In-vehicle technology and the older drivers: debates, skills and attitudes

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The Centre for Transport & Society (CTS) based at the University of the West of England, Bristol (UWE) is an energetic multi-disciplinary academic grouping examining the two-way link between society and transport. Research at the centre to date has involved intelligent transport systems, transport planning, travel behaviour and modelling, transport policy, transport economics, public transport services and transport futures (see www.transport.uwe.ac.uk). A growing strand of work at CTS is on older people and travel behaviour.

The population of older people in the United Kingdom (UK), and indeed most of the ‘western world’, is ageing (ONS, 2010). Older people are increasingly fit and well and hence more active and mobile than ever before. They are more likely to be drivers and have driven most if not all of their adult life and are also driving more miles than previous generations.

Older people face a decrease in quality of life when they give-up their car which can result in isolation, loneliness and depression (Musselwhite and Haddad, 2010b). This is not just as a result of a reduction in ability to get from A to B, but is also to do with a feeling of loss of control, perceived independence, and simply not feeling like a “normal part of society” anymore (Musselwhite and Haddad, 2010b).

One way of reducing the negative impact of giving-up the car is naturally to prolong driving for older people. But is it safe for older people to be driving on the roads? Older people do pose a greater danger on the road than middle-aged drivers and are more likely to be represented in killed or seriously injured even when both frailty and accidents per mile driven are taken into account (do note though that older people are nowhere near as dangerous as the drivers aged 17-21 years of age) (see figure 1; DfT, 2009). They specifically are over represented in accidents at:-

- Junctions;
- in merging traffic;
- with right-hand turns (when driving on the right) and;
- in busy traffic (see Clarke et al., 2009 for review)

And mention having problems with:-

- increased fatigue;
- poorer reactions (for example, on average, drivers over 55 take 22% longer to react than drivers under the age of 30 years);
- difficulty with glare and luminance (for example, average recovery time from glare at age 16 is 2 seconds whereas at age 65 is 9 seconds and 75 year old driver requires 32 times the brightness to be able to see the same scene they did at age 25) and;
- difficulty keeping a consistent constant speed (difficulty in detecting changes in feedback from the vehicle speed and difficulty in keeping foot pressed to the floor in the same position for long periods of time) (Musselwhite and Haddad, 2010a).
Figure 1: Road user casualties per mile driven by age (after DfT, 2009)

So, how might such issues be overcome? Some drivers compensate by not driving in busy traffic, in the rain or in darkness, for example. Training and education is welcomed by older people, but there is little research evidence to date that suggests this works at improving skills. Re-testing at 65 (and then possibly again at regular intervals) has also been proposed, but there is little evidence from countries that do this to suggest it makes any difference to the road traffic accident rates of older people (see Box et al., 2010).

CTS, in a study sponsored by the Strategic Promotion of Ageing Research Capacity (SPARC) (an initiative formed by both the Biotechnology and Biological Sciences Research Council and the Engineering and Physical Sciences Research Council), has been looking at how in-vehicle technology might be a solution. There are plenty of intelligent in-vehicle systems that could aid an older person’s driving including those that take-over some of the driving task such as intelligent speed adaptation and (adaptive) cruise control and those that provide extra information and suggested driving changes such as Fatigue Detection System, Current Speed Warning, Collision Advice System, Lateral and Trajectory Position Warning. But in terms of skills and ability the very factors that cause older people to contemplate giving-up driving are often similar aspects they’d struggle with in terms of using new technologies, including:

- More likely to be distracted by the technology
- Take longer to notice feedback given by the technology
- Less likely to notice subtle feedback given by the technology
- Take longer to process information given by the technology
- Different cognitive processing ability coupled with different norms and experience (e.g. they tend to prefer logical one-step one-function buttons rather than bracketed step-through menu driven items).

Hence, it would seem best to have technologies that take over some of the driver’s tasks rather than provide extra feedback that might not be noticed or could distract the driver further. However, this is not popular...
amongst older people who would prefer information systems. They want to be able to think for themselves and make their own judgements as they have done all their lives, as one focus group participant said to me in a research project,

“Generally the older generation have a different culture to the present generation, as we were not brought up on the computer. We tend to think for ourselves and not rely on the process that computers take you through. Also, Health and Safety regulation was not around when we were younger. Again we had to think for ourselves and make our own judgments.”

(Dennis, Older driver, see Musselwhite and Haddad, 2007)

However, it’s not all bad news and there is plenty of evidence to suggest such technologies should be developed with the older driver in mind. The older cohort changes all the time and although the youngest older people are more wedded to their car than the oldest older people, they are also more likely to have used technology throughout their life. Hence they may well be more open to technology that takes over driving tasks. In addition, almost all research suggests that older people become more accepting of technology when they have actually had a go with it and older people tend to be laggards rather than technology refuter, that is they utilise technology after they observe others using it and getting on with it well. Older people also want this modern technology in their car to aid their driving but not technology that makes their car look like an older person’s car; perhaps the day of spinners and pedal extenders are limited!

At the end of the day if it were a decision between giving up driving and driving with technological aid, then older people would choose the latter, so long as they had been developed with careful consideration of older people’s needs and limitations. Further research needs to be undertaken to develop such technology, working closely with older people themselves. For more information see a summary at http://www.sparc.ac.uk/media/downloads/executivesummaries/exec_summary_musselwhite.pdf

References


\[\text{This is a pre-print version of the paper. Final version of paper is found at Musselwhite, C. (2010). In-vehicle technology and the older drivers: debates, skills and attitudes. *Ignite Bulletin - The Society of Motor Manufacturers and Traders Limited*. Issue 1, November, pp. 5-6.}\]