
Time to Retire Old Methodologies? Reflecting on Conducting Usability Evaluations with Older Adults

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Abstract

The global population is becoming older, and the trend for this shift is only accelerating. At the same time, older adults are using the Internet and mobile technologies in increasingly large numbers. As evidenced by the proceedings of many conferences such as the ACM MobileHCI or the ACM CHI, the usability of interactive technologies designed for older adults is of significant concern. Yet, the methodologies we employ for designing and evaluating such interfaces are largely the same as those used for any other user group. In this position paper, we argue that one methodological size does not fit all especially when it comes to usability evaluations with older adults. We do so by reflecting on our own experiences with designing and evaluating interactive technologies for older adults (particularly for those over 80 years – the “oldest old”). We then propose for discussion senior-centred approaches and adaptations of established usability evaluation methodologies.

Author Keywords

Evaluation methodologies; older adults; usability.

ACM Classification Keywords

H.5.2 [User Interfaces]: Evaluation/Methodology, User-centered design. K.4.2 [Social Issues]: Handicapped persons/special needs.



Figure 1: InTouch is an accessible communication app supports asynchronous communication with loved ones: sending/receiving of images, audio, or video, receiving (but not sending) text messages, and sending of one pre-defined “I’m thinking of you” message. It has a non-language specific interface (based on icons), and requires no typing because it was also developed for seniors with dexterity problems or related motor impairments.

Introduction

Older adults (65+) are often considered to be technologically less savvy than the average population, particularly with respect to using online applications [5]. This can have negative consequences for their financial, health, and well being, by hindering their access to a set of socio-economic resources, from online banking, to relevant health information, and to maintaining connections with family members and friends. In particular, social isolation is a significant issue [12]. As we have shown in our previous research [11, 1] and illustrated by several other studies such as [7, 3], older adults could significantly benefit from the support afforded by mobile communication technologies in reducing social isolation. Yet, the difficulties older adults face when using such technologies represent a significant obstacle for actually benefiting from their adoption. Such difficulties include: little payout with respect to effort required to learn how to use the technologies [2, 13], usability of interfaces [9], or users’ lack of digital literacy [2, 10].

Efforts to address the adoption of communication technologies by older adults have often focused, rightfully, on improving usability during the design phases [4, 6], through approaches such as participatory design [14, 15], and less on addressing the methodological aspects of the evaluation phases. In our previous work we have described the design and evaluation of communication technologies to support older adults and reduce their social isolation. We have proposed guidelines for the design of senior-centred technologies [1] and have presented a case study outlining the challenges we have faced in conducting field trials with older adults [11]. In this position paper we reflect on the implications that our field experiences may have on developing a senior-specific evaluation methodology within mobile interaction research.

Evaluating Technologies with Older Adults

To address the issue of social isolation and loneliness among older adults, we have designed InTouch – a tablet-based app that aims to increase family communication and social connectedness among older adults (Figures 1 and 2). Our field studies with institutionalized older adults (described in [11]) show that the app was bridging generations, since intergenerational relationships were a main reason for the app’s adoption and use. Four of our five participants saw their grandchildren as the “digital generation” and felt that using our app could bridge that gap.

The field studies were conducted in a long-term care facility in a large metropolitan area of an English-speaking country, with non-native speakers, assisted by at least one family member. Each participant received one tablet to be used at all times, with family members encouraged to use their own devices to send messages to their participating seniors (InTouch acts as an email protocol wrapper, and thus the receiving end can be a regular email client).

Evaluating technologies with older adults through field studies such as those described here (and extensively in [11]) can present significant challenges. Some of these challenges are of logistical nature: enrolment and retention of participants, access to participants due to policies specific to the long-term care homes, security of mobile devices, illnesses (not only of participants but also of other residents leading to prolonged quarantine periods and lack of access for researchers). Methodological challenges include the need for additional support (user manuals, repeated demos, involvement of nursing staff), unsuitability of rigid evaluation instruments such as the psychometric scales used in questionnaires and usability evaluation forms, presence of researchers affecting the data collected

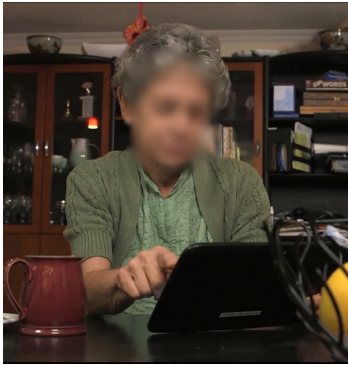


Figure 2: A participant using InTouch – our tablet-based app. InTouch has been developed at the Technologies for Ageing Gracefully lab (TAGlab) at the University of Toronto. Working at the intersection of interactive technologies and ageing, TAGlab researches and designs aids, systems, and experiences that support ageing throughout the life course with the goal of fostering community, identity, and autonomy for our users. We are comprised of computer scientists, social scientists, designers, and health care professionals. Together, we conduct in-depth research on the social contexts of ageing, using social science methods to develop rich understandings of how we age, the factors that affect that process, and how technological advances can be used to improve quality of life.

(e.g. through participant's impression management or reliance on researchers for technical support). Among the design challenges we have faced, issues such as the form factor (weight and size of tablets), or the difficult-to-understand implicit touchscreen affordances (e.g. swipes) have affected the usage of the device.

Reflections on Evaluation Methodologies

Our experiences conducting field studies of mobile technology adoption with older adults suggest that the typical HCI evaluation methodologies are not always suitable for this setting. In [11] we extensively outline the usability evaluation challenges that we have encountered, which we have summarized in the above section. As such, we propose for discussion at the MobileHCI 2015 Workshop on Designing with Older Adults a set of preliminary suggestions for senior-centred evaluation methodologies. These suggestions of a more flexible approach to usability evaluations are empirically grounded in our own experiences with a user group that is defined, among other aspects, by its considerable heterogeneity.

User testing

Problem: our initial protocol relied on methods such as think aloud for collecting usage data; however it became apparent early on that performing simultaneous tasks (performing and describing) can be overwhelming.

Suggestion: alternate testing strategies are thus required in order to uncover users' mental models of interacting with technology, such as indirect accounts of usage (explain to a friend how to use the app), inquire about the meaning of UI elements or elicit preference judgements about these, or assess similar mockups. In addition, we suggest not relying on collecting objective usage data – in our previous work with similar user groups [8] we had to make extensive use of direct

observations or accounts of observations (by non-participants such as family members or caregivers) since on-device interaction logs proved to be unreliable due to non-participants use of devices.

Respondent strategies

Problem: collecting quantitative data is a critical component of any usability evaluation. However, in our studies we noticed that older adults often have difficulties understanding psychometric scales such as Likert.

Suggestion: we have found in the past [8] that marginalized users or those struggling with digital or functional literacy respond better to guided interviews than to Likert scale questionnaires. While interviews may be more difficult to administer, the data collected may be thus more accurate despite its lack of quantitative rigour.

Researcher as participant

Problem: as in any field study in which researchers are immersed, conducting in-situ evaluations with older adults can lead to collected data being biased by researchers' presence. In our experience of field studies with older adults, this has been a significant challenge, due to researchers having to provide additional tech support, troubleshooting, and regular how-to instruction. Moreover, data collection was affected by users' impression management efforts, in which participants actively tried to “impress” researchers by trying to hide their difficulties with certain tasks.

Suggestion: for this, we suggest that data is collected through indirect methods, such as asking participants to explain to a friend how to use the interface, or to describe how another participant may use the app, or to think about what aspects of the app a friend may struggle with. Furthermore, we recommend that data is collected much later in the study, as participants'

growing familiarity with the researchers has the potential to reduce the impression management efforts.

Data from non-users and ecological validity

Problem: since many older adults are struggling with a lack of digital literacy, it is to be expected that they will rely on proxies (caregivers, family members) for learning how to use a mobile app, but also for continuous support during daily use.

Suggestion: instead of trying to isolate participants' usage data from that of their proxies, an alternative is to consider their collective use. It is likely that older users will continue to rely on outside support after the field trial is completed. As such, a technology can be considered adopted when users *together* with their support network can successfully use it.

Conclusions

In this position paper, we have presented an argument that current methodologies for evaluating the adoption of mobile communication technologies by older adults are not always suitable for this user group and related contexts of use. We have grounded this argument in our own experiences with designing and evaluating interactive technologies for older adults (65+) and for oldest old (80+). We have then suggested for discussion four themes that could frame the adaptation of current evaluation methodologies to better reflect the realities of conducting field evaluations of mobile technologies with older adults. We hope that this will contribute to the wider efforts within the MobileHCI community to improve the theoretical and practical framework of senior-centred usability evaluations.

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