How can new technology help older car drivers?

Applying participatory approach to design innovation

Suzette Keith, Mike Bradley

Middlesex University

1School of Engineering and Information Sciences
Understanding older drivers needs and aspirations

Creating opportunities for participation in design development

*Racer software programmed by Ruud van Gaal, www.racer.nl

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Why research older car drivers?

- Changes to the numbers of older drivers (UK 1975-2005)
  - 50-59 up from 50% to 82%
  - over 70’s up from 15% to 51%

- Changes in research focus of older driver
  - From physiological and cognitive change, to safety issues, to social issues of mobility

- Changes in car design

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Aims of the study

Aim of study:

- To explore the socio-technical factors affecting the older driver
- To create opportunities to elicit latent needs, coping strategies, unmet needs, and issues with current vehicle technology interfaces
- To explore the practicalities of applying a participatory approach to design research
  - User is perceived as expert
  - Designer is facilitator
### Driving characteristics

<table>
<thead>
<tr>
<th></th>
<th>50-9 (N=51)</th>
<th>60-9 (N=78)</th>
<th>70-9 (N=76)</th>
<th>80+ (N=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual mileage</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>0-4999</td>
<td>25%</td>
<td>28%</td>
<td>38%</td>
<td>58%</td>
</tr>
<tr>
<td>5000-9999</td>
<td>24%</td>
<td>38%</td>
<td>45%</td>
<td>23%</td>
</tr>
<tr>
<td>10000-14000</td>
<td>35%</td>
<td>24%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>15000+</td>
<td>12%</td>
<td>5%</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Frequency of driving</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>65%</td>
<td>72%</td>
<td>62%</td>
<td>54%</td>
</tr>
<tr>
<td>Weekly</td>
<td>33%</td>
<td>28%</td>
<td>34%</td>
<td>27%</td>
</tr>
<tr>
<td>Monthly</td>
<td>2%</td>
<td>1%</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>3%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Our approach...towards participation

- Challenge of diversity in older age groups
- Active participation of the users
- Iterative design process
- Interdisciplinary representation

“Each generation will have developed different sets of technological skills, knowledge and experience”

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Critical issues (1): parking

- Parking found to be a recurring issue:
  - Some awareness of new developments with parking sensors
- High frequency activity - affected high and low mileage drivers
- Opportunity to identify how well parking technology supports needs of older drivers

I’m not as good at parking as when I was younger, is more difficult to judge smaller spaces.

As you get older you can’t turn round, your shoulders stiffen up.

Reverse parking is the most hairy thing about driving – I find it difficult to judge where I am.

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Familiarity and novel experiences

1. Supporting discussions
   • Retrospective accounts of regular parking experiences

2. Familiar contexts
   • Observation of parking with familiar technology (their car, our car park!)

3. Familiar patterns in a new context
   • Familiarisation with new car

4. Novel technologies
   • Observation of use of car with novel technologies: rear view camera, sensors and automatic systems

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Critical issue (2): Speeding

- Concern for speeding a recurring issue
- Changes caused by introduction of digital ‘safety’ cameras on major routes
- High frequency activity - affected high and low mileage drivers

“I feel in control of the car even when I exceed the speed limit”

“I like to have a powerful car so I can drive fast.”

“I think it is important for safety”

“It’s becoming much easier to break the law”

“I would be mortified if I were prosecuted for speeding”

“I check my speedometer all the time”

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Alternative design detailing

- Simple display
- Inform of speed-limit
- Inform of compliance
  - Distinguish between ok/too fast easily
- Consistent display
- Familiar and intuitive
Conclusions

- The practical lessons:
  - Advanced drivers assistive systems may help to reduce anxiety and prolong safe driving practice
  - 'Designer as facilitator' - need to create positive opportunities for strategies and expertise to emerge from the older adult
  - 'User as expert' - need to encourage more older people to take part in training and education in design research

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Project Team:

- Computing Science: Suzette Keith, Irena Kolar, Gill Whitney, Judy Wilson, and Reg Goodwin
- Product Design and Engineering: Mike Bradley, and Catherine Wicks

Email:
- s.keith@mdx.ac.uk
- m.d.bradley@mdx.ac.uk

Project website:
- www.cs.mdx.ac.uk/research/projects/modat/project.php

Funding body:
- A SPARC (EPSRC/BBSRC) funded research project: An investigation into older drivers advanced technology desires, needs and requirements www.sparc.ac.uk
- Executive summary of this project is available from the SPARC website

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