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

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ABSTRACT
Social commentators in countries such as the United Kingdom and the United States are beginning to recognise that encouraging older adults' use of information and communication technologies (ICTs) is essential for the creation of bona fide information societies. To date, however, few studies have examined in detail older adults' access to and use of ICTs. This important aspect of the interaction between population ageing and societal change is more complex than the published literature's portrayal of a dichotomy between 'successful users' and 'unsuccessful non-users'. The paper examines the extent and nature of ICT access and use by older adults in their everyday lives. Information was collected from a sub-sample of 352 adults aged 60 or more years taken from a large household survey of ICT use in England and Wales among 1,001 people. The findings suggest that using a computer is not only a minority activity amongst older adults but also highly stratified by gender, age, marital status and educational background. Conversely, non-use of computers can be attributed to their low relevance and 'relative advantage' to older people. The paper concludes by considering how political and academic assumptions about older people and ICTs might be refocused, away from trying to 'change' older adults, and towards involving them in changing ICT.

KEY WORDS – computers, information and communications technology, older adults, digital divide.

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).

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Introduction

The ever-increasing importance that is being attached to information and communications technology (ICT) in contemporary society cannot be understated. Academics, politicians and the IT industry concur in their received wisdom 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, have qualitatively and quantitatively altered the exchange of information, knowledge, resources and capital to 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: 343) have 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 bona 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 (Brayfield 2000; Cody *et al.* 1999; Copps 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 this 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: 48).

In essence then, the use of ICTs is seen as a ready means for older adults to 'reconnect or improve their connection with the outside world' (White *et al.* 1999: 362) and 'enjoy a higher quality of life' (Irizarry and Downing 1997: 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. The probability of Internet use, for example, 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 increase steadily 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: 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).

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: 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 prohibitive factor (White and Weatherall 2000).

A growing body of research suggests that older adults are physically and psychologically disadvantaged when 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-ordination 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 the wider negative stereotyping of older people (*e.g.* Sixsmith and Sixsmith 1993), most empirical analyses agree 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: 392).

Government attempts to facilitate older adults' use of ICT

The British government has made great efforts over the last six years to ensure that 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 '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 schools, museums and libraries, 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 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 across England are promoting 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 create 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 the 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 the promotion of older adults' use of ICT, research in this field has to date mainly comprised either small confirmatory studies of groups of older users or reports from surveys of the whole population that older adults make less use of ICT than younger adults. As White and Weatherall (2000) have acknowledged, studies of older people and information technology have been limited primarily because the age group has consisted of 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 are 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 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 of England and Wales local authorities for population density, economic activity and levels of educational attainment.[1] The final sample comprised 1,001 adults, and the age distribution was 352 respondents aged 60 and more 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 years. Within the sub-sample of 352 survey respondents who were older adults, 44 per cent (n = 154) were male and 56 per cent (n = 198) female, and 93 per cent (n = 328) were 'white' and seven per cent (n = 24) 'non-white'. The age range of the older adults spanned 61 to 96 years with a mean of 72.3 years (standard deviation 7.97 years). According to the 1991 local census returns for these areas (2001 figures not available at the time), the sample slightly over-represents female respondents, but is otherwise a good representation of the population (see Madden, Selwyn and Gorard 2002 for further details of the sampling and survey administration procedures).

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 has access to and makes 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 ($\chi^2 = 120.8$, 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

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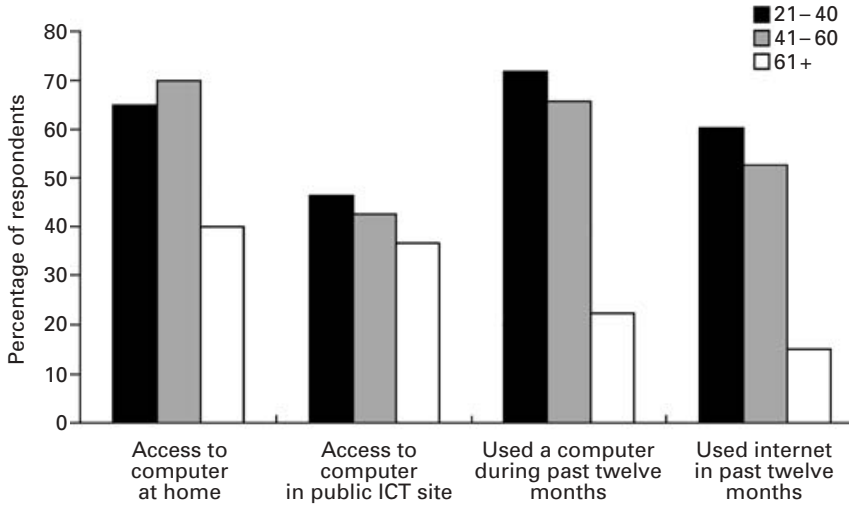

Figure 1. Access to and use of information and communication technologies (ICTs) by age group (years).

cafes ($\chi^2 = 6.8$, df 2, $p < 0.05$), age-related differences were even more pronounced for the respondents' actual use of computers. Only 79 (22.4 %) of the respondents aged 60 or more years reported having used a computer during the previous 12 months ($\chi^2 = 199.7$, df 2, $p < 0.0001$), and only 53 or 15.1 per cent had used the Internet ($\chi^2 = 206.8$, df 2, $p < 0.0001$).

Yet these and similar survey findings reveal little about older adults' relationships to ICT. In particular, such findings encourage the simplistic assumption that older adults' use of ICT is simply polarised between the 'have-nots' (or more accurately 'can-nots') and the highly able and empowered 'silver surfers'. Instead, as we shall elaborate in subsequent sections, there are two distinct facets of access; whether a group has access at all, and the gradation or hierarchy of access amongst those who do. Behind the simple issue of 'access/no access' lie more complex questions about levels of connectivity in terms of the user's capability and the proximity or immediacy of access. Moreover, access to ICTs is more than the physical availability of artefacts and includes the ability to access help and support if using a technology. With this in mind, we asked more nuanced questions of our data from the sub-sample of 352 older adults in order to develop a fine-grained and realistic picture of older adults' access to and use of ICT. The remainder of the paper considers 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

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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 complement the use of other technologies?
- What are the social contexts of older adults' ICT use? In other words, 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

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%). 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 both to 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, entertainment technologies such

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+years (n=352). Categories of access are mutually exclusive. Summed data may not add to 100 per cent due to rounding of decimal places.

as digital and satellite television, DVD players, video cameras and games machines.

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 (68 %) of respondents reported that they 'never' talked about computers with other people, while a further 77 (22 %) said that they

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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 + years (n = 352).

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'.

only 'rarely' did so. Similarly, when respondents were asked which of these potential sources of support they would be able to draw on, the salience of family members was reinforced. This was especially apparent in relation to the likelihood of drawing upon computer-using friends and neighbours; who were less likely to be seen as actual sources of help.

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 (2002*a*, 2002*b*), 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 effectively and progressively to extend their range of uses (Murdock 2002*a*). In a second category are those individuals who have

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

Social or health characteristic	Hierarchical level or category of access: Core access (%)	Peripheral home access (%)	Peripheral family access (%)	Peripheral public access (%)	Excluded (%)	Sample size
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.

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 among older users are those who do not have computers at home but have access through family, friends, at work or through public terminals as well as 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 they have limited support (*peripheral public access*). The most peripheral users are those individuals who have no ready access to computer or support at all (*excluded*).

Using the access and ICT support questionnaire responses, it is possible to assign (albeit crudely) the older respondents to the five groups. Access to computers was calculated from the data summarised in Table 1, whilst access to computer support was graded by the respondents' reported sources of support (Table 2).[2]

A more differentiated picture of older adults' ICT access is found than is suggested in the existing literature (Table 4). Whereas 17 per cent (n = 60) of our older sample were absolutely excluded from ICT access, and

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24 per cent (n = 84) had 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 were 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 the characteristics of the 'core' and 'excluded' respondents, some variations were apparent by gender, age and marital status, although illness/long-term disability and educational background did not co-vary.

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 22.4 per cent (n = 79) reported having used a computer during the previous 12 months. The use of computers was very much a minority activity, especially when 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 92 per cent (n = 324) watching television frequently (*i.e.* 'very' or 'fairly often'), and 77 per cent (n = 271) 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 its most popular application was sending and receiving emails. 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 for Internet-based chat rooms and bulletin boards (8 people).

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. The dominant feature, 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

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).

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 had drawn 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.

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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).

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

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

Because 273 (77 %) of the sample were non-users, more detailed analysis of the remaining 79 respondents is of limited value. Nevertheless, 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 12 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 ($\chi^2 = 13.8$, df = 1, $p < 0.0001$), by the two age groups 61–70 and 71 or more years ($\chi^2 = 28.2$, df = 1, $p < 0.0001$), by two

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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).

marital status groups ($\chi^2 = 31.3$, df = 1, $p < 0.0001$), and by two educational background groups ($\chi^2 = 18.4$, df = 1, $p < 0.0001$). Long-term illness/disability was not a significant covariate ($\chi^2 = 1.6$, df = 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) rather than single, aged 70 years or less and to have continued with their education after 16 years of age. Having established who did and did not use 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 (21 %) 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 (1 %) non-user respondents 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.

Discussion

Although compelling, these findings and subsequent discussion must be assessed alongside the limitations of the study. At best we have been able to produce a 'snapshot' of older adults' use of ICT. Yet, the rate of technological change is fast, so the relevance of the findings of any study of

technology and society are limited by their temporality. For example, the longevity of the patterns highlighted in our data are likely to be compromised by the issue of cohort change. As the current 41–60 years age group enters the 'older adult' cohort, they will bring their higher levels of computer use with them. Nevertheless, the fact that our data have not shown a substantially higher prevalence of ICT use by older adults than shown by earlier studies suggests that the pace of change can be overstated.

Even with these caveats, it appears from our data that age 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 'cannots' 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 much 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 support is available it is mainly from the immediate household 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. As well as being a minority activity amongst older adults, using a computer 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 commonly being made about them. Non-users are not a homogeneous group of disempowered, under-resourced and under-skilled individuals. First, 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 made use of diverse technologies – just not computerised technologies. Although the most frequently used were longer-established technologies such as television and radio, it is simplistic to assert that older adults resist 'new' technologies. Indeed, the use of mobile telephony in our sample refutes the notion that older people practise a blanket rejection of new or unfamiliar technologies.

Instead, it would seem that the clearest reason for the non-use of computers is the irrelevance of ICT to older adults' lives. Much academic and political interest in older adults and technology has been based on an implicit assumption that ICT use is an inherently useful and desirable activity for all sections of society. For many authors, indeed, 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: 9). Yet the rhetoric of the 'information society' belies the fact that for many older people 'dealing with everyday problems' does not involve the personal use of ICT. 'No need to use computers' and 'no interest is using computers' was regularly cited by and a sufficient rationale for the 78 per cent of the older adults who did not use computers in their day-to-day lives.

It is pertinent to consider the concepts of 'relative advantage' (Rogers and Shoemaker 1971) and 'situational relevance' (Wilson 1973) of ICT use as they apply to older non-users of ICT. As Balnaves and Caputi (1997: 92) reason, if 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. Without improvements in quality of life, however, 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 will older adults take part in the Information Age' (Rousseau and Rogers 1998: 427).

This leaves us with the final policy-orientated question: how can older adults be encouraged to make more use of ICT? Much current thinking on this question has been based on 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 marketed to older adults to persuade their use, for example, 'education programs may also be needed to inform older people of the potential capabilities of the new technology' (Madden and Savage 2000: 183).

Whilst we do 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, ignores the fact that technology is socially shaped and determined (*e.g.* Edge 1995; Woolgar 1996). Rather than trying to change older adults, older adults should be involved in changing ICT. The survey findings suggest that ICT at the moment is not attractive, interesting or useful for many older adults, and that those who do use ICT are predominantly male, younger, and well educated.

From this point of view it would seem appropriate for the government and other interested parties to consider 'reshaping' ICT to fit better with the lives of older adults. The point has been well made recently that many government websites which purport 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 for 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 shops. The practical barrier to the development of ICT-based services tailored to the needs and interests of older adults is that few, if any, companies would 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 extends to the government's current attempts to widen levels of ICT through community sites. As our data show, although many older adults say that they *could* use this public provision if they wanted, the vast majority of actual use takes place in the home. The case for locating public ICT sites in libraries, museums and colleges is mainly in terms of the cost of installation and networking. For the government and many commentators, these sites are convenient and appropriate. As Blake (1998: 313) has argued, '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 actually to 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 crucial and, arguably, not currently being achieved. As Shearman (1999) has reasoned, to be effective ICT centres should either be locally-owned or deeply involved in the local community. Although schools, libraries, colleges and museums may well be *physically* located in communities, their connectivity with older adults 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, borrowing books from public libraries is mainly attractive to the social groups who are already well versed in the practice (Gorard and Rees 2002; Smith 1999). The institutional and perceptual barriers that prevent some from using a library or adult education institute are unlikely to disappear merely because a 'free' ICT access site has been installed.

There is a need, therefore, to rethink the state's efforts to facilitate the use of ICT by older adults, and in particular to shift from the promotion of community ICT resources to support for increased *domestic* ICT resources. Different community sites should be considered; but most importantly the development of community resources for loan into people's houses should be explored. Above all, 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 the universal take-up by older adults of ICTs such as the computer and Internet.

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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'.

References

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

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: 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 America, 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**, 4, 269–86.

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

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, 14–32.

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

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.
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.
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. 2002*a*. Debating digital divides. *European Journal of Communication*, **17**, 3, 385–90.
Murdock, G. 2002*b*. Tackling the digital divide: evidence and intervention. Paper presented to the British Educational Communications and Technology Agency seminar. *The Digital Divide*, 19 February, Coventry, Warwickshire.
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*. Stationery 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.
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.
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.
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.
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, , 87–102.

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

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