

Older Driver Training: What Works?

Loren Staplin, PhD
Managing Partner
TransAnalytics, LLC



“Validation of Rehabilitation Training Programs for Older Drivers”

NHTSA Project Manager: Dr. Kathy Sifrit

Research context: Age-related declines in functional abilities needed to drive safely threaten a mode of travel—and the independence it provides—that is widely preferred by elderly persons for reasons of comfort, convenience, and security. In the U.S., an industry has emerged offering a range of competing products and strategies designed to help seniors keep “driving safely longer,” that is largely unregulated and for which independent studies of effectiveness are virtually nonexistent.

Research objective: Examine the effectiveness of four types of training techniques designed to improve (or maintain) the driving performance of healthy (normally aging) adults.

Research Approach

This study was designed to compare the (on-road and simulator) performance of drivers 65 and older in each of four treatment groups with that of a control group before training (Drive 1), immediately after training (Drive 2), and again after a 3-month delay (Drive 3). The control group received a neutral intervention of equal contact time to each of the treatments.

Training Activities (Treatments)

1. Classroom driver education delivered in a group setting, supplemented by an hour of one-on-one, behind-the-wheel instruction.
2. Computer-based exercises designed to improve speed of visual information processing and divided attention.
3. Occupational therapy (OT)-based exercises to improve visual skills and attention.
4. Physical conditioning to improve strength, flexibility, and movement.

Study Sample

- Twenty volunteer older drivers recruited at the Roger C. Peace Rehabilitation Hospital in Greenville, South Carolina, were randomly assigned to each training group, as well as to the control group, for a total of 100 participants.
- Attrition over the course of the study reduced the number who finished the post-treatment assessments and were included in analyses of training effectiveness to between 15 and 17 participants per group.
- Driver age across groups ranged from 64 to 85 years; mean 72.5; s.d. 5.6. 63% male (mean age 73.3), 37% female (mean age 71.1). By group, mean age ranged from 71.5 to 74.1. All were active, healthy drivers.

On-road Performance Evaluations

- Conducted by a CDRS who was blind to each driver's group assignment.
- Involved different routes of equal driving difficulty to counter practice effects.
- Performance was scored on 33 subscales comprising tactical and strategic driving tasks; a 4-point scale was used to score how often a driver evidenced a particular skill or behavior, in relation to the number of opportunities to demonstrate it afforded during each on-road assessment.
- Feedback was provided to study participants about their driving only after the delayed post-treatment assessment (Drive 3), at which time the CDRS also asked for participants' feedback on the utility of the training activities they were exposed to during the study.

Research Hypotheses

The stated goal of each training activity was to preserve or enhance safe driving behavior. Therefore, our research hypotheses were that:

- (1) each training group will have a higher percentage than the control group of *drivers without deficits at baseline* who *maintain* their performance at the immediate and/or delayed post-treatment assessments; and
- (2) each training group will have a higher percentage than the control group of *drivers with deficits at baseline* (Drive 1) who *improve* their performance on Drive 2 and/or Drive 3.

Study Findings

- The only treatment group to demonstrate a significant gain relative to the control group, in the percentage of drivers without performance deficits at baseline who maintained their skills on subsequent evaluations, received the occupational therapy-based exercises to improve visual skills and attention. This effect was significant at $p < .05$ at Drive 2 and at $p < .01$ at Drive 3.
- For the few drivers who demonstrated some deficiency on the baseline assessment, two training groups achieved significant ($p < .05$) gains relative to the control group in the percentage of participants who improved their performance on the *immediate* post-treatment evaluation: the OT-based exercises group and the classroom plus behind-the-wheel training group.

Study Findings (con't.)

- Among drivers who demonstrated some deficiency on Drive 1, *none* of the training groups achieved significant gains (relative to the control group) on Drive 3.
- There were no significant gains *for any of the treatment groups* on post-versus pre-training performance in the simulator (which emphasized attention and divided attention tasks) compared to the controls.
- More study participants perceived practical value for the classroom plus one-on-one, behind-the-wheel training than for any other intervention; although significantly more drivers also agreed that, “*The training I received will help me be a safer driver,*” in the OT-Administered Training and Physical Conditioning groups than did controls.

Discussion

- Study limitations included: small sample size; ceiling effects for performance evaluations; performance during training was not considered when evaluating transfer-of-training to driving.
- Also worth noting: the interventions that may tentatively be identified as most effective required personal administration by specially trained staff; therefore are most expensive.
- A positive sign: the OT-Administered Visual Skills Training, which showed the strongest gains relative to the control group, can be administered by (trained) OT professionals *without* the CDRS credential.

For More Information

NHTSA TRAFFIC TECH, “*Training for Healthy Older Drivers.*” Report No. DOT HS 811 771. May 2013.

Staplin, L., Lococo, K.H., Brooks, J.O., and Srinivasan, R. (2013). “*Validation of Rehabilitation Training Programs for Older Drivers.*” NHTSA Technical Report No. DOT HS 811 749.