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Editorial

Letter from the Editors

The *Journal of Safety Research* is pleased to publish in this special issue the proceedings of several papers presented at the 4th International Conference on Road Safety and Simulation convened at Roma Tre University in Rome, Italy, October 2013. This conference serves as an interdisciplinary forum for the exchange of ideas, methodologies, research, and applications aimed at improving road safety globally.

Conference proceedings provide the opportunity for research in its formative stages to be shared, allowing our readers to gain early insights in the type of work currently being conducted and for the researchers to receive valuable feedback to help inform ongoing activities. This conference in particular offers an array of research topics not often covered by this journal from researchers practicing in over 11 countries. As is common with publishing conference proceedings, the papers published in this issue did not go through the normal *JSR* review process. Each paper included in this issue did meet the Road Safety and Simulation conference review requirements. They reflect varying degrees of scientific rigor, methodological design, and groundbreaking application.

The proceedings published in this special issue of *JSR* draw from the following road safety research sectors represented at the conference: driving simulation, crash causality, naturalistic driving, and new research methods.

It is our hope that the publication of these important proceedings will stimulate vigorous dialogue, rigorous research, and continuing innovative initiatives and applications, leading, ultimately, to fewer traffic fatalities, injuries, and crashes.

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Post-stroke driving: Examining the effect of executive dysfunction

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ABSTRACT

Introduction: Executive dysfunction can refer to both neurocognitive deficits and behavioral symptoms that include impaired judgment, slow decision making, disorganization, impulsiveness, and risk-taking behaviors. Executive dysfunction is relatively common in the post-stroke population but is often undetected. The impact of executive dysfunction on post-stroke driving is unclear but it may pose a risk to affected drivers and other road users. *Aim:* The aim of this study was to investigate the relationship between executive functioning following stroke and driving performance. *Methodology:* A case–control study design was used. Purposive sampling was used to recruit stroke participants ($n = 19$) and healthy controls ($n = 22$). Participants were screened using a battery of psychometric assessments including the Montreal Cognitive Assessment and the Benton Judgment of Line Orientation. Driving performance was assessed using the STISIM driving simulator. Executive function was assessed using the Behavioural Assessment of the Dysexecutive Syndrome (BADS) and the Trail Making Test Part B. *Results:* The control participants performed better than the stroke participants on the driving assessment and psychometric assessments. There was an association between the scores of the Trail Making Test Part B (Rho $= 0.34$, $p = 0.034$) and the Key Search Test of the BADS (Rho $= -0.61$, $p = 0.005$), and the driving assessment scores. However, there was no association between the overall BADS scores and the driving assessment scores of the stroke participants. *Conclusions:* The stroke participants underperformed in the driving assessment and the psychometric assessments that detected neurocognitive deficits, which included executive function. The Trail Making Test Part B and Key Search Test of the BADS were related to identify participants' deterioration in driving performance. *Practical Applications:* In clinical practice, the latter could be used as an indication of a post-stroke driver's performance.

1. Introduction

The annual incidence of stroke in Australia is between 40,000 and 48,000 (Australian Institute of Health and Welfare, 2004). Stroke is a leading cause of long-term disability with almost half of older stroke survivors experiencing moderate to severe disability (Fang, Shaw, & George, 2012). The condition can result in physical and cognitive consequences, all of which may influence driving. Driving cessation among stroke survivors is associated with a loss of autonomy and reduced participation in valued occupations (Logan, Dyas, & Gladman, 2004). Approximately half of stroke survivors return to driving (Perrier, 2009). Stroke survivors are at a greater risk of undergoing a motor vehicle crash than the average driver (Rabadi, 2010). However, due to the highly variable presentation of stroke, it is difficult to determine which deficits are correlated with impaired driving ability.

Research has aimed to identify off-road tests that can assist in the prediction of fitness to drive (Kay, Bundy, Clemson, Cheal, & Glendenning, 2012). Off-road assessment tools are not intended to replace the on-road test, but may highlight the need for training before attempting a costly on-road test (H. C Lee, Drake, & Cameron, 2002). At present there is no gold standard off-road test for predicting on-road driving performance (Kay et al., 2012).

Research on the impact of stroke on driving has identified multiple screening measures that may aid the prediction of fitness to drive (Marshall et al., 2007). However, these studies are limited by their small sample sizes and poor study design (Marshall et al., 2007). The Stroke Driver Screening Assessment is a commonly used test battery; nevertheless, it is unable to reliably predict the outcome of an on-road test (Selander, Lee, Johansson, & Falkmer, 2011). A systematic review of factors predicting driving ability following stroke found that psychometric tests that assessed multiple cognitive

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