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Editorial

Special issue in Transportation Research Part F: Traffic Psychology and Behaviour:

The role of Fitness to Drive in traffic safety and mobility

At some point in our driving career, there may come a time when our fitness to drive is assessed, either clinically or otherwise. The aging process, both cognitively and physically, are undoubtedly contributing factors to fitness to drive, but there are other chronic and acute disorders that are known to affect aspects of the skills and functional capabilities required for driving. Determining fitness to drive can be a personal decision – as in the case of an older person or someone suffering from alcohol dependency opting out of driving. Alternatively, a medical consultation may deem driving cessation, limitation or support necessary if the physician believes a person is unsafe to drive, for example because of a medical disorder. This Special Issue constitutes five papers, three of which focus on the most common aspect of fitness to drive – the older driver – whilst the remaining two are related to impairments related to a degenerative disease (Parkinson's) and a sleep disorder (sleep apnoea).

In this Special Issue, Wong, Smith and Sullivan (2017) attempt to validate a model designed to predict which variables influence whether older drivers self-regulate their own driving behaviour. Such a self-initiated response may manifest itself in their avoidance of certain road types (e.g. high speed motorways), traffic (peak hours) and environmental (night-time) conditions. The model used by Wong et al., known as the Multilevel Older Person's Transportation and Road Safety Model (MOTRS), proposes there to be a relationship between demographic, psychosocial, health and driving-related variables which influence whether an older driver decides to self-regulate or not. With their model accounting for 75% in the variance in reported self-regulation, they conclude that "attitude towards driving" was the strongest predictor. The authors argue that a more thorough understanding of the predictors of self-regulation can lead to more effective older driver safety programs.

An example of such an older driver safety program is reported by Hawley, Smith and Goodwin (2017). As well as identifying self-regulatory mechanisms, the authors evaluated a classroom-based training initiative using subjective measurements of own ability and confidence before and after the training. Whilst the older drivers reported that the intervention increased their hazard awareness and knowledge regarding the effects of distractors, some also reported a reduction in driving confidence following the course. Presumably, this was due to the fact that the course highlighted issues previously not considered by the drivers. This was also reflected in reductions in reported driving ability. Whether the reduction in confidence and perceived ability affected the older driver's driving patterns following the course is not known, although Wong et al.'s (2017) findings suggest that driving confidence is not as strong a predictor of self-regulation as driving attitudes.

Using subjective measures of hazard awareness and general measures of driving safety as per Hawley et al. (2017) and Wong et al. (2017) can provide insight into why drivers might self-regulate their driving habits, however there are also clinical indicators of driving-related competencies that can be derived in parallel. Ben Jemma et al. (2017) report a study in which they evaluate the effectiveness of an auditory display aimed at supporting older drivers in their ability to localise emergency vehicle sirens. Older drivers report front-back confusion in sound localisation, as a result

of the age-related hearing loss known as presbycusis. This impairment is particularly noticeable in complex and noisy environments such as driving. Ben Jemma et al. (2017) used a congruent auditory display (whereby the source of the in-vehicle alarm matches the direction of the source of the siren). This congruence was hypothesised to improve sound localisation in those drivers with hearing impairments. The results suggest partial support for the hypothesis, but only for those not wearing hearing aids; in fact localisation worsened for those wearing aids, perhaps due to the signal processing properties of the aids. This study is an example of how a driver support system designed specifically for older drivers to improve their fitness to drive, could be equally useful in the general population.

A chronic condition which can affect driving safety via a number of different impairments is that of Parkinson's disease. As well as motor dysfunction, those affected can suffer from cognitive, emotional and neuropsychiatric symptoms. Classically, the Trail Making Test (TMT) has been used to distinguish between levels of impairment in patients with Parkinson's Disease. Beratis et al. (2017) however used the Comprehensive Trail Making Test (CTMT) as an alternative, hypothesising that it enhances sensitivity in detecting executive dysfunction. Using data collected via a driving simulator, the authors were able to demonstrate that CTMT scores were more predictive of driving behaviour than the traditional TMT. This, they argue, is the first step in developing cut off points which would aid clinicians in their decision making regarding a patient's fitness-to-drive.

However, in a clinical setting, using a driving simulator is often not an option that is available. Many clinicians do and will continue to rely on self-reports from patients themselves with various measures of sleepiness collected to provide an indication of likely fitness-to-drive. In this special issue, Zhang et al. (2017) adopt a similar approach in a sample of taxi drivers with obstructive sleep apnea. They supplement the standard measures of self-reported sleepiness with those used widely in the field of traffic safety which measure driver behaviour and skill and identified problem areas, namely memory lapse and reduced risk perception, which varied depending on the severity of sleep apnea symptoms. The authors suggest that that, therefore, fitness to drive can be identified prior to licensing.

Timely and appropriate self-regulation of driving or use of assistive technology in populations where fitness-to-drive is an issue, would likely be the most acceptable process for most drivers. However, due to the tension between safety and mobility and our levels of car dependency, reliable and valid measures of fitness-to drive are required to help friends, family, clinicians and the drivers themselves decide on timely driving cessation. There are still unanswered research and policy questions related to fitness to drive and in our increasingly aging population the need to find a balance between self-regulation and legal intervention becomes ever more urgent. Those readers who consider themselves "too young to be concerned" may perhaps be faced with making a fitness-to-drive decision regarding an elderly relative, or even themselves, sometime in the near future.