

**Seniors' Perspectives on the Barriers, Benefits and Negatives Consequences of
Learning and Using Computers**

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Abstract

This paper focuses on an investigation into the role of computers in the lives of New Zealand's senior citizens. The objective of this research was to identify older peoples' perceptions of the barriers, benefits and negative consequences of computer use by listening to their views and stories of their experiences. This project involved the recruitment of single-sex focus groups of volunteers from three SeniorNet clubs in New Zealand. Focus group transcripts and field notes were analysed using Owen's thematic analysis. Findings indicate that participants overcame initial barriers of fear and frustration to become extremely positive and enthusiastic computer users. Negative experiences included physical problems resulting from too much sitting at the computer, feelings of guilt at time spent on the computer, and concerns about the cost of using and upgrading the computer system. Men and women raised similar issues and prioritised their concerns similarly, but their language was at times very different.

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Introduction

During a period in which computerisation has become a significant phenomenon throughout many parts of the world there has also been a significant increase in the number of older people as a proportion of the population (Brink, 1997; Timmerman, 1998). The vast majority of this aged population have not had the opportunity to learn about and use computers during their younger years, and given that computers are commonly perceived as a technology for younger people, they can experience difficulties using facilities, services and opportunities made available through computers (Lawhon, Ennis & Lawhon, 1996). Thus, the purpose of the present study is to explore older peoples' perceptions of the barriers, benefits and negative consequences of computer use and to assess differences in older men's and older women's perceptions of their experiences. Such research is needed to understand the difficulties, including the positives and negatives experienced by older people learning and using computers, and to serve as a basis for enabling them to make an informed decision about taking up computing.

Literature Review

Much of the literature on older people and computers has focused on three main areas: (a) methods of training older people to use computers and computer software; (b) uses of computers to improve the quality of life for older people, and (c) attitudes to computers and computing, including perceived barriers and benefits of computer use, and (d) benefits associated with computer use. Thus, the literature review is organised around these four topics.

Many of the computer-training studies identify old age as a time of deficit, decline and deterioration. Therefore the literature has tended to focus on identifying and devising strategies for overcoming deficits such as: (a) short-term memory loss with increasing age, (b) slower speeds of information processing compared with younger people, and (c) longer timeframes required for extracting and processing information from visual displays. Studies conducted with retirees in both the U.S. and Australia have found that older people can learn how to use computers if teaching methods appropriate for that age group are used (Bourdelaïs, 1986; Eilers, 1989; Irizarry, Downing and Elford, 1997). These methods include: (a) a slower pace of

presentation; (b) individualised help; (c) an informal, non-competitive, “fun” atmosphere; (d) age-peer teachers, assistant and fellow students; (e) hands-on experience; (f) relevant courses; and (g) a comfortable physical environment.

The quality of life literature has focused on lonely, isolated older people who live alone in their own homes or in retirement complexes, investigating ways in which technology can assist them to be independent, and ways in which computers can be used to break down their isolation, allowing them to be re-integrated into society. Studies looking at the potential of computers to provide increased social interaction for older people include, Cazaja, Guerrier Nair and Landauer’s (1993) study of isolated older peoples’ use of the Internet for e-mail purposes in the U.S. and White et al.’s (1999) study of the Internet and e-mail use in a retirement community in the U.S. These studies indicate that computers can provide isolated older people with increased opportunities for social contacts and can contribute to decreased loneliness. Such research is important because it suggests that computers, rather than being a technology for young people as it is often presented, has the potential to bring important benefits to older people.

Research on older peoples’ attitudes to computers includes studies on their opinions of, and experiences with, the barriers and benefits of computer use. Barriers identified in the literature can be categorised into five main areas: (a) financial issues, including the high cost of computer acquisition and tuition for people on pensions (Kornbluh, 1984; Eilers, 1989; Williamson, Bow & Wale, 1998; Roberts, 2001); (b) learning and training barriers associated with aging, particularly short term memory loss, and perceived complexity of the machine (Williamson et al., 1998; Roberts, 2001), limited access to computer training and aged unfriendly instruction methods (particularly when being taught by young people who deliver material too quickly, Eilers, 1989), and an overarching belief that they are too old to learn (Eilers, 1989; Timmerman, 1998; Roberts, 2001); (c) lack of motivation, including a perceived lack of need for, or interest in, computers and computing (Eilers, 1989); (d) physical and cognitive problems in using a computer keyboard and mouse, due to arthritis and other health problems (Eilers, 1989; Timmerman, 1998); and finally (e) lack of social support, due to the absence of friends and relatives encouraging them to learn (Lesnoff-Caravaglia, 1988). On the whole, researchers have focused on a micro or individual level analysis suggesting that older people are inhibited from learning and using computers because of individual circumstances or personal deficiencies.

Despite the existence of real and perceived barriers to older peoples' learning and use of computers, a number of benefits of computer use for older people have also been identified in the research literature. Studies indicate that attitudes to computers tend to become more positive once older people have had a positive experience with using them (Jay & Willis, 1992; Marquie, Thon & Baracat, 1994; Baldi, 1997). Also, Morris (1994) found that familiarity with computers meant that older people felt not only less apprehensive about using a computer but also less 'left out' of an increasingly technologised world. White and Weatherall's (2000) New Zealand study found that SeniorNet members saw computer technology as "a necessary part of contemporary life" (p.377), and a convenient tool to "facilitate their own personal interests and goals" (p.383). Additional benefits found in the research indicate that computers can provide older people with: (a) mental stimulation (Eilers, 1989; Czaja, Guerrier, Nair & Landauer, 1993; Swindell, 2000); (b) an enjoyable hobby in retirement, particularly for men (Eilers, 1989; Ogozalek, 1991); (c) a renewed sense of self confidence and a strong self image (Timmerman, 1998); and (d) improved inter-generational relations, particularly through being able to talk the same language as the grandchildren (Eilers, 1989; Furlong, 1995). In summary, previous research suggests that many older people can benefit from learning and using computers through increased mental stimulation, improved self-confidence, improved communication, particularly with younger generations; a greater sense of connectedness to the modern world, pursuit of an enjoyable hobby in retirement, and provision of a tool to pursue their interests.

While the research described above is quite useful in understanding older people's use of computers, several gaps and biases in the literature may be identified. First, the literature reviewed tends to present a very optimistic picture of older peoples' engagement with computers, apparently assuming that the use of computers by all people, including seniors, is highly desirable and will produce only positive outcomes. Simultaneously, it suggests that those who do not learn to use computers will be disadvantaged and left behind by this increasingly technologised world, and those who are not interested in learning to use computers are somehow deficient or have their heads buried in the sand. No research appears to have been done on identifying possible "downsides" of computer use for older people. Therefore, it seems important to investigate older people's perceptions and experiences of any negative consequences to learning and using computers.

Second, there is, on the whole, a deficit of critical research on older peoples' use of computers, and a lack of differentiation on older computer users by gender, ethnicity and socio-economic status. Other than differentiating users from non-users by demographics, most of the literature fails to recognize potential impacts that such differences may have on older peoples' perceptions of, and experiences with computers. In particular, little work appears to have been done on comparing the attitudes of older men and older women, with the exception of Barnett, Buys and Adkins's (2000) Australian study looking at differences in men's and women's preferences for a range of media, including television and computers. These authors concluded that differences in life experiences of older men and older women, such as women's lack of educational opportunities and women's roles as dedicated mother and child raiser, contributed to women's greater unfamiliarity with and lack of confidence with computers later in life.

Third, there is a paucity of material published on the barriers, benefits and negative consequences of older peoples' learning and use of computers in New Zealand. The one exception is White and Weatherall's (2000) study, which consisted of one-on-one interviews with 6 SeniorNet members. Thus, more research in the New Zealand context is clearly warranted.

Thus, the research we conducted focused on attempting to address these gaps. Specifically, we investigated the barriers, benefits, negative consequences, and gender differences in older New Zealanders' use of computers. The research questions driving the investigation were as follows:

RQ 1: What do elderly New Zealanders perceive to be the major barriers, benefits and negative consequences associated with learning and using computers?

RQ 2: What are the major differences in elderly women's versus elderly men's perceptions of the major barriers, benefits and negative consequences associated with learning and using computers?

Method

Data for the study was obtained primarily through focus group interviews with 98 people from three SeniorNet clubs in the North Island of New Zealand and analysed via thematic analysis.

Research Setting: SeniorNet

SeniorNet was chosen for the study because the organisation was a convenient and easily accessible source of large numbers of older computer users. SeniorNet is an organisation for those 55 years of age and older who are interested in learning about computers and computing from their age-peers. New Zealand is one of a number of countries with SeniorNet clubs, and the first outside the United States to set up SeniorNet clubs for older peoples' computer learning. In addition to learning and sharing computer knowledge, skills and experiences, SeniorNet clubs encourage members to socialise with other seniors in face-to-face forums and to participate in virtual senior networks around the world.

Procedure

Focus groups were chosen as a method of data collection because they allowed "large and rich amounts of data in the respondents' own words" to be gathered quickly, and cost effectively (Stewart & Shamdasani, 1990, p.16). They also provided SeniorNet members with opportunities to discuss issues of common interest with their peers in a non-hostile environment, while giving the researchers an opportunity to "observe participants engaging in dialogue, sharing ideas, opinions and experiences" (Madriz, 2001).

Each SeniorNet club appointed a co-ordinator to work with the first author to recruit participants and find suitable venues for the sessions. Participants were recruited by personal approach either by the first author or the club co-ordinator (our key contact at each club appointed to work with us on the project). Either the club co-ordinator or the first author addressed club members at a monthly Club Day meeting calling for focus group volunteers, or, in one instance, the co-ordinator telephoned club members asking for volunteers. Prior to their attendance at the focus group sessions participants received an information pack, which provided information on the research project and basic details such as where and when their focus group was to be held.

Each of the focus groups lasted for approximately one hour with additional time allowed for participants' questions about the research prior to the start of the

focus group. A social time with coffee and muffins and stories about computer experiences followed the interviews. Field notes were kept documenting the question-and-answer periods as well as the informal discussion.

Focus Group Participants

Men and women participated in separate focus groups so that their opinions and experiences could be compared and contrasted. Forty-three men and fifty-five women were interviewed over 13 focus groups. The size of the groups ranged from 3 to 13; most groups consisted of 7-8 members. Of the three clubs, 25 were from one club, 45 from another and 38 from the third. Participants ranged in age from 55 to 88. While detailed demographic data were not collected from the participants, it was clear that the participants were almost exclusively pakeha (New Zealanders of European ancestry) and relatively affluent. For example, the vast majority of participants in the focus groups had purchased their own computers, while some received computer-hand-me-downs from other family members, and only one person out of 98 did not own a computer at all.

Data Analysis

Interview tapes were transcribed, resulting in 260 single-spaced pages of transcripts. Field notes taken before, during, and after the sessions were also typed up. Since the first author did not transcribe the tapes herself she listened to the tapes, noting speakers' emphases on a hard copy of the transcript while checking the hard and electronic copies of the transcripts for errors or omissions. The focus group transcripts and field notes were analysed using Owen's (1984) thematic analysis. Thematic analysis is a method of identifying and interpreting participants' prominent, shared meanings. Owen's criteria for thematic analysis are: (a) recurrence, in which the same thread of meaning is repeated; (b) repetition, in which key words, phrases or sentences are repeated; and (c) forcefulness, in which linguistic cues indicate importance and emphasis.

Categories of responses were developed inductively from the data. We were no doubt influenced by our review of the literature, yet made no conscious attempt to use the categories derived from the literature review. We looked for recurring, repeated and forceful themes that responded to the research questions, both within and between clubs. Every repetition of a particular phrase or thread of similar meaning was documented so that it would be possible to count frequencies of occurrence or repetition. The categorised data set was reviewed after a couple of days and overlaps

between categories were eliminated to ensure that only like-minded categories were clustered together into a single theme. At this stage the second and third authors examined and refined the categories with the first researcher. In order to confirm and refine the analysis, a preliminary written report describing the initial findings was reported back to the committees of each club and verbal presentations have been made at Club Days for two out of the three clubs at this stage with the third one planned for later in the year. Feedback from clubs was used to refine the analysis, thus incorporating the principle of recalcitrance, which Tompkins (1994) has argued is essential for the credibility of qualitative data analysis.

Findings and Discussion

The first research question asked, What do elderly New Zealanders perceive to be the major barriers, benefits and negative consequence associated with learning and using computers? The second research question focused on gender differences in their perceptions.

In reporting our findings below, each of the three areas identified—barriers, benefits, and negative consequences—is discussed separately. We include within each of these a separate discussion of men’s and women’s perceptions.

Barriers

Tables 1 and 2 provide the results of the thematic analysis for barriers as perceived by women and men, respectively. The tables include the major themes identified, the subthemes, definitions and frequencies of the subthemes, and sample quotes for each.

(Insert Tables 1 and 2 here)

The thematic analysis resulted in identifying seven major categories of barriers: (a) emotions and attitudes, (b) declining faculties, (c) financial costs, and (d) unfamiliarity with technology (e) age-unfriendly instruction (f) lack of relevance/motivation and (g) lack of social support. While the major response categories were the same for men and women, the sub-themes were somewhat different and the frequency with which particular themes were raised varied between the men’s and the women’s groups. Furthermore, our findings are quite similar to the research findings gleaned from the international literature on barriers experienced by older people in computer use. However, what is particularly noticeable is the emotionality of our participants’ expressions compared to previous findings.

Emotions and attitudes. This response category was the most frequently mentioned barrier for the women and the second most frequently discussed barrier for the men. Furthermore, the response category of emotions and attitudes was expressed by women in terms of fears and by men in terms of anxieties and frustrations.

Specifically, the women expressed a number of fears that they felt inhibited their use of computers: fears of the machine, of the unknown, and of learning, as well as lack of self-confidence. For these women, at least prior to their SeniorNet involvement, the idea of using computers was quite a frightening idea. Even in the early stages of their SeniorNet training, the women experienced multiple fears. As one woman explained

There are barriers there . . . it's just this new thing which has got so many wires coming out of it that you're frightened you're going to use the wrong key or wipe everything and this is what we're getting told, be careful, you'll wipe it, you'll do this, you'll do that So it's a lot of mental barriers to begin with until you become a bit more easy about the whole thing.

The men also expressed emotional and attitudinal barriers to computer use. Specifically, they mentioned the unknown void, anxiety and frustration, and lack of self-confidence. While the specific issues they mentioned here were very similar to those expressed by the women, the language they used couched their concerns in terms that avoided the expression (or admission) of fear. Rather than describing a fear of the unknown, they expressed using computers as representing a difference from their past experience, an "unknown void." They talked about anxieties and frustrations rather than fears. Interestingly, in discussing these differences with trainers after the focus groups, they generally agreed that men and women had very similar concerns, but tended to express them differently. As one man said,

The men were not nearly as open or honest in their replies [to the focus group questions] as were the women. I think that many of the men see the computer as just another 'mechanical' tool that they will instinctively be able to understand and use like driving a car or recording a program on a VCR...When first confronted with a computer, it is the women who admit a sense of fear. Whereas for men, their initial lack of fear often leads to a feeling of frustration – 'I had no idea this thing was going to be so damned difficult to learn.

In comparison to the international literature, none of the categories of responses we identified seemed fundamentally different from what previous researchers have

identified. Previous researchers identified barriers such as “fear of something which was seen as complicated and difficult to master” (Williamson et al., 1998, p.1), which seems to capture the emotions and attitudes expressed by our participants. Our findings may be seen as elaborating these previous findings, in that we have identified, in more depth, the complexities and difficulties of learning and using computers identified in previous research. Furthermore, our findings suggest that using computers is a much more emotional experience for this age group than is suggested by previous research. That is, our participants talked in terms of fears, anxieties, frustrations, and lack of self-confidence. For them, computer use was not simply a difficulty that can be dealt with rationally, but something dark and mysterious that made them feel fearful and inadequate. This is an important difference compared to previous research, since for example it suggests that using rational appeals may not be persuasive in convincing many older people to attempt computer training and it suggests that dealing with the emotional “trauma” of computer use may be fundamentally important in working with older adults.

Declining faculties. This response category was the second most frequently mentioned barrier for women and the third most frequently mentioned barrier for men. Both groups indicated that a lack of ability to concentrate, to catch on quickly, to absorb the information explained to them, and to retain what they had been taught, inhibited their learning. Also, failing eyesight and arthritic or shaking hands reduced the ability of both men and women to read the screen displays, to locate information on the screen, and to control the mouse. However women were more inclined than men to take these problems personally, to be embarrassed by them or to allow them to knock their self-confidence. As one woman said: “You’re shown how to do something, ten, five minutes later you’ve forgotten what you were told and you feel like a fool because you can’t remember.” By contrast, one of the men talked about a similar experience without putting himself down in the process: “You do something one minute and you’re full of exhilaration--I’ve done it! And then two minutes later you’ve forgotten what you did.”

Our findings in the area of declining physical and mental faculties with age are in line with the international literature that also identified this area as a particular challenge for older people in learning and using computers. Our research does suggest that declining faculties may contribute to a loss of self-confidence for some older people, particularly women, which may contribute to perceived learning difficulties

with increasing age and even deter some older people from even trying to learn something as complex as a computer. As one woman said: “A lot of people . . . feel you have to have some brains to use it [the computer], but you don’t really need an awful lot do you? You just sort of follow things through.” Certainly SeniorNet classes with age-peer teaching and self-paced learning provide an atmosphere in which declining faculties are accommodated and self-confidence can be boosted by a supportive and understanding environment.

Unfamiliarity with technology. This response category was the third most frequently mentioned barrier for women and the issue discussed most frequently by the men. Two areas in particular were identified as problems by both men and women – computer jargon and typing skills. Computer jargon was considered a ‘foreign language’, ‘designed for engineers’, ‘confusing’ and ‘intimidating’. While some computer words were familiar ones, for example, ‘default’, new meanings made the words difficult to understand, making instructions on the screen unanswerable and computer manuals impossible to read. Women were often intimidated by the jargon while men were frustrated. For instance once man said: “Yes well I agree the language is a wee bit of a problem but once you overcome that, things are a lot easier and it really depends on how far you want to go at our age”. Compare this to the insecurity implied by one of the women, who said “Mine [my computer] told me at one stage I’d done something illegal and I waited for the knock on the door you know [for the police to arrive].” Typing and keyboard skills were considered barriers for both men and women not only because of arthritis and shaking hands but also because of unfamiliarity both with the keyboards themselves and with terminology such as ‘tab’ and ‘spacebar’. As one trainer said after the focus groups, “Women new to the keyboard will look at it and quietly find their way round it. They are not so put off because the layout has no logic. On the other hand there are a noticeable number of men who get frustrated because the layout does not make sense. They have spent their lives believing that A is always followed by B, is followed by C. Physically, men have much more difficulty with both the keyboard and the mouse. This is very noticeable with retired farmers and other manual workers.”

The complexity of learning computers and difficulties in using keyboards have been identified in previous studies of older peoples’ use of computers. However participants in this study emphasised that the computer jargon provided not only an impediment to their learning but to their independence as learners. Many indicated

that they were no longer able to teach themselves about something they wanted to know because “they couldn’t understand the language [in books].” They were forced to expose their ignorance and “they [older people] don’t feel comfortable in showing off their ignorance”, and go back to school. For a lot of older people this was both courageous and intimidating. Recognising this situation and providing an atmosphere to cater for their emotional and ego needs is particularly important for older people learning how to use computers for the first time.

Financial Cost. This response category was the fourth most frequently discussed barrier by the men’s focus groups and one of the least often raised as an issue by the women. This finding stands in contrast with some other studies in the international literature, which have found cost to be a more prominent barrier. The fact that cost was infrequently mentioned by our participants may reflect the rather privileged middle-class nature of SeniorNet organisations and our focus groups in particular.

Age-unfriendly instruction. For both men and women this issue was the fifth most discussed response category for learning and using computers. Both men and women talked about their experiences in non-SeniorNet learning environments with young instructors and large night school classes with competitive, fast-paced instruction methods that were particularly unhelpful to older peoples’ learning needs. Some talked of not keeping up, of not learning anything, and of being on “a different wavelength” from their young instructors. One of the women talked about being intimidated by “smart 20 year olds saying, ‘What did you do that for?’” Similarly, one of the men talked about his night class of “seventeen year olds who are so brilliant you can’t even understand what they’re talking about... we can say we were like that 80 years ago.”

Our findings regarding age-unfriendly instruction are in line with the international literature that also identified difficulties for older people in mixed-age classroom situations particularly with “impatient and/or very young instructors” (Eilers, 1989, p. 71), in which there is often little recognition of their needs for a slower pace of presentation, individualised help, an informal atmosphere, and social support (Irizarry, Downing & Elford, 1997). Our findings suggest that, for this sample of older people at least, their difficulties in computer learning were not because they were intellectually incapable of learning (in fact most of the focus group members had some sort of formal diploma or degree qualification) but because their emotional

needs were not adequately addressed either by the teacher or the teaching method. In particular, they expressed concerns that many learning situations did not adequately address their fears and anxieties of computers, of new computer jargon, of their long-time absence from class-room learning, and their own lack of confidence. In addition to overcoming their own fears and anxieties they had to overcome other peoples' (instructors' and students') perceptions of their abilities. For example, as one woman said "It's intimidation of the young people...you're too old to be bothered, so why should you be doing it? But I was determined to do it. Three [night school] classes and I couldn't do it".

Lack of relevance/motivation. This issue was only raised occasionally as a potential barrier for men and women. It was suggested that many older men and women may see no need to own a computer. For example one woman talked about her initial reluctance to buy a computer because she couldn't see a purpose for it: "That was the one reason I resisted. My husband kept saying [get a computer] ...I said it doesn't sweep my floors, so what use is it?" While many of the focus group participants acknowledged their own motivations for learning how to use the computer were to e-mail family overseas, to pursue hobbies such as genealogy and to keep up with the modern world and modern technology, they recognised that many other older people may have no such need or interest. As one participant said, "Not everybody is interested in computers. They are given these computers by their relatives. They are passed on so mum and dad can keep in touch with e-mail and they are not really that interested but feel obliged to do something about it. So I think that is a barrier, a lack of interest."

Our findings in this area are similar to the findings of Eilers (1989) and others who saw "lack of perceived need" (p.71) as a potential barrier to older people learning and using computers. Our findings suggest that once many older people identify a reason to learn the computer, and they 'hook into' a learning co-operative such as SeniorNet, they can become enthusiastic and avid users. As one of the oldest women in the group (an 84 year old) suggested "I haven't got one [a computer] because I love to travel and that costs money...when I can't travel is the time for me to use the computer...I'm preparing for the time when I might have to [use the computer] because I'm in a wheelchair ...". That is, she'll buy a computer when she's old and can't do anything else!

Lack of social support. This issue was raised on several occasions but did not figure prominently for either men or women. Many focus group members felt that the social support they gained through interacting with others at SeniorNet both formally in classroom situations and informally in Club Day social situations was one of the principal ways they overcame the barriers they encountered in learning to use computers. For many, SeniorNet was the only form of computer support they had available. For others, family members, particularly sons and grandchildren were keen supporters. For instance, as one man said “ I think the real stumbling block has been up until now [prior to joining SeniorNet] that if one gets a computer one has to learn, to teach oneself by trial and error.” One of the women summed it up by saying “Your son [is] not going to help you with the stove or the microwave, is he? But with this [the computer] you know, we’ve got support and I think support gives you confidence to overcome the barriers.”

Our findings are in line with other studies that suggest that “the absence of relatives and significant others may reduce the motivation for adopting a technology” (Lesnoff-Caravaglia, 1988, p.276). Our research suggests that in addition to social support being helpful at the adoption phase of a new technology, it can also be helpful in various ways at the learning and exploring stage. For example in terms of allaying fears, as one woman said “I raised a problem I’d had at home in the chat session [at SeniorNet] and everyone said, ‘Oh you don’t take any notice of that, it does that a lot’. So I felt better.” Social support was also reported as helpful in encouraging feelings of normalcy, for example, “You can kind of get despondent at times and think, oh gosh! But then you come down to a social day and these questions are being asked and you hear people talking and everyone is saying the same thing...Oh well I am fairly normal.” Finally, social support sometimes stimulated further learning. For example, “Well the challenge is finding out what you can do and what you want to do. Positive reinforcement helps. Well done Mum!”

Benefits

Tables 3 and 4 provide the results of the thematic analysis for the benefits of learning and using computers as perceived by older men and older women respectively. The tables include the major themes identified, the subthemes and their frequencies of occurrence, definitions, and sample quotes.

(Insert Tables 3 and 4 here)

The thematic analysis resulted in identifying four major response categories of benefits that were the same for both men and women: (a) connectedness (b) efficient tool (c) mental stimulation (d) and hobby/therapy. While the major categories and the language used in relation to each theme were the same for both men and women, the frequency with which the themes were raised varied between the men's and women's groups. Our findings reinforce findings in the international literature on the perceived benefits of older peoples' learning of, and their real enthusiasm for using computers. However our findings provide evidence of a strong sense of emotionality connected with computing as well as a sense of heightened energy and rejuvenation compared with previous findings.

Connectedness. This response category was the most frequently mentioned benefit for both men and women. Connectedness took four forms. First, participants mentioned connections to others. They particularly emphasized connecting to family residing around the world and to family history through family trees and genealogy. However, they also described connections to friends, old and new, real and virtual, and to company generally. They also described connections to a world outside the home or institution, particularly for the lonely or the handicapped, and to 'home and the old country' for those who immigrated to New Zealand and left their countries of origin behind. A second set of connections described focused on information through the world wide web, particularly for travel and keeping up to date with world events, but also for accessing other perspectives. For example, one man described his interest in accessing Northern Hemisphere views on the Rugby World Cup debate between Australia and New Zealand. Third, participants described connections to the modern-age by learning about the new technologies, that is, "keeping pace with the modern world", instead of "being left behind." Along these lines, several participants mentioned being more connected by being able to talk the same language as their grandchildren. Finally, participants described connections to a new sense of self confidence, (e.g., "you don't feel quite so dumb do you?"), a new sense of energy (e.g., "it keeps you alert") and rejuvenation (e.g., "it keeps me young") through a strong sense of having achieved something and "the excitement of discovery".

Our research findings in relation to the category of connectedness are not fundamentally different from what previous researchers have found. Previous research identified that mastering the basics of computing had the direct benefit of creating increased opportunities for social contact, while reducing isolation (Lawhon, Ennis &

Lawhon, 1996). The indirect benefits attributed to computing for the elderly include enthusiasm, pleasure and health benefits (James, 1996) and empowerment, giving them renewed self confidence and a strong self image enabling them to “become part of the ‘now generation’ (Timmerman, 1998, p.64). Our research elaborates on these findings in that we have identified in more depth the enthusiasm, empowerment and social benefits identified in previous research. Computers, particularly in the context of SeniorNet, offer opportunities for personal growth and development that go far beyond the learning of technical computer skills.

Efficient tool. This category was the second most frequently mentioned benefit for women and the third most frequently discussed benefit for the men. Both men and women talked about the computer as a useful and efficient tool for (a) facilitating their hobbies and interests, such as writing their life stories; (b) doing genealogical research; (c) organising their files; (d) compensating for deficiencies such as their ‘atrocious handwriting;’ (e) assisting them and others in their old age with the functionality of, for example, enlarging the font size to make it easier to read; (f) a diary system with a buzzer to remind them about appointments and grandchildren’s birthdays; and (g) e-commerce, such as booking holidays, banking and shopping on the internet without having to leave home.

Our findings in the area of the computer as an efficient tool are in line with the international literature that also identified the computer as an assistive technology for older people enhancing their ability to lead independent lives (Barnea & Stern, 1994). However our study suggests that efficiency may not be the most important reason for older people to use computers and it may not be the most important outcome of their use of computers. Therefore rational appeals to time saving efficiencies may be of less interest to older people than demonstrations of benefits such as connectedness.

Mental stimulation. This response category was the second most often raised by the men and the third most often raised by the women. Every focus group, men’s and women’s offered the old proverb “if you don’t use it you lose it.” For both women and men, computing offered opportunities not just to learn, but to be continually learning and “re-generating the brain”. As one woman said “you never, ever come to the end of it. You will always have the excitement of discovery. That’s the wonderful thing about it.” And it would seem that the learning that takes place is not just of a technical nature but it provides an opportunity to reflect on oneself and one’s ageing. As one of the men said: “I think this technology is particularly challenging, because

as you get older you can convince yourself that you are staying fit and you can convince yourself of all sorts of things. But in fact you keep lowering the hurdles for yourself. With this technology you can't. Technology sets the hurdles, doesn't it, and you have to face up to it even if you don't like it. I guess it is a sort of a hell of a shock. You can't manipulate this technology, you can't bluff your way through."

The mental stimulation effects of older peoples' learning and using computers have been well documented in the literature and our study re-iterates these findings. However our findings suggest that the mental effort required to learn computers is a challenge for some older people and a deterrent for many others. As one of the men said: "Yes it takes a fair bit of courage to take the plunge to not let the world leave you behind and I think that is probably the common factor amongst us. People have made the effort to try and keep pace with the modern world." Our research suggests that the benefits to older people of undertaking such challenging endeavours need to be seen as worthwhile to older people, particularly in emotional terms, or they will not make the effort.

Hobby/therapy. This response category was the one least often raised by both women and men, though men did talk about it more often than women. As one participant said after the focus groups, "this [discrepancy between men's and women's views on the computer as a hobby] may reflect the old saying, 'a woman's work is never done'. Women never retire. No matter what their age they are faced with the daily challenge of running the house, getting another round of meals for themselves and their husbands." The men in the focus groups talked about the computer in terms of "a form of relaxation, like bowls or golf" of being an "added interest in life" and, for one old gentleman diagnosed with cancer, the computer had "therapeutic content". As he said: "When I wasn't feeling like doing anything or speaking to anybody I could go and play on the computer."

The international literature has previously identified that men enjoyed computing in their retirement. For instance Hahm and Bikson (1989, p.121) found that retirees consistently ranked computers more highly than workers with respect to a computer being "fun", "gratifying" or a "challenge." Eilers (1989, p.66) also found that "computer study opened doors to enjoyable new pastimes or hobbies" particularly for men. Our study reinforces these findings.

Negative Consequences

Tables 4 and 5 provide the results of the thematic analysis for the negative consequences as perceived by women and men respectively. The tables include the major themes identified, the definitions and frequencies and sample quotes for each.

(Insert Tables 4 and 5 here)

The thematic analysis identifies four major categories of response related to the negative consequences of computing that were the same for both men and women: (a) physical problems (b) guilt feelings (c) introversion/isolation/addiction (d) cost and obsolescence. A fifth problem, security anxieties, was raised only by the women.

Physical problems. Both men and women raised a number of physical problems that were likely to occur if too much time was spent sitting at the computer, particularly neck-aches, backaches, and eyestrain. The solution that they offered was to balance sitting at the computer with walking around and doing other things.

Guilt Feelings. Women and men talked about feelings of guilt if too much time was spent sitting at the computer. For example, one man said, “I still have a peculiar attitude inside my mind if I spend more time on the computer I would be wasting time. You feel a bit guilty about it.” One woman offered an explanation about her feelings of guilt this way “Unless you’ve got anything physically in front of you to prove that you’ve actually spent those two hours doing something... Is that our generation? It’s that we’ve been brought up to make preserves and do the ironing, keep the house tidy and be supermums.” For a generation of people who are used to doing practical things and getting a sense of achievement from the accomplishment of physical work – such as farming, gardening, making preserves – sitting at the computer doing non-physical things, not actually producing anything ‘real’ can be seen as time wasting. They feel guilty not doing anything (i.e. not achieving physical outputs/outcomes) and this is equated with waste and unacceptable extravagance.

Introversion/isolation/addiction. Both men and women talked about the possibility of becoming ‘hooked’ by the computer and computing. One man talked about the computer as “an Aladin’s cave. You can get lost in there”. Another man said: “ You’ve got to be careful you don’t become an addict”. For some of the participants there were physical consequences of spending too much time with the computer, for example, “you can get too one track minded and neglect other hobbies or duties or whatever”; “it makes houses dirty”; “it makes gardens overgrow”; and “it

burns saucepans.” It can also be socially damaging in that it can “ruin a reputation for promptness”, “it can become an interloper in the marital status quo” and as one gentleman hypothesised: “I can imagine some older people sort of going into themselves a wee bit, when the computer becomes their socialising.” Our research suggests that learning and using computers offers many challenges and significant benefits for older people but it also has the potential to isolate them and reduce their physical well-being if it’s use is not managed and balanced with other social activities. For as one man said “One disadvantage I feel and this is me again, when I first got the computer I used to spend not hours, days, doing nothing else and I found that I was running downhill fast”.

Cost. Having made the decision to outlay several thousand dollars to buy a computer, the cost of computing becomes a negative consequence rather than a barrier for many focus group participants. Both men and women were concerned about the financial cost of computing in particular the cost of printing, and the cost of upgrading hardware and software. As one man said: “I think we have got to the stage that we don’t replace our cars quite so often as we used to in the old days but I think we are going to have to replace our computers more regularly as the obsolescence advances.” Computing for these older people is still seen as a “luxury rather than a necessity.” It is expenditure that they choose to incur but it has to be carefully managed.

Security anxieties. Several women raised the issue of viruses, credit card fraud, e-mail scams, anxieties about participating in chat-rooms, and crashing computers, as negative consequences of using a computer. Fear and anxiety were prominent in these discussions. For example, “I’m a bit scared to do certain things because of all those viruses and things” or “the frustration of viruses and passwords. It sort of makes you wonder whether it is worth it.” Interestingly none of these issues were raised in the men’s focus groups. It may be that it simply didn’t occur to the men to discuss these issues or that these weren’t major problems for them or that they didn’t want to admit publicly to having problems with these areas.

The international literature seems to be silent on the matter of the ‘downsides’ of older people learning and using computers. While much of the digital divide literature which talks about the haves and have nots of the technologised world suggests that ‘being connected’ is an advantageous position to be in and not being connected is a disadvantageous position to occupy. The pros and cons of each position, for example, of being connected, are not often addressed. This study

therefore asked older people for their views on the negative consequences of their learning and using computers.

Conclusion

In line with the international literature our study found that older people can overcome significant barriers to become enthusiastic users of computers. Our fine-grained approach identified that learning how to use computers is an emotional experience for many older people, particularly women, and account needs to be taken of this when teaching and persuading older people of the advantages of computing. The benefits of learning and using computers are significant particularly in terms of connecting older people to information, to others, to a new-found sense of confidence, and to the modern world. However, older people do see potentially negative consequences to computer use and advocate managing the computer relationship to achieve a balance between mental and physical activity, between virtual isolation and face-to-face socialising and giving your life an added interest and taking over your life.

In terms of differences between men's and women's perceptions and experiences, our study showed that the women were able/willing to share their fear and anxieties about computing while the men were less able/willing to do so. Women's talk about the barriers to computing for older people was peppered with mentions of fears, anxieties and admissions of terror. Men's talk about barriers, on the other hand, contained the details of significant frustration and some impatience, but little open admission of fear of computers. Both men and women were enthusiastic about the benefits of computers and delighted with their individual computing achievements. Both groups expressed quiet concern about potential negative consequences of engagement with computers.

SeniorNet is a socio-economically privileged group of mainly white, educated, English speaking older people, and as such their experiences may not be representative of older peoples' experiences with computers and computing. There is a need to include a wider range of socio-economic, and other ethnic groups in a survey of older peoples' perceptions of the barriers, benefits and negative consequences of learning and using computers. Our future research aims to widen the range of older participants in the study. We will also include older people who do not use computers in order to understand their perceptions of computers and computing.

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Table 1: Major Barriers for Older Women

Theme	Subtheme	Frequency of Occurrence of Subtheme	Definition	Sample Quotes from Women
Emotions and Attitudes	Fear of the Machine	13	Fears to do with the machinery, electricity & damaging the machine	I have always been the sort that doesn't even programme the microwave. Things that go beep and don't do what their supposed to instantly faze me so that was a barrier for me.
	Fear of the Unknown	9	Fears related to the newness of technology and feelings of inadequacy	Yes it's something that our generations have got no background knowledge of and it's a step into an unknown void. That is scary because it's so new and everybody else seems to be able to do it at the drop of a hat, but I can't. So that makes you feel inadequate.
	Fear of Learning	16	Fears related to learning, making mistakes and not understanding	I think older people . . . don't really feel they can start learning again. And people who aren't good at machines find it very threatening.
	Lack of Confidence	6	Fears related to lack of confidence and exposure of ignorance	Possibly older folk . . . feel a bit inferior in that area, in the modern electronic era. . . and they don't feel comfortable in showing off their ignorance. Some . . . people are a bit timid about it . . . lack confidence.
Declining Faculties	Mental Abilities	23	Failing short term memory and concentration	I found a lack of concentration. You have to concentrate so very hard when you perhaps haven't concentrated so hard for many years
	Physical Abilities	11	Arthritis and failing eyesight	Yeah you have disabilities – you can't hear, you can't see and your wrist aches and your fingers ache! I mean it's all downhill!
Unfamiliarity with the technology	Jargon	15		You've learned an awful lot out of books and suddenly you get this and it's a foreign language.
	Typing/keyboard/mouse	12		They need to have an ability to type if possible, that seems to be a big hitch. And I know personally people who have been put off because they say they will never be able to learn it.
Lack of social Support		12		It helps a great deal if there is someone you can consult with. I have got X and Y [put in pseudonyms if X and Y are people] helps me every now and again. But if I ask my kids they say: 'Keep at it Mum you will make it, you will make it.' [This quote doesn't seem to point to a LACK of SS. Better example?]
Age-Unfriendly Instruction		8		I don't think I can stress enough that it's good to learn with your peers that you're all round about the same learning. Rather than with a professional person. They use a lot of this gobbley-gook thing.
Financial Cost		7	Costs related to acquisition and maintenance	I am not on the pension. I am still on the benefit and I couldn't afford to buy a computer but I am very lucky I was given one – an old one.
Lack of Relevance/Motivation		5		I don't feel that every old person should learn to . . . use a computer. I think you've got to be interested and know what you're going to do with it

Table 2: Major Barriers for Older Men

Theme	Subtheme	Frequency of Occurrence of Subtheme	Definition	Sample Quotes from Men
Emotions and Attitudes	The unknown void	9	Computers represent a break with the past – a previously unknown quantity	It's a totally different world to what we're used to. I've grown up on a farm with a totally different background. From cows to computers it's totally different
	Anxiety & Frustration	7	Frustration in learning	Frustration...in learning, in remembering. At the beginning. Entirely at the beginning.
	Lack of Confidence	3	Falling levels of self confidence	Well the biggest one I think is the generic problem that when you are young you're indestructible but when you get older you lose confidence.
Declining Faculties	Mental Abilities	10	Failing short term memory and concentration	I suppose the main barrier is your memory. People show you how to do something and you see it but if you try and do it again next time you have forgotten how to do it.
	Physical Abilities	3	General Physical Health	Depending on health. Generally.
Financial Cost		7	Costs related to acquisition and maintenance	They want to go on computers but not everybody can afford to go on computers. Yeah. You're looking at cost. It's a luxury more so than a necessity.
Age-Unfriendly Instruction		5		At SeniorNet we are all of a similar age and we talk like people of our own age and whereas if you go to a night school you may be with an 18 year old or 16 year old and trying to do the same things and you might get left behind.
Lack of social support		5		I felt if I'd only had somebody there just for an hour when it first arrived [complete the sentence]
Lack of relevance/motivation		2		You have to have that interest [to buy a computer]

Table 3: Major Benefits for Older Women

Theme	Subtheme	Frequencies	Definition	Sample Quotes from Women
Mental Stimulation		9	Learning and Using is good for the brain and concentration	So you always have the excitement of discovery. That's what's so wonderful about it. That's the thing about computers. You are always learning and some little new thing, and sometimes it's such a wonderful revelation.
Connections and Connectedness	To information	14	Connections are made to a world of information	When I first got on to the Internet I was so excited because all of a sudden this square screen in front of me wasn't a screen any longer, it was a window and it just opened up a whole world for me. When you think about it there's nothing I've found that I can't find on the Internet. Everything is there, no matter what I want. There's so much information.
	To the Modern World	8	Connections are made through the computer to the modern world	It just brings you up you know. You think you're coming into this century instead of being left behind.
	To Others	21	Connections are made to family, friends and company	Yeah it's sort of a connection. There's an old man of eighty four down from me and he never went out and then he found the computer and the internet. He's English. So he's into it and the family. He's a live again. Even got in his car and drove it! ... Well his wife died and he just went into the ground you know. So now he's alive..
	To renewed sense of self confidence	2	Improved levels of self confidence	I really think generally that learning to use a computer has given me the confidence that I can now use tele-banking with great confidence and I can even use those ATMs – I even put money in the ATM machines.
Efficient and Convenient Tool		18	Useful tool	And I like typing letters, you know, to friends. It's easy fro them to read. And for one particular friend she has problems with her eyes you can enlarge it.

Table 4: Major Benefits for Older Men

Theme	Subtheme	Frequencies	Definition	Sample Quotes from Men
Mental Stimulation		13	Learning and using is good for the brain and concentration	The whole thing about the computer we were talking about it before, not going over old ground, but it does stimulate the brain. You can sit down and read the leading article on the Herald quite simply and I think its happened more now since I've been on the computer. It makes you think more. It sort of helps the brain to work. It's a case of use it or lose it and I think the computer helps me.
Connections and Connectedness	To information	7	Connections are made to a world of information	I think it's great to be able to keep up with technology, and not only using it for e-mails but also to get on the Internet. I have for instance a niece in Jerusalem, she's a nurse there and I read the <i>Jerusalem Post</i> every morning and it's wonderful for that sort of thing. You'd be surprised what we don't get in our newspapers here.
	To the Modern World	5	Connections are made through the computer to the modern world	Yes it takes a fair bit of courage to take the plunge to not let the world leave you behind and I think that is probably the common factor amongst us. People have made the effort to try and keep pace with the modern world.
	To Others	13	Connections are made to family, friends and company	I was going to say that corresponding by e-mail. I have a son in Melbourne with whom I used to write letters once every month or something like that. Well now, we are writing every day and I feel that we have got a much better relationship than we ever had before.
	To a renewed sense of self confidence	4	Improved levels of self confidence	I think also that during this learning process you are never going to be, well I will never be fully conversant with everything, but during this initial period you get a great deal of satisfaction when you do something tight after struggling for a long time. Finally finding that you are right. It is good for you isn't it? It does boost your self esteem a little bit.
Hobby, Therapy		6	A source of enjoyment	The advantages for me was back in the early nineties I was diagnosed with cancer and went on to chemotherapy and all that sort of thing and my son's partner at that time had an old Omega computer and she just bundled it up and sent it over and said here play with this. So when I wasn't feeling like doing anything or speaking to anybody I could play with the computer
Efficient and Convenient Tool		12	Useful Tool	Advantage is now there's internet baking and you can do it and it doesn't cost you a phone call or the charges they have, but you can do it any time day or night.

Table 5: Major Negative Consequences for Older Women

Theme	Frequencies	Definition	Sample Quotes from Women
Physical Problems	6	Physical affects of using the computer	They make your back ache if you sit there for long enough don't they and if you slouch over you get indigestion
Guilt	3	Feelings of guilt from spending too long at the computer	So I think you have to get over the guilt of sitting there when you think you should, you know you should be doing something else
Introversion and Isolation and Addiction	14	Computing takes time away from other things and people	I find the biggest disadvantage of the computer is that my house is getting very dirty
Security Anxieties	6	Concerns about issues of security	And the frustrations of viruses and passwords. You wonder whether it's worth it.
Cost and Obsolescence	3	Cost of acquisition and maintenance	The cost, I had to get new ink for the printer. The cost of the coloured and black ink was \$159.98! Now that really staggered me!

Table 6: Major Negative Consequences for Older Men

Theme	Frequencies	Definition	Sample Quotes from Men
Physical Problems	3	Physical affects of using the computer	There is another downside too that comes to my mind and that is we senior citizens sitting in front of the screen there are posture factors and being virtually rigid in the same position for a long time, is far more hard on an old person than it is on a young person. What I'm saying is they sell computers they should sell us an armchair with it that will suit it.
Guilt	1	Feelings if guilt from spending too long at the computer	I still have a peculiar attitude inside my mind if I spend more time on the computer I would be wasting time. I am afraid...I say well now I should be putting the spuds on because mum told me too. Instead of that I'm sitting in front of the computer. You feel a bit guilty about it.
Introversion, Isolation and Addiction	9	Computing takes time away from other things and people	You've got to be careful you don't become an addiction.
Cost and Obsolescence	3	Cost of acquisition and maintenance	And coming back to the obsolescence business I think we have got to the stage that we don't replace our cars so often as we used to in the old days but I think we are going to have to replace our computers more regularly as the obsolescence advances more quickly.