**The ANU Better Driving Project**

**Interventions to enhance driving skills in older adults: a randomized controlled trial of efficacy.**

The ANU Better Drive project aimed to develop and trial an intervention to improve road safety in older drivers, and thereby produce an evidence-based option for maintaining independence and mobility in late life.

Current road safety policy for at-risk older drivers involves ‘fitness to drive’ assessment and either license restriction or revocation. Research indicates, however, that there is no clear evidence that mandatory testing lowers crash rates amongst older drivers (Dugan, Barton, Coyle, & Lee, 2013), and that driving cessation in older adults is associated with increased rates of depression (Windsor, Anstey, Butterworth, Luszcz, & Andrews, 2007), social isolation (Marottoli et al., 2000), and general health decline (Edwards, Lunsman, Perkins, Rebok, & Roth, 2009). Given the rising population of older adults in many jurisdictions, these outcomes of current road safety practice will increase the social and economic impact of population ageing. As a result of the focus on license regulation in older drivers, there has been little focus on developing methods to enhance skills and maintain independence in this population of road users.

Previous research on interventions for improving driving skill in older adults indicate that off-road education interventions such as safety workshops and classroom based programs improve knowledge of road rules but do not translate into improvements in on-road safety (Ackerman et al., 2010; Jones et al., 2012). A few small studies suggest that on-road training (Bedard et al., 2008; Marottoli et al., 2007) and video-based feedback on driving errors (Porter, 2013) may lead to improved on-road safety. However, these studies did not examine the impact of training on critical errors that lead to crashes.

The ANU Better Drive project used a two-arm randomized controlled trial (RCT) to investigate the efficacy of individually tailored driving refresher lessons against a group-based refresher course, on on-road driving performance and safety in older adults. By examining safety ratings as well as the incidence of critical errors that could have led to a crash, the study was able to examine the effect of the intervention on crash risk.

Fifty five drivers aged 65 years and above completed the program. All were recruited from the community, were fully licensed, reported not planning to cease driving, and had not undertaken driver education in the past 6 months. Participants were assessed at baseline for cognitive and sensory function. Participants also had a dashboard camera fitted to their private car for a period of two weeks to collect video footage of their daily driving behaviour. All participants then undertook an on-road driving assessment in a dual-brake vehicle with a driving instructor and a driver-trained occupational therapist. The driving assessment occurred on a standard route, and employed a standard scoring procedure. Video footage of the on-road test was also obtained. The occupational therapist then produced a report of the results of the on-road assessment and specific skill deficits of the driver with accompanying video footage of errors.

Following the baseline assessments, all participants took part in a class-room based road rules refresher course given by a driving instructor. This two-hour course provided details on the impact of ageing on driving, tips and resources to compensate for such changes, road rules, defensive driving tips, and an opportunity to discuss current driving practices with the instructor. The study statistician then randomly allocated participants to one of two groups, maintaining an even balance of gender and age range between the two groups. One group (n=28) received no further intervention, while the other group (n=27) received two, one-hour individual on-road driving lessons with a driving instructor. The instructor tailored the lesson to the individual’s skill level by using the baseline assessment report and accompanying video clips to provide feedback and target the training. Approximately 12-weeks following the initial baseline testing, all participants returned to complete cognitive and sensory assessment, two weeks of dashboard camera footage of everyday driving, and an on-road driving assessment with a driving instructor and driver trained occupational therapist.

The main outcome measure for determining the relative efficacy of the interventions was change in performance on the on-road assessment from baseline to follow-up. Statistical analyses using intention to treat approach indicated that there was a significant improvement in safety in both groups. Importantly, critical errors during the on-road test (i.e., those that would lead to a crash) declined at a faster rate in the group receiving tailored lessons relative to the group receiving only the workshop. The tailored lessons group also improved more on the on-road safety rating compared to the workshop group. Furthermore, the percentage of unsafe drivers who were classed as safe after intervention was 64% for the tailored lessons group and 25% for the workshop only group.

These findings indicate that although class-room based road rules workshops for seniors can lead to improvements in on-road driving skill, the inclusion of tailored driving instruction can significantly enhance safety and reduce crash-causing on-road errors relative to class-room based workshops alone. Further work on the dataset will determine whether the gains are maintained over a 6-month period and whether measurable improvements occur during everyday driving based on the dash cam footage. The findings have significant implications for effective methods for maintaining older driver skills and safety.

References

Ackerman, M. L., Crowe, M., Vance, D. E., Wadley, V. G., Owsley, C., & Ball, K. (2010). The Impact of Feedback on Self-rated Driving Ability and Driving Self-regulation Among Older Adults. *The Gerontologist, 51*, 367-378.

Bedard, M., Porter, M. M., Marshall, S. C., Isherwood, I., Riendeau, J., Weaver, B., . . . Miller-Polgar, J. (2008). The Combination of Two Training Approaches to Improve Older Adults' Driving Safety. *Traffic Inj Prev, 9*, 70-76.

Dugan, E., Barton, K. N., Coyle, C., & Lee, C. M. (2013). U.S. Policies to Enhance Older Driver Safety: A Systematic Review of the Literature. *Journal of Aging & Social Policy, 25*(4), 335-352.

Edwards, J. D., Lunsman, M., Perkins, M., Rebok, G. W., & Roth, D. L. (2009). Driving Cessation and Health Trajectories in Older Adults. *Journal of Gerontology: Psychological Sciences, 64A*, 1290-1295.

Jones, V., Gielen, A., Bailey, M., Rebok, G. W., Agness, C., Soderstrom, C., . . . Parrish, J. (2012). The effect of a low and high resource intervention on older drivers’ knowledge, behaviors and risky driving. *Accident Analysis and Prevention, 49*, 486-492.

Marottoli, R. A., de Leon, C. F. M., Glass, T. A., Willians, C. S., Cooney, L. M., & Berkman, L. F. (2000). Consequences of Driving Cessation: Decreased Out-of-Home Activity Levels. *Journal of Gerontology: Social Sciences, 55B*, S334-S340.

Marottoli, R. A., Van Ness, P. H., Araujo, K. L. B., Iannone, L. P., Acampora, D., Charpentier, P., & Peduzzi, P. (2007). A Randomized Trial of an Education Program to Enhance Older Driver Performance. *Journal of Gerontology: Medical Sciences, 62A*, 1113-1119.

Porter, M. M. (2013). Older Driver Training Using Video and Global Positioning System Technology—a Randomized Controlled Trial. *Journal of Gerontology: Medical Sciences, 68*, 574-580.

Windsor, T. D., Anstey, K. J., Butterworth, P., Luszcz, M. A., & Andrews, G. R. (2007). The Role of Perceived Control in Explaining Depressive Symptoms Associated With Driving Cessation in a Longitudinal Study. *The Gerontologist, 47*, 215-223.