitive assessment and greater understanding of how neurocognitive status influences DUI risk could lead to remediation strategies better adapted to the individual characteristics of recidivists.
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Keywords: Driving while impaired; Neurocognitive function; Neuropsychology; Assessment; Alcohol

1. Introduction

Driving under the influence (DUI) of alcohol is a behaviour with significant individual, social, and health consequences. In the United States, traffic crashes represent the most frequent cause of death in individuals between one and 44 years of age (Centers for Disease Control and Prevention, 2002). Across North America, about 35–40% of all fatal motor crashes are related to alcohol (Mayhew et al., 2002; National Highway Traffic Safety Administration, 2004). Following a first conviction

for DUI, most offenders will not recidivate. Unfortunately, approximately 33% of those convicted during a one-year period are recidivists (Fell, 1995). Hence, understanding the factors associated with recidivism is critical to our capacity for better detection of high risk offenders, and our ability to orchestrate effective countermeasures.

Research has identified several characteristics associated with DUI offenders. These include: male gender, alcohol abuse and dependence (Brinkmann et al., 2002; Wieczorek et al., 1992); drug problems (Lapham et al., 2001); hostility, sensation seeking, and psychopathic characteristics (McMillen et al., 1992); psychosocial dysfunction and disrespect for laws, legal authorities, and sanctions (MacDonald and Pederson, 1990); and a family history of alcoholism and antisocial behaviour (Harwood and Leonard, 1989). In addition, recidivists are

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Methods

- 100 recidivists
 - History of 2+ DWI convictions
 - 18 years or older
- Exclusion criteria:
 - BAC > 0.04
 - Reading skills < 6th grade level

Neurocognitive Battery

Rey Complex Figure Test (RCFT)	Visuospatial constructional ability and visual memory	Meyers & Meyers, 1995
Verbal Fluency Test	Fluent productivity in the verbal domain	Delis et al., 2001
Ruff 2 & 7 Selective Attention Test	Attention abilities	Ruff & Allen, 1996
Trail Making Test	Cognitive flexibility	Reitan & Wolfson, 1993
Tower Test	Spatial planning	Delis et al., 2001
Stroop Color-Word Interference Test	Verbal inhibition	Delis et al., 2001
Go/NoGo task	Movement inhibition	Adapted by team

Main Findings

- Neurocognitive functioning of DWI recidivists disproportionately lower than expected in normal population
- 66% of recidivists showed neurocognitive deficits
- Most common deficits observed
 - memory capacity
 - executive functioning

Implications

- Possible role of neurocognitive functioning in not only DWI severity, but also intervention
- Other studies in other clinical populations posit it influences:
 - ↓ Ability for self-regulation
 - ↓ Capacity to learn and retain intervention content
 - ↓ Engagement in treatment

Implications

- In DWI, role of neurocognitive functioning in treatment engagement and overall treatment success?
- 50-90 % of convicted DWI offenders delay participation in remedial programs
 - Associated to increased risk of unlicensed driving, DWI, accidents

Neurocognitive correlates of remediation

■ Research Questions

- What distinguishes non-participants in remediation vs. participants?
- What subjective rationales underlie 'decision' not to participate?
- *What is the nexus between objective/quantitative and subjective/phenomenological findings?*

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DUI Offenders Who Delay Relicensing: A Quantitative and Qualitative Investigation

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Objectives. As in many jurisdictions, individuals convicted of driving under the influence (DUI) in the province of Quebec are mandated to relicensing programs, which include obligatory participation in intervention programs. However, prolonged delay in relicensing is widespread, potentially contributing to unlicensed driving, untreated substance misuse problems, and drink-driving risk. Information about the characteristics of DUI offenders who delay relicensing (DR) is sparse. This investigation compares the characteristics of DR offenders with those offenders who do not delay (NoDR). In addition, the rationales of DR offenders for delaying relicensing are explored qualitatively.

Methods. Two studies were conducted to explore the characteristics of DR offenders. In Study 1, DR offenders (n = 46) were compared to NoDR offenders (n = 74) on multidimensional measures of psychosocial functioning, driving behavior, substance use, and psychological and neurocognitive characteristics. In Study 2, a qualitative examination of 20 DR offenders' reasons underlying delayed relicensing was undertaken, with verbatims content analyzed to identify major themes. A questionnaire, based upon this preliminary analysis, was then administered to another sample of DR participants (N = 37) to appraise and confirm thematic comprehensiveness.

Results. The main findings of Study 1 were that, compared to NoDR offenders, DR offenders had more past DUI convictions, were at greater risk for drink driving per kilometer (km) driven, were more likely to have received substance abuse treatment, and exhibited indices of poorer neurocognitive performance in visual memory and behavioral inhibition domains. No group differences were uncovered on substance use measures. The findings of Study 2 revealed that the expense of participation, availability of alternate transportation, lack of interest, and no access to a vehicle were the most frequent explanations for delayed relicensing.

Conclusions. Overall, these findings suggest that both individual and contextual factors influence timely fulfillment of relicensing requirements. While the cost of relicensing may succeed in removing some offenders from the road, it may also be a barrier for others at risk for drink driving, preventing exposure to needed intervention programs. Reducing this barrier may need to be weighted against the risks of relicensing more DUI offenders. Neurocognitive factors may need to be taken into account to not only decrease delay in relicensing but also increase the benefits from participation in interventions that are part of current relicensing programs.

Keywords Driving Under the Influence; DUI; Recidivism; Alcohol; Assessment; Compliance

INTRODUCTION

In 2003, 2,800 Canadians died and 17,000 suffered serious injuries from motor vehicle crashes. More than a third of these fatalities were associated with driving under the influence (DUI) of alcohol (Health Canada, 2005). In the United States, traffic crashes are the leading cause of death for people aged 2 to

33 years, with alcohol involvement in 41% of all fatal crashes (Hingson & Winter, 2003). To counteract the human, social, and economic costs associated with DUI in North America, a system of federal and provincial/state laws are in place.

In Canada, a DUI arrest and conviction leads to countermeasures invoked at the time of arrest and conviction (under federal and provincial jurisdictions) and during the course of reacquiring a drivers license (under provincial jurisdiction). The former includes license suspension immediately after arrest and opening of a criminal file, fines, and incarceration after conviction. In the latter case, the province of Quebec employs a set of

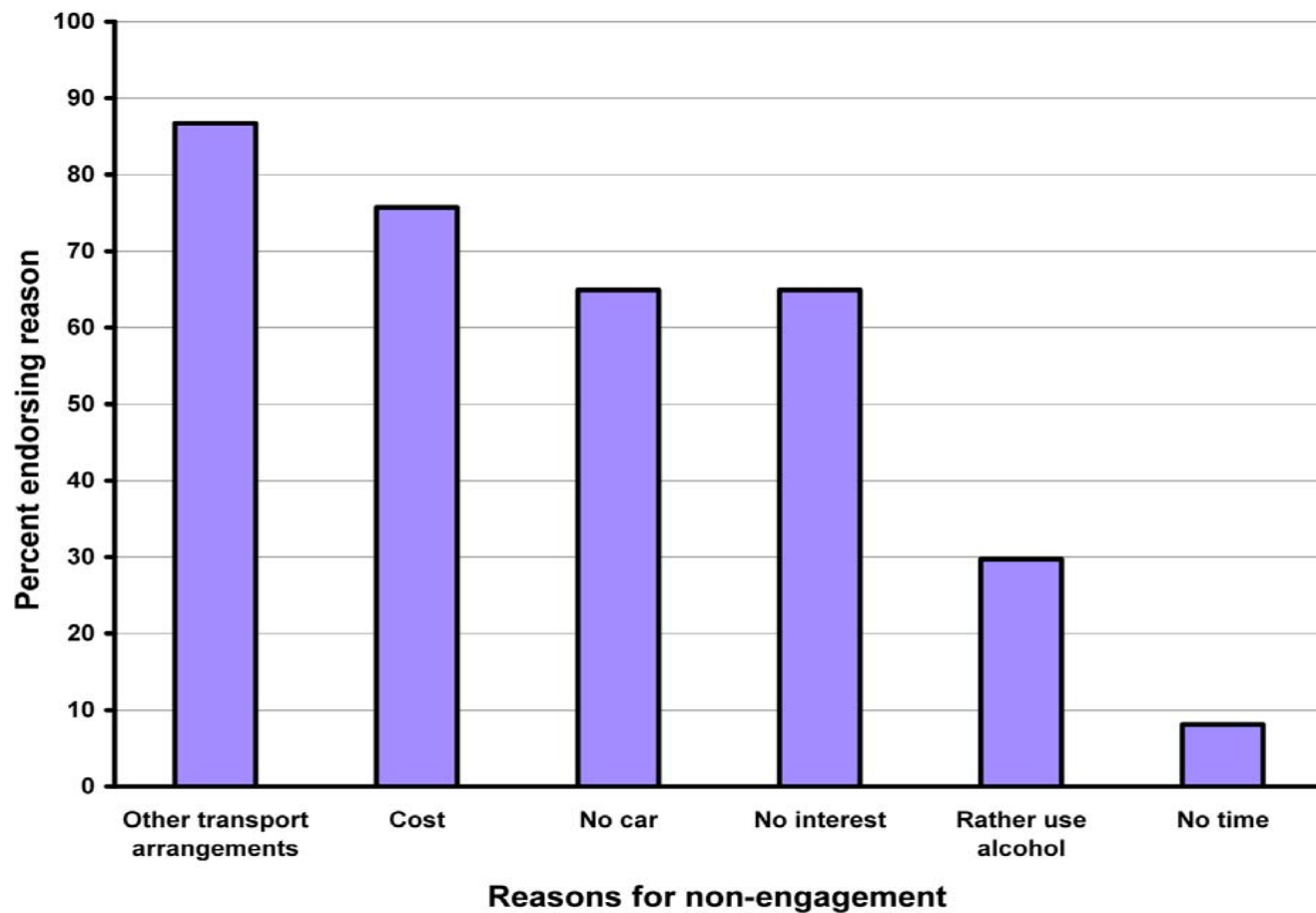
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Methods

- Non-participants (N = 46) in remedial measures vs. participants (N = 76)
 - Sociodemographic characteristics
 - Psychological and personality features
 - Neurocognitive characteristics

Results

- Non-participant reasons for not participating or delaying participation



Results

- Non-participant characteristics:
 - Poorer socio-economic status
 - Poorer neurocognitive performance
 - Memory
 - Behavioural inhibition
 - “Delayed reward discounting”
 - Lower motivation for delayed gratification
 - Heightened attraction for immediate gratification

Implications

- Current policies for engaging offenders to participate in remediation and reacquire license work counter to these characteristics
- Subjectively:
 - Perceived and real economic obstacles to participation contribute to non-adherence
 - Fact: Current programs are disproportionately burdensome for these offenders

Implications

□ Objectively:

■ Delay discounting

□ ↓ motivation for program where positive outcomes are delayed and aversive contingencies are immediate (fines, program costs, no driving, increased insurance etc.)

□ Fact: ↑ motivation for immediate gratification:

■ Unlicensed driving

■ Avoidance of fines and costs

■ Avoidance of behavioural change

Implications

- If we consider that participation in remedial and relicensing programs after DWI is beneficial, then:
 - Current policies and programs work against the tendencies of an important high risk subgroup (established recidivists) and who would benefit from such external restraint programs as Interlock
 - We need to consider policies that provide immediate positive incentives for participation
 - Reduce costs of program participation

Implications

- Contingency management approaches have worked well in analogous “delayed reward discounters”
 - Provide vouchers as incentives for early and successful participation
 - More ready access to interlock and other environmental controls

Neurocognitive mediation of DWI

Problem drinking, especially earlier onset



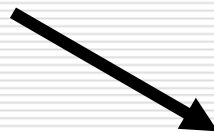
Deficits in neurocognitive performance



- **Memory**
- **Planning**
- **Flexibility**
- **Inhibition**



- **Poorer socioeconomic functioning**
- **Refractory to intervention**
- **Poorer treatment engagement**



Increased DWI risk

Intervention

- Research Question:
 - What intervention may be appropriate for unmotivated, treatment shy DWI recidivists?

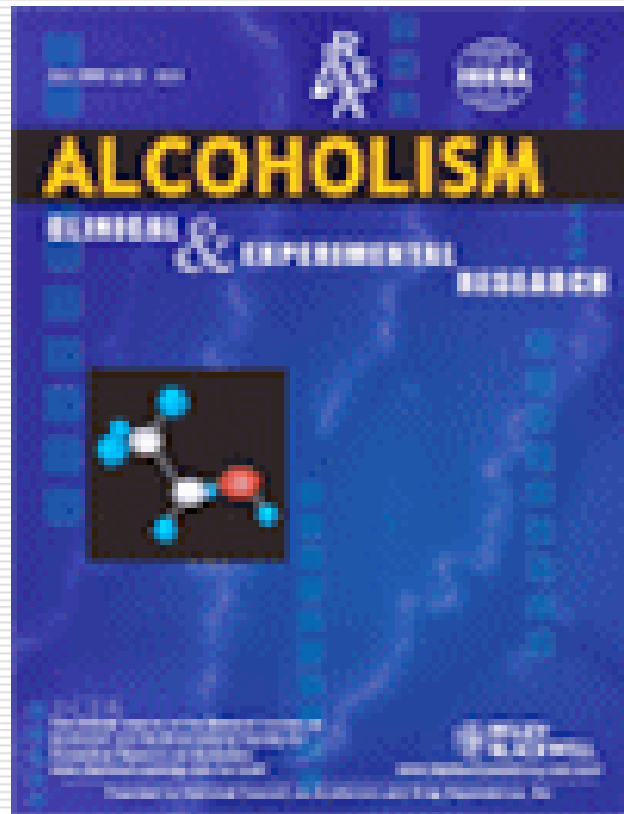
- Motivational Interviewing
 - Evidence for effectiveness in more delinquent populations
 - Designed for unmotivated, resistant individuals with poor problem recognition or acknowledgement
 - Brevity lends itself to opportunistic deployment for hard-to-reach clients

Motivational Interviewing

MI is a therapeutic approach that seeks to enhance intrinsic motivation to change by exploring and resolving ambivalence and incorporates an empathic, patient-centred yet directive counselling style (Miller and Rollnick, 2002).

Intervention

Brown et al. (in Press) Brief Motivational Interviewing for refractory DWI offenders not participating in mandated DWI intervention: a randomized controlled trial. (Alcoholism: Clinical and Experimental Research).

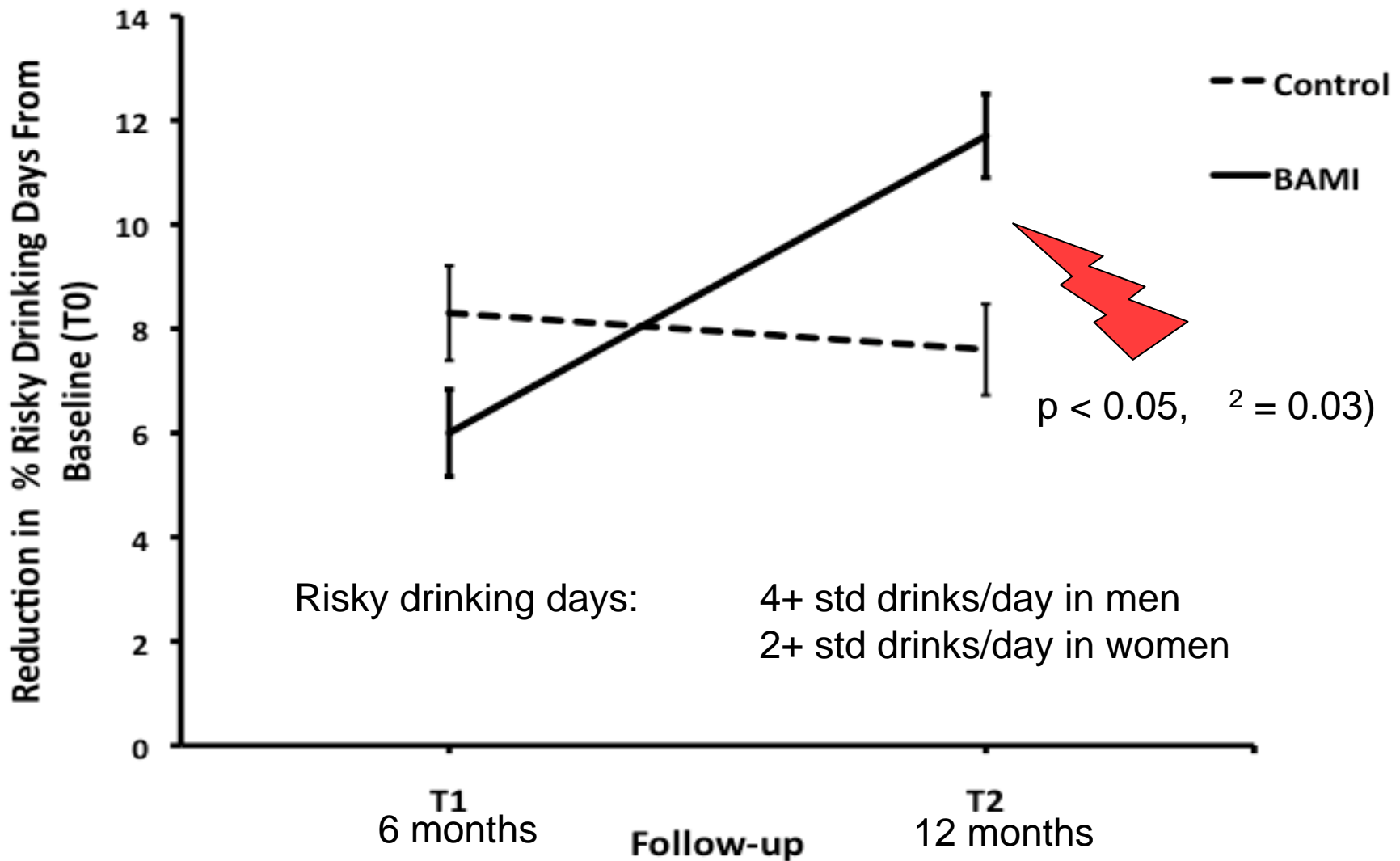


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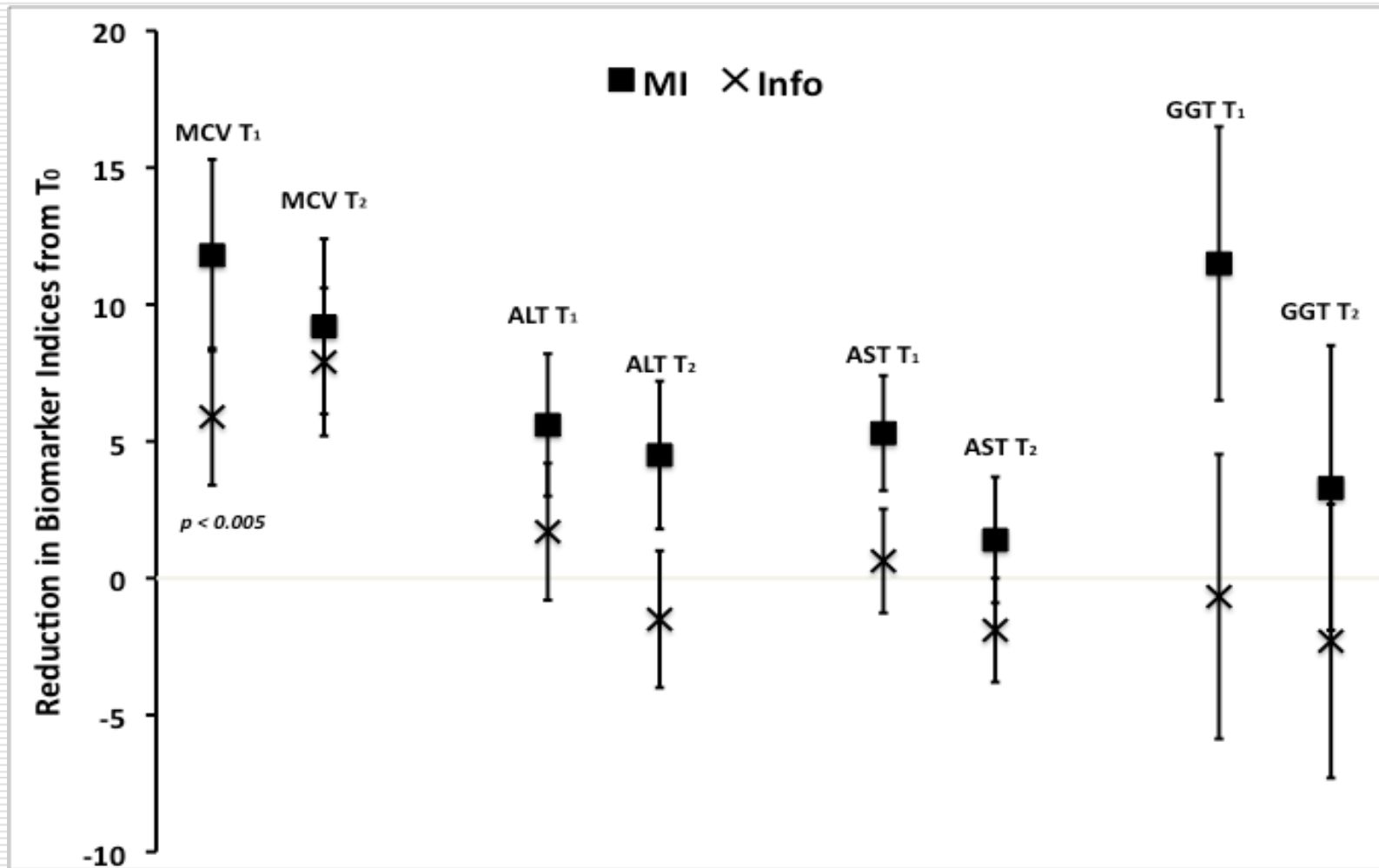
- RCT of 20-30 minute brief adapted Motivational Interviewing (BAMI) at 6 (T1) and 12 (T2) month follow-up
- Recruited recidivists (N = 184) with:
 - current alcohol problems
 - not currently in treatment
 - history of delay or no in participation in remedial programs

Results



Results

Figure 3. Reduction from baseline (T_0) in mean corpuscular red blood cell volume (MCV) in fL, and alanine aminotransferase (ALT), aspartate aminotransferase (AST), and gamma-glutamyl transferase (GGT) in IU/L at six-month (T_1) and 12-month (T_2) follow-ups with BMI ($n = 92$) and Control ($n = 92$). More reduction signifies better outcome.



Interpretation

- How can we explain BAMl's effects in such a brief time?
 - Potentiates other interventions that follow
 - Perceived as increasing self-competence
 - Avoids a moral frame which may be ineffective in hardcore offenders
 - Evokes and validates offenders' own reasons for change and solutions

Implications

- ❑ BAMI may be beneficial in opportunistic venues where hard-to-reach-offenders may be captured
- ❑ Even hardcore cases may be amenable to the 'right' intervention adapted to their characteristics
- ❑ Can feasibly be added to other countermeasures like Interlock
- ❑ 2-3 year follow-up study underway to examine impact on future DWI events

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