

Ageing and technology – what factors influence use and abandonment?

Arlene J. Astell^{1,2}, Faustina Hwang³, Elizabeth A. Williams¹, Libby Archer⁴, Sarah Harney-Levine¹, Dave Wright⁵ & Maggie Ellis⁶

¹University of Sheffield

{a.astell, e.a.williams}@sheffield.ac.uk, slh125@hotmail.co.uk

²Ontario Shores Centre for Mental Health Science

astella@ontarioshores.ca

³University of Reading

f.hwang@reading.ac.uk

⁴Age UK

Libby.archer@ageuk.org.uk

⁵University of Brighton

D.Wright2@brighton.ac.uk

⁶University of St. Andrews

mpe2@st-andrews.ac.uk

Abstract. As part of the Challenging Obstacles and Barriers to Assisted Living Technologies (COBALT) project, this study set out to explore how older adults make decisions about adopting or abandoning technology, something that is rarely addressed in the current literature. Group sessions using two new approaches: ‘Show and Tell’ and ‘Technology Interaction’, were conducted with 29 adults aged 65 years and over. All participants discussed their positive and negative experiences with reference to the adoption and abandonment of technology. Themes that emerged relating to adoption or use were linked to positive benefits the technology brought to an individual’s life. Themes relating to rejection or abandonment were linked to limitations of the technology or related items, such as poor instructions. This research also highlighted the value of interactive, activity-based group sessions to encourage maximum participation and discussion from older adults.

Keywords: ageing • technology • adoption • abandonment

1 Introduction

Globally there are approximately 900 million older people, and with mortality rates falling, life expectancy from age 60 continues to increase in all world regions [1]. Further understanding of how older adults make decisions about adoption of technologies, e.g. needs, attitudes, perceived importance, is crucial for leveraging the benefits of current and future devices and applications to support people to live and age as well as possible [2]. The term Assisted Living Technologies (ALT) has been applied to “any device or system that allows an individual to perform a task that they would otherwise be unable to do, or increases the ease and safety with which the task can be performed” [3]. From this definition, one might imagine that ALT would be readily adopted by people who are adapting to the physical and cognitive changes associated with ageing. However, adoption of technology, particularly that marketed specifically at older adults, has been slower than anticipated for a variety of reasons.

The barriers to the uptake of ALT in older people are reasonably well documented. Issues such as design not appropriate to older adults, ethical concerns about the use of technology, user perceptions of what messages use of the technology gives and the role of markets and policy are cited as some of the central barriers to the uptake of ALT in this population [4, 5]. In particular, adoption of ALT may be avoided by older people if they consider the product/products to have a negative impact on their identities, e.g. if usage sends the message that an individual is frail or dependent [4]. There has been little exploration of older adult’s positive experiences of technology or how they make decisions about when and whether to adopt a technology, particularly ones that are not medically prescribed or officially defined as Assistive Technology and targeted specifically at older adults. Furthering understanding of how older adults make decisions about technology in their everyday lives, including self-purchases, could help illuminate the factors that are important to them in technology adoption.

1.1 COBALT project

The COBALT project set out to work with older adults to find out more about their positive and negative technology experiences. To achieve this the team reviewed what had been discovered with existing methodologies, such as focus groups and interviews. This included best practice for recruiting [6] and conducting focus groups (the most popular format) with older participants (Barrett, 2009). This review identified limitations of previous approaches in not ensuring all participants contribute and avoiding domination of the discussion by one or two more talkative or confident participants. Additionally, most previous research had focused on the problems older people had encountered with technology. Consequently, much less uncovered little about the positive experiences that people have with ALT or with technology in general.

As such we set out to develop some new approaches aimed at elucidating positive technology experiences and factors that influence decision making about technology adoption. The aim was to create activities to explore how older adults become aware, select, learn about, and make use of technologies and how the attitudes and behaviour of partners, friends, families and social networks affect these processes. Within COBALT we decided to take a loose definition of technology and let our participants

tell us if its functions assisted their lives. To overcome the limitations of existing methods, we created two new group activities with the aim of a) encouraging the discussion of positive and negative experiences with technology and b) facilitating contributions from all participants.

2 Method

2.1 Participants

Ethical approval was granted by the ethics committees of both the University of St Andrews and the University of Sheffield. The inclusion criteria specified that the participants should be native English speakers over age 65 years with no known cognitive impairment.

Twenty-nine older adults aged between 63 and 86 years of age were recruited from the two UK sites. They all lived in the community either in their own homes or in assisted living apartments. Two were wheelchair users and one used a walking frame and electric scooter. Informed consent to take part in the study and to be audio and video recorded was obtained from all participants.

2.2 COBALT approaches

‘Show and Tell’ sessions – Each participant was asked to bring an example of a technology they loved and one they had abandoned.

‘Technology Interaction’ sessions – Participants were split into twos or threes and asked to select a device from a range including off-the-shelf items such as digital camera and small health-related devices such as blood pressure monitors, body fat monitor and pedometer. These were boxed ‘as new’ and participants were asked to figure out how they work and then demonstrate to the rest of the group.

2.3 Procedure

Four sessions were organized, two in Sheffield and two in St. Andrews. Each session was lead by a facilitator assisted by another member of the COABLT team. Two groups (n=15) completed both Show and Tell and Technology Interaction and the other two groups (n=14) completed Show and tell plus another activity not reported here. The sessions lasted approximately two hours. All sessions were video recorded for later transcription and analysis.

3 Results

The participants were enthusiastic about sharing their experiences of technology in both activities. They brought a range of items to the Show and Tell sessions (Table 1). The most commonly loved items were phones, followed by laptops, Kindles and digital

cameras. Interestingly phones and laptops also figured high on the abandoned technology list. Several participants had updated their technology, e.g. replacing a 35mm camera with a digital camera or a digital camera with a smartphone which included a camera.

The reasons given for loving or abandoning technologies fell broadly into four themes. The first was ‘Maintaining current activities’. For example, one participant explained at a session held in November:

MP: “I’ve done most of my Christmas shopping online” (line 199)
when explaining why she loved her laptop.

Table 1. Loved and abandoned items (n=29)

Loved Technology	Abandoned Technology
Mobile phone x 5	Mobile phone x 6
Laptop x 3	Laptop x 4
Smartphone x 3	35mm camera x 2
Digital camera x 2	Digital photograph frame x 2
Kindle x 2	SatNav x 2
Big button mobile phone x 1	Desktop PC x 1
CDs x 1	Dictionary x 1
Combination microwave x 1	Digital camera x 1
Ergonomic keyboard and mouse x 1	Electric razor x 1
Extended shoe horn x 1	Freeview box x 1
Hearing aid x 1	Hearing aid x 1
Hot brush x 1	Phone to PC USB cable x 1
Jar opener x 1	Regular shoe horn x 1
Spectacles x 1	Remote control for PC x 1
Spellchecker x 1	Slide to digital converter x 1
Television remote control x 1	Travel clock x 1
Vegetable peeler x 1	Video recorder x 1
Washing machine x 1	Vinyl LPs x 1
Wind Up Torch x 1	

Another theme was “Staying in Touch”. The beauty of a mobile phone is clearly described by this participant:

LT: “Well seeing as I’ve left my phone at home which is an absolute disaster but that’s my loved thing ... and I didn’t love it until four and a bit years ago when my daughter in law was in hospital and was going to have triplets and was very ill up in (location) and I had to keep going up ‘cause my son couldn’t take time off work... so when I came out from seeing her I had to text everybody so I had to get a phone that I had to learn how to text and how to send it to lots of people and I just love my phone and I’ve now got one that I can take photographs of the triplets that were born four years ago and I just think that it’s amazing”.
(Lines 10-16).

“Convenience’ also emerged as a theme for several pieces of technology. For example, this participant described the benefits of switching to a combination microwave cooker from a conventional stove

BS: “we got combination ... I use that most of all with it being smaller than using a bigger one for cooking... I put a three-pound chicken in there...it’ll take about 30 minutes ...if you put it in the electric oven it takes about two hours wouldn’t it?” (Lines 560-563).

“I use the cook bags ...you know and it helps to keep the oven clean so I don’t have to clean it (laughs)” (lines 568-569).

The fourth theme that came through the discussions was ‘Life Enhancement’, that is adopting a technology to improve or maintain an individual’s quality of life. Several items fell into this category and the following example from a participant who had recently moved into a smaller dwelling exemplifies the benefits this technology, in this case a Kindle, brings to her life.

AC: “I’ve always read, I read an awful lot and I’ve thousands of books and it’s where do you put them and when you move into a place like this you haven’t got the space you know you can’t have your own private library erm it’s cheaper than buying books anyway.” (line 309-311)

Most of the items brought along to Show and Tell were either self-purchases or gifts. Sources of information about technologies included family, friends and media. For example:

Moderator: “No I mean how did you first learn about Kindle?”

AC: “Oh I seen erm I’m trying to think...Where did I hear about it. I mean ... It must have been on the television sometime and I saw it ... and thought ‘That’s a damn good idea ... I’ll have one of those’ (laughs) and I I find it great.” (Lines 328-330).



Figure 1. Technology Interaction – reading the instructions

In the Technology Interaction sessions, the participants were exposed to technologies that were largely unfamiliar to them. The process of exploring the technology and trying to get it working was designed to elicit information about the way people make decision about technology and if they will persist with it. The following highlights some of the difficulties with getting started with an unfamiliar item:

Moderator: "OK. What is it you have there?"

GR: "Well, that's the first part, we're not quite sure! *Laughter*. No, it's something which [...] indicates blood pressure, heart rate and so on whilst doing exercise. But setting the time and setting everything to zero and setting up the files is difficult in the extreme [inaudible] instructions and there is only one button. So really all of us had great difficulty in deciding how to set it up."

NL: "We haven't reached starting point. You know, we are still on the starting bit."

GR: "We could see what it is for, but how to use it, er, would take a lot of effort."

MOD1: "Right, OK."

NL: "And it's not very well... I mean there is only one button. Where it says menu structure, we go to menu structure [inaudible] and the instructions are simply useless..." (Lines 195-204)

This exchange highlights the frustration felt by the participants at not being able to set up the device even though it had only one button, which they felt implied that it should be simple. They had consulted the instructions but found these unhelpful in progressing with setting the device up. They also commented that the set-up process was too long:

HB: "We haven't even got the time on it yet! Well I got as far as determining how to set the time but I haven't been able to do it yet because erm...it is time-consuming to use."

NL: "You might buy this in a sort of fit of enthusiasm but you have got to throw it aside because this is utterly useless." (lines 212-215).

The latter comment suggests that frustration is one reason for abandonment. The device was intended for use by joggers, but one of the participants, who was a regular runner felt it was not aimed at the general population, but only for those who were particularly technologically minded. In comparison she highlighted how the technology she has adopted in support of her running enhances her life:

AL: I have a Garmin watch that tells me: how fast I'm running, how far I've run and how many miles an hour that is and I find that great because if I'm trying to run too fast, you know I'll be like 'Oh stop it, you'll not be able to run the distance' (Lines 231-233).

Following on from the frustration experienced with the one-button jogging device, the importance of ease of use or intuitiveness, was highlighted by one of the participants:

GR: Well my wife's not minded at all in terms of technology and I bought her a Kindle for Christmas and she said 'Oh I'll never be able to use this' but I noticed last night and I saw a flicker and I said 'Oh

what are you doing?’ and she said ‘Oh turning a page’ (laughter). (lines 727-729).

In respect of learning how to use a device, the lady with the Garmin revealed that she learnt to use it from the person who sold it to her:

“...but the man in the shop set it up for me! *Laughter (Inaudible)* ‘Hey, I’ll never manage that’ he said ‘Well, I can do it’. He did it in about five minutes flat because he knew what he was doing. I never even read the book so... But it is a fantastic thing.’ (lines 234-235).

At the end of the Technology Interaction sessions each participant was asked if they would like to take any of the items home. This led to further discussion about the relative attributes of the items. In one group a blood pressure monitor prompted a group discussion about the pros and cons of being able to measure this at home. One person was concerned about it being anxiety-inducing for some people. Another explained how she and her husband use theirs:

LT: I mean I do it, if I remember, once a week and just notice that it is fine and just ignore it. Whereas my husband who is very scientific, does it three times a week and he does it three times, chooses the best numbers and makes a graph – which is about the length of the table now!” (lines 278-280).

“... And he has now worked out his blood pressure is actually fine on the one pill that he is taking because the graph shows it.” (lines 282-3).



Figure 2. Technology Interaction – trying a new device

In this example the acquisition of the technology (blood pressure monitoring kit) was suggested by the family GP who was concerned that the readings she took in the surgery from the husband were elevated by anxiety. In this respect the use of the technology had been successful in alleviating the anxiety and the data supported successful self-management of his health condition.

4 Discussion

The aim of this study was to advance understanding about the ways older adults approach technology and make decisions about whether to use it. We developed two new activities with the aim of encouraging the discussion of positive and negative experiences with technology and facilitating contributions from all participants. The structure of the sessions appeared to be successful in enabling everyone to participate. Show and Tell automatically makes everyone an expert about their own decisions and provides a platform for them to express their views. Technology Interaction requires each participant to engage with at least one other person to explore a new technology. Their discussion is then fed back to the rest of the group, usually accompanied by the person who is not speaking demonstrating the device, while the other speaks.

The Show and Tell activity exposed information about how older adults become aware of technologies. For example, one person knew about Kindles from the television and another from seeing a friend using one. In terms of making decisions about whether to purchase an item, being able to continue doing valued activities was particularly important. This included staying in touch with family and friends, taking exercise, as well as practical activities such as shopping and cooking. Many of these decisions related to maintaining or improving quality of life. For example, a mobile phone to take photographs and keep in touch with family.

Technology Interaction sessions provided the opportunity to observe how older adults approached new technologies and the factors of importance to them. What emerged was a desire for technology to be simple and intuitive. When it was not possible to quickly get to grips with a device people became frustrated. Lengthy written instructions were also not popular, with people preferring to learn from someone else, often family or friends. As with the items people brought to Show and Tell, usefulness was an important factor in people's decision-making about technology adoption.

The data collected through these two new interactive activities highlighted that older adults choose technologies to meet their needs. Some examples were health related, such as blood pressure monitoring, but the majority of 'loved' items brought to Show and Tell were mainstream consumer products (e.g. smartphone, Kindle). These items were definitely not in the ALT category or specifically targeted at older adults. Rather they enabled people to do things of importance to them, were convenient and brought benefits to their lives.

In conclusion this research highlighted the value of interactive, activity-based group sessions to encourage maximum participation by older adults, which enabled them to reveal their technology loves and hates.

5 References

- [1] Prince, M., Wimo, A., Guerchet, M., Ali, G-C., Wu, Y-T., & Prina, M. (2015). World Alzheimer Report 2015: The Global Impact of Dementia. London, UK: Alzheimer's Disease International.

- [2] Astell, A. J. (2013). Technology and fun for a happy old age. A. Sixsmith, & G. Gutman (Eds). Technology for Active Aging. Springer Science.
- [3] Long Term Care Commission.
- [4] Coughlin, J. F., D'Ambrosio, L. A., Reimer, B., Pratt, M. R. (2007). Older adult perceptions of smart home technologies: Implications for research, policy and market innovations in healthcare. Proceedings of *IEEE Engineering in Medicine and Biology Society*, August 2007, Lyon, France.
- [5] PLUM report
- [6] McMurdo, M. (2011) Improving recruitment of older people to research through good practice *Age and Ageing* **40** 6 pp 659-665.
- [7] Barrett, J. (2000) Running focus groups with elderly and disabled participants. *Applied ergonomics* 31, pp 621-629.