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BRIDGE

Middlesex
University

Acceptance of technologies supporting driving and walking, by people over 65 years old who do not normally use digital technologies

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Outline

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Invisibility	• Invisibility
Acceptance	• Acceptance and adoption
Walking	• Walking
Driving	• Driving
Conclusions	• Conclusions

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Invisibility

Invisibility

Acceptance

Walking

Driving

Conclusions

- **BRIDGE: Building Relationships with the Invisible in the Digital (Global) Economy**
Project financed by Research Councils United Kingdom, a collaboration between three universities (Leeds, Edinburgh and Middlesex)
- **Manufacturers know their clients, but what about the invisible?**

In the world:	70% of population don't use the internet
In Europe:	42%
In the UK:	18%

 - 60% of over 65's have never used internet**
 - 28% of over 65's own a sat nav**
- **Older, female, lower income and lower level of education below average are over-represented**

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Internet non-users, 2010, UK

Invisibility

Acceptance

Walking

Driving

Conclusions

		% never used the internet		
Age	16-24		1	
	25-44		4	
	45-54		11	
	55-64		20	
	65+		60	65+: 60%
Sex	Male		16	
	Female		21	Female: 21%
Marital status	Single		8	
	Married		19	
	Widowed		68	Widowed: 68%
	Divorced		25	
Occupation	Managerial and professional		9	
	Intermediate		16	
	Small employers and own account workers		20	
	Lower supervisory and technical		23	
	Semi-routine and routine		33	Routine job: 33%
Gross Income	<£10,399		31	
	£10,400 – £20,799		17	
	£20,800 -£ 31,199		5	
	£31,200 - £41,599		5	
	£41,600>		2	Low income: 31%







Table adapted from ONS, (2010) *Statistical Bulletin: Internet Access 2010*,

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<h2>Videos</h2>	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<p>videosparis.ppt</p>
<p>5</p>	
	 

  	
<h2>The Digitally Excluded</h2>	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<p>An incredibly diverse but with similar issues group; relevant continua include:</p> <ul style="list-style-type: none">- Prior experience with digital interfaces- Conflicting experience with other interfaces- Ability to learn - fear reducing ability to learn and cope- Willingness to learn- Ability to generalise interface concepts from one place to another- Lifestyle – perception of benefits vs. difficulties- Attitudes to experimentation: 'Don't play with it you'll break it'- Mental models: apply what I know- Cultural distance from those who design technology- Attitudes to change - 'I am happy with the way it is!'
<p>6</p>	
	 

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The Digitally Excluded

- Invisibility
- Acceptance
- Walking
- Driving
- Conclusions

But it'll be OK – the older old will move on and the younger old will be better.

Or will it?

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And interfaces do not get easier....




'It only takes 4 days to learn how to use'

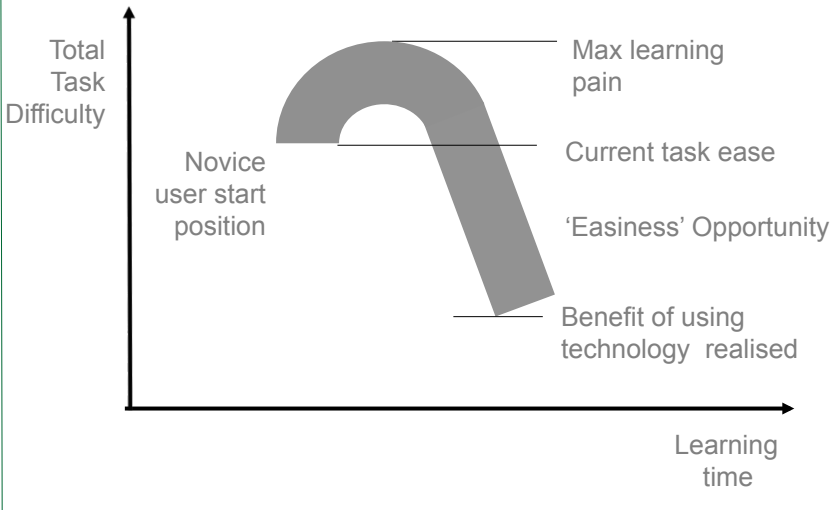
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BRIDGE **Why is it hard to learn how to use new systems?** 


Invisibility
Acceptance
Walking
Driving
Conclusions



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BRIDGE **Why do older users find it hard to learn or to use a new system?** 







Invisibility
Acceptance
Walking
Driving
Conclusions

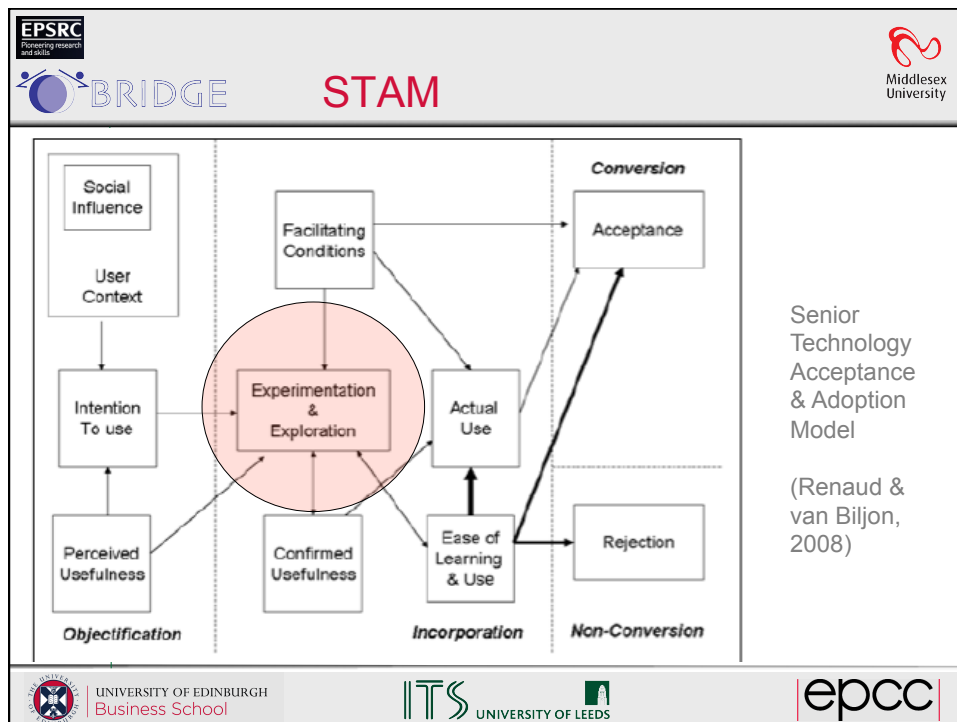
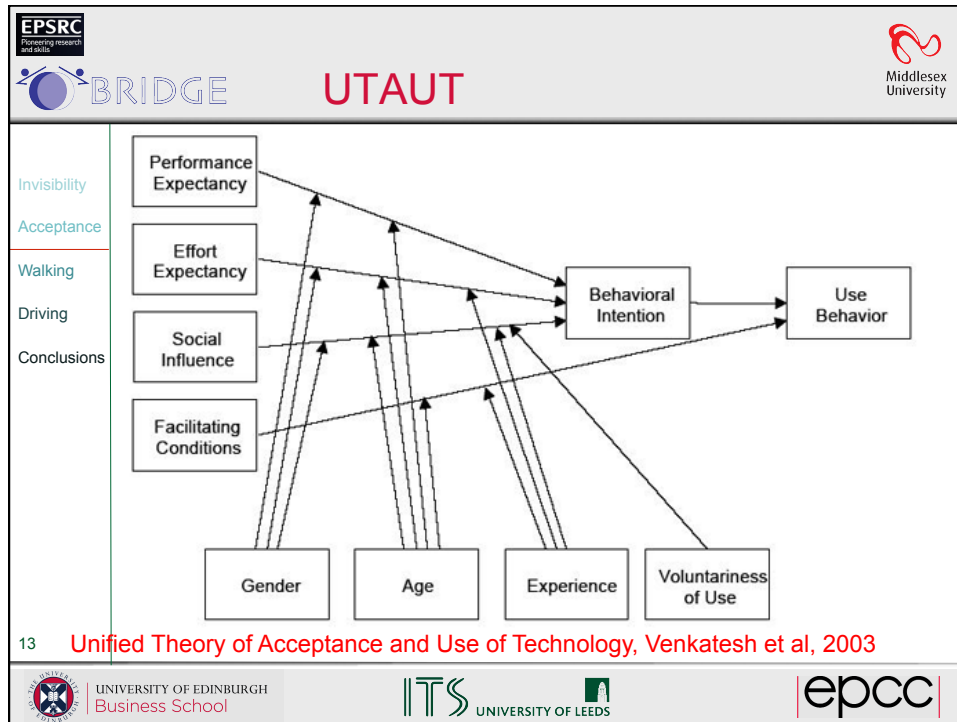
- **Need for concentration on one task**
- **Problems with multi-tasking**
- **“Old people cannot change”**
- **Doesn't fully understand the system and afraid of making mistakes**
- **Not understanding technology**
- **Keep forgetting how to use system**
- **“I like technology but it is difficult to use”**
- **Hard to learn**
- **“Don't make me learn!”**







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  <h2 style="text-align: right;">Acceptance and Adoption of Technology</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <hr/> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> • Acceptance: a positive attitude towards technology • Adoption: a process starting with becoming aware of the technology and ending with embracing and using it fully • If a user buys a piece of technology it does not mean that he/she adopts it • Rogers (2003): 5 stage process of adoption: <ul style="list-style-type: none"> - knowledge phase, get to know the product - persuasion phase, get to persuaded of the need for the product - decision phase, leading to purchase - implementation phase, product is used - confirmation phase, seeks to be confirmed the right decision has been made
11	  

  <h2 style="text-align: right;">Five A's of technology Adoption</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <hr/> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<p>According to OECD-MIT International Symposium(2003):</p> <ul style="list-style-type: none"> • Affordable • Accessible • Adaptable • Acceptable • Available
12	  



  <h2 style="text-align: center;">Use of models</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <hr/> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<p>Concepts used for:</p> <ul style="list-style-type: none"> • Discussion topics • Interviews questions • Questionnaire • Analysis and classification of results
<p>15</p>   	


  <h2 style="text-align: center;">Focus</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <hr/> <p>Walking</p> <p>Driving</p> <p>Conclusions</p>	<p>To get a better understanding of:</p> <ul style="list-style-type: none"> • The ideas of older people about technologies • Why older people do not use or do not want to use technology • Their fears and apprehensions • How technology could fit into their life, contribute to independent living • How technology acceptance and adoption could be facilitated <p>Therefore: more emphasis on ethnographic methods than on questionnaires</p> <div style="background-color: #e6e6fa; padding: 5px; text-align: center; margin-top: 10px;"> <p>Technologies to support walking and driving: do older people accept them?</p> </div>
<p>16</p>   	

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WALKING



USING ETHNOGRAPHIC METHOD INCLUDED A SCENARIO AND INTERVIEW IN WHICH PEOPLE USED A TABLET

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Landmarking Skills: "The street with no name" (Female, T, 101215_1)

Rehearsal practices: "Good idea because usually if I go somewhere... I've not been before I would go the night before so that I know exactly where I am going... with something like this you would not have to do that". (Female, NT, 110111)

Landmarking skills: "I looked for the flyover and I knew I had to go uphill... I asked someone... and I knew it was next to Geography [Building]. So I followed the directions to Geography" (F, T, 101215_1)






Rehearsal practices: uses streetview to plan watching the Tour de France. (m, t 101213)








Landmarking skills: "My focal point was the field, I knew you were next to the field, I asked someone where St George's field was. (Female, NT, 110111)


Map skills: "The index is not in numerical order yet the map identifies each building with a number" (f, T, 101215_1)

Map skills: "I can't understand why they [building index] are not in numerical order". (F, NT, 110111)


Map skills: "static map is not clear and the interactive map is very good" (f, 111214_1)

  <h2 style="text-align: right;">Walking interview goals</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> • To explore existing use of technology and attitudes towards technology, as well as needs for the future • To explore navigation and information searching by bringing participants in an ecologically valid situation: <ul style="list-style-type: none"> - walking around an unknown area, pre-viewed virtually - providing navigation assistance, offering options for finding walk related information - discussing experiences in an informal and friendly manner, as if walking with an acquaintance • To explore social uses of technology such as contacting friends, taking pictures to show to others <p><i>Throughout the walk questions are asked and issues discussed, using non-technical language and grounded in existing use and experience</i></p>
19	  


  <h2 style="text-align: right;">Participants</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<p>13 participants:</p> <ul style="list-style-type: none"> - 6 male, 7 female - 65-79 years old, mean age 68 - 5 experienced, 3 intermediate and 5 non-users of computers - None used mobile internet technologies (e.g. iPhone) <div style="text-align: center;">  </div>
20	  


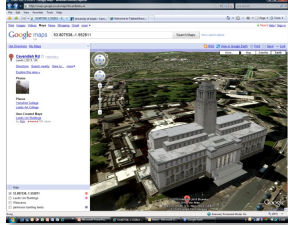


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The interview activities




<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr style="border: 1px solid red;"/> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> • Initial interview at the office • Rehearsing a route for the walking interview • Walking interview, walking combined with: <ul style="list-style-type: none"> - Stop at a static map signpost - Sit down in hall main building: <ul style="list-style-type: none"> - searching for historic and tourist information, bus times, shops etc. - video call with a friend • Take a photograph on walk • Back in office: find bus stop using the tablet • Final questions <p>Total 90-120 minutes</p>	 
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Landmarking Skills: "The street with no name" (Female, T, 101215_1)

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Map skills: "static map is not clear and the interactive map is very good" (f, 111214_1)

  <h2 style="text-align: right;">Findings: task division in the household and experience at work</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> • Skill-sets of computing are often divided between partners leading to a pattern of one technologically proficient partner doing tasks for the other partner and for the benefit of the household e.g. : <ul style="list-style-type: none"> - writing emails - putting music on iPod - putting phone numbers in phone - searching for information and purchasing • Who is/not technologically proficient seems to be heavily influenced by experience at work • Experience at work could be both encouraging and off-putting • It was not always the men who were the technological proficient member of the household • Awareness that the specialism could cause problems for the less technically proficient household member if their partner leaves
23	  


  <h2 style="text-align: right;">Do you have a computer?</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-bottom: 20px;"> <p>“No, my wife has one, you see my wife used to work for Leeds City Council and when she was at the council she was taught how to use the computer for her job, but, er I don't know how to turn it on”</p> </div> <p style="text-align: center;">male, 72, non-user</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-top: 20px;"> <p>“If she (my wife) wants anything doing I do it for her ...oh yes she drives, she's quite modern in that sense because she realises of course, that driving gives her a tremendous amount of freedom, what she doesn't realise is that this thing will give her a lot of freedom in a different sense but it gives her freedom to information”.</p> </div> <p style="text-align: center;">male, 65, experienced user</p>
24	  

  <h2 style="display: inline;">Findings: skills</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> • The lack of skills can also be a source of discordance and disappointment with one’s own competencies and identity • Some participants described how they or their partners felt quite negatively about not having adopted computing technology and not having the skills and competencies to use it • A male partner was reported to have described himself as “ashamed” at not being able to do what his eight year old granddaughter was able to do • Others called themselves “lazy” because they had not learnt the skills to be able to use digital technology • Another described self as “spare wheel” because of lack of skills • Being afraid to use technology, lack of confidence
<p>25</p>	  


  <h2 style="display: inline;">Why is it so hard to use the computer?</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-bottom: 10px;"> <p>“She believes, he can do it, there’s no need for me to do it... but I think she is a little afraid that it will go wrong and then it will spoil it for me and for her and the kids (their grandchildren)I think that’s the main problem with her”.</p> </div> <p style="text-align: right; margin-right: 20px;">male, 65, experienced user</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-bottom: 10px;"> <p>“I wanted to learn it but I was too frustrated when it did not work out. I want it to be easier for me. The only one I had a go on is my daughter-in-law’s and this grandchild, he showed me how to send an email and he has tried to show me how to send a photograph on an email but I couldn’t do it. I went home and there was no-one to ask and I tried to sort it out myself and I gave it up because I am frightened of wiping everything off”</p> </div> <p style="text-align: right; margin-right: 20px;">female, 74, non-user</p>
<p>26</p>	  


Findings: usefulness of mobile technologies




<p>Invisibility</p> <p>Acceptance</p> <p style="border-bottom: 1px solid red;">Walking</p> <p>Driving</p> <p>Conclusions</p>	<ul style="list-style-type: none"> Mobile technologies influence the range of competencies and practices associated with travelling, finding information and contacting and meeting with people Navigation facilities are useful if it fits in a lifestyle where people go to unknown places, and want to synchronise with others Most could think of situations in which this might be useful and they liked the idea; computer users already used Google maps Several participants are uncomfortable with going to unknown places, especially when they are alone, they are afraid of losing their way and they are worried about safety <p style="color: green; font-weight: bold; margin-top: 10px;"> Prior knowledge of what to expect may reduce anxiety and make it easier for older people to go out alone, meet up with others and be more independent </p>
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Would it be useful?



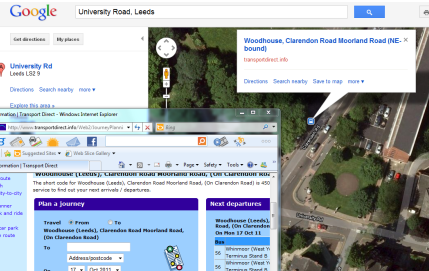
<p>Invisibility</p> <p>Acceptance</p> <p style="border-bottom: 1px solid red;">Walking</p> <p>Driving</p> <p>Conclusions</p>	<div style="border: 2px solid green; border-radius: 15px; padding: 10px; margin-bottom: 10px;"> <p style="color: green;">“I would feel very safe. And it’s saving you time. For example if I were in City Square and my husband rang and said I’m at so and so, in town and do you want to meet me? And I would say how do I get there? And if I had this, I would go on it and I could find out which bus to get, where it were, and how to walk and that would save me time and effort”</p> </div> <p style="text-align: center; color: green;">female, 74, non-user</p> <div style="border: 2px solid green; border-radius: 15px; padding: 10px; margin-bottom: 10px;"> <p style="color: green;">“If I am going to a meeting somewhere I have not been before I would go the night before, so that I know exactly where I am going. With something like this you would not have to do that”</p> </div> <p style="text-align: center; color: green;">female, 67, non-user</p>
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Social environment

<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<p>Social environment is important in three ways:</p> <ul style="list-style-type: none"> • Stimulating and allowing people to use technologies • Have a social network to connect with, to travel to (e.g. friends to email, visits, skypeing children living abroad) • Support network if things go wrong
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Social environment

<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <hr/> <p>Driving</p> <p>Conclusions</p>	<p>"One of my friends, she has a son in Hong Kong and a daughter in Taiwan, so she speaks to them with skype,"</p> <p style="text-align: center;">female, 66, non-user</p>
	<p>"My wife's computer, [laughs], it's in the little bedroom: I'm not allowed to touch it...well see the thing is she said 'if you touch it you'll press the wrong button or something and I won't be able to get whatever back up or whatever'"</p> <p style="text-align: center;">male, 72, non-user</p>
	<p>"Now it's my daughter that comes over and help me, sort out things, she lives close by, she pops in. She is brilliant, doing things with computer"</p> <p style="text-align: center;">female, 66, experienced user</p>

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Conclusions

Invisibility

Acceptance


Walking

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Conclusions

Walking and talking stimulated naturalistic and informal conversations and was an excellent method for:

- getting a deeper understanding of the impact of technology on daily life of older people
- their concerns and problems in using technology and mobile technologies
- the importance of the social context for positive benefits



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DRIVING




STUDIES WITH SIMULATIONS OF ADVANCED DRIVER ASSISTANCE SYSTEMS AND INFORMATION SYSTEMS

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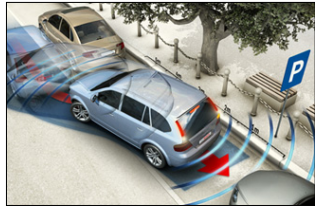




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Driver support systems




Middlesex University


<p style="color: blue;">Invisibility</p> <p style="color: blue;">Acceptance</p> <p style="color: blue;">Walking</p> <p style="color: blue;">Driving</p> <hr style="border: 1px solid red;"/> <p style="color: blue;">Conclusions</p>	<div style="border: 1px solid gray; padding: 10px; margin-bottom: 10px;"> <p style="color: red; font-weight: bold; font-size: 2em;">✘</p> <p>Impossible d'afficher l'image. Votre ordinateur manque peut-être de mémoire pour ouvrir l'image ou l'image est endommagée. Redémarrez l'ordinateur, puis ouvrez à nouveau le fichier. Si le x rouge est toujours affiché, vous devrez peut-être supprimer l'image avant de la réinsérer.</p> </div> <div style="text-align: center;">  </div> <div style="border: 1px solid gray; padding: 10px; margin-top: 10px;"> <p style="color: red; font-weight: bold; font-size: 2em;">✘</p> <p>Impossible d'afficher l'image. Votre ordinateur manque peut-être de mémoire pour ouvrir l'image ou l'image est endommagée. Redémarrez l'ordinateur, puis ouvrez à nouveau le fichier. Si le x rouge est toujours affiché, vous devrez peut-être supprimer l'image avant de la réinsérer.</p> </div>	<div style="text-align: center;">  </div>
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Driver support systems




Middlesex University


<p style="color: blue;">Invisibility</p> <p style="color: blue;">Acceptance</p> <p style="color: blue;">Walking</p> <p style="color: blue;">Driving</p> <hr style="border: 1px solid red;"/> <p style="color: blue;">Conclusions</p>	<ul style="list-style-type: none"> <li style="color: green; font-weight: bold;">• A variety of driver support systems is (coming) on the market: <ul style="list-style-type: none"> <li style="color: green;">– Information systems, e.g. SatNav <li style="color: green;">– Warning systems, e.g. Speed warning <li style="color: green;">– Systems taking over part of the driving task: e.g. Lane Keeping <li style="color: green; font-weight: bold;">• Some systems could be useful for older drivers, offering useful functionalities to compensate for diminished capacities <p style="color: green; font-weight: bold; text-align: center; font-size: 1.2em; margin-top: 20px;">But only if drivers accept those systems!</p>
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Qualitative studies with drivers





<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <p>Driving</p> <hr/> <p>Conclusions</p>	<ul style="list-style-type: none"> Questionnaire, 33 drivers over 65 2 focus groups with 12 drivers over 70 6 individual interviews Users and non-users of computers Demonstration of automated driving system on desk-top simulator: automated lateral and forward control, warning if system cannot cope Ongoing study: 13 older drivers (mean 73) driving a desk-top simulator with dynamic information on a tablet (speed limit, congestion, accident ahead) 	
<p>35</p>		





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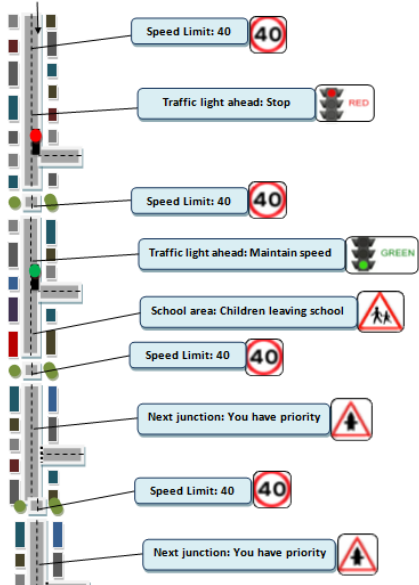
INFORMATION / COOPERATIVE SYSTEM






Congestion in 1 mile: adapt your speed


















Motorway & rural/urban road
















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  <h2 style="text-align: center;">Questionnaire</h2> 																																																																														
Invisibility Acceptance Walking Driving Conclusions	<table border="1"> <tr> <td>1</td> <td>Using the system would improve my driving performance.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>3</td> <td>Using the system would make it easier to drive.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>4</td> <td>Learning to operate the system would be easy for me.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>9</td> <td>I would use the system if my friends used it.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>11</td> <td>Someone is available for assistance with system difficulties.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>14</td> <td>I feel apprehensive about using the system.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> <tr> <td>17</td> <td>If the system was available in my vehicle, I would feel more confident driving on a motorway.</td> <td>Strongly disagree</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> <td>Strongly agree</td> </tr> </table>	1	Using the system would improve my driving performance.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	3	Using the system would make it easier to drive.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	4	Learning to operate the system would be easy for me.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	9	I would use the system if my friends used it.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	11	Someone is available for assistance with system difficulties.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	14	I feel apprehensive about using the system.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree	17	If the system was available in my vehicle, I would feel more confident driving on a motorway.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
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  <h2 style="text-align: center;">Results questionnaire</h2> 	
Invisibility Acceptance Walking Driving Conclusions	<ul style="list-style-type: none"> • 33 drivers over 65 • 58% had none or little experience with computers • 97% had none or little experience with navigation systems • Main factors with significant positive relation with the intention to use a system if it was available in their car: <ul style="list-style-type: none"> - <u>Performance Expectancy</u> - Social Influence - Attitude toward Using Technology
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  <h2 style="text-align: right;">Results focus groups semi-automated driving</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <p>Driving</p> <hr/> <p>Conclusions</p>	<ul style="list-style-type: none"> • The mixed focus group (computer users and non-users) was more positive • In the non-user group, none of the participants wanted to have the system • Non-users found it harder to imagine what the system (or other technologies) could do for them • Non-users had the attitude that these kinds of technologies were not for them, there was no use for it, and they did not trust it • Users were more positive and curious about new developments. They did not fully embrace the system and were cautious about new technologies, but they were more prepared to think about it
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  <h2 style="text-align: right;">Results interviews semi-automated driving</h2> 	
<p>Invisibility</p> <p>Acceptance</p> <p>Walking</p> <p>Driving</p> <hr/> <p>Conclusions</p>	<ul style="list-style-type: none"> • Computer users liked the system and were very interested in its potential • Non-users started by saying that it was interesting, but with more discussion and reflection they became more negative and they did not want the system for themselves
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Preliminary results simulated driving with info system

Middlesex University

Invisibility

Acceptance

Walking

Driving

Conclusions

- Participants were more positive about information system
- Strong preference for information about:
 - Speed limits
 - School areas
 - Congestion and accidents ahead
- Dislike of messages about hotels, rest areas, weather
- They are afraid of distraction and added workload, but they like messages that focus their attention on potentially dangerous situations, or provide essential information

School area: children leaving school

Pub in the next village

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Positive perceived usefulness

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Invisibility

Acceptance

Walking

Driving

Conclusions

- **System is useful because it improves:**
 - Convenience and comfort
 - Safety
 - Independence and control
 - Confidence in own performance
 - Awareness
- **System provides support for:**
 - Task performance
 - Concentration/focus on task
 - Control of situation/task
 - Detection of relevant information
- **System can do things that are not possible without the system**
- **Use of the system will become normal and wide-spread in the near future, or embedded in equipment**

I'm open to all suggestions that mean I'm safer

If it does what it is saying it does then it's not a bad thing as long as everybody had it

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Negative perceived usefulness



Invisibility Acceptance Walking Driving <hr style="border: 0.5px solid red;"/> Conclusions	<ul style="list-style-type: none"> • No use, can perform tasks without the system just as well • Useful only in limited conditions, not (often) encountered • Negative consequences: <ul style="list-style-type: none"> - Loss of skills - Becoming lazy - Loss of control - Danger of overreliance on system - Distraction from other, more important tasks - Takes away the pleasure of the task • Negative perception of the system: <ul style="list-style-type: none"> - Gimmick - Change for change's sake • Only useful for other people 	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; margin-bottom: 20px; background-color: #f8d7da;"> my daughter cannot drive without a navigation system, these systems are killing our instincts </div> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; background-color: #f8d7da;"> I'm comfortable with the way things are...what happens when you're getting used to it </div>
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Trust

Invisibility Acceptance Walking Driving <hr style="border: 0.5px solid red;"/> Conclusions	<ul style="list-style-type: none"> • Lack of trust: <ul style="list-style-type: none"> - System is perceived as unreliable - Technology always breaks down at some point - System has limitations - Possible unforeseen reactions of the system in unexpected and critical situations • Anxiety of system taking control or taking over the task without explicit command from the user <p style="margin-top: 20px;">Systems that provide support are more trusted than systems that take over control</p>	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; margin-bottom: 20px; background-color: #f8d7da;"> all systems in cars are potential trouble, computers go wrong </div> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; background-color: #f8d7da;"> modern equipment will take over, it is scary </div>
--	--	---


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Hard to learn and to use





Invisibility Acceptance Walking Driving Conclusions	<ul style="list-style-type: none"> • Hard to learn because of: <ul style="list-style-type: none"> - Difficulties to learn new things - Lack of understanding of the technology - Afraid of making mistakes - Easily forgetting how the system works if not used frequently • No-one available to show how to use the system
45	<ul style="list-style-type: none"> • Hard to use because system: <ul style="list-style-type: none"> - requires additional concentration - requires multi-tasking - provides too much information • System has poor usability features • Information is difficult to understand and confusing <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto; background-color: #f8d7da;"> might go off suddenly... would have to have your wits about you...be more comfortable without </div>














What would help?



Invisibility Acceptance Walking Driving Conclusions	<ul style="list-style-type: none"> • Expectancy that the system could learned: <ul style="list-style-type: none"> - at a slow pace - in little steps • Good introduction: <ul style="list-style-type: none"> - Manual - Other people (e.g. family) - Demonstration - Lessons • Possibility to try-out the system and get used to it without any risk • Guarantee of easy available support and trouble-shooting from other people (e.g. family) • Interface that is easy to use and understand
46	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto; background-color: #f8d7da;"> I absorb things little by little and get there in the end </div>







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CONCLUSIONS

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Older drivers might be right.....

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- Invisibility
- Acceptance
- Walking
- Driving
- Conclusions

- Should driver support systems be pushed on people?
- Participants provide many valid arguments against them
- Do these systems completely change the driving task?
- And who do we leave behind when completely new technologies arrive ?


....only good if is it useful and increases convenience

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Conclusions




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Invisibility	<ul style="list-style-type: none"> New technologies may be hard to accept, let alone adopt Usefulness is the main issue Acceptance is not just about one system, but related to the role of technology in one's life Support for familiarisation, learning, and if things go wrong is essential Simulation or bringing people in context are very good way of introducing and discussing new systems Our participants had awareness that new technologies arrive
Acceptance	
Walking	
Driving	
Conclusions	


can't stop technology, you shouldn't anyway



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Older users will adopt if...




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Invisibility	<ul style="list-style-type: none"> They think the system brings them enough benefits (comfort, safety, independence...) The effort to learn is related to significance of benefits The system could learned: <ul style="list-style-type: none"> - at a slow pace - in little steps If there are sufficient options for familiarisation If there is support if something goes wrong The interface is easy to use and understand Relevant others have positive experiences and attitudes They have a positive attitude towards new and future technologies in general
Acceptance	
Walking	
Driving	
Conclusions	


It's nice to have one foot in the future



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