Using Grounded Theory to Elicit the Driving Needs of Older People

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To come...

• The Issue

• The Research Study

• The importance of travel

• Driving Behaviour

• The future

• Conclusion

• Current and future proposed work
The Issue
Ageing Population

People over 65 rise nearly 60% in the next 25 years - from 9.6 million in 2005 to over 15 million in 2031

- The percentage of the total population who are over 65 is predicted to rise from 16% to nearly 20% in 2031 and 26.6% in 2071

The biggest growth in relative terms will be amongst the oldest old

- The number of people over 85 in the UK is predicted to double in the next 20 years and treble in the next 30.
Background: Older Driver Statistics

- 5,400,000 drivers over 65 in the UK
  - 47% of population over 70 hold driving licence (compared to 15% in 1975)

- 200% increase in male drivers over 65; 600% increase in female drivers over 65 in past 30 years

- Predicted growth
  - 10,000,000 drivers over 70 in the UK by 2050

Percentage of population who are full licence holders (70 years plus)

[Graph showing percentage of population over 70 holding driving licences]

Chart 1: Forecast driving population by age

[Graph showing forecast driving population by age]

Source: ABI forecast
Mobility Deprivation

- Always driven – car based society

- Increasing level of services moving out of town centres and residential zones

- Sense of control over environment

- Driving increases self-confidence, mastery and self-esteem and feelings of autonomy, protection and prestige (Ellaway et al, 2003)

- Giving up driving is associated with an increase in depressive symptoms (Ra et al, 1997)
The Research Study
What could we offer?

Previous research has given us a real mixed bag. It tends to:

• treat drivers as a homogenous group
• Be technologically led
• Ignore attitudes
• Concentrate only on objective measures
Type of Research to Fill the Gap

• Needs-led
  – Attitudes and acceptance

• Bottom-up
  – Driven by end-user

• Participatory
  – Thoroughly involved throughout the research process

• Iterative and Dynamic
  – Responsive and open to change
Methodology

Prolonging the safe driving of older people through technology

**Wave 1 focus group**
Understanding older people’s driving needs

**Driver Diary**
Reflecting on driving needs in practice

**Telephone Interviews**
Re-visiting driving needs and assessing attitudes to technology

**Wave 2 focus group**
Understanding how driving needs might be met with modern technology

**Phase One - 25 driving (3 groups)**

**Phase Two - 31 no longer driving**

**Interviews**
Why people gave up driving and assessing the feasibility of technologies

**Phase Three - 18 users/experts**

**E-Discussion**
To examine the generalisability and feasibility of developing the new technologies
The importance of travel for older people
Travel Needs

TERTIARY TRAVEL NEEDS
Aesthetic Needs
The need for relaxation, visit nature, test cognitive skills

SECONDARY TRAVEL NEEDS
Social Needs
The need for independence, control, status, roles

PRIMARY TRAVEL NEEDS
Practical Needs
Make appointments, access shops and services, work
Driving Behaviour
Background: How Safe are Older Drivers?

- Older drivers are the safest drivers but...

- Taking into account miles driven, there is a slight increase for over 60s age group, which increases for 70+ age group and again for over 80s age group

- Distractions

- Junctions
Reasons for Increase in Accidents

• Visual search problems, divided attention, poor contrast sensitivity, poor judgement of approaching speeds, slow decision making (Clarke, 2009)

• Physiological - eye-sight and hearing problems, restricted physical mobility

• Cognitive - working memory problems, decrease in information processing capacity decision making under pressure

• Psychological - Lack of confidence, anxiety, social norms, stereotypes, labelling
Driver Needs

- External Distractions
- Maintaining a constant speed
- Tiredness
- Reactions
- Glare and luminance
EXTERNAL DISTRACTIONS

- An issue for all drivers, especially older drivers
- Older drivers need to be closer to and need longer to read and process signs
- External (too many signs) and internal (processing time) factors

Technology wanted
“If you have to drive that slow, put on your emergency flashers to warn other drivers. Or better still, wear a hat.”
MAINTAINING A CONSTANT SPEED

- Unawareness of speed limit
- Muscle stiffness
- Feedback
- Distraction and workload
- Accommodation
- Just Noticeable Difference

Technology wanted
TIREDNESS

- Especially on longer journeys
- Especially in unknown areas
- Self-awareness is high
- Compensate by allowing extra time for journeys

Self-awareness accepted
REACTIONS

• Reaction time increases from around 20 years of age

• Drivers over 55 take 22% longer to react than drivers under the age of 30 years

• Compensate with increased headway and slower speeds

Compensation accepted
• Between 16 and 65 susceptibility to glare increases

• Recovery time from glare (the “white out”) at age 16 is 2 seconds, at age 65 is 9 seconds.

• A 75 year old driver requires 32 times the brightness they did at age 25.

Technology wanted
The Future
Driver Needs

- TIREDNESS
- REACTIONS
- EXTERNAL DISTRACTIONS
- MAINTAINING A CONSTANT SPEED
- GLARE AND LUMINANCE

Compensatory Behaviour
Help Wanted
EXTERNAL DISTRACTIONS

Dashboard sign display
- Most preferred amongst older people

Head-up sign display
- Most preferred option amongst car designers, technologists and academics.

- Mixed dashboard & head-up has some support
- User-prioritisation increases popularity.
- Older people also advocate clearer signs and a change in legislation about amount of signs.
Elderly people
MAINTAINING A CONSTANT SPEED

Head-up display of current vehicle speed
- preferred by older people

Audible speed cue
- preferred by older people

Intelligent Speed Adaptation
Audible warning when reach actual speed limit (Advisory ISA)
- Preferred by academics and technology experts

Take over speed (Supportive ISA)
- Preferred by academics and car manufacturers and by older people if everyone has it fitted.
GLARE AND LUMINANCE

Night vision enhancement

- Head-up display
- Dashboard display

- Either system is preferred by academics, technologists and car designers

- Older people remain more sceptical about use of such system
CONCLUSIONS
Conclusions (1)

• Older drivers view car as important to their lives
  – Functional – Day to day activities, services, A to B.
  – Psychological – personality, prestige, self-esteem, mastery, identity
  – Aesthetic – need to see nature, relax, and test cognitive skills

• Keep technology simple to use and aesthetically pleasing
  – In line with expectations and norms
  – Older people don’t want adaptations that make their car look like an old person’s car

• Key driving issues for older drivers are
  – Distraction
  – Keeping to the speed limit
  – Fatigue/tiredness
  – Reactions
  – Glare and luminance
Conclusions (2)

- Older drivers feel they have good awareness of tiredness and are able to compensate for having slower reactions.

- Technologies to take forwards and be developed along with older people:
  - Sign display and priorisation
  - Additional speed warning and cues
  - Intelligent Speed Adaptation
  - Night vision?

- Lobby for better signs.

- Maintain needs-led and bottom-up approach.
CURRENT AND PROPOSED FUTURE WORK
Role of technology in improving driver behaviour

• Bottom-up, inclusive methodology
• Technology and design specialist

– Sign display and prioritisation
– Additional speed warning and cues
– Intelligent Speed Adaptation
– Night vision?
Role of Virtual Mobility

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Webcams
Virtual Environments
Social networking
Shopping online
E-health
Tele-working

Least awareness
Most awareness
Non-direct current research

• Involvement in direct ageing research:
  – New Dynamics of Ageing (NDA) Co-I on Transport workpackage of Grey and Pleasant Land led by Catherine Henessey, Plymouth

• Make sure older people agenda is addressed in other research projects:
  – PI on Dept for Transport – Understanding public attitudes to road user safety. Contains substantial element on older people’s attitudes and safety
  – Co-I on EU Project Renaissance – design elements of built environment affect behaviour – making sure older people have a specific element of the project
  – Co-I on EPSRC research on Suburban Neighbourhood Sustainability – making sure older people had a substantial role to play in the project.
  – Co-I on GOSW research addressing active travel in the South West – make sure that active travel for older people is included.

■ 2 PhD students
  – Older people attitudes to road pricing
  – Older people and free bus travel
Thanks for listening

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Further information

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