

## Communication experiences for the older hearing-impaired: The uptake and usage of modern communication devices

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### Abstract

**Purpose:** *An exploratory study of the experiences of a group of older hearing-impaired clients who regularly used some form of modern communication technology (MCT, mobile phone, e-mail, texting etc) with a view towards identifying those factors which maximize or diminish the capacity for successful communication using their MCT.*

**Design and Methods:** *14 hearing-impaired participants aged over 60 years underwent a semi-structured interview in which they expressed their experiences with MCT, in either successful or and unsuccessful use.*

**Results:** *Use of MCT afforded an increased sense of empowerment and security. Perception of technological complexity, poorly presented instruction manuals and inappropriate ergonomic design limited successful use.*

**Implications:** *Improvements in design and marketing of these devices are necessary to cater for the growing older hearing-impaired population. Seniors need to be provided with information about MCT and the commercial sector needs to become more attuned to the different needs of this important, and growing, market of consumers.*

### 1. Introduction

The recent rapid development and uptake of modern communication technologies has provided an increasing choice of alternatives to the traditional landline telephone (e.g. cellular phones, texting, e-mail, faxing, and instant messaging amplified telephones). This technology has widespread potential for optimizing communication and quality of life for the elderly. For example such technology may address the significant social isolation which occurs as a result of hearing loss [1] and navigation difficulties [2]. In addition intellectual stimulation is considered an important aspect of healthy mental aging [3, 4]. Access to many learning opportunities for older persons [5], as for all ages, is becoming dependent on communication technology.

Jaeger [6] states that senior citizens have been slow to start utilizing communication technology and thus there is a danger that they may be excluded from a society increasingly reliant on it. The reasons for lower rates of MCT use amongst the elderly are varied. While the introduction of MCT should benefit the daily functioning of older people, there are barriers to their use [7]. For older people, constrained motor skills and dexterity, less peer support, hearing loss and reduced inclination to change may diminish access to, or use of, these technologies [8]. An additional factor affecting uptake of technology amongst older persons is that the marketing of these devices is primarily aimed at young people. Amongst youth the use of cellular phones with SMS texting facilities is widespread and considered an essential means of communicating [9] this is not commonly the case with older persons.

The area of disability studies has seen a recent change from a pathological model to a broader conceptualization of disability as a social construct involving psychosocial processes [10]. The purpose of the present study was to use a qualitative technique to explore the experiences of older, hearing-impaired, people with some form of MCT with a view towards identifying those factors that maximize or diminish the capacity for successful communication. Inclusion of male participants in this study addresses a shortcoming of a previous study with similar goals [8].

## 2. Method

The methods used in this study were approved by The University of Auckland Human Participants ethics committee.

### 2.1. Participants

Subjects were a sample of 75 clients selected from the client database at the University of Auckland Hearing and Tinnitus Clinic. The criteria for inclusion were age over 60 yrs, hearing loss between 30 and 80dBHL, and regular use of some form of MCT. Wearing of hearing aid(s) was not a criterion as the focus of this study was on experience with commonly used devices beyond hearing aids. An information package was posted to these clients, consisting of an explanation of the purpose of the study and an invitation to take part. A consent form was included requiring contact details for interested clients, and to be returned by paid-reply envelope to the clinic. Clients who wished to become participants were then contacted by the researcher either by phone or e-mail to arrange a convenient time for a half-hour interview to be conducted within the university Section of Audiology.

### 2.2. Interviews

A total of 20 people were interviewed, of whom 14 (9 men and 5 women) returned their transcripts. Only those participants who returned transcripts were included in the analysis. Minor alterations to the scripts were made in those cases where the transcript was inaccurate. Mean age was 73.6 years (ranging from 61-80 yrs. Mean pure tone audiometric threshold (averaged over 500, 1000 and 2000 Hz) was 35.5 dBHL (range 30- 53 dBHL).

In all cases the interview format was one-on-one between the researcher and the participant. All interviews were tape recorded for later transcription. Each interview was transcribed verbatim by the researcher and added to the database as a Microsoft Word file.

The interview format was semi-structured. The intention was to invite a range of participant views and opinions regarding the experiences of older people with modern communication technology and the uptake and utility of this in their daily lives. The rationale for the questions used was to probe the extent of participants' knowledge and degree of usage of the MCTs they used, any significant problems encountered in the usage of them and their suggestions as to how their MCTs could be improved to enable them to maximize daily use. A copy of the interview transcript was then mailed to each participant for verification of the interview content. Included with the transcript was a form asking the recipient to confirm that the transcript was a true representation of what was said, and a blank lined sheet for recording any corrections or misunderstandings.

### 2.3. Analysis

Thematic analysis is a qualitative methodology designed for ethnographic interview analysis and consists of three main components: Initial collection of (usually) audio-taped data and search for distinct patterns of experiences [11, 12] followed by identification of all data that relate to these originally defined patterns [12]. These patterns are compared and combined to produce sub-themes [13]. Themes that emerge from the participants' stories are pieced together to form a comprehensive picture of their collective experience. A form of this was carried out for the purpose of identifying what enabled or supported use of modern communication technology by the participants, or acted as a barrier to successful use. This analysis began with manual coding of transcript data into an evolving set of categories. A category was defined as three or more comments or phrases conveying a similar idea or viewpoint. Re-categorization of transcripts was carried out from scratch to check that as much of the data as possible could be placed into the categories, at which point the categorization process saturated the data.

## 3. Results and Interpretation

Mobile telephone, both for vocal and texting modes, was by far the most commonly used form of modern communication technology with only several references by participants to electronic mail, television, and Teletext.

Initial analysis yielded 9 "Maximizing" categories and 8 "Diminishing" categories. During subsequent re-categorization these were collapsed to 5 "Maximizing" and 6 "Diminishing" categories. The resulting category structure is shown below, with examples from the data. Non-identifying names are provided with the examples.

### 3.1. “Maximizing” categories

a) Support from family and friends in encouraging use of MCT to enhance communication. The social influences on personal decision-making and identification with technology use were found to be important. A social environment in which MCT use was facilitated and encouraged was important.

Joe: “*so my son and I’ve been showing her how to use it.*” (mobile phone)

Rochelle: “*I get tired with the new technology, but usually somebody in the family puts me right.*”

Julie: “*I’m really quite happy with (my mobile phone). It’s a very simple one, yes, I’ve got all my family ...and I can just ring them direct, and that’s a big help.*”

b) Experience of enhanced communication capacity through personal application of MCT. Participants related many experiences in which their MCT empowered them to maximize their communication capacity.

Bruce: “*If I can text or e-mail somebody, then I do. I have quite a lot of friends over on the Gold Coast, so I’m sort of texting or e-mailing backwards and forwards.*”

Joe: “*Margaret is able to communicate with it, because she uses it to communicate with my son, because they live some distance from where we are, so occasionally we’re out in the car, so it’s useful.*”

However, in many cases this consisted of limiting usage to a specific set of circumstances deemed to be important.

Grace: “*My computer does everything that I want it to do or need it to do. I’m not involved in a huge demand for a variety of uses.*”

Judith: “*The family wanted me to have it, because I was travelling about quite a lot on the motorway and, you know, you need to be able to call for help. And, unfortunately I’ve had a few trips into hospital over the last couple of years, and, much easier than trying to get someone on the (hospital) staff to let me use the phone, and ring the family and just say, you know, Mum’s in hospital. I also use it when I’m at the hospital. I do telebanking, and I felt very good, if you’re in hospital, to be able to pay power bills, generally, phone bills, I can do it by cellphone. If I’m in hospital, it’s great.*”

c) Cognitive coping skills. Strategies adopted when coping with the challenge of mastering the technology.

Fred: “*You’ve got to break it down (understanding how to use the cell-phone) into steps.*”

Grace: “*I use glasses for reading (to see c-phone buttons clearly).*”

Linda: “*I bring a card with me that tells me what to do (when using it for internet banking).*”

d) Sense of self-efficacy: General sense of increased self-efficacy in communication as a result of using MCT. There were several comments from participants indicating that successful adoption of MCT led to a broader sense of self-efficacy and empowerment.

Joe: “*To be able to use it, it’s very important because it gives her (wife) independence. She’s just passed her driving test, and with the increased mobility we can communicate.*”

Joe: “*Oh, she’s a very competent person; she’s very competent on the computer years ago, as I did. We’re both able to type, as we were taught to type, and that’s an advantage.*”

### 3.2. “Diminishing” categories

a) Shortfall of information and perception of complexity: difficulties arising from lack of, or difficult to understand, information for use supplied with the MCT.

A common theme expressed was a lack of useful or easily understandable instructions about how to operate the MCT. Often the device was perceived as being too complicated or overwhelming, thus acting as a disincentive for adopting the communication options available on MCT.

Andrew: “*You need something simpler. When someone has to teach you how to use one of these, it’s silly. You should be able to simply pick it up and use it, but you can’t. I mean it’s like a computer; you’ve got to learn how to use it... I mean they’re all different and then you’ve got to carry on with the next one.*”

Fred: “*There is no such information given with the mobile phone. That makes it difficult to appreciate and understand.*”

Joanna: “*I don’t think either of us would appreciate it if it was more complicated.*”

Linda: *"I get very tired with new technology, having to learn something new all the time."*

Bob: *"I know a lot of people are like me, my age; they don't want all that (extra technology) stuff on it... so that's that."*

Audrey: *"Well, somebody's got to sit down and teach you. Like the digital cameras. I'll have another try at it someday, when I've got all day and nothing to lose."*

In some cases this perception of complexity led to a generally negative attitude towards technology.

Deborah: *"No, none of my elderly friends have mobile phones. I think older people don't take to electronics as easily as younger people do you know I mean?"*

Andrew: *"I don't know how they work, (DVD, internet, TXT etc). I'm not interested."*

b) Dissatisfaction with service provider: Unsatisfactory or less than expected level of service available provided by the provider.

Bruce: *"Well, take broadband, for example, the physical connections. Broadband apparatus was returned by us as unusable. Excessive length shielded cable was needed from the jack point, but it's just not worth the effort. So we're baffled."*

Alice: *"It (the service provider company) sounds service-oriented but they want to get your money. That's my sole impression. Such as are a number of such organizations."*

Deborah: *"There was an assumption (by the service provider company) of user competency by sales-oriented vendors which was counter-productive."*

c) Effect of impairment (auditory, visual or coordination) on MCT use. Considering that the original aim of this study was focussed on older hearing-impaired people and the trend towards reduced size of MCT, there were surprisingly few comments specifically expressing difficulty in hearing or physically operating them.

Fiona: *"I feel that loudness of the hearing part of it could be raised, and something done to make it much easier for sight-impaired."*

Joanna: *"I'd like the cell-phone to have bigger keys, so you can see, but I have to put my glasses on, see, those (keys) are very small, if I'm going to text anyone I have to put my glasses on to see the screen."*

Brian: *"Yes, my cordless phone for carrying around in the house, it makes no difference at all (using a mobile phone instead of landline). Especially in the upper registry of noise (i.e. loud noise)."*

Amy: *"I do have trouble with hearing the (mobile) telephone."*

d) Generational cultural barriers. Several participants said that they did not identify with the modern communication culture of mostly younger people which revolved around widespread usage of MCT. This culture was foreign to that which they had become accustomed for most of their lifetime.

Audrey: *"There's a market for the small (phones), there's a fashion in those things, isn't there. As long as you're young you get one."*

Gloria: *"I don't do that (texting) very often... I'm not like the teenagers that (do texting all the time). It's just a socializing thing, like "what have you been doing with yourself?" they're just chatting... children of 14 or 15. My daughter will say "oh, yes I've been texting all morning". I mean, that's what she's been doing!"*

Andrew: *"That's another pet hate of mine, is when I get abbreviated e-mails, especially from my grandchildren, but they've grown up with this technology."*

## 4. Discussion

The aims of this study were to investigate the experiences of older hearing impaired people in their uptake and use of commonly used forms of modern communication technology (MCTs). However, thematic analysis showed that hearing impairment was only one factor in determining the uptake and usage of MCT. The issues expressed by the participants covered wider social, gerontological and psychological domains. The recurrent themes expressed can be broadly grouped into those which enable the person to gain the optimal outcome from their MCT, and those that act to hinder this outcome.

Variables which enhanced the outcomes were social support, ability to learn and cope with new skills required to use MCT successfully, a sense of self-efficacy or empowerment derived from MCT use, successful adaptation of MCT to

everyday personal communication needs, and a generally positive approach to new technology. Social support has been found to be an important factor in receptivity to technology in older people [14]. Experience of successful use then leads to an increased sense of self-efficacy, in turn encouraging application of the device to lifestyle needs [15]. Kent and La Grow [16] that found that hope acted as a mediator in the relationship between the degree of hearing loss and adjustment to an acquired hearing loss. In the construct of hope, self-efficacy is a core component and can be enhanced to promote client outcomes in rehabilitation [16]. In addition, Garnes [17] found a significant relationship of measures of hope and computer self-efficacy with intentions to implement recent and future technology strategies. This confirms the value of adequately assessing and taking action to address the psychosocial elements that are implicated in living with a hearing loss and optimising the use of assistive technology.

Variables which diminished success of outcome were shortfall of easily understandable information concerning use and application of MCT; perception that MCT is too complex and overwhelming; dissatisfaction with the service provider; and the quality of sound output from cellular phones. Bruder, Wendke and Blessing [18] found that senior mobile phone users, with less experience with multifunctional electronic devices attempted to read, but did not understand the instructions included with their phone, and suggested there was a need for improving the process of familiarization of MCT. Visual impairment has been associated with difficulty in operating mobile phones [19] and sound quality has been found to be important in successful use [20]. In addition, older people have been shown to have difficulty in navigating the operating menu of a complex mobile phone in comparison to the menu of a simpler one, in which their ability was similar to a comparison group of younger users [21].

It must be stated that the study sample consisted of people who were existing users, therefore does not present a complete picture of communication technology as seen by older people who are not active users. The participants in this exploratory study revealed some areas which warrant further research regarding use of communication technology for senior citizens. In an ageing population, there will be a greater need to cater for older people. However, there is evidence that older peoples' use of MCT depends less on chronological age than a myriad of social factors that accompany aging [2]. For seniors to maximize the potential gain from using MCT, support and encouragement from family and peers is important in identifying relevant situations within their communication 'web' where use of communication technology has direct application. Mobile phones need to be made simpler for use for this population, with user-friendly instructions and a less complicated visual format. Future marketing techniques aimed at the interests and lifestyles of older people will be necessary. Some manufacturers and service providers in large markets already recognize the importance of design and catering for the older population (<http://cellphonesforseniorcitizens.com>). These options are likely to become ubiquitous as the population ages.

In summary there are barriers to the use of MCT amongst the elderly [8] and MCT designers need to take a multidisciplinary approach to product design [7].

## 5. References

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