The efficacy of narrative video for raising awareness in ICT designers about older users' requirements.

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Abstract

This paper discusses the efficacy of narrative video to communicate some of the fundamental differences between older users of ICT interfaces and the interface designers who tend not to be familiar with the general perspectives and user requirements of this and other 'non-typical' target groups. Some preliminary results are presented regarding the impact such videos can have on relevant audiences' perspective on designing systems for older adults. The findings suggest that they can influence the mind set of those with no experience of designing for older users and that this influence can persist in the longer term. The findings also suggest that the extent of this influence can be equivalent to that of meeting and interacting with older users in a user centred design process, a valuable but logistically (and otherwise) challenging element in the training of prospective software designers. The potential utility and limits of this approach are also discussed.

Keywords: Film/video, user requirements, interface design, older people

Introduction

The importance of suitably informed empathy with users

Successful inclusive design requires designers develop some degree of empathy with their potential users, and then subsequently inform this with sufficient relevant human factors information in order to make appropriate design decisions. This requirement is emphasised when the user population includes older and/or disabled people, who are not likely to be well represented in the peer group of the designer. This seems to be particularly marked amongst Information and Communication Technology (ICT) designers, such that, much current software and the associated user interfaces seem to have been designed by young male computer scientists with a limited, or even nonexistent, understanding of the relevant characteristics of the wider population, particularly older people (Newell & Gregor, 1997). Danowski and Sacks (1980) comment that "older people differ from 'typical' computer users … as a result, software designed for such 'typical' users can present barriers to learning and use for older people" (p.125). Further, the somewhat less than positive 'attitudes' toward

ICT which many older people can have will tend to be very alien to the younger software engineer who is so proficient with and enamoured of digital technology that it is effectively inconceivable that others might not be. Thus, beyond the need to provide such designers with more specific human factors information about the needs, wants and capabilities of older (and other 'non-typical') users, it is important to raise their awareness about the disparity (from themselves) and the diversity of their potential users. It is only with such awareness that the potential for empathy can be realised and it is only such empathy that can provide the motivation to seek out and utilise suitable user information as the basis of more appropriate designs for more, and more diverse groups of users.

There are two distinct (but ultimately interrelated) ways that older people differ from 'typical' computer users. They are less likely to have the degree of familiarity (and hence, confidence) with digital technology that younger people do (e.g. Docampo-Rama et al, 2001). This will impact their potential ability to develop an understanding of the principles of operation, and their motivation to persevere if difficulties are encountered. Secondly, the physical, sensory and cognitive limitations brought about by ageing can add significant barriers to the use of computer (and computer-like) interfaces as they tend currently to be designed (Carmichael, 1999; Czaja & Lee, 2003). It can be seen that the combination of these types of factors can be particularly deleterious to a 'non-typical' user. That is to say, not accommodating their basic capabilities into the interface design increases the difficulties they will encounter, making it more likely that their (relatively fragile) confidence will be damaged which in turn increases the likelihood that they will 'give-up' (and consequently be even more convinced that they are 'too-old' to use this modern technology). In other words, people's entire relationship with technology can be negatively impacted simply because the relatively minor effects of age have not been taken into account in the design. Although a range of other capabilities are involved, it is untenable that the design of any predominantly visual interface would not address the diversity of the population's eyesight as this will cause difficulties for many people, older ones in particular.

For example, eyesight can be affected by a wide range of factors, some age-related and some not, which can have an equally wide range of impacts regarding the use of visual interfaces (Fozard, 1990). All older people have some minor visual impairments be they age related *per se* and/or added to by the effects of injury and/or disease. Advancing age can affect most optical parameters, each of which can have a disparate impact in regard to using visual displays and other visual aspects of the interface. Although many older people may not consider themselves 'Visually Impaired', they will find the use of 'typical' screen layouts much more difficult than they did when they were younger. Regardless of 'designing for older adults', awareness of (and accommodating for) such visual limitations will also be beneficial for 'typical' users in 'non-typical' situations (e.g. sub-optimum lighting conditions). Many older people (and other 'non-typical' users) will also have combinations of other minor impairments and these impairments may also interact with one another, creating, in effect, a more serious handicap (Carmichael, 1999; Newell & Gregor, 1997 & Gregor and Newell, 2001). Clearly it is important for designers to address such issues for the benefit of these user groups, and that by doing so benefits will also accrue for many 'typical' users in relatively more challenging usage contexts.

Beyond these issues of 'user ability', there are also significant challenges in achieving successful communication between designers and older people (another important foundation for empathy), again, particularly in the context of designing ICT. One example of this is jargon (and associated technological concepts, metaphors, etc.) used almost unavoidably by

technically proficient software designers, which many older (and other) users may be unfamiliar with or may misunderstand. This mismatch in understanding and the basic human urge to avoid looking 'ignorant' may be related to the general finding that older users tend to be positive about prototypes they are confronted with, even if they actually had difficulty using them, rather than give what might otherwise be a more objective view (Newell et al 2006b). It has also been identified that for many older people, if they do experience difficulty with 'modern technology', they will tend to blame themselves rather than the possibility of poor design (e.g. Hawthorn 2000; Rabbitt & Carmichael, 1994). Another important (and, again, possibly related) issue is that some older people's confidence regarding their ability to use technology can be very fragile, and it is vital from an ethical perspective not to put people in a position where whatever confidence they may have is put under threat (Gregor & Newell, 2001). These, and other issues, demonstrate that a variety of aspects of the communication channels between older people and designers about the design of ICT is far from straightforward (Zajicek, 2004 & 2005; Eisma et al. 2004).

The present paper focuses on the communication of relatively general insights about 'non-typical' users, in this instance older adults, to designers of ICT in a relatively efficient but informative and engaging way. This is important because, as indicated in the following section, such insights are currently available but their predominantly static and text based format limits their effective utility for many ICT designers. Although the UTOPIA Trilogy does contain some 'design guidance' the emphasis in the current study is less on information transmission and more on 'awareness raising', particularly in regard to the notion that potential users of technology are not the same as its designers. Other aspects of the communication channels between designers and 'non-typical' users, and the role theatrical techniques can play in this (Boal, 1995 and Dishman, 2003) and of which the UTOPIA Trilogy is but one element, are discussed further in (Newell et al, 2006a), wherein a comprehensive account of the motivation and process behind the Trilogy is given.

'Guidelines' about older users' requirements

One approach to informing designers of the needs of older and disabled people within a design brief is the use of guidelines. Many such guidelines have been produced, including those based on accessibility standards for the Web (World Wide Web Consortium, 1998 & 1999; Office of the e-Envoy, 2002a, b & c) and more generalised guidance based on human factors principles in relation to the characteristics of older people (e.g. Carmichael, 1999; Hawthorn, 2000). There is also a body of HCI research information in the academic literature on the particular problems older people face using ICT systems (e.g. Coyne & Nielsen, 2002, Williamson et al 1997 & Hawthorne 2002). However, Robey and Markus (1998) report that many designers find these sorts of 'academic' sources of user information, "literally unreadable" (p 8). Similarly, Blomberg et al (2002) state that "re-presentation of observational data or lists of disconnected findings is not particularly useful as an aid to design" (p974). Further, many designers simply do not utilise such guidelines as do exist, and there is evidence suggesting that even when they are used, guidelines in isolation, have limited efficacy (Sloan et al 2002, Kelly 2002, Diaper & Worman 2003) and can often be inappropriately applied in the absence of broader knowledge about the context of the user population they relate to (Thatcher, 2003). Clearly, the mere availability of guidelines or equivalent information is not enough to ensure their utility, nor, it would seem, are the relevant legal imperatives (Gregor et al 2005). Another factor impacting the utility of such 'guidelines' may be that designers are typically visually oriented and much design education (and subsequent practice) is done by example. In contrast to this, most 'user' information is

presented in textual and numerical/tabulated form and requires a marked degree of interpretation if they are to be successfully incorporated into a design.

Another, distinct, approach being developed to inform designers about users (including the implications for design), focuses on this 'by example' preference and is based on 'claims' or 'patterns' that relate 'good' interface design elements in a brief but adequate context (e.g. Zajicek, 2005). This type of approach has great potential but is limited (currently at least) by being static and predominantly text based and is also likely to lag behind state-of-the-art design questions by being 'tried and tested' in the context of earlier product generations.

Thus, although a sizeable corpus of information exists about the abilities and requirements of 'non-typical' users such as older adults; much of this is currently unknown or considered effectively inaccessible by many designers and therefore is only of limited or nonexistent utility. It has also been argued that, given the information needs of 'interface' designers, there is a paucity of appropriate population based anthropometric data particularly in reference to older age groups (see for example; Charness and Bosman, 1990; Kelly and Kroemer, 1990). Thus there is also a need to gather data on relevant (to modern digital products) anthropometric parameters that include the full diversity of the population. While such data is potentially crucial, there would still remain the question of how to make it accessible and useful for designers. At least part of this would involve the designers being aware of their need for such information.

User Centred Design

'User Centred Design' methodologies, and 'usability testing' were developed to provide ways in which designers can address the actual characteristics of their user population, and these have proved to be very useful in conventional software design (i.e. for 'typical' users), but, as Newell and Gregor (1997) have pointed out, such methodologies do not cater well for the much wider spread of characteristics that are embodied by 'the population', which includes older and disabled people. This is important as increasing numbers of interfaces are being developed where the 'target user group' is the entire population (e.g. WWW, DTV).

The wide ranging characteristics and functionality of older and disabled people, add to the diversity of the 'target population' making it difficult if not impossible to identify and select meaningfully 'representative' user samples and to produce 'universal' guidelines (Gregor & Newell, 2001). Newell and Gregor (2000) suggest that a new design paradigm should be developed which they describe as User Sensitive Inclusive Design. Based on the idea that "inclusive" is more achievable than "universal" or "for all", and that "sensitive", rather than "centred", identifies the lack of a truly representative sample of a user group (especially when that group is 'the general public') and thus the need to be sensitive to the diverse needs of a large group rather than be centred on the needs of a particular (and not necessarily representative) sub-group or, indeed, of some notional 'ideal', 'typical' user. The UTOPIA Trilogy aims to impart an initial basis for such 'sensitivity'.

Another approach commonly used in User Centred Design to foster designers' engagement with users is that of personas and scenarios (see for example, Cooper 1999; Carroll 1997, and Benyon & Macaulay, 2002). An important motivation in the development of these approaches was to help designers to break away from a mindset that (albeit implicitly) encourages them to essentially design for themselves (Keates, et al, 2000). However, personas and scenarios are limited by similar presentational factors as mentioned above for 'user data', by being static and essentially text based. Beyond this, and despite the

undoubted benefits of this approach from the perspective of many designers, the suitability of personas and scenarios in reference to a diverse user group limit their ability to produce more 'inclusive' designs (Newell, et al, 2006b) although it is clear that there is something about the 'person' within a persona that promotes engagement and some degree of 'empathy' between the designer and their potential users.   However the efficacy of such empathy is potentially offset by its focus on a (quasi) individual rather than on a relatively diverse group of individuals. The UTOPIA Trilogy aims to embody the combined strengths of personas and scenarios in a way that maintains a focus on a 'user group' rather than a 'user'.

From the above it can be seen that the development of effective methods for obtaining and presenting 'human factors' and other 'user requirements' information to designers in order for them to be optimally used has become a pressing issue, particularly in the context of the design of ICT that will be used by older people.

The UTOPIA Project

The UTOPIA Project (Usable Technology for Older People: Inclusive and Appropriate; see http://www.computing.dundee.ac.uk/projects/UTOPIA) funded by the Scottish Higher Education Funding Council, was led by the University of Dundee and involved Abertay, Glasgow and Napier Universities. It is notable in this context, that this project shares a name (acronym not withstanding) with the seminal participatory design study in Sweden (see, for example, Bodker, et al [2000] and Newell, et al [2006a] for more on theatrical techniques for design, which has clear roots in participatory design and elsewhere). The Scottish UTOPIA project was established to examine a range of issues surrounding older people's use (or not) of modern technology. One aspect of this was the development of a volunteer panel of older people who act as surrogate users in a variety of capacities. A major objective of the project was to promote (to both academia and industry) the need for suitable types of technology to be appropriately designed for this group (Dickinson et al 2002 & Eisma et al 2003) an important element of which being the development of various tools and methods to support designers in achieving this.

The UTOPIA Trilogy

An important strand of the work in UTOPIA was the development of video portrayals of some of the common challenges and difficulties older people can experience with modern technologies. This was motivated in large part by an earlier academic/industry collaboration to develop an easy to use e-mail system, during which the 'industry' designers had something of a 'road to Damascus' experience, but only after witnessing first-hand just how unsuitable his design was, evidenced by the complete bewilderment of a group of elderly users when faced with it, and despite thorough briefings in this regard from the academics involved. This particular issue and a fuller discussion of the collaborative project are given in Dickinson et al (2005). Based upon the marked influence of this experience on these designers, we commissioned the Foxtrot Theatre Company to produce a series of narrative based videos to illustrate the kinds of problems that many older people face with ICT (see Newell et al, 2006a, for more on this collaboration). The 'problems' depicted covered a range of the 'lifestyle', confidence, 'jargon' and 'user ability' issues touched upon above. The stories portrayed were an amalgamation and distillation of many older people's real experiences and the findings from various human factors and usability research with older people drawn both from the UTOPIA project and the wider literature. These data and experiences were distilled by the scriptwriter into narratives which encapsulated a range of issues within an engaging, cohesive and 'dramatic' storyline. These were then produced as

short vignettes using professional actors, director, and crew. These vignettes formed the "UTOPIA Trilogy", which consisted of dramatizations of:

- A new (older) user of a mobile telephone
- A new (older) user of email both at home and in a 'training' setting
- A new (older) user of a home PC dealing with a new peripheral device (a webcam)

Brief synopses of the final stories included in the trilogy are given in Figure 1 below.

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Peter and Jane Buy a Webcam
Having been given her son's old computer, Jane has set about learning the basics and now feels confident using it for email and word processing. Having come across an article in a paper, she has decided to take the plunge and buy a webcam so that she can talk to her daughter and grandchildren in Australia.

Sandy's Mobile Adventure
Sandy has been given his daughter's old mobile phone. He never uses it but carries it around with him to keep her happy. Today he finally finds a use for it when he locks himself out of his house...

A few months later...

After his problems with the phone, Sandy's daughter gave him a quick lesson and a cheat sheet of simple instructions. Sandy still doesn't use the phone, but carries it with him in the car fully charged... just in case.

A year and a half later...

Since saving him a long walk home, Sandy has changed his attitude towards mobile phones and now uses his frequently. Over a glass of wine his daughter brings this change up...

Email Experience
Peter is quietly jealous of his wife's confidence with using a computer, but is too proud to admit it. One day he finds that she's left it on when she's gone shopping. He decides that this is the chance to give email a go in privacy...

After the debacle of trying email on his own, Peter has bitten the bullet and signed up to computer classes at the local university. He's feeling his petulant self as ever...

Frustrated with his experiences so far, Peter decides to give email one last try. The computer class is demonstrating a new cut down email application which has been designed for simplicity, clarity and ease of use...

Figure 1: Synopses of the three films in *The Utopia Trilogy* (running time 35 mins.)

A variety of audiences including academics, usability practitioners (with experience with 'non-typical' users) and older people from our volunteer panel viewed the Utopia Trilogy.

Various 'focus group' and other discussions with these audiences suggested that the videos accurately portray the kinds of challenges which many older people experience with much new technology, and that as such, had the potential to 'enlighten' many ICT designers. (MORE - Alan – qualitative/anecdotal info from these screenings that supports the 'validity' of the trilogy)

(end with 'clearer question' - see new title)

Method

Following the informal 'validation' of the Trilogy by the audiences mentioned above, it was decided to explore whether these videos could have some measurable impact on the type of 'mind set' indicated above, which seems common amongst ICT designers. Our experience has shown that undergraduate computing students are particularly likely to have such a mind set and as such we incorporate a 'user centred' practical project as part of their training which includes the evaluation of paper prototypes with small groups of older people. While this approach has had clear educational value, its organisation raises significant logistical and ethical challenges, not least of which is due to the profound inexperience of the undergraduates in dealing appropriately with older adults in this sort of context. Thus one of the motivations behind the development of the Trilogy was to serve as 'orientation training' in preparation for the 'user involvement' course activities, a requirement echoed by the 'road to Damascus' experience of the professional developers indicated above. Therefore the 'impact' to be assessed is at the level of general awareness rather than more detailed levels of 'understanding' or 'knowledge' of the content of the stories. This is based on the view outlined above that awareness (e.g. that older users are different from the designer) is effectively a prerequisite for seeking out appropriate kinds of 'user data' in order to achieve a more suitable design. This basic awareness is important despite the fact that the provision of relevant (to the user) and accessible (to the designer) 'user data' remains an ongoing challenge.

A "before and after" questionnaire was developed with the aim of addressing the potential impact on awareness. The eight items on the questionnaire were developed to reflect some of the relatively stereotypical 'attitudes' that often seem to be held by designers with regard to older people and ICT (see Figure 2). It can be seen that in relation to the Likert rating scale used, 'agreement' with these statements suggests an affinity with the 'mind set' that the videos are intended to challenge.

1. Most current interfaces are easy for most people to use.
2. Successful inclusive design is a matter of following the appropriate guidelines properly.
3. Older people are not interested in new technology.
4. A clear and comprehensive user manual is the key to usable technology.
5. Designing for older people is the same as designing for any niche market.
6. If an older person has difficulty with technology there will usually be a younger relative around who can help.
7. Older people have more in common than do younger people.
8. Specialist (rather than mainstream) companies should provide technology suitable for use by people with disabilities or impairments.
Response Categories

| Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |

Figure 2: the eight 'attitude' statements and associated response categories

Initially, two opportunistic samples of potentially suitable respondents presented themselves. One was a first year class of Applied Computing undergraduates, who had not yet undergone any 'HCI' courses. The other consisted of HCI professionals and academics attending a workshop on older people at the HCI 2004 conference. Although involved in HCI (with many describing themselves as 'interface designers' or similar), most of this group did not have any particular experience with older people as users (the data from the few who did was not included in the analysis). However, it should be noted that there is a certain degree of self-selection bias in this group on the basis that they chose to attend a workshop on HCI and older adults. The existence of this bias can be construed as limiting the potential to measurably raise this group's awareness regarding older adults as users. Data from these initial samples and a comparison between them is presented below.

All groups viewed the videos under essentially the same circumstances. The UTOPIA Trilogy runs for about 35 minutes overall, and was apparently sufficiently engaging to the audiences such that no interruptions occurred during any screenings. Simply stated, a brief introduction would be given including an overview of the content of the videos and an indication of their role as the basis for subsequent discussion. For the 'before and after' questionnaires, respondents indicated their dis/agreement with each of the eight statements on a five point scale (Figure 2). They completed one set of responses before they had viewed the trilogy and these forms were all collected before the screening began. Although the opportunity to discuss any issues raised by the videos after they had been shown was indicated to the viewers, no explicit mention was made about the 'after' questionnaires until they were distributed on completion of the screening. Systematic replication while distributing the forms ensured that 'before' and 'after' response forms were correctly paired. Subsequently, further samples of suitable student groups have viewed the Trilogy and completed the questionnaire, both from Applied Computing at Dundee and elsewhere (we acknowledge the kind assistance of Dr. Nina Reeves, Department of Multimedia and Computing, University of Gloucestershire, in this regard) and the viewing sessions were all equivalent to that described above. An overall analysis of this larger sample is also presented below.

As indicated, these data reflect only the immediate impact of viewing the Trilogy, but not any longer term impact on the characterized 'mind set'. In order to address this, the initial (Applied Computing) undergraduate sample was followed up in their subsequent academic year. This was approached in a similar way to the now common practice of obtaining student feedback as part of course review procedures. Thus, in relation to the appropriate first year module the students were asked to rate how influential different elements of the module had been for them in considering the people who may use the applications they develop. Simply stated, this module involves an initial grounding in HCI and further lectures, the development of (paper) prototypes which are subsequently utilized to obtain feedback in user evaluation sessions with older people from our volunteer panel, followed by the 'completion' and documentation of their 'user centred' application. As mentioned above, the Trilogy videos were shown as 'orientation' prior to the 'user evaluation' sessions. The module elements included in this questionnaire were; the student's prior knowledge (reading etc.), the lectures, the process of developing their prototype, the feedback sessions with the older people, and the Trilogy session which also included some discussion of issues raised by the videos. Each element was rated on a five point scale (i.e. 'not influential', 'slightly influential',

'moderately influential', 'fairly influential', and 'very influential') and the students were asked to consider all the elements before giving a rating to each. The 'influence' questionnaires were distributed in a similar manner to other 'course review' material for anonymous completion and return (this occurred around eight months after this undergraduate group had viewed the Trilogy and completed the 'before' and 'after' forms).

The data from this questionnaire is also presented below, unfortunately the requirements for anonymity in obtaining course feedback disallowed 'within-subjects' analysis of the relationship between individual students' 'immediate' (i.e. 'before' and 'after') and 'delayed' (i.e. 'influence') responses. Beyond this, the disparate nature of the two questionnaires disallowed a meaningful examination of their connection using 'within-groups' analysis. This is unfortunate as it may have been informative to explore any relationship between (for example) the extent to which an individual's awareness was raised and their subsequent perception of how influential that experience had been. We are currently looking into how we might address this in the future.

Results

As mentioned above an initial analysis was carried out on the responses of the two samples. One group consisted of first year Applied Computing undergraduates (N=40). The second group was made up of HCI professionals and academics (N=51). An analysis of variance for the responses (averaged across all statements, which gave acceptably normal distributions and thus allowed examination of interaction effects) showed a significant 'improvement' between the 'before' and 'after' responses across both groups ($F (1, 89) = 40.96, p < .0001$), see Figure 3. Figure 3 also shows that the HCI group showed more 'disagreement' overall than did the undergraduates ($F (1, 89) = 27.51, p < .0001$). The effects of these two factors also interacted significantly ($F (1, 89) = 10.59, p = .0016$) such that the Undergraduates' responses showed a greater extent of change than did those of the HCI group. It is worth noting that examination of the distributions in this analysis indicates the results are not due to floor or ceiling effects.
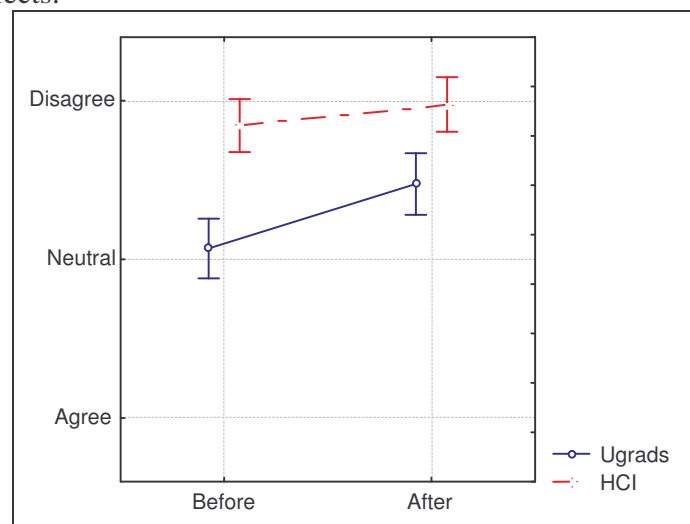

Figure 3: Averaged ratings given to all 'before & after' statements by computing undergraduates and HCI researchers

A more detailed breakdown of these groups' responses (see Figure 4) shows that the overall pattern of effects is similar across the different statements. One exception is the marked difference in views about the utility of user manuals (Statement 4), which may be due to different levels of experience between the undergraduates and the HCI professionals

regarding the; quality, usefulness, usability, and actual usage (by 'end users') of such documentation. A similar but smaller disparity can be seen for Statement 1; "Most current interfaces are easy for most people to use", which also seems to be an issue that the undergraduates changed their view on the most, having seen the videos.
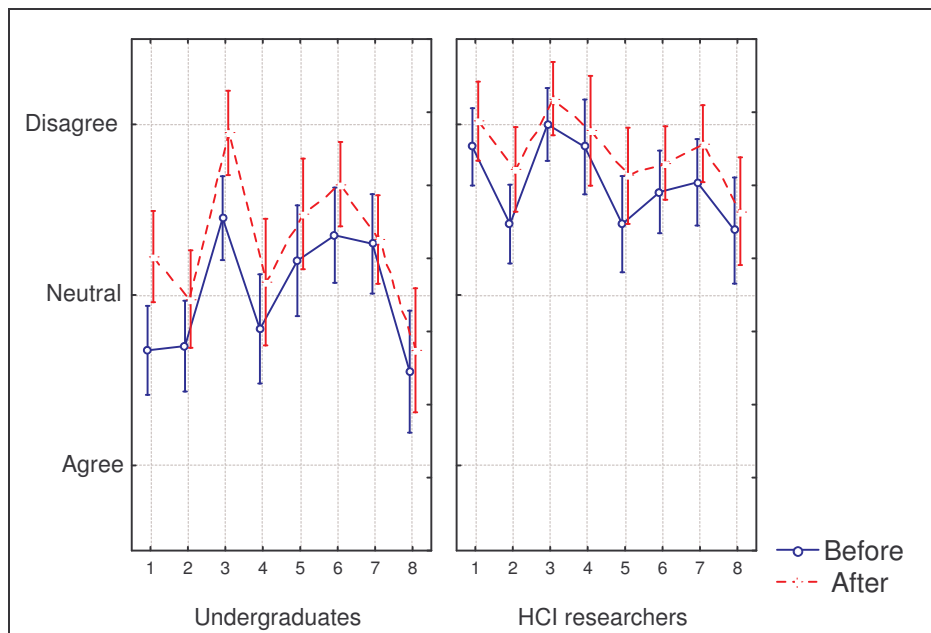

Figure 4: Difference in 'before & after' ratings for all statements, between undergraduates and HCI researchers.

These findings suggest that this approach can have an impact on the mind set of people involved (or soon to be) in the design of ICT for older people. As described above, subsequent to this analysis, the undergraduate data has been supplemented by further samples of (mostly 'computing') students with varying degrees of exposure to HCI issues. This larger sample (N=198) replicated the overall significant change in 'before' and 'after' responses reported above ($F(1, 196) = 138.88$, $p < .0001$) and as can be seen in Figure 5, the overall pattern of responses across statements is consistent with the initial smaller undergraduate sample although there is a slight tendency for more 'disagreement' overall in the larger sample.
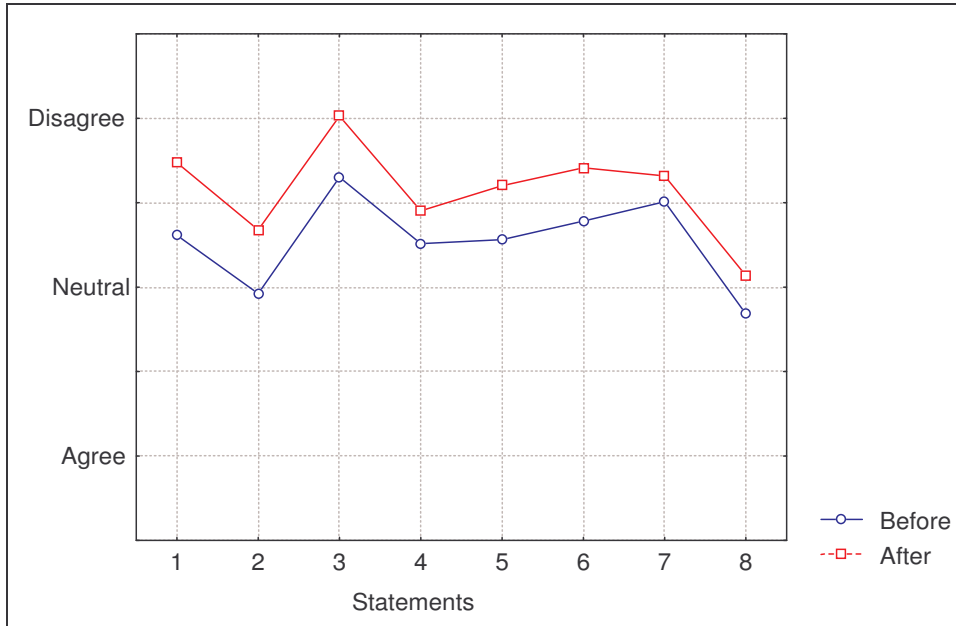
Figure 5: Difference across 'before & after' ratings by larger undergraduate sample (N=198).

Finally, an analysis of the 'influence' questionnaires was carried out. As mentioned above these were completed by students involved in the initial 'before & after' sample and it would have been potentially informative to examine the relationship between these sets of ratings. However, constraints of anonymity for the student feedback did not allow such 'within subjects' analysis between the 'influence' data to the earlier 'before & after' data. Figure 6 shows that no striking differences emerged between the perceived influence of the different module elements, with the averaged ratings falling between 'fairly' and 'moderately' influential (i.e. below 'very', and above 'slightly' and 'not'). However, it can be seen that meeting (and getting feedback on 'paper' prototypes from) the older volunteers, and watching and discussing the UTOPIA trilogy are considered the most (and similarly) influential.
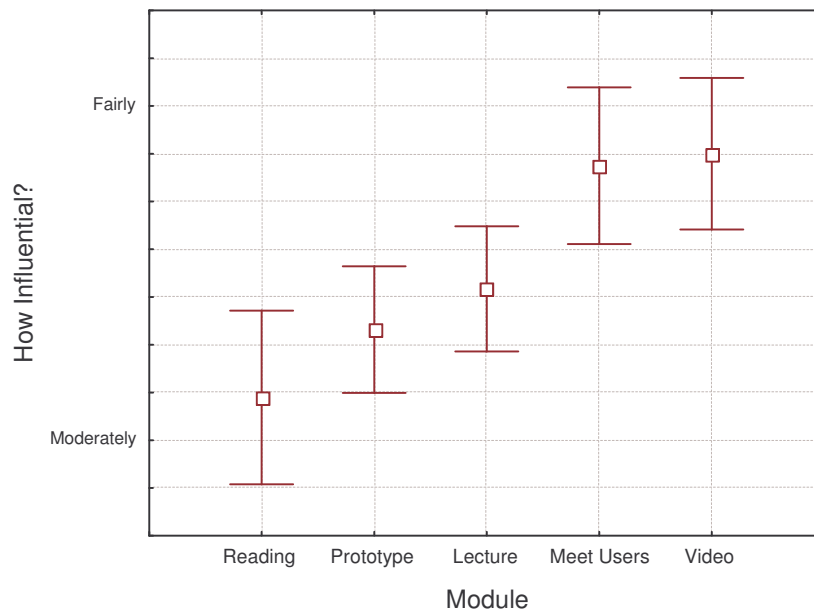

Figure 6: Ratings for degree of influence for different module elements.

Comparisons between the ratings for the individual module elements using a Wilcoxon matched pairs test indicated that the only significant differences among the 'influence' ratings for the different module elements were between 'Reading' and 'Video' (N=43, Z=2.52, p = .011) and between 'Reading' and 'Meet Users' (i.e. meeting with the older volunteers) (N=43, Z=2.44, p = .014).

Discussion

Following previous success in the use of video as an element in the communications link between older users and designers (McKenna et al, 2003, and see Newell et al, 2006a) there seemed potential to use this medium to convey insights about older users of ICT to designers. This initial venture focused mainly on common issues and indicated some of the general motivations and difficulties older people often have with regard to using ICT. Thus the main expected impact was in relation to the general insight that many potential users can have very different relationships with ICT than its designers. The questionnaire results suggest that the UTOPIA Trilogy can have some degree of impact in this regard which is in line with anecdotal indications from some of our industry contacts. Acquiring this general insight about the diversity of the older population is an important step if designers are to appreciate the need to investigate further the diversity of their preferences and requirements and gather relevant information so that the resulting design is more suitable for use by a wider range of people. On the one hand there is a need to direct these sorts of message to the professional design community and it is hoped that the UTOPIA Trilogy is a step in that direction. On the other hand there is potential for relatively greater impact if this 'message' can be conveyed earlier during the formative education of those aiming for careers involving ICT design.

The importance of this insight regarding the diversity of 'user populations', is addressed for our undergraduates by the provision of modules incorporating direct interaction with older people, an approach which currently seems to be far from widespread. While these are undoubtedly successful course elements, there are significant ethical, logistical, administrative, financial and educational challenges in regard to there satisfactory implementation, which may seem somewhat prohibitive for other institutions which might otherwise consider similar approaches. Therefore, while not in any way a replacement for 'the real thing', an encapsulation of some of the main background issues on video has potential to be a useful complement to the other ways of highlighting the role of users in interface design. Our experience has also shown they can act as a helpful orientation for students in preparation for 'the real thing'.

The UTOPIA Trilogy was an initial foray into this approach and much was learned from the process (see Newell at al, 2006a). It is extremely important to ensure that the researchers, script-writer, director, producer and the actors are all aware of the various agendas involved in producing an effective video. The tension between the artistic requirements of a rich and rewarding story and the scientific requirement of conveying particular issues accurately needs to be carefully managed to ensure that the videos encapsulate a satisfactory balance. There is also tension between a narrative which primarily raises awareness of issues and one which aims to convey "information" or other forms of prescriptive guidance and in the present case we opted for the former.

There were also constraints due to time/budget pressures, which seem to have compromised some of the surface qualities of the productions. The scripts, for example, could have benefited from an additional developmental session with an invited audience where the

actors, using the script, acted out what had been developed so far. Comments from the audience, researchers and 'older participants' in the project, could have been added at that stage and the script be sharpened up in places. The planning of the video shoot is based on the script, and once the shoot is concluded (particularly if further shooting days are disallowed by the timetable/budget, as was the case here) there is only so much that can be done in the cutting room. We thus aim to further refine the process so that the outcome can be "tighter", and possibly cover a greater range of the challenges experienced by older people. There will, however, be some interesting challenges exploring how well this approach can convey relatively more 'detailed' (or otherwise 'instructional' for the designer) information about users. One video cannot achieve everything and it is important to use this approach where it is likely to be most effective, and for all the parties to have a clear idea of the particular purpose of the final production.

In this instance, the aim was for a very general, overall 'message' regarding the idea that other people can have a very different 'relationship' with technology, and that this would be complemented as appropriate with slightly more specific 'messages' about some of the types of difficulty older people often encounter (e.g. the use of 'jargon'). This helped to shape the decision to focus on well established technologies, such as the PC and mobile 'phone, with two of the vignettes relating to the PC (one in relation to using software applications and the other to the management of hardware, peripherals etc.). In a variety of ways these three aspects of the use of modern technology are becoming effectively necessary in today's society and thus seemed to provide suitable 'case studies'. We believe that this combination of general 'messages' about older users in the context of established mainstream technologies makes the UTOPIA Trilogy a good facilitator for discussion on associated issues in this area and also as a relatively efficient surrogate for interaction with actual users.

Theatrical techniques for augmenting the communication links between designers and users has been shown in other areas to be very effective in stimulating discussion, and thus we will continue investigating the use of this and other techniques both in conjunction with videos and live performances for advancing and promoting the "inclusive design" message within the design community. We are also investigating ways in which we can more closely link such theatrical presentations to scientific and demographic data about older users, so that the messages in such presentations can be more grounded in scientific data, whilst still retaining the impact characterized by this genre. Any readers interested in viewing or otherwise utilising the UTOPIA Trilogy should contact the corresponding author as the videos can be made available on CD-ROM.

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Figures & Legends
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