



Strategic Promotion of Ageing Research Capacity

Prolonging Safe Driver Behaviour Through Technology: attitudes of older drivers

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Prolonging Safe Driver Behaviour through Technology: attitudes of older drivers

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Being able to drive is growing in importance for an increasingly mobile older age group. Older drivers want to be able to keep driving safely for as long as is possible, and so are enthusiastic about the development of technologies which may enable them to do this. Despite a general understanding of the dependence of older people on being able to drive, little is known about the actual travel needs of older people and the many different ways in which being able to drive affects their overall well-being. Focus groups and interviews with both older drivers and those who had recently given up driving were conducted in order to understand their needs, attitudes and preferences towards travel and driving. The study uncovered a range of issues which have been so far overlooked by planners, car designers and those who advise older people about their life styles.

Key Findings

- Older drivers generally have a positive attitude towards their abilities behind the wheel. Older drivers stated they were better than the average driver and also they felt they were better than when they were younger. They feel this is partly due to being under less time pressure, having better hazard perception, and experience giving the ability to read the road ahead. The findings from this study challenge some of the wide-held beliefs that older people are not aware of their driving behaviour and limitations.
- Older drivers needs can be split into three categories: *practical* (for example, getting to the shops and doctor's surgery); *social* (visiting friends and attending functions); and *aesthetic* (enjoying the countryside, other towns, fulfilment of independence and control over one's life). Understanding social and aesthetic needs is crucial to a proper understanding of older drivers. This will inform how older drivers can be best supported, so that they can continue to drive safely, as well as enabling these needs to continue to be met when they give up driving.
- Driving issues included: problems with signage; maintaining a consistent speed; tiredness and fatigue; longer reaction times; parking; reversing; dazzle and glare from the sun and other drivers lights at night; junctions (especially joining motorways); and overtaking.
- Female drivers are more likely than male drivers to make the decision to give up driving. This was found to be either as a result of self-diagnosis (because they felt they no longer had the ability) or due to a specific incident. Male drivers are more likely to give up driving because they are told to do so. The realities of giving up driving were found to be different to those which were expected. In general, men were often devastated, whilst women were more philosophical about this.
- Older people tended to want technology which would enhance feedback; professional designers would rather have technology that takes over part of the driving task. Of the technologies considered, displaying road speed in-vehicle with additional speed cues, and displaying road signs in-vehicle would be worthwhile pursuing further. Older drivers felt that night vision was likely to be distracting though.
- Professional designers need to take more account of older people, adopting a more human-centred, inclusive design approach.

Introduction

The Issues

The number of older people in the UK is growing and will continue to grow well into the future. Increasingly, older people are continuing to be mobile for longer, with more travelling by car than ever before.

For many reasons, older people as a group have the most difficulty accessing local amenities, such as shops, banks and hospitals. Reduced mobility can have serious consequences for mental wellbeing and is a major cause of depression.

Background

Contrary to popular belief, older drivers do not present an excessive risk to other road users: they engage in less risk-taking behaviours than younger drivers. However, because of their increased frailty, they are more likely to be seriously injured or killed in accidents.

New in-vehicle technology, termed Advanced Driver Assistance Systems (ADAS) and Advanced Vehicle Control and Safety Systems (AVCSS), are thought to reduce the likelihood of accidents. Studies of older drivers and of these technologies are scarce though, and they show mixed results.

Previous studies have largely treated drivers as one group of people. When they have considered older drivers, they have not distinguished between the younger-old and older-old. Interestingly, an understanding of the attitudes of older drivers has been ignored, even though these are important for ensuring adherence and acceptance of new technologies. Most of the previous research has been non-participatory, has not been people-centred and has rarely used techniques such as interviews.

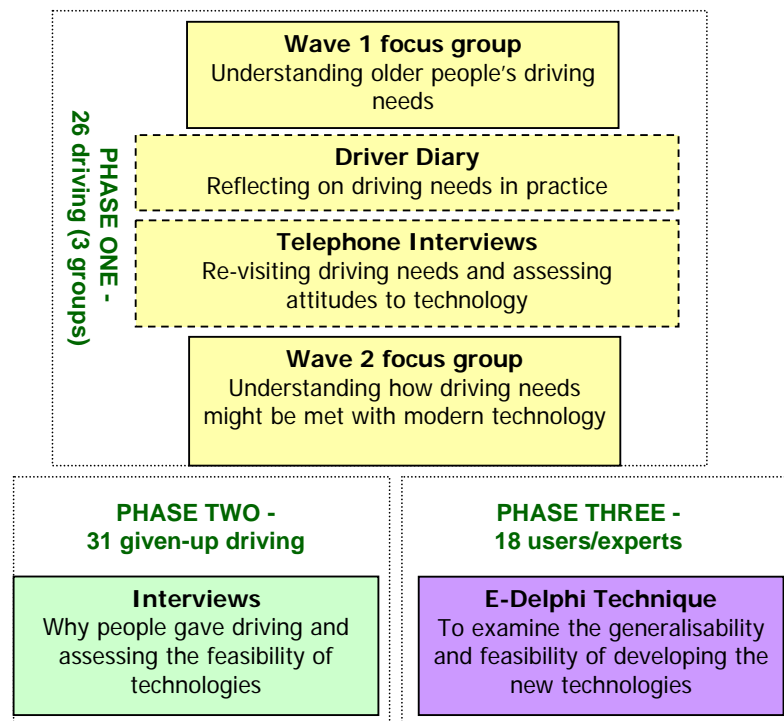
The Aim

The study aimed to critically examine whether new technological advances in AVCSS are actually able to aid driver safety, and therefore prolong driving for older drivers in the UK.

Linked to this aim were numerous other objectives. These included understanding the needs of older drivers, the potential of AVCSS to meet these needs, and the acceptability of such technologies to older drivers.

The Study - Overview

The study adopted an approach in which older drivers became co-researchers within the research team, and participated throughout the research process. The study had three phases, and started with a comprehensive assessment of older driver's travel needs and requirements. It also looked at their attitudes and acceptability of potential new in-vehicle technologies.



Three Phase Methodology

Three phases

The three phases were:

- Phase 1: three focus groups consisting of current car drivers. Participants in these three focus groups took part in two waves of meetings, a short telephone interview, and a diary task.
- Phase 2: interviews with older ex-drivers who, for one reason or another, had stopped driving. The objective was to examine why they had stopped driving, and to propose new technologies to assess how useful they could have been prolonging their driving.
- Phase 3: Electronic-Delphi Technique (E-Delphi) in which a group of 'experts' examined the extent to which the new technologies which had been discussed in Phases 1 and 2 were feasible and could be developed.



Phase 1 focus groups in action.

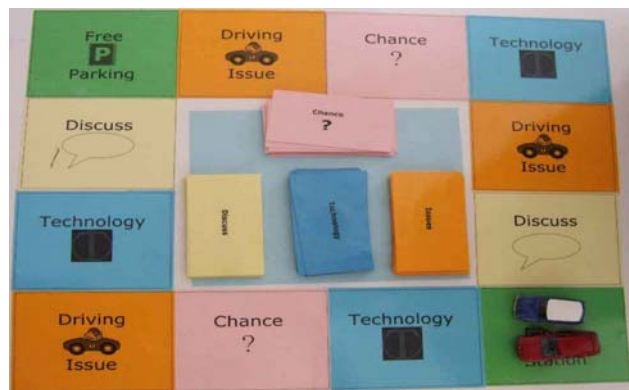
Participants

There were twenty six participants in Phase 1: 18 men and 8 women. The ages of participants ranged from 68 to 90 years old, with an average age of 75. All had a current driving licence; owned, or had access to, a car; and drove an average of 109 miles per week. Participants came from urban, rural and semi-urban areas in the largely rural county of Dorset. This county has a large proportion of older people in the population.

A number of approaches were used to stimulate discussion, including a specially designed board game which proved very successful in prompting the discussion of individual experiences and insights.

Phase 2 involved thirty one participants: 18 men and 13 women. The participants were aged between 65 to 92 years old with an average age of 76. All had given up driving between 6 and 18 months prior to the study. Participants were recruited from urban, semi-urban and rural areas of Dorset, Devon and Cornwall; three largely rural counties with a high proportion of older people. On average, participants drove 91 miles per week prior to giving up driving.

Eighteen 'experts' were identified and contacted to take part in an E-Delphi discussion. These eighteen consisted of four people from the focus groups; eight from industry (four car designers and four technology manufacturers); and six academics (from disciplines such as ergonomics, human factors, transport psychology, engineering and sociology).



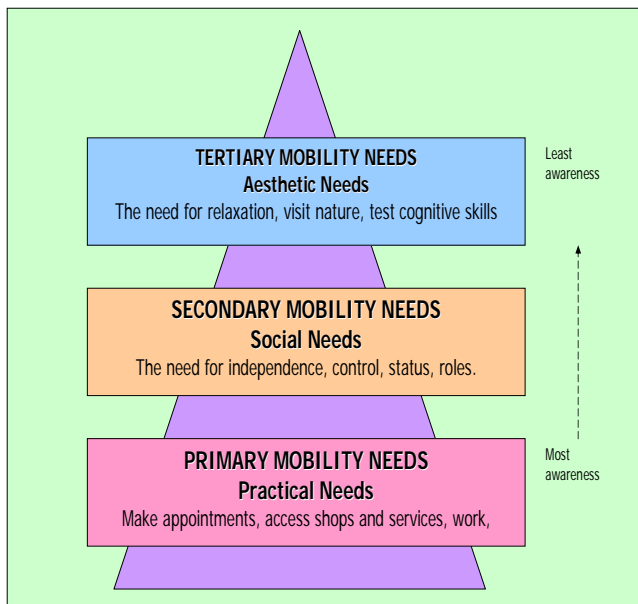
Board-game used in Phase 1 focus groups

Findings

Older People's Travel Needs

The study showed that participants travelled for a variety of reasons: *practical* (primary) needs, *social* (secondary) needs and *aesthetic* (tertiary) needs.

- Practical - to get from A to B in order to access services, shops and the like, in a safe, comfortable and reliable way.
- Social - for fulfilment, independence, control and status that travel can fulfil.
- Aesthetic - for travelling for its own sake; for instance, to enjoy viewing scenery and to enjoy the physical act of movement and travelling.



Triangle of older drivers' travel needs

Participants were very conscious of practical needs, but less aware of social needs and even less so of aesthetic needs, although these are very important to them. The implication of this is that interventions aimed at meeting travel needs often only concentrate on the most articulated practical needs. Despite anxiety over this level of need not being met when older people give up driving, this is not the case; this study found that practical needs are largely met. Older people continued to be able to travel to go shopping and access services. However social and aesthetic needs tended to be unmet when driving was given up.

This is very clear from the following quotations.

"Until I moved into my (retirement) flat, I loved looking at my garden, how it changes throughout the seasons. With my car, at least, I can still visit parks and the forest regularly to watch them change." (Female driver)

"We go down to the coast regularly to see the sea. I love being by the sea. We couldn't do it if we didn't have a car." (Male driver)

"Sometimes I take the long way round to drive past the forest and see the trees, especially in Autumnn." (Male driver)

Older People's Driving Needs

On the whole, the older drivers considered that they were better than the average driver and also they felt they were better than when they were younger drivers. They thought they had a better attitude, had less time pressures, had better hazard perception skills, and that experience meant that their ability to read the road ahead was enhanced. Men were particularly attached to their cars and to driving.

"It is the one thing that allows me to compete with youngsters. It is something I can probably still do as well as when I was a young man. I feel able to be part of society." (Male driver)

"My friend had a Honda. He loved it. Me and him think alike a lot, so I thought I'll get one next time I need one and now I drive a lovely Honda." (Male driver)

However, major issues which the drivers encountered included: problems with signage; maintaining a consistent speed; tiredness and fatigue; longer reaction times; parking; reversing; dazzle and glare from the sun and other drivers' lights at night; junctions (especially joining motorways); and overtaking. A range of physiological, cognitive and psychological reasons for these issues were discussed.

Giving Up Driving

The youngest of the 31 participants who had given up driving did so at 65. The oldest gave up at 91 years of age. The average age for giving up was 74 years.

The interviews with the ex-drivers identified four main triggers for giving up driving:

1. a form of self-diagnosis (7 male, 8 female);
2. the influence of friends and/or family pressure (6 male, 3 female);
3. the consequence of a specific incident or event (2 male, 3 female);
4. being forced by a medical professional (3 male, 0 females).

Male drivers were more likely than female drivers to need to be told to give up driving. Female drivers were more likely to decide for themselves when to give up driving, either through self-diagnosis or due to a specific incident.

Attitudes to giving up driving and coming to terms with this varied greatly.

"It's hard to explain I suppose. You just don't seem like you belong. I suppose yes, there are feelings that you might be ready for the scrapheap now. The first step to it, you know." (Male, gave-up at 76)

"You can't ask other people to take you out for 'a drive'. They'd think you'd lost their senses. Anyway they have got better things to be doing with their time, then ferrying me about just for the sake, like." (Female, gave-up at 80)

"To be honest I'm not sure it's mattered as much as I expected it to. I haven't changed as a person. I'm still me. I thought it'd be awful." (Male, gave-up at 79)

"You get used to it. You realise you're not alone and there is help to get you out and about from a variety of sources." (Male, gave-up at 78)

"Well, you know, I realise how expensive it was just having a car sit there, let alone use it. I certainly save money now." (Female, gave-up at 72)

"Well Dorothy and David from number 3 take me shopping every week, we all go, we have a bit of a time of it you know, it's a kind of outing. I never expected that. I thought people like to, you know, keep themselves to themselves." (Female, gave-up at 80)

Advanced Driver Assistance and Information Systems

Initially, as a consequence of the focus groups, three areas of advanced driver assistance and information systems were thought to be potentially useful by older drivers in terms of meeting their needs.

- *Displaying road speed in the vehicle with an additional speed cue* – a system linked to a satellite which displays the speed which the vehicle is travelling at and alerts the driver when the speed limit is either about to be reached, has been reached, or is over by a certain amount.
- *Displaying road signs in-vehicle* – a system linked to satellite that displays some of the key signs on the dashboard or by head-up display (a transparent display on the windscreen that presents data without obstructing the user's view; initially developed for aviation, but now used in some cars).
- *Night Vision* – enhancement to vision of the road at night and how this might be displayed to the driver could be investigated.

Each of these technologies was presented to the expert group, which included older people, for consideration. The subsequent discussion highlighted the fact that older people tended to want technology that would enhance feedback but leave them in control of the vehicle, whilst 'professionals' would rather develop technology that took over part of the driving task.

Following this discussion, the specific technologies which were identified for further investigation included:

- a system of auditory feedback on the current vehicle speed;
- intelligent speed adaptation;
- a system to display road signs (either on the dashboard and/or through head-up display).

The older people felt that night vision would not be helpful as it would potentially add to distractions, and this was not short-listed for further investigation.

Discussion and Implications

This study has provided valuable evidence about the central and critical role that driving plays in the lives of older people; it also highlights the negative impact arising from giving up driving, especially on men. This has helped to build an understanding of older people's travel needs, and their attitudes to advanced driving technologies.

This understanding is assisted by a model which identifies three main travel needs: practical, social and aesthetic. Significantly, the model will help policy makers to understand the potential importance of meeting the social and aesthetic travel needs of older people. These needs can be, and often are, overlooked.

These important dimensions have been revealed by an inclusive research approach, which has involved older people throughout the research process. In turn, this has ensured that older people are able to shape the research, and maximise the benefits of the research outcomes for themselves and their age groups.

The study has also revealed that there is a difference between what older people expect of technological developments, and what designers actually provide. Older people want assistance, but at the same time remain in control of the tasks involved in driving a car; car designers seek to develop technologies which take away some of that control.

Nevertheless, there is a range of technologies which designers and older people could work on together. This would enable designers to understand and take account of the social issues that may mediate or enhance the value of their designs. Certainly, potential technological advances resulting from this project could enable older people to continue driving for longer, whilst retaining confidence in their ability. This could ensure that older people continue to be safe drivers.



Men and Cars

The Research Team



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The Study

The study received financial support from SPARC of £27,564 and ran for 14 months ending in October 2007. Additional support was provided by the University of the West of England.

More information about the study can be found on the SPARC website www.sparc.ac.uk and obtained directly from the investigators.

Collaborators and Mentors

The research was supported by:

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SPARC

SPARC is a unique initiative supported by EPSRC and BBSRC to encourage the greater involvement of researchers in the many issues faced by an ageing population and encountered by older people in their daily lives. SPARC is directed, managed and informed by the broader community of researchers, practitioners, policy makers and older people for the ultimate benefit of older people, their carers and those who provide services to older people.

SPARC pursues three main activities:

Workshops to bring together all stakeholders interested in improving the quality of life and independence of older people.

Advocacy of the challenges faced by older people and an ageing population and of the contribution of research to improving quality of life. SPARC is inclusive and warmly welcomes the involvement of everyone with a relevant interest.

Small Awards to newcomers to ageing research, across all areas of design, engineering and biology and at the interfaces relevant to an ageing population and older people. In 2005 and 2006 SPARC received 185 applications for support in response to two invitations for competitive proposals of which 34 were supported.

Executive Summaries

SPARC is supporting its award holders through funding, mentoring, a prestigious dissemination platform, professional editorial assistance, international activities and provision of contacts. Each of the projects has been small, yet the enthusiasm for discovery, and impatience to contribute to better quality of life for older people, has more than compensated for the very limited funding which was provided.

This executive summary is one of a series highlighting the main findings from a SPARC project. It is designed to stand-alone, although taken with summaries of other projects it contributes to a formidable combination of new knowledge and commitment by newcomers to ageing research, with a view to improve the lives of older people. This is a tangible contribution towards ensuring that older people receive full benefit from the best that research, science and technology can offer.