

Age-old Question(naire)s

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Abstract

Older people are an important and growing sector of the population, yet are often excluded by design. It is important to find out more about this user group so that they can be included effectively. As a first step towards this, we carried out a questionnaire and interview study in Scotland with 353 participants over the age of 50, investigating their use of and attitude towards technology. This is a method which can be very useful yet also fraught with difficulties. This paper therefore discusses how it can be used effectively, observing in particular the use of survey interviews in extracting more in-depth information. It also describes the study and some of its results, discussing trends in technology use among older people and possible reasons for these trends, noting in particular the effect of technology age and complexity. It also discusses the implications for designers.

1. Introduction

Recent statistics show that the proportion of older people in developed countries is rapidly increasing [8]. Although this is a group with many people with large amounts of disposable income, they are often excluded by design, particularly of technological products [1]. This has prompted some recent work on design that includes older people, for example the Utopia project (Usable Technology for Older People: Inclusive and Appropriate – <http://www.computing.dundee.ac.uk/projects/utopia>), which has been formed expressly to address this issue. However there is still much to learn about the way this group relates to technology before design that includes older people can really be effective.

There are several ways in which such knowledge can be obtained, such as interviews, focus groups, ethnographic methods and experiments. However, the diversity within the older population renders large-scale methods, in particular, questionnaire surveys, particularly useful for an initial investigation. Questionnaires can be problematic with poor return rates and self-selecting respondents, which can lead to biased results. In addition, it can be difficult to elicit in-depth information. However, their ability to obtain large-scale information relatively inexpensively means that the effort to overcome these problems is worth-while.

Questionnaires have been used to survey basic aspects of older people's technology use, particularly their computer and internet use. In the UK and Europe, surveys (e.g. [2,4,5]) indicate a drop in technology use with age. But these studies have often focused on specific technologies, and therefore do not provide a picture of technology use as a

whole. Most also do not consider the trends within the older population nor the reasons for them.

Therefore, as part of the Utopia project, we conducted a medium-scale questionnaire and interview study into the experiences of older people with technology. This paper describes the study and discusses the use of questionnaires as a means of getting to know user groups, focusing in particular on how to obtain more in-depth data. It also presents some of the results of the study, focusing on trends in technology use. We discuss what these indicate about reasons for technology use in this age group, and some implications of the results for designers.

2. Method

2.1 Sample

The sample comprised 353 older adults from Scotland, 25% aged 50-64, 43% 65-74, 27% 75-84 and 5% 85 or older. The gender distribution was female (68%) and male (32%).

We used various methods of convenience sampling, distributing 42% of the received questionnaires through organisations, 38% directly through a researcher, using a variety of contact means, 17% through a relative or friend, and 3% through other means. These methods have more sampling bias than, for example, probability sampling using mail shots. However they allow more personal contact, and so richer, more in-depth information can be elicited, helping us to get to know the group better. They also let us develop contacts, both with organisations and individuals, for future work. For our survey these factors were important goals.

Some effort was made to balance the age groups and computer experience of the sample, through the choice of organisations contacted. However the middle two age groups are still over-represented and it is also likely that participants use technology more than average. Therefore this paper mostly discusses trends in technology use, which are likely to hold true for the general population.

2.2 Procedure

The questionnaire was piloted with a small number of older adults ($n=19$). As a result, the structure of tables was clarified and more options were added to multiple-choice questions.

The questionnaires were distributed between May and November 2002, as described above. They were mostly distributed through organisations, and were administered in an informal interview situation within libraries, sheltered housing complexes and social clubs. The questionnaire was self-administered by 74% of the sample and administered to 26%, mostly to older participants.

Questionnaires distributed outside Scotland were excluded from statistical analysis.

2.3 Materials

The start of the questionnaire described the Utopia project, the questionnaire's aims, use of the data and instructions for completing the questionnaire. The body of the questionnaire comprised both closed multiple-choice and open-ended questions. It included demographic and lifestyle topics like age group, gender, accommodation and activity, so that their effect on technology use could be explored. It investigated the use of everyday technology, like televisions, telephones, videos and teletext, as well as that of computers. It also included short questions about a range of technology including mobile phones, DVDs and interactive TV, as well as more traditional technologies such as radios and microwaves. Space was provided at the end for comments on any area of technology. Finally, respondents were asked if they would like to participate further in the Utopia project, and could give contact details if interested.

3. Results

There is not room to discuss all of the questionnaire's results here. This paper concentrates on trends in technology use in order to investigate some of the factors affecting it and how these can be taken into account in product design and development.

3.1 Differences with Age

Figure 1 shows the results for mobile phone use. There is a general decrease in their use with age, which is significant using a Chi squared test ($p < 0.01$).

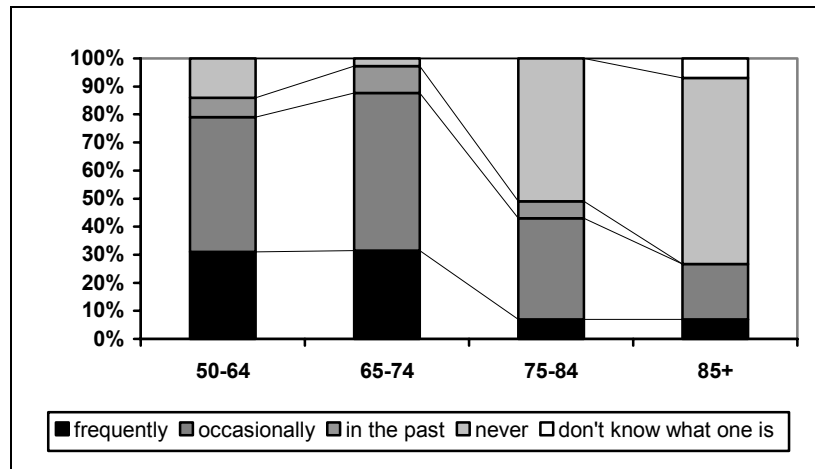


Figure 1: Mobile phone use in the older population.

Almost all the technologies surveyed show a similar decrease in use with age, significant using Chi squared ($p < 0.05$ or $p < 0.01$). This includes all the technologies listed in Table 2 below, except telephones, televisions and microwaves, which are not significantly affected.

3.2 Differences with Technology

Different technologies have different degrees of popularity and are affected by age to different extents, as shown in Table 2. In it, the significance values differ from those above because only current use is considered.

	Overall frequency	50-64	65-74	75-84	85+	Significant age effect
Telephone	99	100	99	98	100	NS (P>0.05)
Television	98	98	98	100	100	NS (P>0.05)
Radio	96	98	98	93	75	P<0.01
Microwave	85	92	86	76	62	P<0.01
Video	83	89	90	70	62	P<0.01
CD player	72	85	78	52	28	P<0.01
Computer	63	90	37	38	28	P<0.01
Mobile Phone	60	80	64	41	18	P<0.01
Teletext	58	68	62	45	33	P<0.01
Personal Stereo	36	43	43	17	22	P<0.01
Cable TV	28	36	22	29	13	NS (P>0.05)
Text Messaging	19	32	20	5	5	P<0.01
DVD	9	17	9	2	0	P<0.01
Interactive TV	7	11	6	5	0	P<0.01
Internet through TV	2	4	2	2	0	NS (P>0.05)

Table 2: Frequency (%) of current technology use (occasional or frequent) by age group.

Telephones and televisions are the most popular and their use does not decline with age. Radios, microwaves and videos are also popular but their use is affected by age, while cable TV and internet through a TV are not significantly affected but are not very popular.

3.3. Differences with Technology Age and Complexity

We examined the effect of “technology age” on popularity by ranking technologies in approximate age order. We also considered the effect of technology complexity. However, because this is difficult to measure, we used a very approximate ordering within technologies of similar type.

Figure 3 shows that, among the telecommunications equipment surveyed, there is a decrease in use with decreasing technology age and increasing complexity. The differences in use are significant using one-sample proportions tests ($p<0.01$).

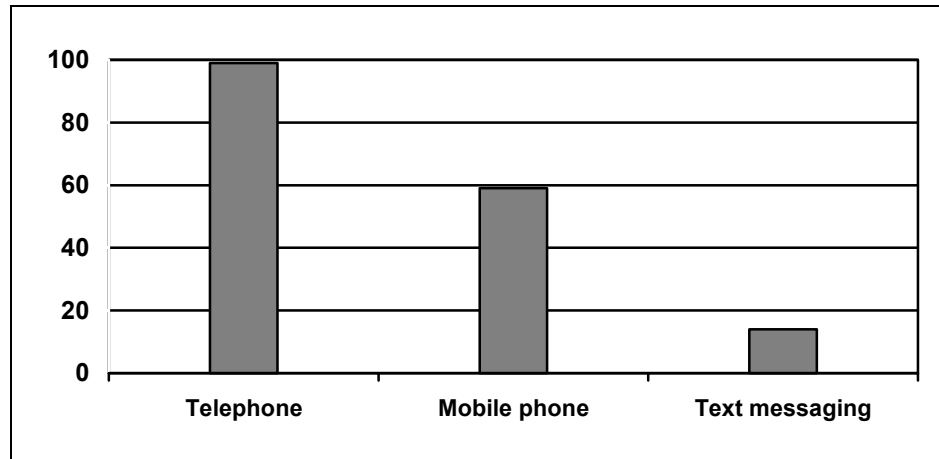


Figure 3: Use (%) of telecommunications equipment by over 50's

Similarly, Figure 4 shows a general decrease in radio and television use as devices become newer, with the exception of radio (differences are significant using one-sample proportions tests, $p < 0.01$). The effect of technology complexity is harder to discern as it depends heavily on the particular equipment and use. However we consider videos to be more complex than teletext or cable TV, since most video users in our survey used timer record, which is usually relatively complex. Yet videos are much more popular than these other technologies.

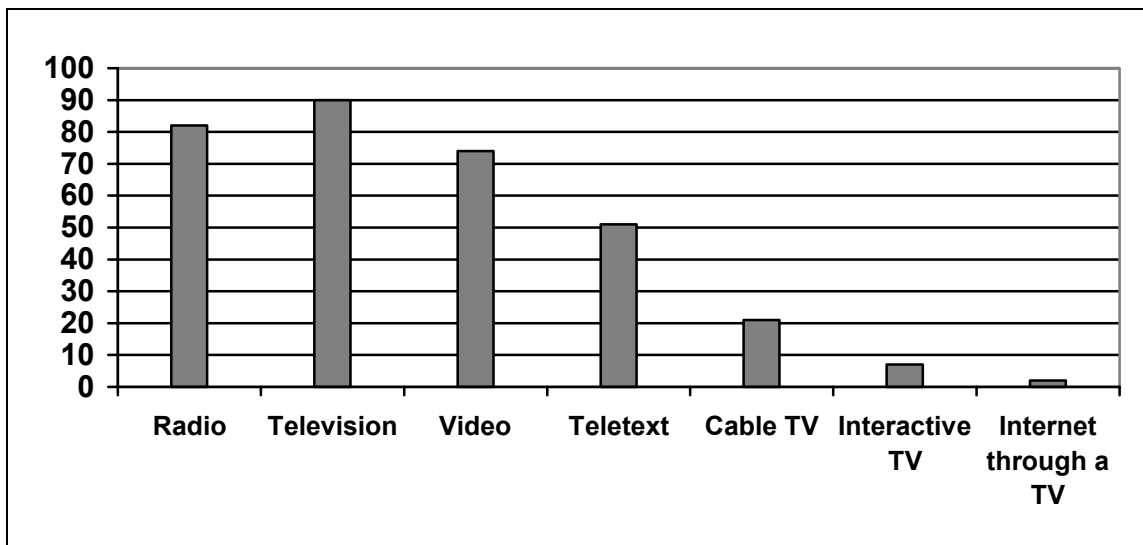


Figure 4: Use (%) of radio and television equipment by over 50's

3.4 Comments

Comments given by respondents illuminate these figures by indicating barriers to and reasons for technology use by older people. The most common problem cited was psychological discomfort, such as confusion, frustration and lack of understanding. The feeling of being too old for new technology was also mentioned several times, e.g. "Too old to bother with more modern things" and "I am too old to learn new tricks". Other

barriers mentioned included cost and physical difficulties. Positive comments mostly focused on usefulness, mentioning a range of equipment with specific uses.

4. Discussion

4.1 Questionnaire methodology

We suggest that administering a questionnaire face-to-face augments the questionnaire's value. In this case the questionnaire not only provides useful figures and information, but can lead to further discussion and insight into how this user group relates to technology.

In our survey, the questionnaire served as a stepping stone to further discussion on the technologies under investigation. For example, a closed question about mobile phones would, on occasion, evoke further discussion with a demonstration of the user's own mobile phone. The researcher could then observe the user in action with their mobile, and see, for example, if they used all of the functions available and what problems they had. The researcher could then probe further, asking what they liked about it, why they didn't use it or why they felt the need to buy one.

Administering the questionnaire face-to-face also sometimes provided the opportunity to see how a device fitted into the user's life. For instance, one respondent tentatively explained that he "thought" he could connect to the internet on his mobile phone, but had no idea how to use it. He didn't even use the mobile frequently, but only when he visited his sister, as she lived in a caravan in the country. Another respondent, whose usage of technology was extremely minimal, became very animated when asked about her use of a microwave. She reported not being able to "live without it". She said that, although she lived in a sheltered housing complex, she wanted to be as independent as possible with her cooking and that the microwave allowed her to do this.

The questionnaire would also evoke discussions of devices not included in the questionnaire. For example, those in the oldest age group would often talk about the safety alarms they carried around, reporting design problems, such as them being too bulky or showing through their blouses. This brings up important concerns that would not otherwise be discovered in this study.

These spontaneous excursions into own experiences and demonstrations of various personal devices were not rare events during the administration of the questionnaire.

Additionally, attitudes towards technology could be expressed more easily in such a session. Although the comments sections allowed the respondents to express their opinions and attitudes, not all felt that they could do this. For example, when a 94 year respondent was asked if she knew what a personal stereo was or if she used one, she replied "What the heck would I do with that?". These insights into respondents' attitudes towards technology use go further than simple indications of frequency of use. Such expressions of attitude also help researchers to identify potential participants for further research.

4.2 Trends in Technology use

4.2.1 Age Effects

Our results show a significant decline with age in the use of most technologies. Exceptions are telephones, televisions and possibly microwaves. This agrees with other surveys [2,4,7] which have identified these trends across the age span as a whole, using coarser age groupings. We extend their results, showing that these trends continue within the older population. This also supports the few studies that have examined within this group (e.g. [5]).

We cannot assume that this decline will disappear when those familiar with technology become the next generation of “older people”. Not only is new technology being continuously developed, but the figures for radio use show that age trends may continue even for well-established technology.

This trend may make designers think that it is not worth-while developing products with this user group in mind. However the figures, while generally decreasing with age, are high enough to represent a large market, and negate assumptions that older people are not interested in technological products.

Nevertheless, this trend does exist and presents a challenge when designing for older people. In order to meet this challenge, it is important to consider the reasons for it and make efforts to overcome them.

4.2.2 Reasons

Various reasons for differences in technology popularity in the general population have been proposed including the technology's age, its cost in money and time, its learning curve and the extent of positive feedback from others [3]. These and similar reasons may also help to explain the trend described above.

Length of time a technology has been available

The most popular technologies are the telephone, television, radio, microwave and video. In addition, telephone, television and microwave use are not greatly affected by age. These technologies are all fairly well-established and were introduced earlier than the other devices surveyed, indicating that older technologies are more popular. This can also be seen within telecommunications and radio/TV devices. This may be caused, in part, by older people's greater familiarity with older devices.

However television is more popular than radio, despite radio being introduced much earlier. In addition, radios were popular when all the age groups surveyed were young adults, and so all groups should be equally familiar with them. Yet radio use continues to decline with age, suggesting that a technology's age is not the only determining factor.

This factor can be addressed, in part, by building on existing technologies and designing new devices to look like and use similar interfaces to older ones.

Technology complexity

The complexity of a device, particularly of its interface, greatly affects its ease of use [6]. Many of the comments referred to psychological barriers related to complexity,

indicating that this is a problem. It is therefore important to keep interfaces simple and have them evaluated by older people.

However the relative popularity of videos compared to teletext and cable TV indicates that there is no simple relationship between complexity and technology use – decreased complexity does not always result in increased use.

Other factors

The positive questionnaire comments indicate that technology use is likely to increase if it is perceived to be useful. This applies not just to usefulness for practical activities, but also for entertainment, as shown by the popularity of television and radio. However usefulness is a difficult concept to determine, as it varies from person to person. It is important to find out what the users want and what they consider to be useful, and then to target design and marketing to their needs.

Another frequently mentioned barrier was the feeling of being too old for new technology. One possibility for overcoming this is to demonstrate that older people can use technology, by making more usable systems, by appropriate training and by featuring older people in advertising and media.

5. Conclusions

Questionnaires can be a useful means for finding out about the older population, particularly in the early stages of a project. As well as quantitative data, they can provide an opportunity for further discussion with older people, allowing one to get to know the user group better. This paper presents some of the key results from such a study, highlighting trends towards decreasing technology use with age and discussing possible reasons for this, such as the effect of technology age and complexity. These barriers to use can be overcome, at least to some extent, by appropriate design.

In the future, we hope to build on this work by investigating older people's interactions with technology using different methodologies in smaller scale studies with novel applications.

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