School of Social Sciences

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Working Paper Series
Paper 36

The information aged: Older adults' use of information and communications technology in everyday life

NEIL SELWYN, STEPHEN GORARD and JOHN FURLONG
School of Social Sciences, Cardiff University, Wales

June, 2003

ISBN 1 872330 87 8

The information aged: Older adults' use of information and communications technology in everyday life

NEIL SELWYN, STEPHEN GORARD and JOHN FURLONG
School of Social Sciences, Cardiff University, Wales

ABSTRACT

Social commentators are beginning to recognise that encouraging older adults' use of information and communication technologies (ICTs) is an essential prerequisite for (over)developed countries such as the United Kingdom becoming *bone fide* information societies. To date, however, few studies have examined older adults' access to and use of ICTs in detail. This important aspect of the interaction between population ageing and societal change is more complex than the existing literature's portrayal of a dichotomy between 'successful users' and 'unsuccessful non-users'. We still know little, for example, about the reasons and motivations underlying older adults' adoption or non-adoption of ICTs. We also know little about the nature of this use and the support which older adults draw upon regarding ICTs. Finally, and perhaps most importantly, we know little about the outcomes and 'life-fit' of older adults' (non)use of ICTs. The paper examines the extent and nature of ICT access and use by older adults in their everyday lives through two sources of data: (i) information collected from a sub-sample of 352 adults aged over sixty years taken from a large household survey of ICT use in England and Wales among 1,001 people, and; (ii) follow-up interview data from thirty-five of these individuals. The findings suggest that using a computer is not only a minority activity amongst older adults but also highly stratified activity by gender, age, marital status and educational background. Conversely, non-use of computers can be attributed to the low relevance and 'relative advantage' to older adults' lives. From this analysis the paper highlights the key issue of many older adults' ambivalence towards ICT in light of the limited relevance of new technologies to their day-to-day lives. The paper concludes by considering what steps can be taken to facilitate wider use of ICT by older adults; in particular how political and academic assumptions about older people and ICTs might be refocused, away from trying to 'change' older adults, and towards involving older adults in changing ICT.

KEYWORDS – computers, information and communications technology, older adults, digital divide, ageing

Older adults' use of information and communications technology in everyday life

> The number of older people becoming 'silver surfers' by establishing expertise in using new technology is growing fast. IT and the Internet has the power to transform their lives … 24 hours a day, seven days a week through the click of a button (Ian McCartney, Cabinet Office Minister. See Cabinet Office 2000).

Introduction

The ever-increasing importance that is being attached to information and communications technology (ICT) in contemporary society cannot be understated. Received wisdom amongst academics, politicians and the IT industry concurs that we are now entering an 'information age', prompted and sustained by a computer-based technological revolution that has evolved over the past three decades (*e.g.* Lyon 1988, Castells 1996, Department of Trade and Industry 1998). At the heart of such proclamations is the widely held belief that ICTs, such as the computer, Internet and mobile telecommunications, have initiated fundamental compressions of time and space and, it follows, qualitatively and quantitatively altered the exchange of information, knowledge, resources and capital on an 'anytime, anywhere' basis (Harvey 1989). New technologies, if all these accounts are to be believed, now define the society in which we live. Given this apparent social and economic sea-change, and the importance and apparent ubiquity of ICTs in day-to-day life, it is little surprise that there is a considerable imperative for older adults to become users. As Jamieson and Rogers (2000, p.343) argued:

> The requirement to learn to use new technologies is becoming pervasive in the lives of adults, young and old. For example, computer systems of various forms are prevalent in nearly every aspect of our lives, including video-cassette recorders, computerised library catalogues, electronic banking, information kiosks, multi-function answering machines *ad infinitum*.

Social commentators are beginning to highlight the fact that the *information* society is also an *ageing* society (Bernard and Phillips 2000), and that encouraging older adults' use of ICT is an essential prerequisite if countries such as the United Kingdom and the United States of America are to become *bone fide* information societies. This has in turn led to the recent discursive portrayal of 'silver surfers', a popular but nebulous description of the burgeoning group of confident and competent older ICT users (Cody *et al.* 1999; Copps 2000; Brayfield 2000).

The inclusive/exclusive potential of ICT for older adults

The 'silver surfer' discourse reinforces the notion that older adults stand to benefit from ICTs in various ways, and that the ability to make use of new technology is a ready means through which to 'bridge the generation gap' (Burdick 2001). For some

commentators, indeed, ICTs lie at the heart of older adults' participation in society in the 21st century:

> Technology is not something we can ignore in the new century, and we too would argue that technology should be at the heart of social policy [for older people] for several reasons. First, it is *intergenerational* in the sense that technology has the ability to improve the situation and quality of life for *all* people. Secondly, technology is important to a social policy of ageing because it pervades *every aspect of life* and has the potential for assisting with many of the 'traditional' problems associated with ageing. … Thirdly, technology is *pluralistic and preventative*. It is about facilitating communication which can enable people, of whatever race, age or gender, to participate as citizens in decision-making and can empower people as they shop, vote and seek expert help 'on line' in all areas of policy. Technology can assist us to overcome some of the barriers already noted between conventional policy areas such as housing, health and social services, education and work, in order to create a 'seamless' service (Emphases in original. Bernard and Phillips 2000, p.48).

In essence then, the use of ICTs is seen as ready means for older adults to 'reconnect or improve their connection with the outside world' (White *et al.* 1999, p.362) and 'enjoy a higher quality of life' (Irizarry and Downing 1997, p.161). Indeed, from the limited empirical work that has been carried out with older technology users, ICTs have been argued to be a source of increased social support and life enhancement for older people, a convenient means of promoting access to learning, health information, and communication with family and friends, as well as a means to increased civic and community inclusion (White *et al.* 1999; Adler 1996; White and Weatherall 2000).

Yet the *potential* of ICTs for the inclusion and empowerment of older adults has been tempered by a succession of reports that technology is proving *in practice* to be an exclusive activity. For example, the probability of Internet use has been found to decline with the age of the user (Madden and Savage 2000), as have levels of skill and the breadth of activities that the Internet is used for (Teo 2001). Although older people's consumption of established technologies, such as terrestrial television and analogue radio has been found to steadily increase with age, older people remain 'much less likely to have multi-channel television (particularly satellite) or to have enhancements such as stereo or wide-screen sets [and very few are] in households with computers or DVD players. … This gap is wider when access outside the home is included' (Hanley 2002, p.6). Other studies have found older people to be less likely to use public ICT facilities such as health information kiosks (Nicholas, Williams and Huntington 2000).

There is therefore growing concern that older adults must engage with new technologies or be further disadvantaged in contemporary society. As Green and McAdams (2003, p.8) reason:

> "to lag in the use of technology is to remain behind a veil of limited knowledge and opportunities. In combination, education and access to information can ameliorate the impact of … disadvantage".

Several factors have been put forward as influencing these patterns. Older people are less likely than younger adults to be exposed to new technologies because they are less likely to live with children and were more likely to have left both the educational system and the workplace before the widespread introduction of IT (Rosen and Weil 1995; Irizarry and Downing 1997). The continual evolution and updating of new technology

and software (known as 'churn') has also been argued to cause difficulties for older adults (Rousseau and Rogers 1998; Westerman *et al.* 1995), as has the fact that many technological artefacts and applications are not designed with older users in mind. As Smither and Braun (1994, p.382) acknowledged, 'many [technology] products lack features essential for some older adults, such as larger print, audible signals, low memory-load interactions, easy-to-use menus, adequate help signals and so forth'. Financial cost has been found to be another obvious prohibitive factor (White and Weatherall 2000).

A growing body of research suggests that older adults are physically and psychologically disadvantaged with regard to using the new technologies. Factors such as 'perceived control' have been found to influence significantly older people's adoption and use of new technology (Morris and Venkatesh 2000). Rousseau and Rogers (1998) found that whilst employed adults aged 60 or more years do not avoid using new technology, they did report being less comfortable than younger adults when using it and were more selective of the applications that they used. In addition to the psychological restrictions faced by older people, physiological changes associated with ageing, such as decrements of sight, hearing, dexterity, motor functioning, hand-eye co-orientation and cognitive processing, also make new screen-based technologies more difficult to use (Blake 1998; Virokannas *et al.* 2000).

All these factors have prompted the suggestion that a large proportion of older adults tend to oppose changes that involve the implementation of technological innovations (Taylor and Walker 1998). Whilst some authors argue that this view is merely an expression of wider negative stereotyping of older people (*e.g.* Sixsmith and Sixsmith 1993), most empirical analyses concur that age and the experience of being an older adult, rather than confounding factors such as income or education, have a significant impact on ICT usage. As shall be discussed below, some denials of the impact of older adults' low income on their capacity to buy and maintain ICTs are naïve, but for some authors 'even after controlling for potential confounding variables (income, occupation and education) … it appears that age does have important influences on technology adoption and sustained usage decisions' (Morris and Venkatesh 2000, p.392).

Government attempts to facilitate older adults' use of ICT

The British government has made great efforts over the last six years to ensure the inclusion of older adults in the 'opportunities of the information age' takes place. Its drive to widen older adults' access to ICT has been constructed around the pledge to achieve 'universal access' to the Internet by 2005. This commitment has prompted various initiatives, latterly collated under the umbrella programme name 'UK Online' (Department of Trade and Industry 2000). To widen older adults' access to ICT, the initiatives have focused largely on the establishment of distributed community sites for technology access, *e.g.* a network of over 7,000 'UK Online Centres' in diverse learning sites such as schools, museums and libraries have been set up, thus providing flexible access to new technologies for those without ICT facilities at home or at work (Department for Education and Skills 2001). Alongside these initiatives, £200 million of 'New Opportunities Funding' has been committed to a 'People's Network', through which all public libraries are connected to the Internet, with some offering 'silver surfer' training sessions for older people.

Other financial announcements have been concerned with extending levels of home access to ICT among the United Kingdom population. The 'Computers Within Reach' initiative offers people aged 60 or more years on state pensions access to low cost re-conditioned computers. Disadvantaged older people are also a target for the 700 new ICT Learning Centres that offer local access to ICT equipment and training. As part of the government's 'Better Government for Older People' two year programme, projects have been held across England to promote the use of ICT among older people through free 'taster' sessions, older people's festivals and courses in libraries and colleges. In this way the government seeks to establish an older cohort of technology users. As the Social Security Minister, Jeff Rooker, recently argued, 'more and more older people are banishing traditional stereotypes as government schemes are opening up opportunities to them through IT. New technology can play a major part in improving quality of life for older people – giving them quicker and easier access to vital information including mobility, transport, health and friendship' (Cabinet Office 2000).

Research methods

Despite the increasing political, academic and practitioner interest in older adults and technology, research in this field has to date been mainly comprised either small confirmatory studies of groups of ICT-using older adults or reports from surveys of the whole population that older adults make less use of ICT than younger adults. As White and Weatherall (2000) acknowledged, studies of older people and information technology have been limited primarily because the age group have been a minority of users. Moreover, studies of all adults which have examined older users have tended to use self-selecting samples through web-based or telephone surveys (*e.g.* Alder 1996). Our contention is that when examined more closely, the patterns of older adults' use of ICT is likely to prove more complex than the customary portrayal of a dichotomy between 'successful users' and 'unsuccessful non-users' (*e.g.* Wresch 1996; Jurich 2000; Parker 2000).

This paper examines in more depth the extent and nature of ICT access and use by older adults in their everyday lives. It first draws upon household survey data that was collected in a multi-phase study of the patterns of ICT use by adults. A 36 page structured-interview instrument was administered by a university-based commercial research organisation during the summer and autumn of 2002 in four local authorities in the west of England and South Wales. These were selected as representative for population density, economic activity and levels of educational attainment of England and Wales local authorities.[1] The final sample comprised 1,001 adults, and the age distribution was 352 respondents aged over sixty years, 319 aged 41-60 years, and 330 aged 21-40 years. The primary response rate was 75 per cent. In analysing these data this paper defines older adults as people aged over the age of 60. Within the sub-sample of 352 survey respondents who can be classed as older adults, 44 per cent (n=154) were male and 56 per cent (n=198 female), 93 per cent (n=328) were classified as 'white' and 7 per cent (n=24) classified as 'non-white'. The age range of older adults spanned 61 to 96 years with a mean age of 72.3 years (standard deviation 7.97 years). According to the 1991 local census returns (2001 figures not available at the time) for these areas, the sample slightly over-represents female respondents, but is otherwise a fair representation of the population of study (see Madden, Selwyn and Gorard 2002 for further details of the sampling and survey administration procedure).

The paper then draws upon a second stage of the data collection which involved in-depth, semi-structured interviews with 100 respondents covered by the initial survey. This sub-sample of 100 interviewees was selected to include equivalent numbers of individuals with high/low levels of technology use and high/low educational background; with additional criteria of selection including age, socio-economic status, geography (urban/rural) and ethnicity. This paper concentrates on data from the thirty-five interviews conducted with individuals over the age of sixty. These interviews focused on individuals' educational and employment 'careers' as well as their technological histories and present technological and educational activities. In this sense, the interviews approached a life-history or 'life-story' method in that they focused on eliciting individual's experiences through a chronological autobiography of education, work and technology use (see Dhunpath 2000). Obviously people's use of technology is a complex and 'messy' affair and is inevitably less straightforward in practice than many of the elicited narratives from our interviews (McAdams 1998). Nevertheless, these interview data do allow for a more detailed investigation of the factors influencing older adults' use (and non-use) of ICT.

Research questions

The first question to be considered is whether age is an influential factor in the use of and access to ICT in the general population. The survey data confirm the findings of previous studies that age is related to people's access to and use of information technologies such as the computer and Internet. Indeed, they suggest that age is *highly* significant in whether an individual can access and make use of ICT. For example, respondents were asked where they could access a computer. As Figure 1 shows, only two in five older adults were able to access a computer at home, as opposed to 65 per cent of 21-40 year olds and 70 per cent of 41-60 year olds (χ^2=120.8, degrees of freedom (df) 2, p<0.0001). Although the age relationship is less pronounced for access to ICT at public sites such as libraries, museums, community centres and Internet cafes (χ^2=6.8, df 2, p<0.05), age-related differences were even more pronounced for the respondents' actual use of computers. Only 79 of the respondents aged over 60 years (22.4 per cent) reported having used a computer during the previous 12 months (χ^2=199.7, df 2, p<0.0001), and only 53 people or 15.1 per cent had used the Internet (χ^2=206.8, df 2, p<0.0001).

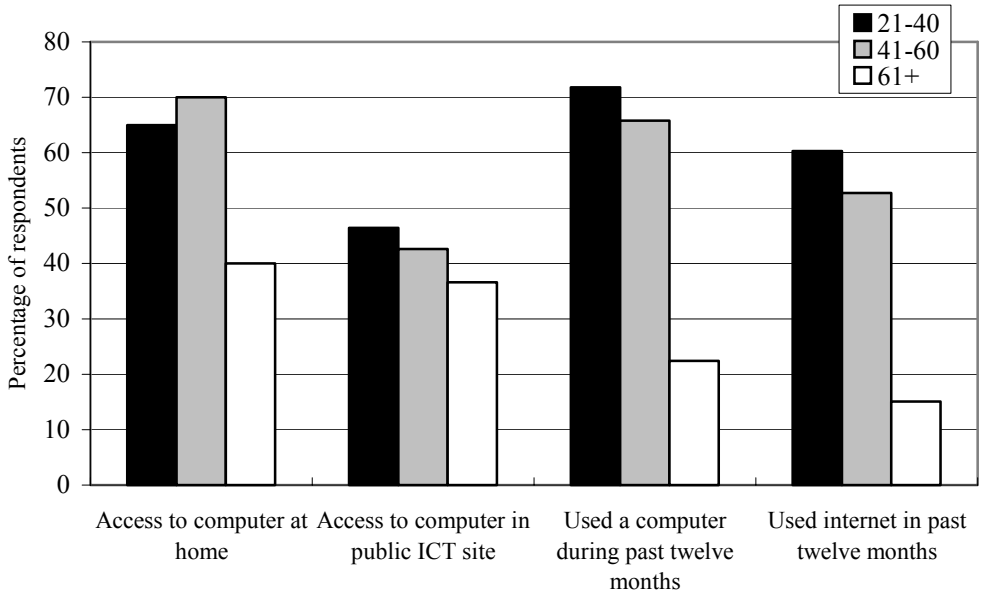

Figure 1. Access to and use of information and communication technologies (ICTs) by age group.

Yet these and similar survey findings reveal little about older adults and ICT. In particular, data such as these often support the false assumption that older adults' use of ICT is simply polarised in terms of 'have-nots' (or more accurately 'can-nots') on the one hand and the highly able and empowered 'silver surfers' on the other. Instead, as we shall discuss in subsequent sections, there are two distinct types of access; whether groups have access at all and the hierarchy of access amongst those that do. Thus, beyond the simple issue of 'access/ no access' to ICT come more complex questions of levels of connectivity in terms of the capability and distribution of the access concerned. Moreover, access to ICTs goes beyond the physical availability of artefacts and also includes the ability to access help and support if using a technology.

As previously intimated, throughout this body of existing research and the surrounding debate on older adults and ICT there are a number of unanswered questions regarding older adults' use of ICT. We know little about the reasons and motivations underlying older adults' adoption or non-adoption of ICTs. We know little about the nature of this use and the support which older adults draw upon when making use of ICTs. Finally, and perhaps most importantly, we know little about the outcomes of older adults' (non)use of ICTs. As Loges and Jung (2001, p.536) reason, "underlying much of this research is a presumption that seniors who do not gain internet access are deprived of a resource for enhancing their lives, a resources to which others (e.g. other seniors or younger people) have access". In short, despite the increasing political, academic and practitioner interest in older adults and technology, we know little of the realities of how older adults use, and do not use, ICTs in their everyday lives.

With these caveats in mind we asked more nuanced questions of our data from the survey and interviews in order to develop a more fine-grained and realistic picture of older adults' access to and use of ICT. With this in mind the remainder of the paper now goes on to consider the following research questions:

- What access to ICTs do older adults have? How does access to 'new' ICTs such as computers and the Internet fit in with access to other technologies? Where can older adults access ICTs (*e.g.* in domestic or community settings)? What access to support when using ICT do older adults have?
- What 'hierarchies of access' to ICT exist for new adults?
- What factors are associated with older adults' access to ICT (*e.g.* gender, age, educational background, long term disability/illness, marital status)?
- What are older adults using ICTs for? How does the use of computers and the Internet fit in with use of other technologies?
- What are the social contexts of older adults' ICT use? *e.g.* where do older adults use ICT, what networks of use and support are developed by older adults when using ICT?
- What determining factors lie behind older adults' use and non-use of ICT (*e.g.* gender, age, educational background, long term disability/illness, marital status)? What are the reasons behind older adults' non-use of computers?

Results from the survey data

Older adults' access to information and communications technologies

An important step towards understanding older adults' use of ICT is to gain a picture of patterns of *access* to ICT; especially the gradations of access to different technologies (from actually owning a technology in the home through to shared access elsewhere). In line with other findings, the current survey showed that the most accessible technologies to older adults were mass market broadcast and communications technologies. As can be seen in Table 1, the majority of older adults had access at home to fixed/landline telephones, terrestrial television, video recorders/players and radios. Half or more of older adults in the sample also had home access to CD players and mobile telephones. The level of access to the Internet was lower and predominantly through computers (53 or 15%), rather than the newer Internet-enabling technologies such as digital televisions (3 or 1%) and mobile phones (1 or 0.3%).

TABLE 1. *Older adults' access to technologies.*

Information or communication technology	Own/ access at home (%)	No home access but access from family/ friends (%)	Access at work (%)	Access elsewhere (%)	No access (%)
Computers					
Laptop computer	3	2	0.3	1	94
Palmtop computer	2	0.3	0	1	98
Desktop computer <5 years old	18	14	1	1	65
Desktop computer 5+ years old	7	3	0	1	89
Computer printer	23	11	1	1	64
Computer scanner	13	9	1	1	75
Digital camera	6	3	0.3	1	91
Telephones					
Payphone (shared or public)	1	0.3	1	31	67
Videophone	1	0.3	0	1	98
Telephone (fixed/land line)	92	1	0.3	1	6
Fax machine	11	3	1	3	83
Mobile telephone	50	5	0.3	0	45
Television and video					
TV with basic channels (1-4 or 1-5 only)	88	1	0.3	1	10
Cable/satellite television (non-digital)	21	10	0	1	68
Digital television	20	9	0	1	70
DVD player	10	9	0	1	81
Video recorder/player	80	1	0	0.3	20

Other entertainment					
Personal stereo (*e.g.* Walkman, minidisc)	19	7	0.3	1	73
CD player	54	3	0	0	42
Digital radio	10	5	0	1	84
Radio	95	0	0.3	0	5
Video camera	17	11	0	1	72
Handheld games machine (*e.g.* Game-boy)	3	11	0	1	86
Video games machine (*e.g.* Playstation)	5	11	0	1	84

Note: Data are percentage of all respondents aged 61+ (n=352). Categories of access are mutually exclusive. Summed data may not add up to 100 per cent due to rounding up and rounding down of decimal places.

For access to computer-based technology, the most frequently cited location was at the home of a relative (Table 2). The second most common location was the respondents' own home, followed by libraries and the houses of friends. The relative importance of family and friends was repeated for access to both computers less than five years old and to peripherals such as printers and scanners (Table 1). This 'access by association' or through others is an important constituent of older adults' access to up-to-date computers, computer peripherals such as printers and scanners as well as entertainment technologies such as digital and satellite television, DVD players, video cameras and games machines.

TABLE 2. *Older adults' perceived access to computers.*

Site of Access	Percentage
Your home	40
A relative's home	47
A friend's home	13
Your workplace/place of study	4
A Museum/Science Centre	2
A Community Centre/Site	4
A Private 'Pay-per-Use' Site (*e.g.* Internet Café)	5
A Local School/College/University (non-students)	5
A Library	19

Note: Data are percentage of respondents aged 61+ (n=352)

Older adults' access to ICT support

As to *potential* sources of ICT support for older adults, the importance of children and other family members can be seen in Table 3. Yet merely knowing someone who uses computers does not constitute a ready source of support. Although the majority of older adults knew someone who used a computer, 239 of respondents (68 per cent) reported that they 'never' talked about computers with other people, with a further 77 people (22 per cent) saying that they only 'rarely' did so. Similarly, when respondents were asked which of these potential sources of support they would be able to draw on when/if they used ICT the salience of family members is reinforced. This is especially apparent in relation to the likelihood of drawing upon computer-using friends and neighbours; who are less likely to be seen as actual sources of help.

TABLE 3. *Older adults' potential and actual sources of ICT support.*

	Potential source of support[1] (%)	Actual source of support[2] (%)
Your partner/spouse	13	8

Your children	32	24
Other member of household	7	3
Other family living elsewhere	64	45
Neighbours	20	3
Friends	29	9
Work colleagues	5	4
No	15	19

Notes: The reported data are percentages of computer-using and non-computer using respondents (n=352). 1. Answer to inquiry about 'someone you know who uses a computer'. 2. Answer to inquiry about 'someone you could go to for help/advice'.

Determinants of older adults' access to ICT

To develop a more detailed understanding of variations in access to ICTs among older adults, the models proposed by Wilhelm (2000) and Murdock (2002a, 2002b) which seek to identify the degrees (or layers) of connectivity/marginality to ICTs have been adopted. At the centre of this hierarchical model are 'core access' individuals who have ready access to computers at home and enjoy access to advice and support that enables them to operate more effectively and to continually extend their range of uses (Murdock 2002a). A second category occupied by those individuals who have access at home but are limited by ageing equipment and limited support (*peripheral home access*). Not in Murdock's original description but worth distinguishing from the last two groups in the case of older users, are those individuals who lack access to computers in their home but do have access through family and friends as well as terminals in public locations or at work alongside access to limited support (*peripheral family access)*. Yet another group are those individuals whose only access is through shared terminals in public locations or at work, where their use is heavily constrained by the demands of other users and limited support (*peripheral public access*). The most peripheral are those individuals who have no ready access to computer or support at all (*excluded*).

Using the access and ICT support data from the questionnaire, it is possible to assign (albeit crudely) our respondents over the age of 60 to one of these five groups. Access to computers was calculated from the data summarised in Table 1, whilst access to computer support was calculated in terms of respondents' reported sources of support as summarised in table two [2]. This analysis shows a more delineated picture of older adults' ICT access than is suggested in the existing literature (Table 4). Whereas 17 per cent (n=60) of our older sample can be classed as being absolutely excluded from ICT access, and 24 per cent (n=84) as having ready access to ICT in a home setting (albeit only 25 or 7% with up-to-date resources and a range of support), the majority of older adults are reliant on some form of outside-home peripheral access. As was suggested above, this peripheral access is supplied for most people by the extended family rather than at public or community sites. In terms of differences between 'core' to 'excluded' categories of access, some variations are apparent according to respondents' gender, age and marital status - although not in the case of factors such as illness/long-term disability and educational background.

TABLE 4. Level of access to computers by social and health characteristics.

Social or health characteristic	Hierarchical level or category of access					Sample size
	Core access (%)	Peripheral home access (%)	Peripheral family access (%)	Peripheral public access (%)	Excluded (%)	
Gender						
Male	9	24	40	15	12	154
Female	5	11	42	22	20	198
Age group (years)						
61-70	9	27	43	15	6	141
71 or more	5	10	40	22	24	211
Marital status						
Single / separated / widowed	3	5	47	27	18	163
Married / living with long term partner	11	28	37	12	14	178
Health status						
No long-term illness / disability	7	18	39	19	18	217
Long-term illness / disability	6	13	47	19	15	129
Education						
Continued after 16 years old	8	32	29	7	25	73
Completed education at or Before 16 years of age	7	13	44	22	14	279
Total	7	17	41	19	17	352

Note: Summed data may not add up to 100 per cent due to rounding.

Older adults' use of ICT

Having access to ICT is not however the same as using it. Although only 60 or 17 per cent of the sample were totally without access to computers, only 79 or 22.4 per cent reported having used a computer during the previous 12 months. The use of computers was very much a minority activity compared with the use of other ICTs such as television, video/DVD, radio, hi-fi and the mobile phone.

Indeed, watching television and listening to the radio were the most popular technology uses among the older sample; with 324 people (92 per cent) watching television frequently (*i.e.* 'very' or 'fairly often'), and 271 people (77 per cent) listening frequently to the radio. As to computer uses, word-processing was the most popular activity, followed by 'fiddling around on the computer', file and memory organisation, and learning from computer software (Table 5). For these relatively popular applications, roughly equal numbers were regular and irregular users. Levels of use of the Internet were lower still, and sending and receiving emails was the most prevalent internet-based activity. Fewer searched for information on goods and services, sought information relating to work, business or study, or 'browsed the web with no specific purpose'. Only very few used the Internet for more advanced purposes such as banking (11 people), to purchase goods and services (18 people), for learning (9 people) or Internet-based chat rooms and bulletin boards (8 people).

TABLE 5. *Use of computers and the Internet in the last 12 months.*

Activity or use	Very often	Fairly often	Rarely	Never
Playing games	8	5	7	59
Writing and editing letters, reports and other documents	27	23	18	11
Making films or animations on a computer	1	1	7	70
Creating and manipulating images (*e.g.* photographs)	12	9	10	48
Watching DVDS/ videos on a computer	2	5	3	69
Making music with a computer	2	2	4	71
Listening to music on a computer (CDs, MP3S)	4	7	7	61
Fiddling around on a computer/explore different bits of the computer to develop your own knowledge	16	19	13	31
Organising the computer's files/memory	12	19	11	37
Programming the computer	6	5	6	62
Learn something when using a computer program (*e.g.* from a CD ROM, encyclopaedia or database)	13	19	6	41
Send/read E-mails (via computer or digital TV)	27	12	9	31
Making/maintaining your own website product information	4	2	1	72
Look for products and services/gathering product information online	8	13	11	47
Buy goods and services on-line	4	5	9	61
Online banking/management of personal finances	4	4	3	68
Look for information related to work/business/study on the world-wide web	10	15	7	47
Download software, music, films or images from the Internet	7	1	8	63
Participate in educational courses/lessons on the world wide web	1	4	4	70
Use adult entertainment on the world-wide web	0	3	3	73
Browse/surf the world-wide web for no specific purpose	4	11	13	51
Use Internet newsgroups, bulletin boards chat rooms or instant messages	2	3	3	71

Note: The reported data are numbers of computer using respondents (n=79)

The social context of older adults' ICT use

Most older adults' computer use took place in their homes (64 out of the 79 computer users), while workplaces or places of study (14 people) and relatives' homes (14 people) were other sites of note. The low number (7) making use of computers in libraries is especially striking given the assumed accessibility of libraries for older adults. This dominant pattern, that home access is a condition of use, was confirmed in an analysis of actual usage by the five categories of access. The majority of older users (67 or 85%) fell into either the 'core access' (27%) or 'peripheral home access' (58%) categories. Only eight (10%) of the 'peripheral family/friends and public access' group and four (5%) of the 'peripheral public access' group had made use of a computer during the previous 12 months.

This lack of inclusiveness of older adults' computer use beyond the home and family setting is also confirmed when we consider with whom older adults use computers and what sources of support they drew upon during the previous 12 months. Most (74 or 94%) used computers on their own, and only 29 people (37%) at times with a partner/spouse and seven (9%) with a neighbour. As can be seen in Table 6, using a computer 'on your own' and 'working problems out for yourself' are the dominant modes of computer use: friends, neighbours, work colleagues and telephone/Internet helplines were rarely called upon.

TABLE 6. *Sources of help or advice with computer use during the previous 12 months*

Source of help or advice	Very often	Fairly often	Rarely	Never
Worked it out for yourself	32	23	12	12
Your partner/spouse	3	14	7	55
Your children	6	10	11	52
Other member of household	0	3	3	73
Other family living elsewhere	6	13	16	44
Neighbours	2	1	3	73
Friends	2	4	10	63
Work colleagues	2	5	7	65
Telephone help-line	1	7	3	68
Online help (websites, chat rooms)	0	6	7	66

Note: The data are the frequencies of computer using respondents (n=79)

Determinants of older adults' use and non-use of ICT

Given our previous arguments against a dicotomous portrayal of ICT access and use it would be ideal to construct a hierarchical analysis of core and periperhal users alongside absolute non-users. However, in the case of older adults, because 273 or 77 per cent of the sample were non-users, more detailed analysis of the remaining 79 respondents is of limited value. Thus it is possible to gain a sense of who is making use of computers by using the (albeit less discriminating) dichotomy between those who had made use of a computer during the past twelve months (users) and those who had not (non-users). This analysis shows a more stratified picture of older adults' ICT use than was apparent earlier. As can be seen in Table 7, clear differences in use were apparent by gender (χ^2=13.8, d.f=1, p<0.0001), by the two age groups 61-70 and 71 or more years (χ^2=28.2, d.f=1, p<0.0001), by two marital status (χ^2=31.3, d.f=1, p <0.0001) and educational background groups (χ^2=18.4, d.f=1, p<0.0001). Long-term illness/ disability was not a significant covariate (χ^2=1.6, d.f=1, p <0.21). Thus computer-using older adults are more likely to be male rather than female, married (or living with a long term partner) than single, aged 70 years or less and to have continued with their education after 16 years of age.

TABLE 7. Usage of computers by personal characteristics.

	User (%)	Non-user (%)	Sample size
Gender			
Male)	32	68	154
Female	15	85	198
Age group (years)			
61-70	37	63	141
71 or more	13	87	211
Marital status			
Single / separated / widowed	10	90	163
Married / living with long term partner	35	65	178
Health status			
No long-term illness / disability	24	76	217
long-term illness / disability	19	81	129
Education			
Continued after 16 years old	41	59	73
Completed education at or before 16 years old	18	82	279

Total	22	78	352

Having established who is and is not using computers, we turn to the reasons behind older adults' non-use of computers, especially in light of the argument that many older adults are simply 'unable' to use ICT due to age-related factors and barriers. As can be seen in Table 8, the expressions of the non-ICT using respondents offer only limited support for this argument. Only 57 or 21 per cent of the non-using respondents cited age and only four (2%) ill-health as the main reasons for their non-use of ICT. Similarly, only three non-user respondents (1%) cited cost as the chief reason. Instead, for the majority the stated rationale was based on 'interest and relevance to life'. Indeed, a quarter (n=67) simply expressed no interest in using ICT, and 18 per cent (n=47) said that they had no need to use ICT.

TABLE 8. *Non ICT users' main stated reason for not using ICT.*

	Frequency	Percentage
No interest / motivation	67	25
Too old	57	21
No need	47	18
No skills / inability to use computers	34	13
No access	18	7
Too busy / life full outside of using computers	14	5
Not clever enough / too lazy / too dull	6	2
No longer used in workplace (previous sole reason for use)	5	2
Ill Health	5	2
Frightened of computers / too technical	4	2
Financial cost	3	1
Computer is broken / given away / sold it	3	1
Anti computers	2	1
Family use it for me	1	0.4

Note: Data are percentage of sample who had not made use of a computer in the past twelve months and who offered a reason (n=266).

Results from the follow-up interview data

It is now possible to refine and expand upon the emerging themes from our survey data through an analysis of the in-depth interview data. In particular we can revisit the three areas of (i) the motivations and mechanisms underlying older adults' adoption of ICT during their lifetime; (ii) the reasons and motivations underlying older adults in our sample who were not making use of ICT at the time of interview; and (iii) finally, exploring how ICT did, and did not, 'fit' with older adults' everyday life. These themes are now explored in the following sections:

i) Exploring Older Adults' Adoption of ICT

When talking to those older adults in our interview sample who were making use of computers a range of motivations and reasons to begin using ICT were offered.

Reflecting the 'information society' imperative discussed in the introduction to this paper, some interviewees explained their adoption of ICT simply in terms of feeling that they wanted to 'keep up' with computerised technology - thus reflecting the self-referential nature of much computer use apparent in the interviews (i.e. deciding to use a computer for its own sake):

> **When did you think of getting a computer in the house?**
> I retired more or less when I was sixty in 1992. I didn't even dream of it as I had enough to do. Later this house came up and with some help I was doing that and I wasn't particularly interested in getting [a computer]. Then I had a heart attack and bypass and in that last two and a half years I've decided *I need to get with it*. I don't know why. I think not knowing something about it worries you! [Now] I set up email and I use the web for various things but I've had no immediate goal. I decided after a year that I might as well get one so I got one [Male, 70]

Other interviewees expanded upon this sense of keeping up-to-date in terms of the perceived usefulness of ICT for their near future - especially in terms of maintaining independence in the face of the reduced financial security and reduced mobility associated with old age. As one retired woman reasoned, "we're going to need it, and I can imagine myself at ninety, setting my house in order, doing my shopping, sending emails all over the place. It makes you independent: that's what attracts me" [Female, 64]. Thus for some of our younger interviewees beginning to use a computer was a way of coping preparation for old age, as this recently retired man explained: "Old age is coming on and I'm looking at the time when perhaps we may be immobile but we can still do our shopping on the Internet [and] I can get access over the Internet to my bank account" [Male, 61].

Yet the decision to acquire and use a computer was not always a decision taken on the part of individuals and/or their partners. In particular, we found many examples throughout our interviews of encouragement and overt coercion from children who wanted their parents to make use of computers. As this man, who had one of his daughter's laptop computers 'lent' to him on a long-term basis explained:

> It's [my daughter] actually, who keeps saying to me, 'Dad, you know, here's my computer, *use it*, otherwise you'll lose it'. And my eldest daughter … she also encourages me, because when I go over to their offices, she'll say, 'sit down at the computer, Dad, have a go – do this letter for me'. [Male, 69]

Whilst some interviewees had begun to use computers for specific projects and activities once having retired and others had simply continued using a computer after retiring as they had previously done in work and at home. Yet this theme of encouragement from younger members of the family rather than peers was recurrent. Whereas some interviewees spoke of using a computer as being an 'unusual' activity within their social networks, only rarely (and generally with more affluent interviewees) was having a computer seen as being part of people's cultural and social expectations of being 'retired'. As this retired women explains, the computer was an expected status symbol within her and her husband's social network:

> **How did you end up having the computer in the house?**

> Because my brother had one and my husband is going to be president of Rotary. And of course, all these Rotarians, because they're ex-bank managers and that's how they spend their day – faffing around on these things – have set themselves up in their retirement in their spare bedroom, sending each other these little billet-douches [sic], you see, and my husband wanted to have the same sort of situation for him [Female, 65]

In terms of *how* older adults had adopted and acquired computers it was noticeable that few of our interviewees had independently purchased a new computer. Wallace (2000) distinguishes between the different economic spheres that household activities such as acquiring a computer can be conducted in - i.e. the formal/market economy, the social economy or the informal economy. From our interviews it was clear that older adults tended to rely on a variety of informal and social strategies - most notably the informal acquisition of computers through the extended family, usually in the form of children and younger relations who were also using computers. As this man explains, his entry into using computers at home came via a combination of having to use a computer in his job in a milk pasteurising plant, support from his then schoolboy son, learning from books and, eventually, from an old computer acquired from a friend:

> **How did you learn to use the computer for controlling the milk pasteurising system…**
> I read the book. Just read a book.
> **What, the manual that came with it or …?**
> The manual that came with it to start with and then I bought a couple of computer books and picked it up from that. My lad showed me a lot because he was – I was at home with him then.
> **That's when he was still at school?**
> No, he'd left school then. He was into computers when he was at school, from about thirteen, but we hadn't got one at home then. He got an old one, a very old one, from somebody we know and he sort of showed me one or two bits from that. And then he bought one himself, when he started work. Then I got this one. [Male, 63]

Family and friends were, therefore, presented as being very important elements in many of our interviewees' adoption of ICT. There were many examples of computers being acquired through 'unpaid community exchanges' where computers, software and peripherals were exchanged on an unpaid basis within the extended family and social or neighbourhood networks" (Williams and Windebank 2000). This non-market-orientated acquisition of goods was a recurring theme through our interviews with all age groups but, in the case of older adults, was predominantly initiated and executed by grown-up children:

> My stepson arrived for my birthday in August and he said, 'I've brought you a present' and he put it on the floor there and it was his old computer, fully set up. Well, he plugged it in and set it up, put it on the internet, everything was done for me. And I would have never gone into that, if I hadn't been pushed by Richard, that's my wife's older son. And he just pushed me willy-nilly into the whole internet fiasco. [Male, 61]

Interestingly the prevalence of mutual aid and unpaid exchange was not confined to those respondents on lower incomes or in lower socio-economic groups, with some of our more affluent respondents also acquiring and using computers via non-market means. That said there were noticeable differences in the nature of these exchanges, as our Rotarian's wife again explains:

> My brother had one. His son, my nephew, Timothy, is in the business. Timothy's company sets up these systems all over the world. And so Timothy is always dealing with the next wave of improved computer. And my brother had one, courtesy of Timothy, when they upgraded. And then Timothy, bought his father a garden planner thing that would draw out your garden, only to find that the system which my brother had wasn't quite compatible with this package. So Timothy, of course, said well that's alright, and set Laurence up [with a better computer] and my husband, had already spoken to my brother saying 'look, can have we have the next one in line when Timothy's you know, his company's sorting out'. So that's how we got one. I think most people like us get them like that. Our friends who have them, none of them have bought them; they've retired and it's been part of the retirement package. They come away with the one that was in their office. Because as they've gone, [the computer's] come with them. And then the incoming chappie, whosoever, he wants the latest all-singing, all-dancing affair, so that seems to be how it works. [Female, 65]

Interestingly as Williams and Windebank (2000, pp.134-135) observe, such examples of self-help are "not a strategy pursued solely out economic necessity or simply because the household has the tools to do it. Instead, over half of all self-help is undertaken by people themselves out of preference". Thus many of our interviewees had benefited from this constant process of the recycling and informal redistribution of computers from the workplace to the family and from family member to family member. Given the rapid 'hi-tech' obsolescence of computers, older adults were often at the end of such recycling chains, with knowledgeable younger family members 'setting them up' and 'sorting them out'.

ii) Exploring Older Adults' Non-Adoption of ICT

As we had found that the majority of older adults from our survey data (78 percent) were not computer users at the time of study, understanding why individuals were *not* making use of ICT is also an integral part of understanding older adults' engagement with the information age. In line with the findings of previous research some of our non-computer using interviewees offered practical reasons of cost, health and lack of exposure in the workplace as underlying their inability to now use a computer. For example:

> It depends on the old finances, actually, to be honest. Because I'm not always going to be working or able to work, probably – touch wood I'll go on for a few years yet, you never know [Male, 69]

> I have an affliction. Though I can do lots of things with my hand, I have never been able to operate a keyboard. I can never operate a typewriter, I was never able to play the piano. Yet, I can do plenty of other things. [Male, 84]

> I wasn't [at work] long enough to go on further with [computers] [Female, 71]

Whilst these practical 'barriers' are undoubtedly important, a significant amount of our interviewees were simply not interested in using a computer - especially when compared with other pastimes and activities which they were participating in.

> We have got so many friends now who talk about the internet and you sort of feel a bit out of touch but I don't know that I would have the use for it, I've got neighbours who use it to find hotels but I can do most things over the phone.
> **So you haven't heard of anything someone has done and thought 'wow!'?**
> No …I like gardening, painting and decorating, anything creative. I can't think of anything else apart from going on holiday which is my biggest hobby! [Female, 61]

This equating of computer use as a hobby akin to gardening as opposed to a valuable life-tool is an interesting reflection of many older adults' perceptions of the computer as something to be used for its own sake rather than as a genuinely useful tool. This feeling of a lack of pragmatic utility was also echoed by other non-using interviewees:

> I suppose I'm up in the library three or four days a week really one way and another, looking up things. I use the libraries a lot. If not to take books out, to look things up. Using the internet is the modern thing to do [but] I have never actually asked them to find something on the internet.
> **Have you ever been tempted to have a go?**
> No, I have just no interest. I go to friends' homes and they say, 'come and look at this' and they fiddle about a bit and it seems to take ages to get onto it and then they press the wrong key or something and it's not engaged. No, I'm afraid I haven't. I've got no need, no intention or need to use it. If I was working I probably would. [Male, 72]

> No, no, no, no need. If you could type, you don't need one. There's a library if you want to find things out; there's a telephone if you want to ask somebody a question or you can write a nice letter as quick as a flash. …. It's a myth; people have been sold a myth to say they can't live without one. They could live extremely well. [Female, 65]

It is worth exploring this recurrent reason of 'not being interested' or 'having no need' to use computers in more detail. One interpretation of these data could be that these individuals have a lack of interest in new technologies due to a lack of skills, knowledge or opportunities to use technology. However, for many of our respondents this lack of interest and subsequent non-use was not for a lack of 'computer rich' social networks or opportunities to use computers if they wished:

> You can always scan the papers for cheap flights. I don't think there is any way we can apply it to our lives to make such a vast difference. We are happy as we are. My sons would say 'why don't you get a computer?'. My son was a computer advisor for schools in the city and was producing educational software in tandem with being a schoolteacher and then he was bought out for millions of pounds. [He] despairs of us but we are not interested. [Male, 67]

We also found that many non-using interviewees could be classed as 'lapsed users'; i.e. they had previously used computer at earlier times in their life but now were not doing so. Thus a lack of familiarity or skills was not a problem - rather a genuine lack of interest in computers once having finished work. As this man who has retired from a career where he used laptops and email on a daily basis to schedule and co-ordinate a team of maintenance engineers explains:

> **Have you got a computer now?**
> No.

What about your children and grandchildren, do they have one?
Yes they have actually. My oldest one has a computer; my daughter's husband had the lot. It can be quite handy. They've got the printer, the lot. My other grandson has his own computer and so does my son. My youngest daughter, the office she is working in got rid of all their computers and she got one for my grandson.
You've never thought of getting one?
No.
Why's that?
I don't know, I'm not really interested. I have other hobbies, books … I walk quite a lot, go on holiday, go on a ski holiday - spend the kid's inheritance! Coach holidays. We see things in the paper and ring up and book. [Male, 69]

Throughout our interviews we found individuals who had used computers at work but now chose to make no use of them. In our interviews with individuals in higher socio-economic groups there were some interviewees who had retired from executive or managerial jobs where the computer was ostensibly an integral part of their work but now did not see it as having any role to play in their retirement:

Yes, of course, like any manager I had a computer on my desk, of course, because I needed to know factually what was happened on the financial situation on a day-to-day basis. And my secretary had a word-processor, of course, so consequently all these things had to be tied in. And I had a computer connected to the whole financial system in the organisation, on my desk,
Did you first learn how to use computers at work?
Yes but … I haven't got one now. My son, who is in the industry, he always says to me, 'I'll drop one off to you, Dad, one of these days', but – I don't know what I'd use it for at the moment. It's not something that terribly interests me, you know. I've got other interests that take my time. If I was somebody who liked sitting at a computer and playing with it, then that would be fine, I'd get one, but it doesn't interest me very much. In fact, I'd rather not, because there's all sorts of things that could get in the way of my other activities. [Male, 72]

Individuals' non-use of computers was therefore often based on a complex and inter-dependent on a series of events over time. Some interviewees had attempted to adopt but then given up and moved onto other activities, as can be seen in the example of this woman who bought a computer towards the end of her career in order to work from home:

How did you end up with a computer?
Well, it seemed the sensible thing to do, like … it makes your life easier and I was thinking, well I could spend more time with my daughter or my mother… It would save time for my real life. [Working on the computer] wasn't a part of what I consider my real life. You know, my real life started when I went home, so, maybe that was why, I never took [the computer] seriously enough. That's why I was a complete idiot at it. … I think I got it for the wrong reason. And my concentration level at that time was sorely under par, I had too many other things going on in my life at the time so, again, I didn't really stick at it. I didn't see it through, which is very unlike me, I've got to tell you.
What jobs was it that you wanted to do on the computer?
I wanted to put all my client base on it and obviously wanted to – a lot of my job was investments, accounting, book-keeping – I could have put all that on the computer.
So then what actually happened?

> I don't know what it was, it was probably an electrical fault or a problem with the computer so I gave it up. I doubt I've used a computer since then … I don't think it's an age thing either, I think it's mental, I don't want to be bothered with it. I haven't, I've had no great ambitions. And I think I obviously didn't treat it with the respect it deserved. [Female, 62]

iii) Exploring Older Adults' Use of ICT and its 'Life-fit'

Having considered how and why older adults were either using or not using computers we can finally consider the nature and outcomes of their technology use when it occurred; in particular how ICT use fitted with the rest of people's lives. As was reflected in our survey data, older adults' use of ICT was more limited in its range and frequency in comparison to the whole population. That said, a minority of our interviewees could be classed as 'heavy' or extensive users of computers, engaging with a range of technologies and applications and, in one case, used computers at home for over forty years. For these individuals computing could be classed as one of their primary interests and hobbies:

> I should think I'm on [the internet] every day for something … and if I want some information, I'll stay on there, you know.… All that information is on there if you keep looking for it. Ask Jeeves, ' could you please state where all television transmitters are'. And then it will give you a list of websites to go into … I've got a programme on there that will tell me where every speed camera is in England! So if I'm going somewhere long distance, I'll tap out the journey. There's a link to everything practically. I find I can get – well you can get in anywhere round the world. You can actually get into space satellites now.
> **Yes. I remember when you could look down the Hubble telescope…**
> You can still get in it now! I've got that on there [points to the computer] – I can just go into what that's looking at at the moment.
> [Male, 63]

Most computer-using interviewees, however, were less extensive users with many using a computer for a restricted range of applications with one or two specific main uses. Unlike many of our interviewees in other age groups who tended to use computers on a more regular basis and for a range of purposes, older adults were more likely to be using a computer for a specific 'project' or use - be it emailing one or two specific individuals or cataloguing or digitising collections of photographs, music and books. In this way the computer was a specific and purposive event:

> Well I use it as a word processor for letters. I store a few. I'm the sort of bloke in the office where papers are all over the place. Once a month I have a blitz and tidy up. There's rubbish on there I haven't bothered to clear off. So, I use it as a processor. [Male, 70]

> We chat with a chap called Mike who's up in Essex. He's a bit of a war historian as well. And of course, we talk a lot about this and we go on and on. We have to stop it, otherwise it costs a fortune. But that's the sort of thing I do and nothing more than that really. [Male, 69]

> I have a scanner and I'm in the process of scanning all my black and white negatives into the computer. They're over 40 years old; they're from when I was a teenager. [Male, 61]

> Well, the first thing I wanted to do was to create a sort of database of all my books, which I have maybe about 2000 books. And I want to put everything down. [Male, 61]

There was therefore a strong sense of older adults using ICT to sustain and support non-computer based hobbies and leisure activities (Savolainen 2000):

> **And so the computer was the first thing that inspired you to go out and start doing some classes?**
> Yeah, having got the computer, I thought I want to find out how to use it. It really exercises the grey matter, because if you don't exercise your brain you just become redundant, you know. It's good because it does challenge you in many ways – makes you work, makes you exercise your brain and there are end results as well. It's helped my tennis coaching immensely. All the lesson plans and I'm secretary of the club as well. Letter-writing, minutes, and I'm into tennis all round the area actually – groups and community tennis partnership. I've got tennis coming out of my ears.
> [Male, 63]

This interviewee's initial allusion to using ICT as a medium for a specific activity in itself reflects the perceived importance of remaining active. Activity has long been thought to be related to successful ageing, with social and productive activities being argued to afford physical benefits, and more solitary activities, having more psychological benefits (Menec 2003). Of course, computers can fulfil both types of activities - acting for some people as a means to 'keep the brain ticking' and 'filling a void in your life':

> I always said when I'd left work I'd had enough [of computers] but I think it fills a void in your life. It's a useful tool. Its good if you've got any grandchildren, two or three of mine are computer literate so I try to keep up with them. But it can be a bit boring talking to people about computers.
> **Do you have people you can chat to?**
> My friend who I used to work with. He became a computer buff because he had to do it- he was on a supervisory grade. He had to learn. When I said I was going to have one he said don't! It's a waste of time, you realise two or three hours have gone by and you haven't achieved anything. [But] it keeps the brain ticking a bit.
> [Male, 70]

There was, therefore, a recurring sense of ambivalence from many of our interviewees, acknowledging on the one hand the 'amazing' and 'miraculous' nature of computers but struggling to fit them into their day-to-day lives:

> My daughter went to New Zealand on her own just before Christmas for a month and she set up the email thing and we went to a friend's house and I actually sent one. I tapped it out and my friend sent it, yes. We had a laugh and I thought that was amazing … But then, I've got an uncle in New Zealand, but he's on the phone. It's nice to hear a voice. I really don't know what we would use one for.
> [Female, 63]

> Yes, you can get information from companies quickly. You don't have to wait for them to send you their brochure. You can go on to their website, as it's called, and there it is in front of you, the answer to your initial question. That's fine. Yes, people can do their

> accounts if they want to, but that's idleness. That's a lot of money to sort of set out to just merely to have an electrical gizmo that will do what you can do with paper and pencil yourself, or you should be able to. So I say this, because I have in my mind, my friend, Jenny, who I've been with this morning. And she's given up coming to sewing class with me for why? Because she's always sitting at that damn machine. It takes over your life, it seems to me. It can do so many things that you feel *obliged* to do them. We get pretty pictures from Jenny. She's sitting there, she's obviously waiting for something to come through on a fax machine or something, so she sends us rubbish. Well, I think that's wasteful in a home situation. Now, having said that, yes, they are miraculous.
> [Female, 65]

Discussion

It would appear from our survey and interview data that age is, and continues to be, an important factor in determining people's use of information and communication technologies. Above all it is clear that to conceptualise all older adults with the popular notion of a polarisation between the 'can-nots' and the highly empowered 'silver surfers' is misleading. Indeed, the construction of the highly resourced, motivated 'silver surfer' using ICTs for a range of 'high-tech' applications is erroneous. Our data have shown that a lot of older adults' computer use is more basic and mundane than the silver surfer discourse suggests. With only 15 per cent of older adults having made use of the Internet over the past 12 months, and with all but a handful of these using the web mainly for email communication and information browsing, the stereotypical notion of the silver surfer using the Internet for banking and finances, shopping and dealings with government agencies was not evinced. Instead the minority of older adults who were using computers were doing so for word processing, keeping in contact with others and generally teaching themselves about using the computer.

Older adults' computer use mainly takes place at home and where there is support it is from immediate family and relatives. Sustained use of computers in public sites such as libraries, community centres and Internet cafes was not in evidence. Neither were wider support networks and 'communities of practice' involving neighbours, friends and other members of the community. Moreover using a computer, as well as being a minority activity amongst older adults, is also highly stratified by gender, age, marital status and educational background. Those older adults who are using computers would appear to conform to the younger, male, educated stereotype which has been associated with computer users over the past two decades.

Similarly, when we consider the three-quarters of older adults in our sample who did not use computers, various circumstances and motivations belied the political assumptions being made about them. Non-users are not a homogeneous group of disempowered, under-resourced and under-skilled individuals. Firstly, although issues of income and ability to buy are of obvious importance, it does not seem that older adults fail to make use of computers because they lack formal access. Indeed, only 17 per cent of our respondents felt totally unable to access a computer; while the majority reported that access was available if they wanted or needed it either at home, through family and/or community sites. Secondly, it is not apparent that older adults are not making use of computers because they are alienated from new technologies. The older adults in our sample were making use of technologies - just not computerised technologies. Similarly, a significant number had used computers at work and home earlier in their lives.

Although the most frequently used technologies were older, more established technologies such as television and radio it would perhaps be misleading to concur with the assumption that older adults are actively resisting 'new' technologies. Indeed, the use of mobile telephony within our sample would not point towards a blanket rejection of new or unfamiliar technologies *per se*.

How then can be begin to develop a more realistic understanding of older adults' (non)use of ICT than exists at present? Firstly, we would not argue, as others have, that technology-using individuals tend to follow a 'general life script' or lifecourse which is typical to all (Green and McAdams 2003) - neither would we claim that there are necessarily replicable elements of 'successful' technology-using older adults which can be replicated via government policies. Instead, it is clear from our data that using ICT is not merely about having or 'not having' access to technologies, but the scope and intensity of the relationships that people develop with technologies and the nature of what they do with them (Loges & Jung 2001). More importantly, and a point often overlooked, is that older adults are not simply 'users' or 'non-users' of computers. Being a 'computer user' is not a permanent state-of-being and once having learnt to use a computer does not irreversibly make one a computer user for life (and it follows 'technological have', 'information rich' and successful 'cyber-citizen'). Instead, as Murdock (2002) reminds us, the influences behind people's (non)use of ICT are multi-faceted and historical - with individuals living technological 'careers' mediated by 'local' contexts of individual and community technology use. Over their lifetime we have seen examples of how older adults therefore move through different states or levels of technology (non)use depending on their circumstances and context. For example, someone making continuous and comprehensive use of ICT in the workplace may then move into making only spasmodic and limited use of ICT once having retired.

Of particular interest in our interview data was the often non-enduring influence of the workplace in enrolling people into the information age for the rest of their lives. As we saw from our interview data, the workplace often acts as key site for people having to use, and if not learning to use, computers. Yet the forced or coerced use of technology at work (as employees do not own the computers they use and their use is often forced, shaped and structured by their employment) was often not translated into later use in older age. This is an important point, especially regarding the common argument during the 1980s and 1990s that non-use of ICT was merely a 'generational' effect which would soon die away as cohorts of computer-using workers become older adults themselves (e.g. Negroponte 1995). Instead there are deeper influences at play here causing older adults to make less use of ICT despite their prior skills and experience of computers. Thus, in trying to understand this enduring pattern, whilst we did find some evidence of the usually suggested physiological and psychological reasons behind older adults' lower levels of use of ICT (e.g. poorer vision, memory and dexterity) it seems that there were wider structural reasons to older adults' limited use of ICT. Key here are the two prominent issues from our interviews of ambivalence and relevance of ICT for older adults.

Ambivalence refers to the experience of simultaneous positive and negative affect towards an object. Whereas psychologists see ambivalence arising from intrapersonal conflict, here we can turn instead to the broader sociological notion of ambivalence arising at the level of social structure when an individual in a particular social relation experiences contradictory demands or norms that cannot be simultaneously expressed in behaviour (Weingardt 2000). Smelser (1998) makes the convincing case that whilst the

idea of ambivalence is commonly used by academics to explain phenomena such as reactions to death, separation and relationships, it is also is required in our understanding of more prosaic socially structured issues. Thus with regards to ICT we can identify older adults' profoundly ambivalent attitudes as reflecting various structural attributes of the 'information society' - in particular where we are surrounded by 'macro' discourses and portrayals of inherently beneficial, empowering and 'magical' new technologies from governments, media, peers whilst at the same time experiencing a fairly limited utility and usefulness of the same technologies on a 'micro' every-day life perspective.

Thus on one hand, we found plentiful evidence in our interviews that "the personal computer has become such a symbol of efficiency and participation in the information age that is it often embarrassing for [people] to admit no knowledge of them' (Lupton and Noble 2002, p.10). Yet, on the other hand, though, we found that older adults are less likely to be involved in the high level use of ICT both in the home and at work, less likely to be involved in the culture of ICT and, most importantly, less likely to be involved in the *pleasures* of using ICT (see Faulkner 2001). From this perspective, if something is both less useful and less pleasurable in practice then people are understandably less inclined to engage with it. Of course, "the effect of the felt ambivalence about technology is often either immobilising or polarising" (Faulkner 2001, p.90). Whilst some of our interviewees were polarised into an almost ideological opposition to computers, the majority were immobilised via an inability to fit computers usefully into their lives and, therefore, made little or no use of them.

It would therefore seem that a highly salient reason behind the non-use of computers is simply the relevance of ICT to older adults' lives. Much academic and political interest in older adults and technology been based on an implicit assumption that ICT use is an inherently useful and desirable activity throughout all sectors of society. Thus for many authors, the logic behind state-subsidised public ICT provision is an imperative towards 'giving people the information tools they need to participate in the decision-making structures which affect their daily lives. It means helping people use these resources to deal with their everyday problems' (Doctor 1994, p.9). Yet the rhetoric of the 'information society' belies the fact that for many older people 'dealing with everyday problems' does not involve personal use of ICT. As we can see from our survey data concerning current non-users of computers, 'no need to use computers' and 'no interest is using computers' was a regularly cited and powerful rationale amongst the 78 per cent of our sub-sample of older adults who were not making use of computers in their day-to-day lives.

There is maybe a need here to reconsider the 'relative advantage' (Rogers and Shoemaker 1971) and 'situational relevance' (Wilson 1973) of ICT use for those older adults who are non-users of ICT. As Balnaves and Caputi (1997, p.92) reason, it follows that where the impact, meaning and consequences of ICT use are limited for individuals then we cannot except sustained levels of engagement: 'the concept of the information age, predicated upon technology and the media, deals with the transformation of society. However, without improvements in quality of life there would seem to be little point in adopting online multimedia services'. In other words, only 'when a system is useful and training is made available, older adults will take part in the Information Age' (Rousseau and Rogers 1998, p.427).

This leaves us with the final policy-orientated question of how then can older adults be encouraged to make more use of ICT. As we outlined in our introduction, much current

thinking in this area has been based around the notion of 'correcting' the deficiencies of non-ICT using individuals - be it in terms of their access, skills or disposition. Some authors contend that computers merely need to be better publicised and 'sold' to older adults in order to persuade their use, for example, 'education programs may also be needed to inform the elderly of the potential capabilities of the new technology' (Madden and Savage 2000, p.183). Whilst we would not contend that there is no need for computer education and training provision, this technologically determinist view of non-ICT using older adults needing to be reskilled and re-educated towards computers ignores the fact that technology is socially shaped and determined (*e.g.* Edge 1995; Woolgar 1996). It could, therefore, be the case that rather than trying to change older adults, older adults should be involved in changing ICT. It would seem from our survey and interview data that ICT at the moment is not an attractive, interesting or useful option for many older adults - and that those older adults who are using ICT fall into the male, younger, well educated social groups which new technologies have long been argued to be attractive to by dint of their development by these social groups. Indeed, older people are far more likely to be "on the receiving end" of new technologies than to be involved in their creation (Arnold & Faulkner 1985). It could, therefore, be the case that rather than trying to change older adults, older adults should be involved in changing ICT to be more of an attractive, interesting or useful option for many older adults.

From this point of view it would seem appropriate for the government and other interested parties to begin to consider alternative means of 'reshaping' ICT to fit better with the lives of older adults - rather than the other way around. The point has been well made recently that many government websites purporting to offer citizens ready access to state services such as pensions, social security, television licensing and the like are underused due to their lack of substance and utility (Hedra 2002; Public Accounts Committee 2002). Similarly, the modest boom in online shopping has been largely based around a narrow range of leisure and entertainment products such as CDs, videos, DVDs, books and electrical and computing equipment. One would hardly expect older adults to begin purchasing such products online if they are not already doing so in the high street. The practical barrier to the development of more ICT-based services tailored towards the needs and interests of older adults is that few, if any, companies would likely to be willing to provide them until a ready online consumer base exists. Yet older people are unlikely to develop an interest in using ICTs until such services are available.

This notion of shaping ICT around the needs and situation of older adults also extends to the government's current attempts to widen levels of ICT via community sites. As our survey data show, despite older adults acknowledging that they *could* use this public provision if they wanted the vast majority of actual use takes place in the home - and to a lesser extent the homes of family. The practical logic for locating public ICT sites in existing community sites such as libraries, museums, and colleges is clear in terms of the financial cost of establishing new sites as well as in terms of utilising an existing networks of community facilities. For the UK government and many academic commentators these sites are seen as being both convenient and appropriate for encouraging older adults' ICT use. For example, as Blake (1998, p.313) argues, 'for most older people, some kind of public access would seem to be the best solution, with the public library presenting itself as an appropriate venue. Increased availability of the Internet in public libraries would certainly enhance opportunities for older people to gain access to the internet'.

Yet this strategy appears to be having a minimal impact on encouraging more older adults to actually make use of computers in these communities. Above and beyond the issue of relevance, if this strategy of state-provision is to stand a chance of being effective the issue of public ICT being 'at the heart of their communities' is a crucial issue and, arguably, one which the current system of provision falls short. As Shearman (1999) reasons, to be effective ICT centres should either be locally owned or deeply involved in the local community. Although sites such as schools, libraries, colleges and museums may well be *physically* located in communities whether they are that deeply connected with older adults in the community is debatable. There is considerable evidence that adults (both older and younger) do not use facilities such as museums and further education colleges because they do not feel 'part' of them and that, for example, the borrowing of books from public libraries is attractive primarily for certain social groups who are already well versed in such practices (Gorard and Rees 2002, Smith 1999). The institutional barriers which prevented older adults from previously entering facilities such as a library or adult education institute are unlikely to disappear merely because a site of 'free' ICT access has been located within them.

There is a need, therefore, to rethink state efforts to facilitate use of ICT by older adults - in particular reconceptualising the notion of community ICT resources as *domestic* ICT resources. Given the limited attraction of sites such as schools, colleges and museums for facilitating ICT access for older adults it could be argued that different sites should be considered; shifting the emphasis away from community sites towards developing systems of community resources which can then be loaned into people's houses thus augmenting older adults' willingness to use ICT in their own and relatives' houses. Yet above all, whilst these strategies may go some way to increasing the take-up of ICT by older adults, there is a need to promote more realistic expectations for ICT use. The government and others must accept that, in its present forms, ICT is not universally attractive to, or universally needed by, older adults. Until these circumstances alter it is folly to expect 'universal' take-up of ICTs such as the computer and Internet by older adults as is currently hoped.

Notes

1. A systematic sample stratified by age and gender of 1,001 adults aged 21 or more years living in three electoral wards in each of the four communities was selected. Reserve cases were pre-selected from adjacent postal addresses to cover non-response. The interviewer called on up to three different occasions at three different times of day, and moved on to a reserve case either due to candidate refusal or inability to make contact. The interviews were held in people's houses, or infrequently by appointment elsewhere (*e.g.* place of work or relative's house).
2. 'Ready access to a range of ICT support' was defined as being able to access two or more sources of support in answer to the question 'Who of the following, if any, could you go to for help/advice if you wanted to use a computer?'. One cited source was classed as 'limited support'.

Acknowledgements

This research reported in this paper was funded by the Economic and Social Research Council (grant R000239518). The authors would like to thank Kate Hubert and Louise Madden as well as the individuals who took part in the household survey.

References

Adler, R. 1996. *Older Adults and Computers.* Available online at http://www.seniornet.org/php/default.php?PageID=5476&Version=0&Font=0

Arnold, E. and Faulkner, W. (1985) 'Smothered by invention: the masculinity of technology' in Faulkner, W. and Arnold, E. '*Smothered by invention: technology in women's lives*' (pp.18-50) London, Pluto Press

Balnaves, M. and Caputi, P. 1997. Technological wealth and the evaluation of information poverty. *Media International Australia*, 83, 92-102.

Bernard, M. and Phillips, J. 2000. The challenge of ageing in tomorrow's Britain. *Ageing and Society*, 20, 33-54.

Blake, M. 1998. Internet access for older people. *Aslib Proceedings*, 50, 10, 308-15.

Brayfield, C. 2000. Rise of the silver surfers. *The Times*, 8th March, p.37.

Burdick, D. 2001. Digital divide or tool for understanding and collaboration: computers and intergenerational relationships. Paper presented to the 54th Annual Scientific Meeting of the Gerontological Society of Americas, Chicago.

Cabinet Office 2000. *Older People Enter Brave New World of Technology.* Press Notice 158/00, 10 April, Cabinet Office, London.

Castells, M. 1996. *The Information Age: Economy, Society and Culture.* Volume 1, *The Rise of the Network Society,* Blackwell, Oxford.

Cody, M., Dunn, D., Hoppin, S. and Wendt, P. 1999. 'Silver surfers: training and evaluating internet use among older adult learners' *Communication Education*, 48, pp.269-286

Copps, A. 2000. Gold mine awaits in the silver-surfer market. *The Times*, Interface, 6 November, p.2.

Department for Education and Skills 2001. *1,200 UK Online Centres Help Make Internet Access.* Press Notice 2001/0126, 8 March, Department for Education and Skills, London.

Department for Trade and Industry 1998. *Our Competitive Future: Building the Knowledge-Driven Economy,* Department for Trade and Industry, London.

Department for Trade and Industry 2000. *Closing the Digital Divide: Information and Communications Technologies in Deprived Areas,* Department for Trade and Industry, London.

Dhunpath, R. 2000. 'Life history methodology: 'narradigm' regained' *Qualitative Studies in Education*, 13, 5, pp.543-551

Doctor, R. 1994. Seeking equity in the national information infrastructure. *Internet Research: Electronic Networking Applications and Policy*, 4, 3, 9-22.

Edge, D. 1995. The social shaping of technology. In Heap, N., Thomas, R., Einon, G., Mason, R. and Mackay, H. (eds), *Information Technology and Society,* Sage, London, pp. 14-32

Faulkner, W. 2001. 'The technology question in feminism: A view from feminist technology studies' *Women's Studies International Forum* 24, 1, pp.79-95

Gorard, S and Rees, G. 2002. *Creating a Learning Society?* Policy, Bristol.

Green, R. and McAdams, D. 2003. 'The souls of digital black folks: a narrative study of digitally fluent African-Americans' paper presented to the *American Educational Research Association annuals conference*, Chicago, April, 9pp.

Hanley, P. 2002. *The Numbers Game: Older People and the Media,* Independent Television Commission, London.

Harvey, D. 1989. *The Condition of Postmodernity,* Blackwell, London.

Hedra Consultancy 2002. *One Billion Pound Government Internet Strategy Misses Target.* Press Release,29 December, Hedra Consultancy, Farnham, Surrey.

Irizarry, C. and Downing, A. 1997. Computers enhancing the lives of older people. *Australian Journal on Ageing,* 16, 4, 161-65.

Jamieson, B. and Rogers, W. 2000. Age-related effects of blocked and random practice schedules on learning a new technology. *Journals of Gerontology: Psychological Sciences and Social Sciences,* 55, 6, B343-53.

Jurich, S. 2000. The information revolution and the digital divide: a review of literature. *TechKnowLogia*, 2, 1, 42-4.

Loges, W. and Jung, J. 2001. 'Exploring the digital divide: internet connectedness and age' *Communication Research*, 28, 4, pp.536-562

Lupton, D. and Noble, G. 2002. 'Mine/not mine: appropriating personal computers in the academic workplace' *Journal Of Sociology* 38, 1, pp.5-23

Lyon, D. 1988. *The Information Society: Issues and Illusions,* Polity, Cambridge.

Madden, G. and Savage, S. 2000. Some economic and social aspects of residential Internet use in Australia. *Journal of Media Economics,* 13, 3, 171-85.

Madden, L., Selwyn, N. and Gorard, S. 2002. *Adult Learning@Home: Selecting the Research Sites.* Occasional Paper 52, School of Social Sciences, Cardiff University, Cardiff.

McAdams, D. 1998. The role of defence in the life story. *Journal of Personality*, 66, 1125-1146

Morris, M. and Venkatesh, V. 2000. Age differences in technology adoption decisions: implications for a changing work force. *Personnel Psychology,* 53, 2, 375-403.

Murdock, G. 2002a. Debating digital divides. *European Journal of Communication*, 17, 3, 385-90.

Murdock, G. 2002b. Tackling the digital divide: evidence and intervention. Paper presented given to British Educational Communications and Technology Agency seminar, *The Digital Divide,* 19 February, Coventry, Warwickshire.

Negroponte, N. 1995 *'Being Digital'* London, Coronet

Nicholas D., Williams P. and Huntington P. 2000. Digital health information: case study, the information kiosk. *Aslib Proceedings,* 52, 9, 315-30.

Parker, E. 2000. Closing the digital divide in rural America. *Telecommunications Policy*, 24, 281-90.

Public Accounts Committee 2002. *Improving public services through e-government: Public Accounts: Fifty-Fourth Report,* Stationary Office, London

Rogers, E. and Shoemaker, F. 1971. *Communication of Innovations,* Free Press, New York.

Rosen, L. and Weil, M. 1995. Adult and teenage use of consumer, business, and entertainment technology: potholes on the information superhighway. *Journal of Consumer Affairs,* 29, 1, 55-84.

Rousseau, G. and Rogers, W. 1998. Computer usage patterns of university faculty members across the life span. *Computers in Human Behaviour,* 14, 3, 417-28.

Savolainen, R. 2000. 'Embarking on the Internet: what motivates people?' *ASLIB Proceeding* 52, 5, pp.185-193

Schneider J. 2000. 'Pathways to opportunity: The role of race, social networks, institutions, and neighbourhood in career and educational paths for people on welfare' *Human Organisation*, 59, 1, pp.72-85.

Selwyn, N., Gorard, S., Furlong, J. and Madden, L. 2003. 'Exploring older adults' use of information and communications technology in everyday life' *Ageing and Society*, 22

Shearman, C. 1999. *Local Connections: Making the Net Work for Neighbourhood Renewal,* Communities Online, London. http://www.communities.org.uk/ukco.pdf

Sixsmith J. and Sixsmith A. 1993. Older people, driving and new technology. *Applied Ergonomics,* 24, 40-3.

Smelser, N. (1998) 'The rational and the ambivalent in the social sciences' *American Sociological Review* 63, 1, pp.1-15

Smith, I. 1999. What do we know about public library use? *Aslib Proceedings*, 51, 9, 302-14.

Smither, J. and Braun, C. 1994. Technology and older adults: factors affecting the adoption of automatic teller machines. *Journal of General Psychology,* 121, 4, 381-89.

Taylor, P. and Walker, A. 1998. Employers and older workers: attitudes and employment practices. *Ageing and Society,* 18, 6, 641-58.

Teo, T. 2001. Demographic and motivation variables associated with Internet usage activities. *Internet Research-Electronic Networking Applications and Policy,* 11, 2, 125-37.

Virokannas, H., Rahkonen, M., Luoma, I. and Sorvari, M. 2000. The 60-year-old female worker as user of new technology. *International Journal of Industrial Ergonomics,* 25, 5, 491-5.

Weingardt, K. 2000. 'Viewing ambivalence from a sociological perspective: Implications for psychotherapists' *Psychotherapy* 37, 4, pp.298-306

Westerman, S., Davies, D., Glendon, A., Stammers, R. and Matthews, G. 1995. Age and cognitive ability as predictors of computerised information retrieval. *Behaviour and Information Technology*, 14, 107-20.

White, H., McConnell, E., Clipp, E., Bynum, L., Teague, C., Navas, L., Craven, S. and Halbrecht, H. 1999. Surfing the net in later life: a review of the literature and pilot study of computer use and quality of life. *Journal of Applied Gerontology,* 18, 3, 358-78.

White, J. and Weatherall, A. 2000. A grounded theory analysis of older adults and information technology. *Educational Gerontology,* 26, 4, 371-86.

Wilhelm, A. 2000. *Democracy in the Digital Age: Challenges to Political Life in Cyberspace,* Routledge, London.

Williams, C. amd Windebank, J. 2000. 'Self-help and mutual aid in urban neighbourhoods: some lessons from Southampton' *Urban Studies*, 37, 1, pp.127-147

Wills, M. 1999. 'Bridging the digital divide' *Adults Learning*, December, 10-11

Wilson, P. 1973. Situational relevance. *Information Storage and Retrieval*, 9, 457-71.

Woolgar, S. 1996. Technologies as cultural artefacts. In Dutton, W. (ed.), *Information and Communication Technologies.* Oxford University Press, Oxford, pp.87-102

Wresch, W. 1996. *Disconnected: Haves and Have-nots in the Information Age,* Rutgers University Press, New Brunswick, New Jersey.

Wright, K. 2000. 'Computer-mediated social support, older adults, and coping" *Journal of Communication*, 50, 3, pp.100-118