Improved driving performance of elderly drivers (70+ years) by training in real traffic: a control group based study

Ageing and Safe Mobility

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The study was funded by the Eugen-Otto-Butz-Stiftung and was conducted at the Leibniz Research Centre for Working Environment and Human Factors (IfADo) in Dortmund, Germany.
Train the (weaker) elderly drivers!

But, WHY????
Because we will all be (weaker) elderly drivers soon!
Driving license holders in Germany by age and gender (2002, 2008, 2023)

- Demographic change:
  Estimated percentage of driving license holders in 2023 in Germany

[Image of line graph showing percentage of driving license holders by age and gender for 2002, 2008, and 2023.]
Age-specific problems

- With increasing age, however, specific changes of sensory, cognitive and motor functions occur.

- Cognitive problems of the elderly caused by multiple tasking are scientifically well documented.

- There are typical accidents of elderly drivers.
Age-specific accidents

Cause of accidents with personal injuries/casualties in 2013 per 1,000 drivers by age group

- Speed (inadequate)
- Right of way / yielding
- Alcohol

Age from.....until under .....years

Source: Statistisches Bundesamt, 2014
Training of the elderly

• We would like to know, whether professional training of complex situations in real traffic can improve performance of elderly drivers

and

how long such professional training will have an effect on elderly drivers

because

elderly people should take part in social life as long as possible.
Design of the study

- A total of $n = 120$ persons took part

- 92 elderly drivers (70 years+) distributed randomly in two groups (50% men, 50% women)

- 46 elderly drivers received professional training
  ($M = 72.6$ years, “treatment group”; $SD = 2.88$)

- 46 older people acted as control group
  ($M = 72.7$ years; “feedback only group”; $SD = 3.40$)

- 28 people aged 40-50 acted as “reference group”
  ($M = 44.3$ years; one-time test drive, base line for driving performance; $SD = 3.35$)
• The test track (yellow) in Dortmund with black spots (blue and red).
• Intersection Märkische Str.: 3 times to pass through from different directions!
Test track: several black spots

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Standardized assessment: TRIP-protocol
Main Effects

- Main effects:

- Experimental group: training + feedback

- Control group: feedback only

- Red = reference group
Outcome: huge benefit for weaker drivers!

- Main effects on sub-groups:
  
The 5 best and the 5 weakest drivers of both groups

- Red = reference group
Result: who benefits most from training?

- **Main effects (in detail):**
  
  **Training group**
  
  - Red = reference group

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|                   | TRIP 1            | TRIP 2            | TRIP 3            | TRIP 4            |
|                   | Before training   | After training    | Approx. 3 months  | Approx. 1 year    |
| Absolute change of driving performance |                   |                   | after training    | after training    |
| 5 best drivers experimental group |                   |                   |                   |                   |
| 5 weakest drivers experimental group |                   |                   |                   |                   |
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Performance of the Reference Group

The 5 best and 5 weakest drivers of training group
Result: who benefits most from training?

- **Main effects (in detail):**

  Feedback only group

- **Red = reference group**
Main conclusions:

Have weaker elderly drivers trained professionally!

They benefit most from training.

Simple feedback works too.
• Training and feedback have a long-term effect.

• The elderly drivers were not aware about their learning potential (follow-up interviews).

• Use standardized analysis (e.g. TRIP protocol) and professional training methods in real traffic!
In 2012 this study received the
German Road Safety award (1st Place)
from the Federal Minister of Transport
Dr. Peter Ramsauer

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