SUPPORTING OLDER DRIVER MOBILITY AND EFFECTIVE SELF-REGULATION

DR JULIE GANDOLFI

DRIVING RESEARCH LTD

THE CHALLENGE

- The older driver population is increasing rapidly around the world
- Many older people need to drive in order to maintain their lifestyle
- They expect to be able to keep driving for longer into old age
- They do not have a single shared set of characteristics
- Overall they have relatively low crash frequency but high fragility
- The traffic environment is becoming increasingly demanding
- The relationship between the driver and the vehicle is changing

We need to understand:

- What does the relationship between age-related decline and driving performance look like?
- How is the relationship between older drivers and increasing vehicle technology developing?
- What strategies can be used to design interventions that will be effective?

AGE-RELATED IMPAIRMENT

- Physiological and visual impairment
  - Objective measures are widely used
  - Direct pathways exist from assessment to intervention
  - Visual impairment is the common focus for age-based driver legislation

- Cognitive impairment
  - Mild Cognitive Impairment (MCI) is common in over-70s
  - Linked to reduced situational awareness
  - Capability to deal with increased workload is affected
  - Lower confidence and higher anxiety are common
  - Research findings relating MCI and driving risk are mixed, but high levels of self-regulation are observed

MEASURING COGNITIVE IMPAIRMENT

- No cognitive assessment is proven to directly predict MCI effects on driving capability – too many extraneous variables
- Assessments tend to measure optimal performance not typical performance
- Some assessments measure components linked to performance, e.g.
  - Trail Making Test measures general cognitive function associated with crash risk
  - Useful Field Of View (UFOV) measures visual processing capability, with strong links to time-to-collision estimation and crash frequency

MEASURING IMPAIRED DRIVING

OLDER mobility

Vehicle telematics

Objective data to help understand older driver risk patterns and determine individual driver needs

- The 100 Car Study detected differences in frequency of high “G” events between crash-involved and uninvolved older drivers
- Speeding events tend to be low level, associated with inadvertent speeding, so awareness can be increased through notification
- Requires minimal third party input – low cost, always watching

On road assessments

Less objective but can provide more detail on an individual level

- Best used on driver-selected routes, for maximum application to real-life driving demands
- Assessors can provide feedback and advice specifically tailored to individual requirements
- Snapshot in time, may not represent broader performance
- Standardised comparisons between drivers are more difficult, but some systems have achieved this (e.g. eDOS)
- Potential for subjective bias or inter-rater reliability issues

STRESS, CONFIDENCE AND TECHNOLOGY

- Higher than expected levels of acceptance of vehicle technology
- Gender differences around acceptance
  - Men focused on perceived usefulness
  - Women focused on perceived usability

PERCEPTIONS OF TECHNOLOGY

- Perceived safety benefits highest for:
  - Navigation systems
  - Blind spot warnings
  - Lane departure warnings
  - Collision warnings
  - Parking assistance systems

- Navigation systems are associated with concerns about distraction, but have been found to reduce workload (particularly landmark-based systems with audio guidance)

BARRIERS TO ENGAGEMENT

- Concerns identified primarily around
  - Reliability
  - Complexity
  - Cost
  - Risk of distraction
- Lack of training on assistive systems
- Difficult to embed usage in daily driving – habit formation takes time

HIGHLY AUTOMATED VEHICLES

- Many older drivers have concerns over safety of self-driving vehicles

- Key risk areas:
  - Challenge of maintaining situational and mode awareness when in self-driving mode
  - Ability to take control appropriately when required

EFFECTIVE INTERVENTIONS

- There is huge variation among the older driver population – certainly not a homogeneous group
- Interventions must be targeted to specific individual needs in order to be effective
- Identifying needs is difficult – no gold-standard assessment has been identified
- Attracting older drivers in need of training is difficult – schemes tend to attract the most highly functioning and self-aware

SELF-REGULATION – THE GOLD STANDARD INTERVENTION

- Interventions should focus on increasing self-awareness, to encourage drivers to engage in a continuous process of self-appraisal and behavioural modification

- Some tools have proven useful in supporting this process
  - Driving Decisions Workbook – increases awareness of deficits, triggering self-regulation
  - OSCAR – increases interest in discussions about driving, improves awareness of age-related declines, encourages use of compensatory strategies

FACILITATING SELF-REGULATION

Feedback mechanisms may assist drivers in calibrating self-appraisals

- Vehicle feedback, e.g. Trip Diary
  - Objective system providing automatic feedback and suggestions on route choices to reduce stress and workload
  - Proven very effective in a US study
- Third party feedback, e.g. family, friends
  - Can create barriers and discomfort for all parties
  - Subjectivity can lead to inconsistent feedback
  - Embedding positive age stereotypes in the cultural belief system is likely to encourage participation in collaborative monitoring of older driver performance

ADDITIONAL SUPPORT

- Specific interventions could target sub-groups requiring further support, e.g.
  - Refresher training for older drivers who have had a break from driving
  - “Oldest old” training, focused on specific challenges faced by that group

- Interventions focused on forward planning would be beneficial
  - encouraging adaptation in preparation for a time when it is necessary to reduce driving and ultimately stop
  - good planning and implementation of social support mechanisms reduces trauma and negative effects linked to driving cessation

CONCLUSIONS

- Older drivers are an immensely varied group who cannot be targeted with a set of standardised interventions
- Developing self-regulation skills is key to improving older driver safety
- They have an increasing amount of technological support available
  - For self-awareness calibration
  - To assist them in performing the driving task
- They aren't as resistant to technology as may be expected – they just need to understand what they can have, what it does, and how they can use it to help them
- Preparing adequately for the eventuality of driving cessation makes it much less traumatic if and when it happens

www.racfoundation.org/wp-content/uploads/Supporting_older_driver_mobility_Gandolfi_January_2020.pdf

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JOHN PLOWMAN

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DAN CAMPSALL

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