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## Self-regulatory driving behaviours amongst older drivers according to cognitive status



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### ABSTRACT

Self-regulation of older drivers was explored according to their cognitive status in this pilot study by examining situations commonly avoided by older drivers. In addition, the role of driver insight on self-regulation was examined via passenger reports. Telephone interviews were conducted comprising 49 drivers aged 65 years and above and 40 passengers who acted as informants. Self-regulation was found to be common, with the majority of drivers (71.4%) reporting sometimes or always avoiding one of seven driving situations. However, drivers with cognitive impairment reported self-regulating more often than drivers without cognitive impairment. The largest discrepancy between passenger and driver reports of self-regulation behaviours was found for the drivers with cognitive impairment. These results possibly reflect a decreased awareness of self-regulatory driving behaviours in this subgroup of older drivers and may suggest that other external factors are contributing to self-regulation in older drivers with cognitive impairment. A discussion of these factors is provided with the aim of maintaining mobility and enhancing quality of life in this growing segment of the driver population.

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### 1. Introduction

Given that the population of Australians aged over 65 years is expected to triple by 2060, the proportion of older drivers will be the fastest growing segment of the driver population (ABS, 2014). This demographic shift presents itself as a health promotion challenge to assist older adults to remain independent and active contributors to community life for as long as possible. As a group, older drivers are relatively safe. However, once involved in a crash, they have a greater likelihood of sustaining serious injury or fatalities due to increased fragility (Meuleners, Harding, Lee, & Legge, 2006). Furthermore, older drivers who experience age-related changes in physical and sensory functioning and who also have a medical condition can be at a heightened risk for motor vehicle crash involvement (Charlton et al., 2010). Due to the wide variation in health status amongst older drivers, the need to monitor individual progress over time and assess for fitness to drive is increasingly important.

Self-regulation of driving behaviour has been described as one strategy that can assist drivers to continue to stay mobile for as long as possible (Gwyther & Holland, 2012). Drivers may self-regulate their driving by restricting their driving, avoiding certain driving situations or even ceasing driving altogether. Some of the most frequently reported self-regulation behaviours include; avoiding driving at night, driving shorter distances, driving in bad weather, or driving fewer hours per week

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(Molnar et al., 2013; Wong, Smith, & Sullivan, 2012). The extent to which self-regulation translates into a reduction in driver crash risk is an important question. There have been limited studies in this area (Ball et al., 1998; De Raedt & Ponjaert-Kristoffersen, 2000; Owsley, McGwin, Phillips, McNeal, & Stalvey, 2004) and this relationship is still not clear (Man-Son-Hing, Marshall, Molnar, & Wilson, 2007). A sophisticated understanding of the factors that predict self-regulation may inform the development of interventions to assist drivers to safely modify their driving behaviour rather than cease driving altogether.

The reasons older drivers engage in self-regulation vary widely, and are not yet clearly understood; however evidence from several studies indicates that older drivers modify their driving to compensate for perceived changes in sensory abilities, cognitive abilities or physical functioning (Braitman & Williams, 2011; Donorfio, D'Ambrosio, Coughlin, & Mohyde, 2008; O'Connor et al., 2010). Recent survey data provided an insight into the type of driving situations that are avoided by drivers with clinically determined functional impairments such as vision and cognition (Molnar et al., 2013). Compared to 105 healthy older drivers, 32 older drivers with functional impairments were more likely to report greater discomfort while driving and were more likely to report avoiding driving at night, driving on freeways and driving in unfamiliar areas. Self-perceptions of a decline in ability were evident for the clinical group who reported difficulties seeing at night, processing information and difficulties with memory (Molnar et al., 2013). These results suggest that awareness of functional decline may influence the decision to modify driving behaviour in driving conditions that are perceived to be challenging for older drivers.

It is important for drivers to have a realistic awareness of their driving competence, as either overestimating or underestimating competence can be dangerous and may result in an increased risk to safety (Cotrell & Wild, 1999). A lack of awareness often accompanies cognitive decline, particularly in moderate and severe stages of cognitive impairment (Ball et al., 1998; Man-Son-Hing et al., 2007). Drivers with cognitive impairment therefore may have less awareness of their cognitive difficulties than their healthy counterparts and consequently may be less likely to regulate their driving. However, there is mixed and sometimes inconsistent evidence to suggest that this is the case (Devlin & McGillivray, 2014).

The relationship between driver insight, driver avoidance and driver cognition has typically been investigated using survey studies (Cotrell & Wild, 1999; Gabaude, Marquié, & Obriot-Claudé, 2010; O'Connor et al., 2010). Drivers from the general population in France were recruited to participate in a survey study undertaken by Gabaude et al. (2010) in which it was established that self-reported cognitive difficulties were the best predictors of driver avoidance, even in comparison to poor driver behaviours such as speeding, failing to give way and braking too quickly. In a study with a defined clinical group, O'Connor et al. (2010) investigated the self-regulatory driving behaviours of 304 drivers with questionable cognitive impairment (MCI) and 2051 drivers without cognitive impairment. The researchers found that self-reported driving difficulty increased at a greater rate for the group with MCI compared to drivers without cognitive impairment. Furthermore, drivers with cognitive impairment reported driving less often in challenging situations. Evidence from a survey study and a naturalistic driving study suggests that drivers with diagnosed conditions such as Alzheimer's disease do restrict their driving and that those who do so are typically aware of memory difficulties and difficulties performing everyday activities (Cotrell & Wild, 1999; Festa, Ott, Manning, Davis, & Heindel, 2013).

Despite being aware of changes in cognitive abilities, not all drivers choose to change their driving behaviour for this reason. Other factors that appear to influence the decision to self-regulate include wishing to maintain connected with society and a sense of independence, maintaining self-confidence, avoiding potential fears about ageing and the need to travel to places such as medical appointments when few alternative transport options are available (Donorfio, D'Ambrosio, Coughlin, & Mohyde, 2009; Molnar et al., 2013). It is those drivers who choose not to modify their driving who are likely to be at a heightened safety risk. Family members are in a unique position to be able to provide information to health professionals about patients' driving and may assist with driver self-regulation by providing the driver with useful strategies and discussing future mobility options. Discussing these concerns with the driver is often a difficult task because of lack of knowledge about how to approach the topic, or fear of a negative response from the driver (Perkinson et al., 2005). Furthermore, this task can be particularly challenging when the driver lacks awareness or denies any problems related to driving. The principal aim of this pilot study was to examine self-regulatory driving behaviours amongst older drivers according to their cognitive status and their extent of driver awareness. In addition, the study provided preliminary information about passenger perceptions of driver self-regulation.

## 2. Method

### 2.1. Participants

This cross-sectional study was comprised of 89 community dwelling older adults. There were 49 drivers with a mean age of 75.50 years ( $SD = 6.73$ , range = 65–88 years), and 40 passengers with a mean age of 73.40 years ( $SD = 9.13$ , range = 51–99 years) who acted as informants. Participants were recruited from bowling clubs, independent living units, and older adult organisations from the metropolitan and rural areas of Victoria and volunteered for the study. Note that Victoria, unlike other states in Australia, does not have any age-based requirements for licence testing. The inclusion criteria included; a current driver's licence, driving more than once a week, having English as a first language, and being able to provide informed consent. Drivers with depression or any physical, ophthalmological, or neurological disorder that could impair their driving

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