SAFER-Senior: A situation awareness and escape route identification skills intervention improving the road safety of senior drivers

Bridie Scott-Parker[a,b], Bonnie Huang[a,b]

[a]Adolescent Risk Research Unit, Sunshine Coast Mind and Neuroscience – Thompson Institute;
[b] School of Social Sciences, University of the Sunshine Coast

Abstract

With the ageing of the global population, the overrepresentation of older drivers in road crash statistics has never been more important. A pilot of SAFER-Senior, a revision of SAFER which is accelerates the acquisition of situation awareness skills in young drivers – also overrepresesntated in road crash statistics across the globe – is underway on the Sunshine Coast. An analysis of data collected pre- and post-SAFER-Senior reveals that SAFER-Senior builds situation awareness skills in older drivers.

Background

In 2017, senior adults road users aged 75 years and older comprised 5.7% of the licensed population, but these road users contributed 14.2% of deaths and were involved in 9.7% of all deaths on Queensland roads in 2017 (TMR, 2017, 2019). Clearly there are very real road safety risks associated with ageing and driving, and these arguably arise from a combination of age-related factors. It is important to note, however, that older drivers have been found to make driving errors and to experience lapses in decision making, with such error and lapses contributing to crashes (e.g., Kay et al., 2012). Poor situation awareness has been found to contribute to crashes of young drivers (e.g., McDonald et al., 2015), and, given that older drivers experience overrepresentation in road crashes similar to young drivers and that recent research reveals that the Situation Awareness Fast-tracking including identifying Escape Routes (SAFER) intervention significantly improved the situation awareness skills of young learner drivers and their supervising parents (Scott-Parker et al., 2018), SAFER was revised for application with older drivers (SAFER-Senior). SAFER builds situation awareness in different contexts, including road users (e.g., other vehicles, pedestrians, animals), infrastructure (e.g., roundabouts, roadworks, school zones), and exposure (e.g., weather conditions, rain, dusk, dawn), with SAFER-Senior operationalising a talking-out-loud-while-driving strategy.

Method

One hundred and twenty participants aged 60 years and older (n=60 aged 60-74 years, Young Seniors, n=60 aged >74 years, Senior Seniors) were randomly allocated to Control and SAFER-Senior Intervention groups. Thirty participants from each age cohort received the SAFER-Senior Intervention after all participants completed the baseline simulated drive verbal commentary task ('task'). All participants completed the task 3 months' post baseline. Verbal commentary was transcribed verbatim and coded accordingly to Endsley's perception, comprehension, and projection (Endsley, 1995), and data is available for 100 drivers who completed both tasks.

Results

Intervention participants evidenced a statistically significant increase in the proportion of their verbal commentary pertaining to comprehension (p=.04) while their reduction in the proportion of the verbal commentary pertaining to perception approached statistical significance (p=.08). Intervention participants also evidenced a moderate increase in the proportion of their verbal

commentary pertaining to projection – the indicator of optimal safety-critical SAS – while Control participants experienced a decline in the proportion of their commentary pertaining to projection.
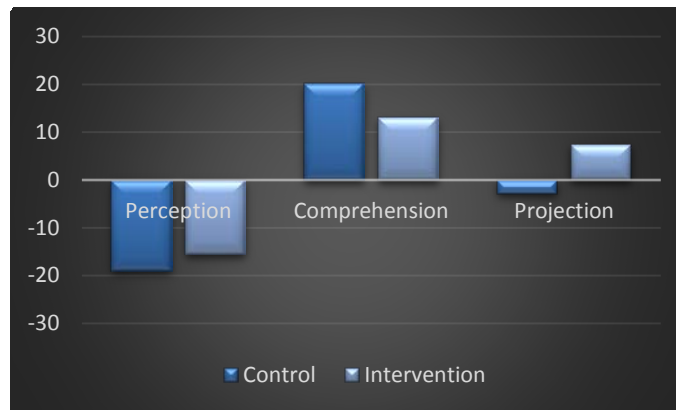

Figure 1: Changes in the average proportion of verbal commentary pertaining to perception, comprehension, and projection levels of situation awareness, from Baseline to Time 2, by study group (n=51 Control; n=49 Intervention)

Intervention and Control Young Seniors experienced a moderate increase in the proportion of their commentary pertaining to projection from Baseline to Time 1 (18.9%, 27.4%; 11.7%, 16.7%, respectively). Intervention Senior Seniors had an increase (5.9%, 12.5%) compared to Control Senior Seniors who had a reduction (24.9%, 14.3%) in the proportion of their commentary pertaining to projection, from Baseline to Time 1, a pattern that was repeated for female and male Intervention and Control participants.

Conclusion

The first longitudinal evaluation of SAFER-Senior suggests that it is an effective intervention in building safety-critical situation awareness skills in drivers aged 60 and older. The retention (and decay) of these skills will be monitored for the next 12 months as four further evaluations at 3-month intervals are completed.

References

Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society, 37*, 32-64.

Kay, L. G., Bundy, A. C., & Cheal, B. (2012). DriveSafe/DriveAware: A primising new off-road test to predict on-road performance. In *Driver behaviour and training: Human factors in road and rail transport*, L. Dorn, G. Matthews, & I. Glendon (Eds), Ashgate, London.

McDonald, C. C., Goodwin, A. H., Pradhan, A. K., Romoser, M. R. E., & Williams, A. F. (2015). A review of hazard anticipation training programs for young drivers. *Journal of Adolescent Health, 57*, SA15-S23.

TMR. (2017). *Queensland current driver licences as at 30 June 2017*. Available at https://www.tmr.qld.gov.au/Safety/Transport-and-road-statistics/Licensing-statistics

TMR. (2019). *Queensland Weekly Road Toll Report No 1102. Fatalities Year to Date to Sunday 17 February 2019*. Available at https://www.tmr.qld.gov.au/Safety/Transport-and-road-statistics/Road-safety-statistics.aspx

Scott-Parker, B., Wilks, L., & Huang, B. (2018). Situation awareness fast-tracking, including identifying escape routes (SAFER): Evaluation of the impact of SAFER on learner driver situation awareness skills. *Transportation Research Record, 2672*(33), 1-10.