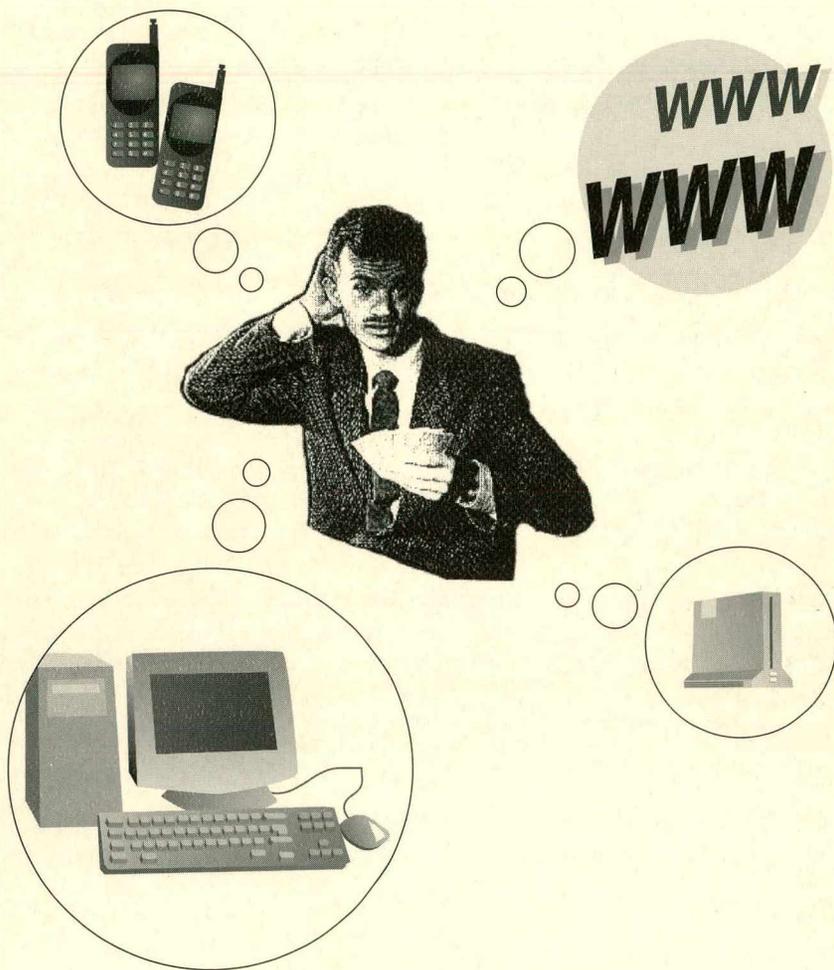


Juha Nurmela

The Finns and Modern Information Technology



REVIEWS 1997/12



Tilastokeskus

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Report 1 of the project 'The Finns and
the Future Information Society'



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ISSN 1239-3800

ISBN 951-727-358-4

Yliopistopaino,
Helsinki 1997

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Foreword

This report forms the first part of an interview survey conducted under the title 'The Finns and the future information society' which is focused on a statistically representative sample of the skills and capabilities of the Finns for making use of modern information technology. The aim was to create a body of material accessible to the general public and to draw up a basic report on the capabilities of the citizens of this country as they step out into the information society.

The data collection and reporting were financed by the Ministry of Education, Ministry of Transport, Ministry of Finance, Ministry of Internal Affairs, the Finnet Association, Telecom Finland, the Academy of Finland and the Association of Local Councils. The project steering group was chaired by Aarno Laihonon of Statistics Finland and its members comprised Ilpo Kokko, Ministry of Education, Kristiina Pietikäinen, Ministry of Transport, Antti Rainio, Ministry of Finance, Seppo Toivonen, Finnet Association, and Jukka Miiluvaara, Telecom Finland. The steering group provided the project with excellent support. The author received valuable assistance from Kaarina Hyvönen, Auli Keskinen, Anita Rubin, Minna Puirava, Marja-Liisa Viherä and others in the formulation of the questions.

The data were collected according to a tight schedule, and I am grateful to the team comprising Pirjo Hyytiäinen, Reijo Kurkela, Ritva Korhonen and Kai Vikki for managing

to complete a computer aided questionnaire form and for enabling it to be handed out to the interviewers in time. Without their joint effort this would have been impossible to accomplish. The interviewers similarly conducted the interviews well and efficiently despite the tight timetable (4.11–15.12.1996).

Pauli Ollila was responsible for the non-response adjustments and calculation of the weights, while Ritva Korhonen and Mari-Elina Laukkanen assisted in the processing of the material and the writing of this publication. The section on the data privacy was written by Risto Heinonen of the Office of the Data Protection Ombudsman. Malcolm Hicks has translated this report in English. I wish to express my thanks to all these people.

The aim was to make the basic results of this investigation accessible to the general public rapidly, so as to ensure that they could be used as a basis for discussion on the information society. Analysis of the material is continuing, and the next report, which discusses marginalisation from the future information society, will be published at the end of 1997. Responsibility for the results and conclusions presented here lies with the author and not with Statistics Finland or with those who financed the project.

Helsinki, November 1997

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I. Introduction

I.1. Background and implications of the survey

A conscious effort is being made in Finland to guide the country rapidly into the information society. Views to this effect have been presented on a number of occasions ever since the government introduced its guidelines at the beginning of 1995. The following excerpts selected from a variety of sources help to justify implementation of the current project as a form of basic research into the way in which the information society is evolving.

Juhani Korpela, Permanent Secretary at the Ministry of Transport....., said at an afternoon seminar held at Tutkas on 19.4.1995 that: *'The Council of State decided at its evening session of 18.1.1995 on measures aimed at developing the information society in Finland, and the President, Martti Ahtisaari, stated at the opening of the new parliamentary session that: '..our country should be transformed into an information society in which human knowledge, entrepreneurship and high standards of education are fundamental production factors.'* Similarly the new government's programme mentions development of the information society at a number of points under the heading of *'Communications and transport'*.

In addition, the *'Information strategy for education and research'* published by the Ministry of Education makes frequent reference to the information society, e.g. stating that: *'Education and research will be major factors when developing Finland as an information society. Citizens of the information society are required to possess high standards of general knowledge, a variety of skills*

required for taking acting and solving problems and the professional skills called for in an ever-changing working environment in which networking and international contacts are becoming increasingly important.... Adults should be given the chance to learn the basic skills of data search, data management, communications and information technology and to expand these on a continuous basis. Vocational training should provide information society skills of a kind that will meet the requirements of working environments of the future. Development of the information society, the application of information technology and networking have extensive financial, social and cultural implications, and research into these should be increased.'

The report *'FINLAND INTO THE INFORMATION SOCIETY – national guidelines'*, published by the Ministry of Finance, is a document of major importance for any discussion of the information society. Its Guideline 4 states that: *'Opportunities for taking advantage of information society services and the necessary basis skills should be made available to everyone... Information technology will open up a wealth of new opportunities for individual people, and for the implementation of a citizens' society. It will act as a tool for executing numerous working tasks and will open up new ways of working and opportunities for doing so... Communications and the use of information networks will also form an essential part of the distance work of the future... Information technology will also enrich our leisure time through entertainment, culture and personal development... Information networks will provide alternative access to an increasing*

number of services... Information technology and networks will offer people new opportunities for mutual interaction and for influencing public affairs... More sophisticated data networks will also provide opportunities for exercising direct influence on local government bodies... It is thus necessary to make a practise of verifying people's skills in using information technology, just like the assessments of reading and writing skills that have been carried out for centuries. People need different driving licences for different vehicles and purposes, and this should also apply to information networks... Measures should thus be taken to invest in the ability of adults to utilise information technology and information network services... In addition, the needs of the disabled and the elderly should be taken into consideration in all information technology and network solutions.'

The above excerpts indicate that there is an evident need for comprehensive research into the use of information technology among the Finns and the experiences that they have gained from this. It is essential from the point of view of targeting future action that the initial situation should be examined thoroughly.

The National Information Society Forum and the National Committee for the Information Society Issues were set up in 1996 in order to monitor the progress of the information society and related activities at the political level. They are expected to make proposals for steering the development of the information society and for the measures that should be taken. It is hoped that the results of the current research project can be made use of in that process.

Objectives of the project. It was easy to define the points of departure for 'The Finns

and the future information society' on the basis of the public sector guidelines. *The basic aim was to examine the extent to which the Finns possess the skills required for participation in the information society by examining their use of information technology at work, at school and in the home and the degree to which their capabilities correspond to the utilisation requirements.* It may be argued that all information society visions and plans should be based on reliable data regarding the current use being made of different technological tools and on people's opinions regarding information technology. For this reason, *the second aim here is to document the Finns' experiences of the use of modern information technology, e.g. whether they perceive it as step forward or as a threat, and whether they feel that they could use it in their own lives.* The information society can expand on a broad front only if people accept it as part of their everyday life and as an element which can make their work easier and bring them certain benefits.

Although the emergence of the new information society is naturally opening up numerous new opportunities, there is also a *danger of marginalisation*, in that some of the population may fall outside it, due to their lack of the necessary knowledge and skills or the absence of the appropriate conditions for its exploitation. It is thus essential that an extensive survey should be made of people's experiences of the new information technology and their related desires and fears. One objective is thus to examine *whether the spreading of speech-based innovations, for example, deviates from that of technologies that rely on computers and writing, for reasons other than cost*, that is.

An interview survey which covers the entire population offers an opportunity for

examining a number of issues, and by extending the age range to cover those aged 10–18 years it is also possible to examine the use of information technology in schools on the basis pupils' own experiences. In addition, the collection of such a vast data base can provide an opportunity for looking at other perspectives such attitudes towards teledemocracy. One object of research could be the financial resources that households are able to invest in the use of new information technology, though such hypothetical situations tend to be difficult to examine. There are a wealth of opportunities for interpreting the data, as the interviews involved questions which could be of use in a number of research settings.

Sponsors and partners. The collection of interview data which are statistically representative of the entire country calls for substantial funding, which has been applied for and obtained from a variety of instances, the largest grant being made by the Ministry of Education. In addition, the Ministry of Finance, Ministry of Transport, Telecom Finland, the Finnet Association and Statistics Finland all made equal contributions, with slightly smaller investments coming from the Ministry of Internal Affairs, the Association of Local Councils and the Academy of Finland.

To the author's knowledge, the material is currently being used by Statistics Finland and by four researchers at the Centre for Research into the Future who are working on doctoral theses on the topic 'Nationality and ecological modernisation in the information society', a project financed by the Academy of Finland. It is also likely that the material will be used by the Department of Information

Research at the University of Tampere, so that the extensive utilisation that was initially hoped for has already been achieved.

In addition to Statistics Finland, the data will be analysed this year by Marja-Liisa Viherä at Telecom Finland from an interactive perspective and by Anita Rubin at the Centre for Research into the Future from the point of view of young peoples' expectations and visions. The results of the latter analysis should be available in 1998. Auli Keskinen will start a teledemocracy survey at the Centre for Research into the Future in Autumn 1997, using material collected for the purposes of the present report. Another review paper, containing an analysis of marginalisation from the information (technological) society, will be published by Statistics Finland in 1997 (in Finnish), and a model for the dissemination of information technology to households will be constructed by the present author for publication in 1998.

1.2. Objectives of the first-stage report

This publication provides a basic study of the range of technical appliances in Finnish households in November–December 1996 and of the extent to which the Finns used information technology at home, at their places of work and at school.

The focus in the case of households is on examining their stock of information devices mainly in relation to household size and income, but more restricted surveys at the provincial level are also included, in order to examine the extent to which information technology has spread to individual households so far. New devices can be as-

sumed to spread from the built-up areas to the sparsely populated countryside (cf. On the road to the Finnish information society, Statistics Finland 1996, Chapter 8).

Attention is also paid to the extent to which the Finns make use of information technology products of different types at home, at school or in their place of work, with the aim of assessing the frequency of their use by sex and age. This paper also discusses the Finns' experiences with the use of information technology in terms of the same background variables and their opinions on the data protection and on the information society in general.

The third topic is the use of computers in comprehensive schools and upper secondary schools, estimated on the basis of responses from the pupils themselves. Finally, an analysis is made of certain questionnaire items geared to assessing the potential for distance work and its scope at present.

1.3. Structure of the report

The nature of the material, i.e. sampling, estimation, implementation of the research and a brief account of the concepts and questions concerned, is dealt with in Chapter 2, while Chapter 3 begins with a discussion of the numbers of telephones in households and their use, followed by an analysis of computers and their use. Section 3.3, in turn, is concerned with the use of e-mail systems and Internet connections in places of work and study, and a discussion of the potential for distance work and its present scope in the light of the questionnaire replies. Chapter 4 contains pupils' evaluations of the use of information technology in schools, while Chapter 5 deals with the Finns' opinions on information technology and the threats posed by the information society. Chapter 6 discusses their views on the maintenance of official registers and the data protection, and Chapter 7 provides a summary of the main results.

2. Sampling, estimation and implementation

This chapter describes matters concerned with the collection of the interview data. The sampling and estimation procedures are discussed fairly comprehensively on account of the fact that different surveys of the numbers of information technology devices possessed by households have yielded widely varying results depending on the institute responsible for conducting the survey. The details provided will enable those readers who wish to do so to compare the reliability of the results with that of parallel investigations.

2.1. Sampling and estimation procedures

Pauli Ollila

Sampling. The purpose of the study was to examine households in general terms and through personal interviews with their members aged 10–74 years. As there is no comprehensive national household register available, combinations had to be made instead. The basic sampling process framework included all Finns aged 10–74 years, excluding those in institutions. Thus a basic sample of individual persons taken from the central population register was filled out with the other persons occupying the same dwelling. As the outcome does not conform precisely to the definition of household, the latter were formed on the basis of the subsequent interviews. Some persons who had already participated in another Statistics Finland survey within a short space of time were eliminated from the basic sample in order to reduce the response strain on them. In addition, a second stage sample was col-

lected from the original subjects in households comprising more than one person so that the people occupying the same dwelling with them could be included in the investigation. It was also felt that one-person households should be well represented in the initial sample by virtue of their greater proneness to non-response, as observed earlier. The final sample thus comprised over 1,432 households with 3,782 members, of whom 3,488 were within the specified age limits.

Sampling design. The above process can be regarded as an example of *single-stage, two-phase, stratified cluster sampling*. The cluster here is the group of persons occupying the same dwelling, and the units are the household members aged 10–74 years for the purpose of the personal questions and all household members as far as the household questions are concerned. The sampling procedure naturally involves the feature that the larger a dwelling unit is, the more likely it is to be selected. The probability of a given dwelling unit being selected was $p_{ask} = r / N$, in which r denotes the number of persons aged 10–74 years in the unit and N the number of such persons in the population. The inclusion probability was determined in the following manner (where the number of dwelling units at the first stage $n_I = 1,811$):

- inclusion probability at the 1st phase:

$$\pi_{askI} = n_I p_{ask}$$

- the stratification for 1-person dwelling units is:

$$\pi_{askI,1} = n_{I,1} / N$$

- and for others:

$$\pi_{askl,2} = n_{l,2} r / N$$

- inclusion probability at the 2nd phase is then:

- for 1-person dwelling units:

$$\pi^*_{ask1} = \pi_{askl,1} \pi_{askll,1}, \text{ in which}$$

$$\pi_{askll,1} = n_{ll,1} / n_{l,1}$$

- and for others:

$$\pi^*_{ask2} = \pi_{askl,2} \pi_{askll,2}, \text{ in which}$$

$$\pi_{askll,2} = n_{ll,2} / n_{l,2}$$

The first and second phase sample sizes in groups 1 and 2 (i.e. $n_{l,1}$, $n_{l,2}$ ja $n_{ll,1}$, apart from $n_{ll,2}$) are random variables. There is a very small possibility that the basic sample of 1,811 persons could contain more than one person from a given household, but this was not the case in practise.

The sampling design weights required to compensate for the varying probabilities of selection are thus π^*_{ask1} and π^*_{ask2} . Thus, ignoring non-response, the estimators of the total required by this design would be

- for households:

$$\hat{t} = \sum_{j=1}^{n_{ll,1}^*} \frac{y_j}{\pi_j^*} + \sum_{j=1}^{n_{ll,2}^*} \frac{y_j}{\pi_j^*}$$

- and for individual persons:

$$\hat{t} = \sum_{j=1}^{n_{ll,1}^*} \frac{y_j}{\pi_j^*} + \sum_{j=1}^{n_{ll,2}^*} \sum_{i=1}^{r_{ask,j}} \frac{y_{ji}}{\pi_j^*}$$

In view of the one-stage nature of the sampling, it should be noted that, as all the units i of the cluster j are examined, the weighting attached to each unit will be that of the clus-

ter. The calculation of means thus involves division of the estimate for the total by the (estimated) number of households N_{kot} in the household survey and by the number of non-institutionalised persons (N_{10-74}) aged 10–74 years in the personal survey.

The above estimators were not final ones to be used, however.

Adjustment of estimators for non-response and efficiency.

It is hoped in many investigations that the marginal distributions of significant demographic variables in the expanded data will coincide with those in the actual population. Skewnesses due to unit non-response can usually be adjusted with the help of modelling by a) *post-stratification* or b) *calibration* of the weights. In both the cases the original design should be taken into consideration when creating the model. *Post-stratification* can be performed provided that the size of the population in each class, or 'cell', can be known through classification in terms of the desired background variables (e.g. age and sex) and provided that each observation can be identified as representing one of these classes. If the number of demographic variables is even slightly greater, the population frequencies or percentages of the cells cannot be indicated accurately. The best procedure available in such a case is *calibration*, i.e. approximated modification of the weightings in such a way that the desired marginal values can be achieved. Post-stratification or calibration will often increase the efficiency of estimation as well (making the groups examined homogeneous in many respects). Calibration and its approximation methods are discussed in more detail in Deville, J.-C. & C.-E. Särndal (1992): Calibration Estimators in Survey Sampling. *Journal of the*

American Statistical Association, vol. 87, 376–382, and Deville, J.-C., C.-E. Särndal & O. Sautory (1993): Generalized Ranking Procedures in Survey Sampling. *Journal of the American Statistical Association*, vol. 88, 1013–1020.

In the present survey household non-response amounted to 24% and personal non-response to 32%, some of the latter taking place within households. *Age and sex, province and size of dwelling unit* were selected as calibration variables. The age classification comprised nine categories, seven of which were in the range 10–74 years. The classification also took account of the special grouping for young people employed in this survey. Data for the combination variable *age & sex* and for the *province* variable were derived from the population statistics closest to the point of time concerned, from which the proportion of institutionalised persons was deducted (percentage estimate based on information regarding the end of the year). Percentages indicating inclusion in given household size categories were obtained in the form of estimates derived from the most recent incomes distribution inquiry. Each observation regarding a background variable could be assigned to one of the defined classes. These background data were used to calibrate a) *household weights* based on distributions without age restriction, and b) *personal weights* based on distributions for persons aged 10–74 years, which yielded the same weights for all members of the same household replying to the questionnaire. The variance of the calibrated estimator should be estimated using the method recommended in the above papers for the approximate generalised regression estimator.

2.2. Implementation of the interviews and questionnaires

The total sample comprised 1,432 households, with a total of 3,782 members, of whom 3,488 were aged 10–74 years and were therefore interviewed. It was expected before the interviews that household non-response would amount to 20% in addition to which partial personal non-response within the households was assumed to be in the range of 12%, i.e. that the outcome would be 1,146 household interviews and 2,420 personal interviews.

Some of the personal interviews were conducted by phone, and only one actual interview visit was made to each of the households, except that two visits could be made if the household had no telephone. The interviews were conducted in the period 4.11.–15.12.1996. The questionnaires were adapted to the form of a blaise computer program, which was used to record the replies during the interviews. The respondents aged 12–74 years also filled in a questionnaire form during the interview or afterwards which was concerned with their attitudes towards the future and towards teledemocracy. The material was returned to the central unit by 30.12.1996, with the exception of the questionnaire forms, which were gradually returned throughout January.

The eventual household non-response rate was 24.5%, i.e. there were a total of 1,080 interviews yielding information on at least the technical devices possessed by households. A total of 2,362 personal interviews were conducted in these households, and 2,059 persons returned the separate questionnaire concerning attitude towards the future and towards teledemocracy. Al-

though the initial objectives were not fully achieved in the end, this has no effect on the reliability of the results.

The final item on the questionnaire asked whether the respondent's personal data could be retained to allow a possible new interview later. Permission was received from 1,189 of the respondents aged over 22 years (77%), 141 aged 18–22 years (83%) and 296 aged 12–17 years (88%). A new interview could thus be conducted with a total of some 1,600 persons in 1999 or 2000, thereby guaranteeing the continuity of research on this theme.

2.3. Concepts and questionnaire compilation principles

Although the project is entitled 'The Finns and the future information society', it would be better to talk about 'the future information technology or information society', for the questions were aimed at examining the use of information technology in particular and to some extent the purposes for which it is used. The idea was to focus on the tools needed for data acquisition and transactions rather than the content of the information or data items processed. It should be borne in mind that the Finnish word '*tieto*' used in this

context has a very much broader meaning than the word '*information*' in other languages, and correspondingly the term *tieto-yhteiskunta* carries wider implications than *information society* in English.

An essential point of departure when formulating the questions was that information should be obtained on the extent to which Finns have access to modern information technology (mobile phones or computers and their peripherals), the purposes for which they use this technology and their experiences related to it. Background questions were employed in order to relate information technology to the respondents' use of other audiovisual technologies and the related equipment. The use of audiovisual technology could be regarded as acting as a 'gateway' to the adoption of modern information technology, and further analyses should be able to connect the use of information technology to people's occupational background and leisure-time interests. The authors have thus tried to bear in mind throughout that the use and adoption of information technology cannot be regarded as an island in people's lives but should be perceived of as part of their general functioning. A general discussion of such questions is provided in Appendix.

3. Information technology in households and the Finns' experiences with it

This chapter discusses the types of information technology equipment possessed by Finnish households and the Finns' experiences with its use. The results are presented below mainly in terms of household size and the age and sex of the respondent.

The following review is based Chapter 8 of the publication 'On the road to the Finnish information society', which discusses the entry of the information society into people's homes and leisure time. Whatever name is given to the society of the future, demographic changes will also be taking place in Finland in the next two decades which should be taken into consideration when discussing new technology. This is indicated by the steady increase in the number of one or

two-person households, and the gradually ageing of these small households. These factors will greatly affect the way in which Finnish society functions at the beginning of the next millennium, and they will also be important from the point of view of the diffusion of new information and communications technology, provided that we are able to live under 'normal' conditions. The changes in the numbers of households and in their structure that have taken place in recent times are indicated in Figs. 1–3, together with predictions for the next twenty years or so.

As people become older, it is likely that they will keep up many of the customs and habits they have learned in their youth and their work and that they will continue in this

Figure 1. Estimated numbers on households by size in 1966–2020

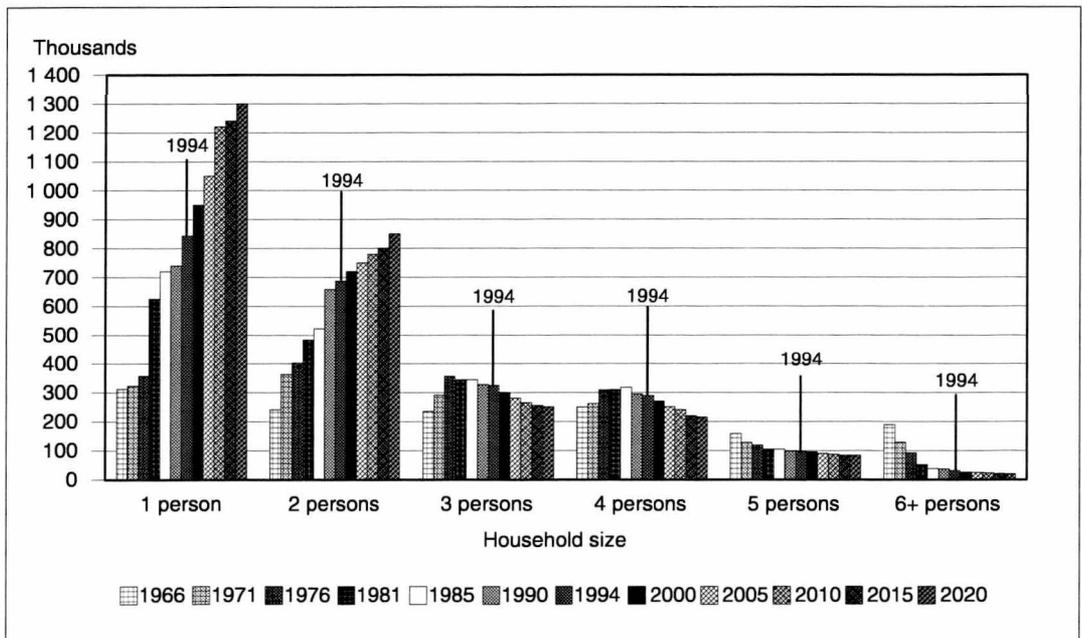
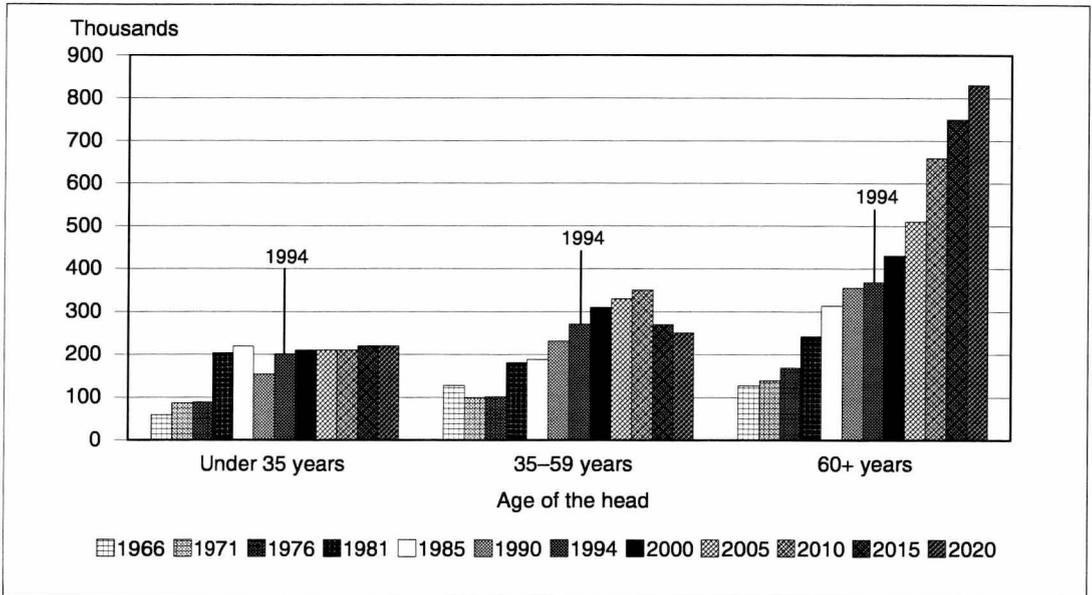


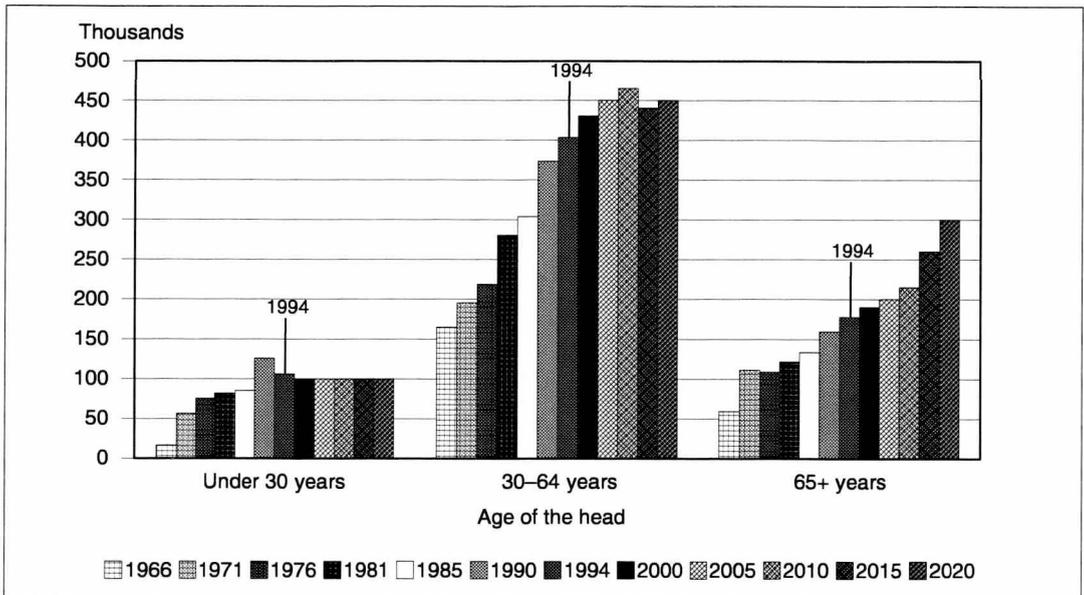
Figure 2. Estimated numbers of single-person households by age in 1966–2020



way in their retirement. Thus it is useful to think how the generations differ from each other in their ways of life. A good example of this concerns cars. Where less than one fifth of female pensioners currently have a driving

licence, the figure will be approximately four out of five in 10–15 years' time, and most of them will still be driving a car of their own. This may increase motor traffic substantially. Similar patterns could no doubt be perceived

Figure 3. Estimated numbers of two-person households in 1966–2020 by age of the head of the household



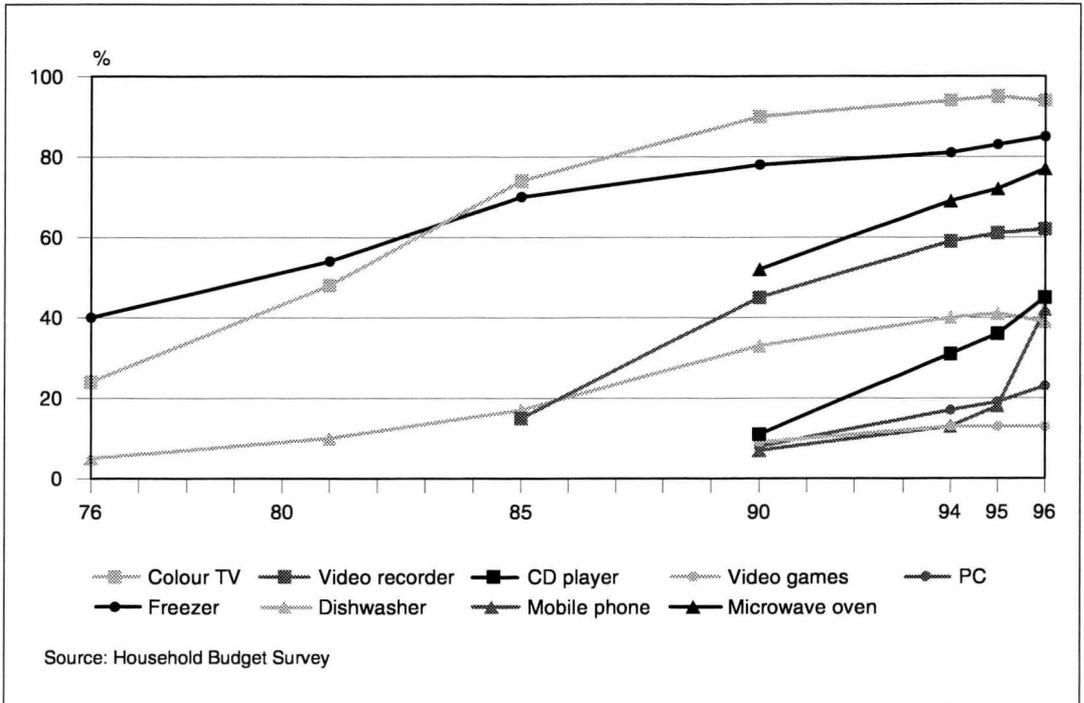
in the case of modern information technology and its use.

The number of households has increased by one million, by about 2/3, over the last 30 years, during which time the proportion of small households of one or two persons has increased from some 30% to almost 70%. Where approximately 800,000 Finns out of a total of 4.5 million were living in such households in 1966, the figure is currently about 2.2 million out of 5.1 million. From the point of view of the use of household appliances and equipment, this means that *a new product has to 'enter' a considerably larger number of households than earlier in order to be accessible to the same proportion of the population.* On the other hand, it also means an expanding market in the household sector. The growth in the number of smaller households will evoke a demand for commodities for as long as people wish to own these

rather than circulating them (e.g. the books on one's shelf).

Let us look now at the diffusion of modern information technology into households. Trends in the frequency of ownership of mobile phones, home computers and CD players are compared with those of 'conventional' household appliances in Fig. 4, from which cautious conclusions can be drawn on whether the spread of these items of information technology has followed the pattern of other appliances or whether they have entered the household market in a manner of their own and at a different speed. The figure shows the numbers of households possessing at least one example of the appliance mentioned, i.e. we are talking only about accessibility, and have chosen to ignore the fact that the same household may possess several TV sets or freezers, for example.

Figure 4. Frequency of certain technical appliances in households



If one wishes to compare the frequency and rate of diffusion of CD players, mobile phones and PCs with those of other appliances, perhaps good points of comparison are provided by colour TV, video recorders and microwave ovens. Colour TV, for example, entered Finnish households at a very rapid rate in the early 1980's, and video recorders at the end of the decade, though the proportion of households owning one seems to have remained some 30 percentage points lower in the latter case. Although information on microwave ovens is not available until the 1990's, they are still spreading at such a rapid rate that it seems justifiable to assume that they will be more common in households than a freezer by the turn of the millennium.

There are also products which for some time appeared capable of reaching practically every household but which in the end did not attract any very great demand, e.g. bread-making machines and water beds were only able to 'penetrate' about 10% of Finnish households.

The CD player has spread at a rapid rate, although less so than colour TV ten years earlier. This is quite natural, in that it has had to compete with ordinary cassettes and records, whereas colour TV had a more obvious 'niche' to occupy. Even video recorders have spread more rapidly in recent years than the CD-player did at the beginning of the decade, as they, too, had a ready-made 'niche' as an extension to the TV, with no obvious competitor. It would seem that the most active phase in the spread of CD players will be reached in the late 1990's, as their prices have now settled at their final level and the audio industry has adopted the CD as its main article. But although CD players are nowadays an integral part of modern entertain-

ment electronics packages, they can scarcely be expected to become as common as colour TV during this millennium, at least, as their use only for listening to music makes them vulnerable to a number of competitors, including the ever-increasing group of radio stations.

The life-spans of mobile phones and PCs in households have only just begun, as both of them made their appearance as consumer items about 10 years ago. Their diffusion curves are consequently still short and it is difficult to find analogues among other appliances. Mobile phones have enjoyed very rapid growth for the last two years, but it remains to be seen for how long this will continue, as they have to face competition from many other products, including wireless versions of the conventional phone, telephone answering machines or answering services, an ever-increasing array of card telephones, paging devices and electronic mail. The transfer from wired to mobile phones may also be hampered by the existing share-based system of telephone ownership. On the other hand, it seems that the prices of basic mobile phones have reached a steady level, so that they can in this sense be regarded as an economically safe investment for the consumer.

Since the mobile phone is typically only used by one person, it should be compared with other personal appliances such as walkman stereos, portable CD players, or even touring or mountain bicycles, which are currently to be found in 64% of all households. The increasing number of small households may even favour the spread of mobile phones, thanks to the personal nature of the latter. It is by no means obvious, however, that they will ever become as common as microwave ovens, for example, although

they can be expected to enter a larger number of households for reasons of the members' work than would be the case with most appliances.

PCs have not increased in number very rapidly in the present decade, and can be said to have spread at a steady rather than an accelerating pace. It is evident that their future trends will be dependent on the speed by which new models enter the market and the fact that their configuration requirements remain at a high level. Their prices are still relatively high and have not reached a stable level as those of many other appliances have. Most households probably purchase a computer for their children or for use in their work, though some may also perceive it as a hobby. Even so, less than one third of households with children have a computer, so that it can hardly be expected to become an everyday matter very rapidly. Even among the households of senior salaried employees, for example, only a half possess a home computer (On the road to the Finnish information society 1996, 187).

The frequencies of PCs and mobile phones in November 1996 by size of household, as indicated in Fig. 5, suggest that both of these are more common in larger households. In addition, they increase along with income per family member, and possession of a computer also becomes more likely if there are teenagers in the family.

What do the percentages in Fig. 5 imply in terms of numbers of households? Slightly less than one million households out of the 2.3 million in Finland had a mobile phone and 560,000 a PC at the end of November 1996, and 245,000 of the latter were composed of one or two persons. 90,000 households had more than one computer, and 48% of all computer households, i.e. 270,000, had a CD-ROM unit, making them potential purchasers of video games and other CD products. Slightly fewer households, i.e. 41% (230,000), had a modem connection.

The above figures can be compared with those recorded for other appliances. Just over 1 million households, i.e. 47%, had a CD player, 42% a walkman, almost all of

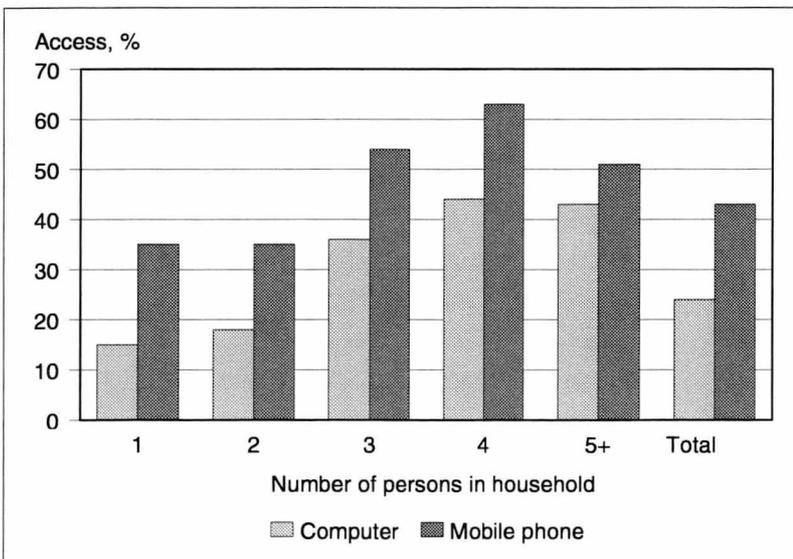


Figure 5. Access to a computer and mobile phone in 1996 by household size, %.

them a cassette recorder and over 60% a record player. This means that appliances that could seriously challenge the printed media are not yet very common. As stated above, the number of computers has so far not increased very rapidly. One reference figure is that 1.26 million households have text-TV, which can be assumed to reduce the number of persons watching the TV news but not that of newspaper readers.

If we wish to learn from history, it may be recalled that where 55% of all households had a car in 1976, the figure had risen to 59% in 1985 and 67% in 1996 despite the fact that it is a very much more expensive commodity than a mobile phone or a computer.

The following sections will discuss first the number and use of telephones, the use of computers and peripherals and finally job-related e-mail systems and distance work.

3.1 Telephones and their use in households

The households of Finland can be divided on the basis access to telephones at the end

of 1996 in the manner indicated in Fig. 6.

Comparison of the results with those obtained in January 1996 indicates that access has continued to increase slightly (cf. On the road to the Finnish information society, 193–196). The households that do not have an ordinary telephone almost invariably comprise only one person, and 3/4 of the households that only possess a mobile phone are of this size.

Mobile phones in households. Slightly less than one million households, i.e. 42.3%, had at least one mobile phone. By way of comparison, 64% of all households have at least one video recorder and 120,000 (12%) at least two mobile phones. 35% of all one or two-person households had a mobile phone at the end of November, 1996, the figure being over 50% for larger households. Of the four-person households, as many as 63% had at least one mobile phone and very many of these also had a second one.

A fairly small number of mobile phones are provided by an employer, i.e. 28% of the first ones in a household and only 43% of the

Figure 6. Access to a telephone at the end of 1996, by household size, %

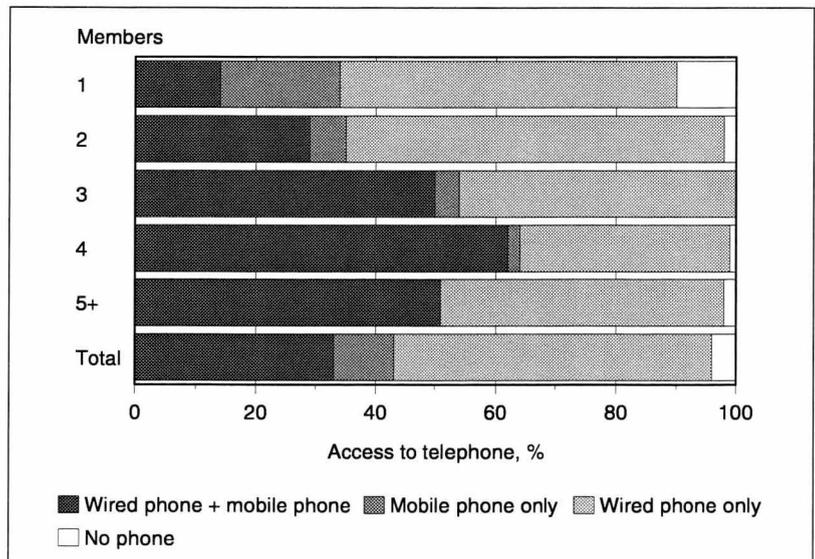


Table 1. Access to a mobile phone in November 1996, by household size %

Household size	No mobile phone	One mobile phone	More than one mobile phone
1 member	65	33	2
2 members	65	28	7
3 members	46	40	14
4 members	37	43	20
5+ members	49	40	11
All	57	34	9

second ones. Of all the approximately 1.2 million mobile phones owned by Finnish households, some 270,000 are related to the owner's work, so that there are other factors behind the purchase and use of mobile phones as well as being reachable for one's work.

In regional terms, 55–57% of the households located in the Provinces of Central Finland and Lapland (and the Åland Islands) have a mobile phone, while the next 'groups' comprise the provinces of Mikkeli and Vaasa (49–51%), Uusimaa (43%), Turku, Kuopio and Häme (30–41%) and Kymi and Oulu (36%). The smallest figure, i.e. 28%, was recorded for Northern Karelia. The order of provinces in terms of the proportion of households with a mobile phone differs quite considerably from the order of households with home computers. It may be mentioned as a curiosity, however, that where 89% of the households in the province of Kuopio have a car, the number is only 61–62% in the provinces of Oulu and Uusimaa.

Growth in personal gross incomes increases the proportion of households with a mobile phone up to the category FIM 8,000–10,000/person but not above that (cf. Fig. 10,

23). As mobile phones are more common in families than in small households, only 51% of Finns aged 10–74 years do not have access to a mobile phone at home.

Of the first mobile phones to be possessed by households, 60% had been purchased shortly before the interview (in 1995 or 1996) and only 25% 3 or more years before. Only 19% of the households without a mobile phone reported that they intended to purchase one. Of those with a mobile phone, 32% reported that their phones were computer-compatible.

Conventional phones in households. 14% of the households lacked an ordinary wired phone, while some 300,000 had wireless phones. Only 21% of all households with a wired phone had two or more sets. Approximately 1.4 million households, i.e. 73% of all wired phone households, had a voice-frequency telephone (with # and * keys). (The proportion of such phones is uncertain in that the existence of the above keys does not necessarily guarantee that the phone is a voice-frequency appliance that would allow the use of digital services. The situation was verified in the interviews by calling a special information number, but only if the respondent was uncertain of the type of telephone concerned.) Some 75,000 households had more than one telephone number, slightly over 20,000 an ISDN extension and slightly less than 30,000 a device for revealing the caller's number. 23% of the persons aged 10–74 years reported that they used digital services.

Telephone answering access in households. 390,000 households (17%) had an answering machine, and a further 45,000 replied that they had had one but had given

Table 2. Telephone answering access by size of household, %

Size of household	Answering access
1 member	17
2 members	12
3 members	20
4 members	21
5+ members	15
All	17

it up. One third of the machines had been purchased in 1995 or 1996, and 52% in 1993 or earlier. It can be stated by way of comparison that 82% of the video recorders reported had been in use for at least three years.

582,000 of the population aged 10–74 years (16%) had access to an answering machine at home and 147,000 (4%) an answering service. Even the telephone answering access seems to be more common in families than in one or two-person households.

Of the women with an answering machine at home, 15% reported that they did

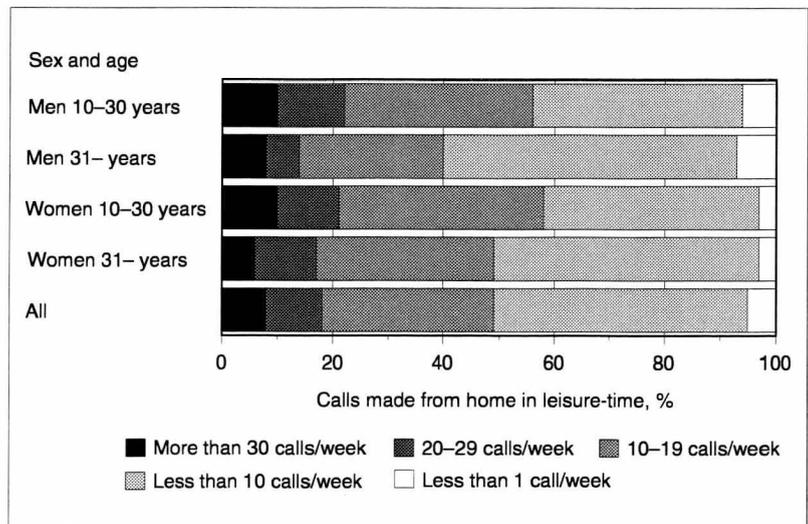
not know how to use it, the figure being 7% for the men. 72% of the men possessing an answering machine and 62% of the women were able to dictate a new message, so that the sex difference in user skills is not very great as compared with use of the computer, as discussed below.

Use of the telephone among the Finns.

Calls made from home in leisure time were more frequent among persons aged 10–30 years than among those aged over 31 years, the lowest figures being recorded for men. Calls received at home in leisure time were distributed almost in the same manner, as those made from home, so that the phone can be regarded as a tool for mutual personal communication.

When the respondents were asked to compare their mobile phone calls with wired phone calls, 47% of them reported that the former were of much shorter duration and 19% that they were slightly shorter. Use of a mobile phone tends to cut down call duration more among women, those aged over 31 years being particularly 'economical' in this respect.

Figure 7. Weekly telephone calls from home in leisure time, by sex and age, %



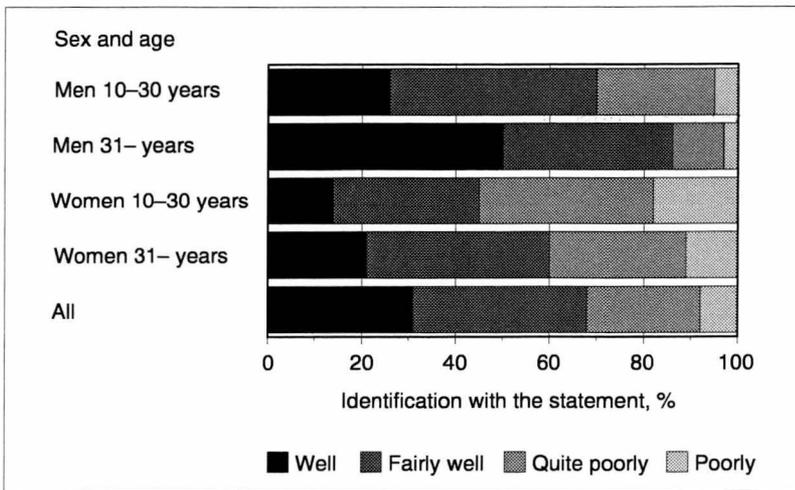


Figure 8. Validity of the statement 'I only call somebody if I have good reason to do so'. by sex and age, %

The motives behind the Finns' use of the telephone can be examined on the basis of the statements accepted by the respondents. The claim 'I only call somebody if I have good reason to do so' was deemed highly or fairly highly characteristic of their behaviour by 82% of the men, the corresponding figure for the women being 56% and that for respondents aged 10-30 years 45%.

75% of the females aged 10-30 years felt that the opposite statement 'I easily pick up the phone to call somebody' was true or fairly true for them, while the other extreme was represented by men aged over 31 years, only 38% of whom were of this opinion, whereas 87% of them agreed with the previous statement.

77% of the respondents regarded the third statement 'The phone is an essential part of my way of life' as being applicable or fairly applicable to them, including 68% of the men aged over 31 years.

Almost an equal proportion (75%) identified themselves with the statement 'It is easy to call a stranger', with only small differences between the groups.

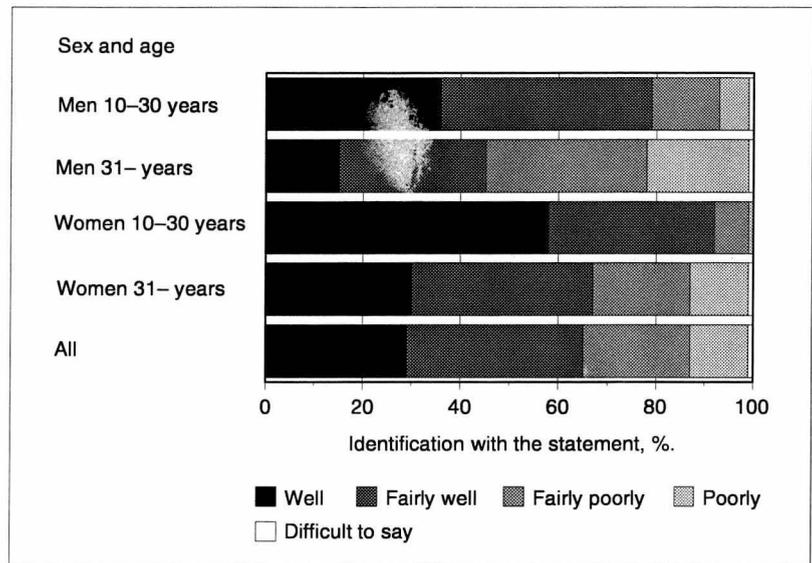
The respondents' attitudes towards the

phone as a means of communicating messages was also examined on the basis of statements, the results indicating that 75% of the respondents felt that the 'I am usually delighted when the phone rings' was typical or fairly typical of their reactions. There was a major difference between the men and women in this respect (63% and 88%), respectively.

'The phone sometimes rings too often' was perceived by 54% of the men aged 10-30 years as characteristic or fairly characteristic of them, the figure for women aged over 31 years being only 35%. Less than one fifth of the respondents felt that the statement 'I sometimes pull the phone out' and 'I am sick and tired of having to act as an answering machine for others' apply to them well or fairly well. This suggests that the majority of Finns do not consider telephone calls irritating.

A similar technique was used to examine the character of telephone conversations in Finland. The statement 'I try to discuss things quickly and efficiently' was accepted well or fairly well by as many as 87% of males, whereas the figure for females aged 10-30 years was only 54%. By contrast,

Figure 9. Applicability of the statement 'I want to know how my friends and pals are getting on' by sex and age, %



80% of the women felt that the 'It is nice to chat on the phone' described their telephone conversations well or fairly well, the figure for men being only 40%, however.

The statement 'I want to know how my friends or pals are getting on' was considered characteristic of their telephone conversations by 91% of the females and 79% of the males aged 10-30 years, while the corresponding figures in the age group over 31 years were 68% and 45%. Thus there was again a clear generation gap.

It may be concluded from the above that women are more likely to perceive the telephone as a natural medium of communication than are men, while persons aged 10-30 years were more prone to regard it as a permanent part of their way of life than older respondents. It seems when predicting future trends that younger men are approaching the telephone habits of women in these respects.

Calls to service numbers. Although the telephone seems to be an important means of maintaining leisure-time contacts, it is sel-

dom used for calling service numbers, directory inquiries being the only number that more than half of the Finns have called at least once or twice in their lives. The most active group in this respect are men aged over 31 years, though only 19% of these had contacted the number frequently. 24% of the respondents had called vehicle timetable numbers once or twice, and 4% frequently, and 11% the free booking numbers, for example. An equal proportion reported that they had called bank service numbers that do not reply with recorded messages and 5% that they had called bank service messages. The number of persons calling information numbers was perhaps slightly greater than that calling fortune-tellers, horoscopes, or friendship, sex or chat numbers. All in all the number of callers to each type of service number made up some 1% of all respondents.

The replies may, of course, have been affected by the same social desirability factor that manifests itself in questions concerning drinking habits, for example, in that the consumption figures calculated on the basis of

Table 3. Access to a computer by size of household, %

Size of household	Yes	Given up	No
1 member	15	5	80
2 members	18	2	80
3 members	36	3	61
4 members	44	1	55
5+ members	43	3	54

interviews are well below those estimated on the basis of sales statistics. Nevertheless, the small number of persons who have used directory and timetable inquiry services will serve alone to indicate that the majority of Finns are not accustomed to dialling service numbers.

3.2. Home computers and their use

This section discusses the number of PCs and video games (Nintendo, Atari, Secam) in households, their use and people's mas-

tery of the skills required. 24% of the households had a computer at the end of November 1996, and 3% had once owned one but did not have it any longer.

Household size seems to have a concrete effect on the purchase of computers. The results obtained from the 1995 household inquiry indicate that computers owned by one or two-person households are evidently used by persons aged 35 years, although a computer was available to less than one third of the households in this age category. It should be noted, however, that such households made up 75% of all households in Finland (cf. On the road to the Finnish information society, 184–190).

Microcomputers were much more common in three-person households, although even then they were only found in slightly over one third, while over 40% of the households with four persons or more had a computer. *More than a half of the households with teenagers had a computer.* Altogether 245,000 out of the 560,000 households owning a computer in November 1996 (45%) comprised one or two persons. 1.3 million

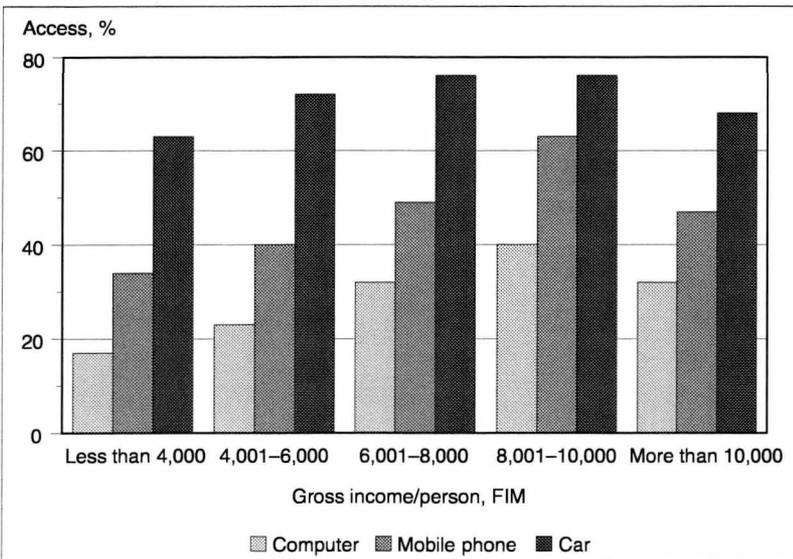


Figure 10. Access to a computer, mobile phone and car (%) in relation to gross income/person.

Finns aged 10–74 years were living in households which had a computer.

A total of approximately 90,000 households, 16% of those with a computer, possessed more than one computer, while some 70,000 had access to a laptop computer. 16% of the households had a computer provided by their employer.

Classification of the results of the question on gross incomes on the basis of household size in order to provide a rough account of incomes per household member enabled the role of incomes in the availability of technical appliances and instruments to be examined, conforming to the notion of the consumption unit. A higher gross income per person increased the number of computer households up to the category 'FIM 8,000–10,000/person', but not in the higher categories. One surprising finding was that most of the households giving up computers had good incomes, which may be associated with children leaving home and taking the computer with them and their parents not purchasing a new one.

The differences observed between the income categories in terms of car ownership were not as prominent as those recorded for computer and mobile phone ownership, which may be taken to some extent to indicate the difference between necessity and luxury goods. The mobile phone is not even as common as the car in any of the gross income categories.

Ownership of a computer was most common among the occupants of private houses in suburban areas. In regional terms, 35% of households in the province of Uusimaa had one, while the corresponding figures were 26–28% for the provinces of Oulu and Kuopio (and the Åland Islands), 21–23% for Häme, Vaasa, Turku and Central Finland,

14% for Mikkeli and as low as 11–12% for Kymi, Lapland and Northern Karelia.

60% of the households had purchased their first computer at least three years before and 30% in 1995 or 1996. 55% of the most recent computers had been purchased in 1995 or 1996, and 48% of them had a sound card, but only 9% a video card. This means that only some 50,000 households are able to use network multimedia services requiring a video card. Some 7% of the most recent computers were of the Macintosh type. The respondents evidently had a low opinion of the service life of their home computers, as 52% reported that their machine's capacity or memory would be insufficient within two years.

Only 15% of the households with no computer (representing 265,000) reported that they were planning to purchase one, of which 54% estimated that they would do so in 1997 at the latest. They were willing to pay an average of approximately FIM 9,300 for their computer, the smallest figures, an average of FIM 8,300, being recorded for one-person households and the highest, FIM 10,400, for two-person households. The figure for the largest households lies between these two.

268,000 households (48% of those with a computer) had a *CD-ROM unit*, and a half of these units had been in use for less than a year. Only a half of the 1.3 million Finns aged 10–74 years with a computer at home have access to a CD-ROM unit.

41% of the households (230,000) had a *modem interface*, a half of which had been purchased within the last two years. The most common baud rates were 14,400 and 28,800, both types constituting some 30% of the cases in which the respondents were able to answer the question. The next most

common baud rate was 1,200 (13%). The results are slightly uncertain, however, as 17% of the respondents did not know the baud rate of their modem and it was also impossible to know whether their modems had the same baud rate distribution as those of the persons who could provide this information.

The personal questionnaire also showed 42% of the respondents (551,000 persons in the population) to have access to a modem, of whom 73% (400,000) also had e-mail and Internet connections.

The types of program used in home computers are indicated in their order of frequency in Table 4. It is likely that some of the respondents will have confused image processing facilities with a drawing program, but the distribution of the program types as such may be taken to conform to expectations and to be of a kind dictated by the packages of programs that typically accompany computers.

Users of computers and modem interfaces. The first topic of discussion here will

Table 4. Types of home computer program in order of frequency

Program type	Percentage of computer households
Word processing	94
Spreadsheet	79
Games	74
Database/filing	66
Image processing	47
Music composition	23
Pagemaking	20
Processing of moving images	12

be who uses the computer in the 24% of households that have one. This was examined by age and sex. Although classifications in terms of age categories are always somewhat difficult to interpret, the dichotomy of 10–30 years and over 31 years used here means that even the oldest persons in the younger category were only 20 years of age in the mid-1980's when the first home computers came onto the market, so that

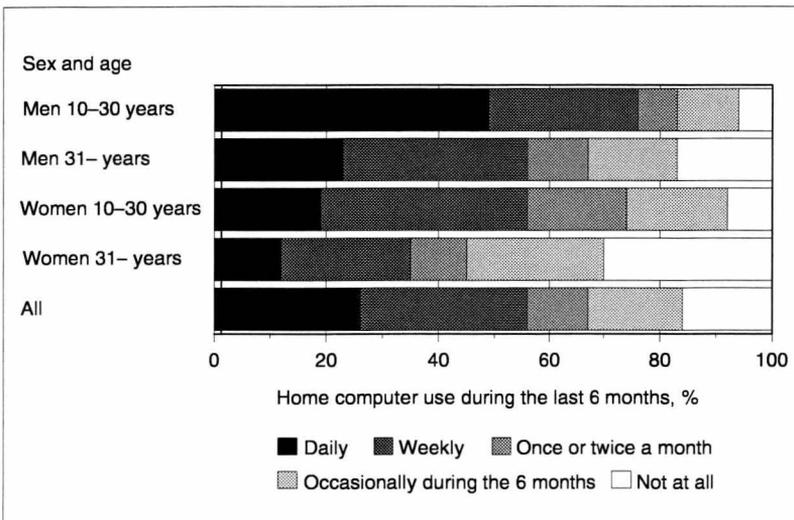
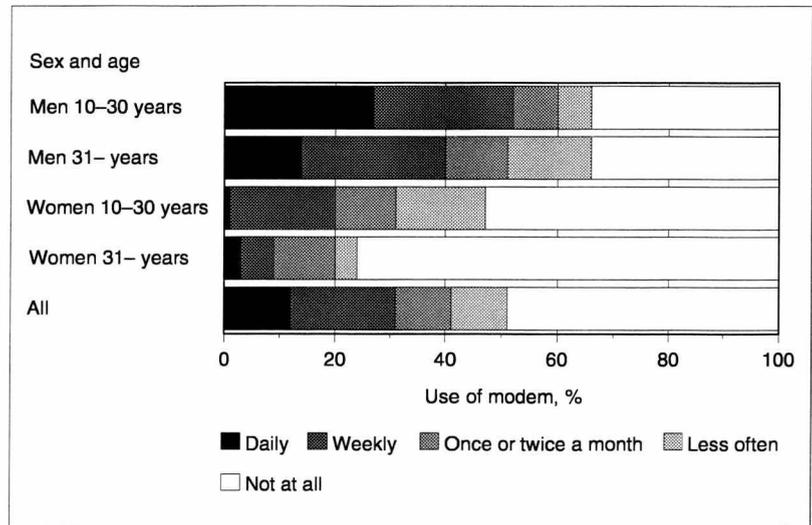


Figure 11. Use of a home computer during the last 6 months by sex and age, %

Figure 12. Use of a modem by sex and age, %



they will have lived the early part of their adult lives at the time of rapid development in information technology.

Almost 700,000 men and 610,000 women aged 10–74 years were living in households with a computer, and all in all approximately one third of the Finns of this age had access to one. The frequency of computer use among men aged 10–30 years is extremely high, whereas 54% of women aged over 31 years use a home computer only every now and then.

300,000 men and 240,000 women, i.e. 13% of Finns aged 10–74 years, had access to a modem at home, which means that 41%

of the people with a home computer in November–December 1996 also had access to a modem. A modem interface can thus not yet be regarded as a ‘service’ generally available for leisure-time use. The frequency of modem usage by age and sex is described in Fig. 12.

A major difference in modem use was observed between the sexes, for where men aged 10–30 years used one much more frequently than the other age categories, they were quite rare among women aged over 31 years.

One reason for the differences in the use of computers, and particularly of modems,

Table 5. Commencement of home computer use by sex and age, %

Use started	Male		Female		Total
	10–30 years	31+ years	10–30 years	31+ years	
	%	%	%	%	%
Less than a year ago	9	16	23	21	16
Less than 2 years ago	10	9	17	16	13
Less than 3 years ago	12	11	17	8	11
More than 3 years ago	69	65	44	54	59

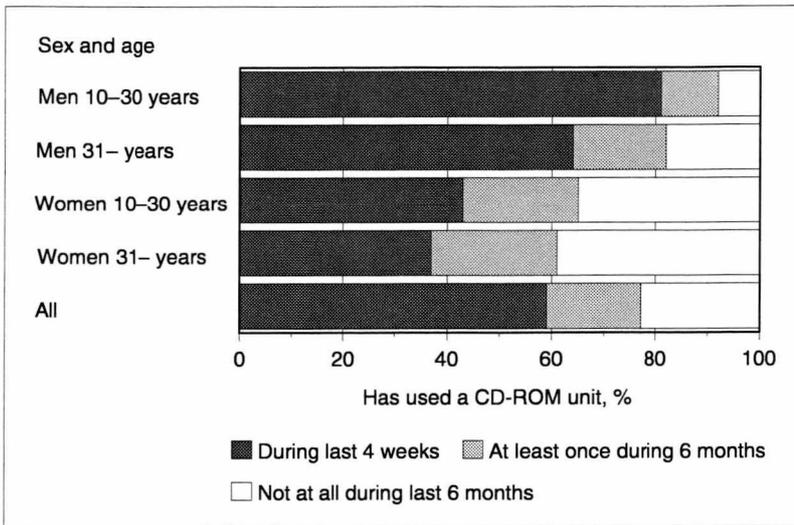


Figure 13. Use of CD-ROM units by sex and age, %

could lie in the number of years for which respondents had had a computer at home. Despite their youth, the men aged 10-30 years included the largest number of persons with a long experience of using computers, and it would seem that men aged over 31 years are entering a 'second wave' of home computer use. Of the female respondents, 40% had only been using a home computer for two years. This may be one explanation for their infrequent use of modems even though the access itself would have supported this technology.

Men aged 10-30 years were also the most active users of CD-ROM units, as indicated by the fact that a half of them had used one 1-5 times during the past four weeks

Table 6. Respondents mastering keyboard skills well, %

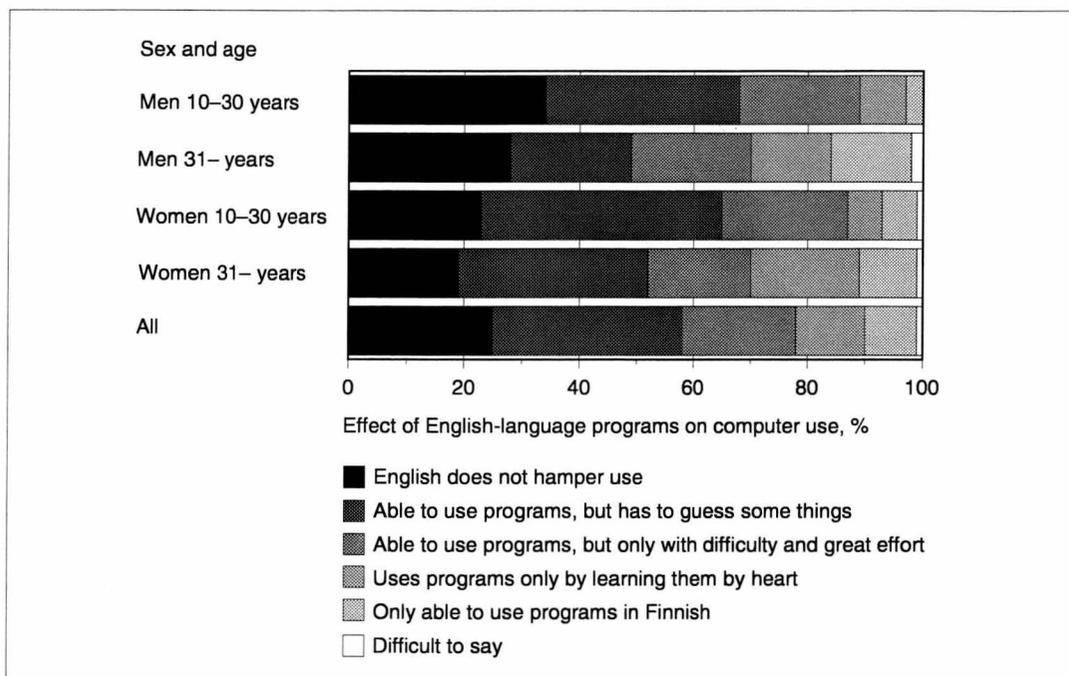
Age-group	Men	Women
10-30 years	48	57
31+ years	46	68

and a half of them more often. Even the women were more likely to use a CD-ROM than a modem. The CD-ROM unit was mainly used for playing games, although quite a number of the respondents also used one to consult databases (e.g. dictionaries). In addition, the number of persons using CD-based learning programs already amounted to tens of thousands.

Computer usage skills. The respondents mastered keyboard skills fairly well, for 53% of the approximately 2 million persons aged 10-74 years with access to a computer at home or elsewhere believed that they could use the keyboard fluently or mastered the ten-finger system. 12% reported slowness and difficulties in keyboard use and 2% said that they had never used a keyboard.

Women aged over 31 years evidently mastered keyboard skills the best, while the other extreme was represented by men aged over 31 years (18%). The respondents considered a mouse more convenient, 63% of them feeling that they could use it easily and smoothly. 7% of them did not use it at all, and

Figure 14. Effect of English-language programs on computer use by sex and age, %



6% regarded it as a slow, laborious tool, an opinion especially common among women.

A much more problematic issue is the fact that the programs are usually in English. This question was only answered by people with at least some experience in using a computer. The results evidently reflect the problems of a country with a minor language in that only one fourth of them did not consider English-language programs a drawback. The men mastered computer English better than the women did, and the young people better than those aged over 31 years. This raises the question of whether one should assign resources not only to improving the general knowledge of languages among the population but also to translating computer programs into Finnish.

Program installation and updating can be regarded as one of the basic skills of com-

puter use, though not the most important one. 74% of the women reported that they are only able to use programs installed by others and that they are unable to install them by themselves. This was also reported by 37% of the men, though as many as 49% of the men aged 10-30 years reported good installation skills, the figure for women of the same age being only 11-14%.

The respondents rarely copied programs from the Internet or boxes, although 43% of the men and 49% of the women mentioned the limited capacity of their computer as the main reason for this and 24% and 36% simply said that they had had no need to do so. 6% of the men and 9% of the women said that they would not know how to copy a program from the net or that they would not wish to do so. This means that only 10% of the approximately two million computer users mas-

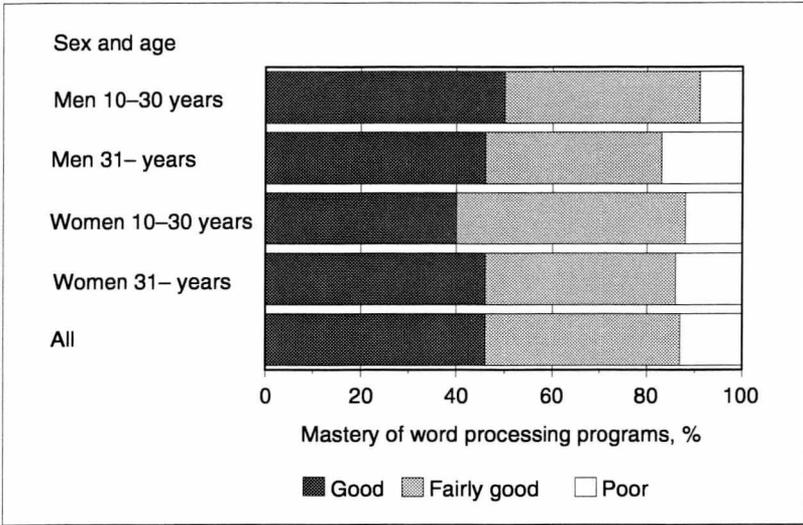


Figure 15. *Mastery of word processing programs among their users by sex and age, %*

tered program copying well, a half of whom were men aged 10-30 years. The results indicated that women's skills are much poorer than those of men in this respect.

Mastery of basic computer programs.

Word processing can be regarded as one of the basic computer skills, its use being reported by 87% of all those with access to a computer. No appreciable differences were observed between the men and women in this respect, though persons aged 10-30 years had done word processing slightly more often than those aged over 31 years, and one fifth of the latter had not used it at all.

The skills of the respondents reporting word processing seemed to be distributed within the various groups in more or less in the same manner as those of computer users as a whole. It thus seems that word processing programs are usually at least fairly user-friendly and that, as this is one of the first purposes for which a computer is acquired the respondents may have the longest experience in its use.

Drawing is another basic computer function, the use of such a program being reported by 75% of the men and 65% of the women (see Table 7). Its use was much more common among persons aged 10-30 years than in the category over 31 years.

Mastery of drawing programs	Men		Women		Total
	10-30 years	31+ years	10-30 years	31+ years	
	%	%	%	%	
Good	51	34	39	25	38
Fairly good	40	39	42	42	41
Poor	9	27	19	33	21

Table 7. *Mastery of drawing programs among their users by sex and age, %*

Table 8. Mastery of spreadsheet programs by sex and age, %

Mastery of spreadsheets	Men		Women		Total %
	10–30 years	31– years	10–3 years	31– years	
	%	%	%	%	
Good	26	36	14	20	25
Fairly good	47	39	40	47	43
Poor	26	25	46	32	31

Table 9. Knowledge of copying files onto discs by sex and age, %

Mastery of copying	Men		Women		Total %
	10–30 years	31– years	10–30 years	31– years	
	%	%	%	%	
Good	46	45	17	32	40
Fairly good	27	19	41	35	30
Poor	27	18	42	32	29

Programs of this kind are in general regarded as the easiest to use, and reported abilities were only slightly poorer than for word processing, although more clearly concentrated in the age group 10–30 years.

Spreadsheet programs had been used by 57% of the respondents with computer experience, about half of the women and 2/3 of the men. People aged over 31 years mastered these better than those aged 10–30 years. One reason for the fairly poor general mastery of spreadsheet programs might be that they are quite new and may still be rare at many places of work.

One basic function of a computer is that of copying files onto discs (this was particularly necessary before the spread of networking), and it is quite surprising that as many as 60% of the computer users interviewed reported that they have never done this, the figure being as much as 72% for women aged 10–30 years and 45% for men of the same age.

Apart from the women aged 10–30 years, the respondents who mastered copying seemed to master the copying of files fairly well. The infrequent use of this type of data transfer and the insufficiency of the related skill may reflect the fact that people often become familiar with a computer only by trial and error. It may be quite common for people to start working on a computer without examining its basic functions first, which may lead to long-term deficiencies in certain skills.

Database programs had been used by 37% of the respondents, statistical packages by 21% and pagemaking programs by 19%. Only a fraction of those using such programs can be said to master them well, however.

There seems to be a major need for arranging training leading to a computer driving licence, particularly for women aged 10–30 years and both men and women aged over 31 years, whereas many men aged 10–30 years seem to have obtained their computer skills by other means.

Table 10. Ways of learning information technology, by sex and age, % ^{*)}

Way of learning	Men		Women		Total
	10–30 years	31– years	10–30 years	31– years	
"I have learned information technology on my own"	65	56	29	28	38
"I have applied at home the things I have learned at my work, school or place of study"	60	48	41	39	47
"One or more people have instructed and encouraged me to use modern technology and services"	74	55	64	61	63
"I have frequently attended information technology courses or corresponding events"	20	43	19	42	32

^{*)} Consider the statements that fit their own case well or quite well

The ways in which various groups become familiar with information technology are compared above on the basis of statements (Table 10).

Men aged 10–30 years had learned information technology and its use more often than the other groups in all the ways listed in

the statements except for attending specialised courses. In addition, they had learned the necessary skills on their own much more frequently than the women had. The role of other people was equally important to all the groups in the table.

It was stated above that 48% of all computer

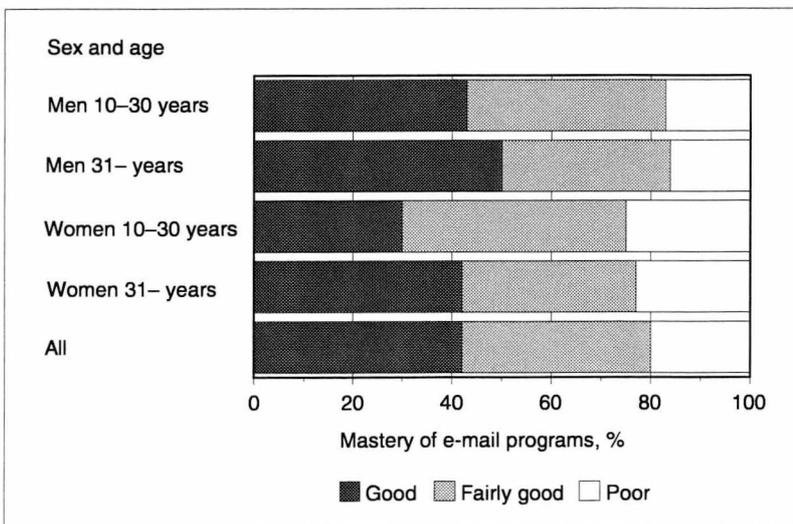


Figure 16. Mastery of e-mail programs among their users by sex and age, %

Table 11. Use of an Internet browser by sex and age, %

Mastery of an Internet browser	Men		Women		Total %
	10–30 years	31– years	10–30 years	31– years	
	%	%	%	%	
Good	44	37	15	19	31
Fairly good	40	35	55	29	40
Poor	15	29	30	51	28

users also used e-mail programs. The related skills are assessed here in Fig. 16. The skills of persons aged over 31 years seemed to be equal to those of younger persons in this respect, particularly if we assume that women may tend to underrate their skills more often than men. In any case we are currently in a situation where only a half of all e-mail users feel that they master it well.

Use of an Internet browser was most distinctly favoured by the men, to the extent that a half of the male computer users had ‘surfing the net’ as compared with one third of the female users. As many as 63% of the men aged 10–30 years had used an Internet browser, whereas the figure for women aged over 31 years was only 25%. It is evident that these skills are widespread among young men in particular. There is thus good reason to ask to whom Internet services should be directed. It would seem at first glance that men aged 10–30 years may not be a very solvent group at least for the time being, but they did up approximately one third of the 700,000–800,000 Internet users estimated on the basis of this survey.

Use of information networks through libraries. It may be calculated that 16% of Finns aged 10–74 years have contacted information networks through library computers and 15% through their friends’ home

Table 12. Respondents who had used library-based information network connections at least once during the past six months, by sex and age, %

Age group	Men	Women
10–30 years	30	37
31– years	8	9

computers. Some 600,000 used such a source in a library at least once during the past 6 months, a high figure which evidently reflects age-specific usage skills.

Given the above definition, it may be somewhat surprising that women should have used library-based network connections more than the men had. Comparison of more regular usage, amounting to at least 10 times, yields figures of 8% for men aged 10–30 years and 1.5% for those aged over 31 years, the figures for women being 10% and 2%, respectively, showing a similar trend to that among the men.

Households’ video games. 15% of the households reported possessing a computer for playing games, such as an Atari, Nintendo, Segam or Amiga machine, and a further 8% had previously had one but had given it up. Games of this kind are particularly popular in families with children, as indicated by the fact that they were found in a half of the hou-

holds comprising at least five persons, 37% of the four-person households and 25% of the three-person households. The rapid growth in game purchases is already over, for only 12% of these had been purchased during the last year, a further 12% less than 2 years ago and 64% three or more years ago.

Of the respondents with access to video games, 13% reported that they played them regularly, 45% every now and then and 42% never. Similarly 49% played the game only by themselves, 34% with other people as well and 17% only with other people. This means that such games cannot be regarded as a sign of isolation or 'living in a world of violence' but rather as a way of living and acting in a group. It should be remembered, however, that actual computers are already being used more and more for games as well, so that the use of machines intended specifically for that purpose does not provide a full picture of whether any excessive time is spent on them.

Reference data on other equipment and functions. The reference data indicated

that 4% of Finnish households have no TV, and of those possessing one, 17% do not have a remote control unit, while 31% of households that possess this do not have teletext facilities. This means that approximately 1.26 million households in Finland have at least one teletext TV, a figure which is double that of households with a computer and approximately 300,000 greater than that of households with a mobile phone. Only about 190,000 households have a video camera, 77% of them having purchased it at least three years before the time of the interview, and 21% of households do not subscribe to a newspaper, whereas 45% read one newspaper, 21% two and 10% three.

Almost a half of the persons aged 10–74% (48%) were living in a household with no access to a walkman stereo.

Likewise, 47% of the households had at least one CD player, 59% of these having purchased it at least three years earlier, though the numbers of compact discs owned are still quite small. These are compared with video recordings and books in Table 13. Books are still numerically the most popular of these items in households, while almost

Number	Compact discs %	Own video recordings %	Own video films %	Books %
None	1	3	1	2
Less than 10	21	23	57	8
Less than 50	52	52	38	30
Less than 100	14	13	4	23
More than 100	9	8	0	37

The distribution questions were asked of all subjects who had access to the necessary equipment, except for the number of books, which was asked of all households. This should be taken into consideration when interpreting the differences in the percentage distributions.

Table 13. Distribution of books and entertainment recordings in households with access to the latter equipment.

equal numbers were reported for compact discs and TV video recordings. It can be estimated on the basis of the number of self-made recordings that over 40% of the households with a video camera use it regularly.

3.3. Use of e-mail systems in places of work and educational establishments

The questions discussed below were asked of both unemployed and employed persons with reference to their last place of work and of students aged over 18 years. The results showed that 28% of the respondents, representing some 650,000–700,000 Finns, had access to e-mail at work or their place of study. Almost all of them reported that the e-mail system is also used for communication with other workplaces belonging to this same employer, if any.

The respondents were then asked to compare their use of e-mail with the telephone for maintaining contacts at their place of work:

- a) more than the phone 18%
- b) less than the phone 52%
- c) as frequently as the phone 13%
- d) does not use e-mail at all 17%

The telephone is still the most popular means of distance communication at work, although e-mail already occupies a prominent position. In fact, almost one third of the respondents used it for communicating in work and study at least as frequently as the phone. Use of the telephone at work is analysed in Table 14.

Three out of every four respondents reported that they had access to outside systems through an e-mail system arranged by their place of work or study. Some 480,000–500,000 of employees and students in Finland evidently have access to such a system, and 70% of them use it for outside contacts.

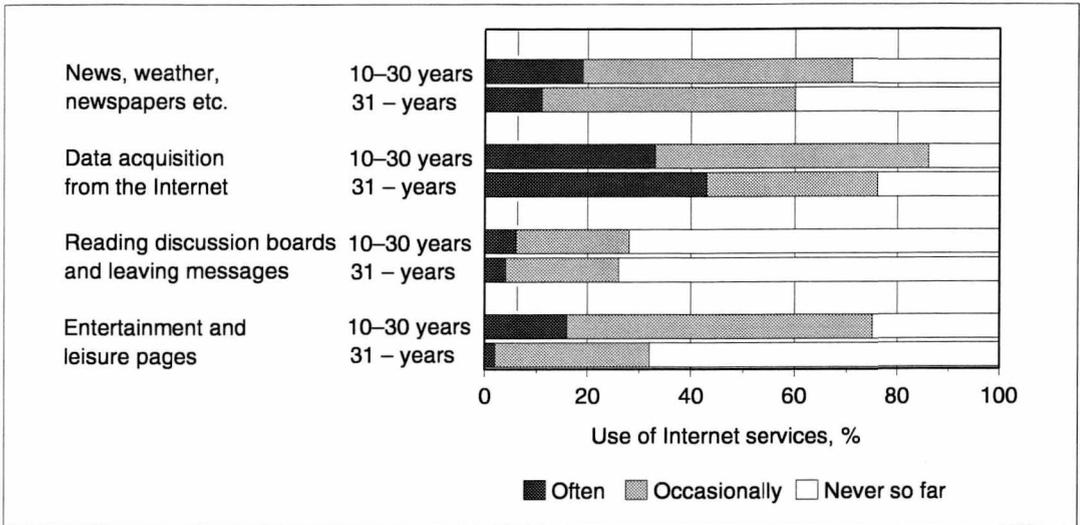
The respondents estimated that they use e-mail for outside contacts in the following manner:

- a) more than the phone 23%
- b) less than the phone 67%
- c) both equally as extensively 8%
- d) cannot say 1%

Table 14. Use of the telephone at work

Use of the telephone at work	%
1. My work mainly involves the use of the phone	3
2. I spend more than a half of my working time on the phone	2
3. The phone plays an important role in my work, though I do not spend most of my time using it	29
4. I use the phone to make contacts	22
5. I only use the phone occasionally in my work	26
6. I do not need the phone at work	14
7. Some other answer or difficult to say	4

Figure 17. Use of Internet services at places of work and study by age among those with access to these services, %



E-mail has not yet become a particularly popular means of communication outside places of work either. 65% of the respondents sent e-mail messages frequently, 31% occasionally and 4% never. Files were transferred outside the respondent's place of work much less often, 36% doing so frequently, 38% occasionally and 26% never.

Only a small number of the respondents used a computer at their place of work or study for banking transactions, 13% of them doing so often, 13% occasionally and as many as 74% reporting that they had never done so or that they did not have an interface for doing so.

The Internet is said to be an important aid in many forms of daily work. Among those people able to access systems outside their place of work, 85% reported that they were able to consult WWW pages. Generalized to all places of work and study in Finland, this implies that some 300,000 people use Internet services, in the man-

ner described in Fig. 17.

Persons aged 10-30 years were more active in using networks in all the four ways listed than those aged over 31 years, most notably as regards entertainment and leisure pages. The Internet seemed to be a major aid to data acquisition for a number of employees and students, and in this sense can be said to have redeemed the expectations set for it.

The efficiency of the e-mail as a communications tool is dependent on how often people check their messages (cf. Table 15). Where persons aged over 31 years usually read their e-mail messages on the same day, only slightly over a half of those aged 10-30 years did so at least daily. This is probably due to the fact that some of the respondents were students, for not all students visit their places of study every day.

Electronic bulletin boards and discussion forums at places of work and study would seem to be have a sufficient coverage from the point of view of in-house communication-

Table 15. Reading e-mail messages by age, %

	10–30 years	31– years
Frequently during the day	16	63
Daily	40	28
A couple of times a week	29	7
At least once a month	6	1
Less often	8	2

s, for only 7% of the respondents reported that they had never consulted them and only 16% that they did so less than once a week. It is likely that an equal number would also skip weekly paper handouts.

Open network discussions offer good opportunities for participation at work. Approximately one third of the respondents had left a message on those notice board at least once a month and about 10% did so daily. 27% did not know whether it is allowed to leave an anonymous message on the discussion board of their place of work or study, and only slightly over one third of those answering the question considered this possible. This implies that leaving messages in the Hyde Park style is not favoured at such places.

3.4. Opportunity and willingness for distance work

The question of distance work was approached here by asking the respondents for their own definitions and interpretations of it. Background information was first obtained from employed persons, unemployed persons and pensioners on the extent to which their work required moving from one place to another. The following distribution was obtained:

- Mainly transport work	5%
- Daily visits to customers	6%
- Place of work varies, e.g. according to building site	10%
- Movement from one site to another in same company	26%
- Mainly at the same place all day	51%
- Some other arrangement	2%
Total	100%

The question of the opportunity and willingness for actual distance work was asked of persons who were employed or studying at a vocational or at least intermediate-level educational establishment, and of unemployed persons with reference to a job that would correspond to their qualifications.

Approximately 10% of the respondents aged 15–74 years who complied with the above criteria, i.e. representing a total population of 230,000, estimated that their work would lend itself to distance working, and another 10% felt that they could manage to arrange distance work with major adjustments or could do short-term distance work outside their actual place of employment. These figures suggest that the potential for distant work is in fact not very great.

The persons who believed that their occupation would lend itself at least to short-term distance work (indicated in the table with *) were then asked whether they were willing to do such work. These people repre-

Table 16. Suitability of respondents' work for performing at home or in a separate workspace, by sex and age, %

Suitability of occupation for distance work	Men		Women		Total
	10–30 years	31– years	10–30 years	31– years	
	%	%	%	%	%
No fixed place of work	6	9	4	4	6
Suitable for full-time distance work*	2	5	5	5	5
Suitable for distance work with occasional visits to workplace*	5	6	5	3	5
Short periods outside place of work*	4	7	8	6	6
Outside place of work only by special arrangement	4	3	5	6	4
Suitable only for a fixed workplace	75	67	71	76	72
Cannot say	3	2	2	1	1
<i>Finnish population, thousands</i>	293	912	224	902	2 329

sented some 370,000 persons in the Finnish population. The results indicated that some 210,000 Finns could do distance work and would be willing to do it. Although this willingness was greater among persons aged 10–30 years than among those aged over 31 years, the former were rarely employed in work that could be pursued on this basis.

The following replies were obtained to the question: 'Have you done any work connected with your employment or entrepreneurship at home or outside your actual place of work in your leisure time during this autumn?'

- a) 29% had not done any work outside their place of employment,
- b) 23% had done such work only in the evenings or at weekends,
- c) 40% during the normal working hours, in the evenings and at weekends, and
- d) 9% only during normal working hours.

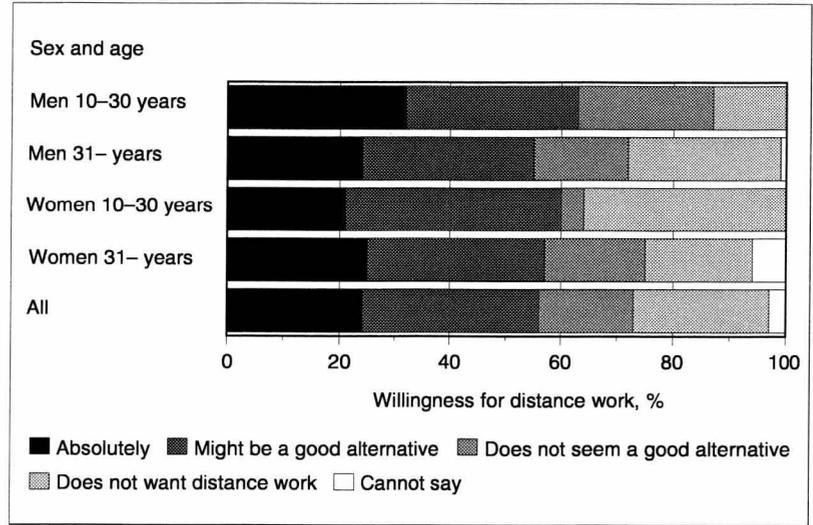
Those people who considered their occupation suitable for distance work were already doing a lot of their work outside their place of employment, although the replies suggest that this was due to tight schedules rather than to any genuine desire to work at home.

When the respondents in categories a, b and c above were asked to estimate whether they were distance workers or not, the following distribution was obtained:

- | | |
|-------------------------------|-----|
| a) full-time distance worker | 8% |
| b) part-time distance worker | 6% |
| c) occasional distance worker | 23% |
| d) none of the above | 63% |

Thus, based on the respondents' own estimates, some 18,000–30,000 the Finns regard themselves either as part-time or full-time distance workers, a figure which roughly corresponds to those achieved in

Figure 18. Willingness to do distance work for present employer or in a job corresponding to the respondent's education, by sex and age, %



other surveys. According to the publication "On the road to the Finnish information society" (pp. 175-176), for example, some 21,000 persons are engaged in distance

work, having agreed on it with their employers beforehand. Such persons were typically employed in the private sector and were most often senior salaried staff.

4. Primary, secondary and upper secondary schools as a link with the information society

Mari-Elina Laukkanen

The results discussed here concern Finnish comprehensive schools and upper secondary schools, at which a total of 475 of the respondents were studying. Their replies to questions regarding the use and teaching of information technology at schools were taken as representing over Finland's population of half a million pupils and students at these levels. 39% of the respondents were pupils aged over 10 years and attending the lower level of the comprehensive school (primary school), 40% were at the higher level (secondary school) and 21% at an upper secondary school. Boys were in a slight majority at the primary level (54%), while almost two thirds of those at an upper secondary school were girls (62%), which may be said to reflect fairly well the actual sex distribution of these students. The distribution at the higher level of the comprehensive school is more even.

4.1. Information technology equipment at schools

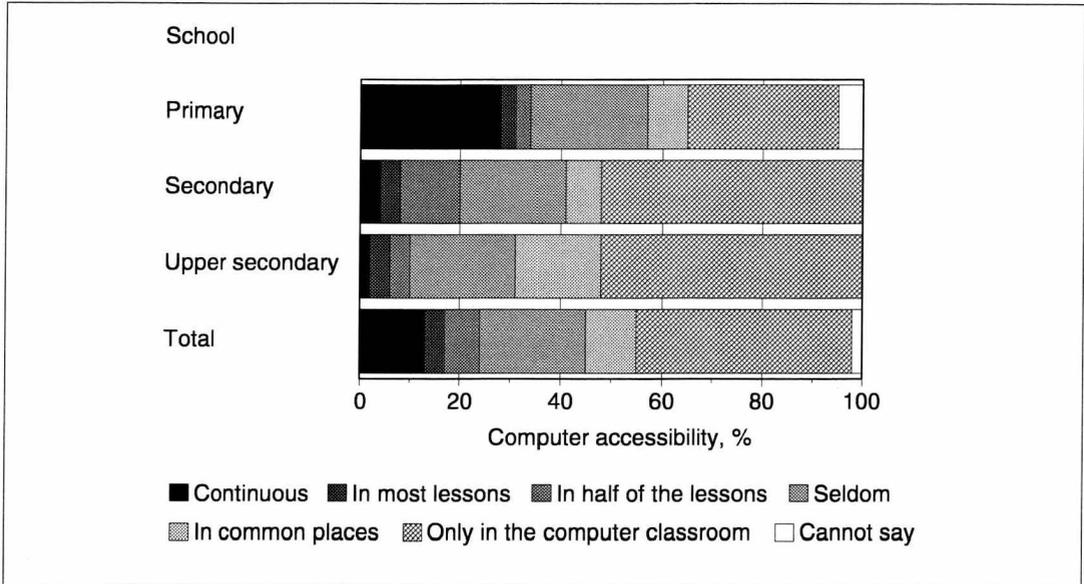
The majority of pupils and students were studying in large schools of more than 100 pupils and usually at least 10 teachers. Large size, and the consequently perhaps more extensive resources directly contribute to the standards of information technology equipment at schools, as indicated by the fact that 83% of the pupils at these large schools had access to a separate computer classroom but only every third respondent studying at a school with less than 50 pupils.

All in all, the standards of information technology equipment at places of general education can be regarded as fairly good, for the results prove that over half of the pupils at the primary level had access to a computer class despite the fact that this category includes the smallest schools of all. In addition, as many as 89% of the secondary school pupils and 87% of the upper secondary school students had a separate computer classroom at their school.

In addition to the availability of separate computer classrooms, equipment standards are determined by the directness of access to computers during lessons and other forms of teaching. At least a half of the lessons of as many as 120,000 school pupils were held in classes where computers were available. Quite a surprising finding was that this was often the case in the primary schools and was least common for upper secondary school students, only 10% of whom stated that such facilities were available in least half of their lessons. This may be due to the fact that the fairly variable system for choosing subjects in the upper secondary school involves great mobility between classrooms whereas most of the primary school teaching takes place in the pupils' 'own classroom'. This interpretation is also supported by the fact that, of the different types of school, the upper secondary schools most often provided commonly available computer facilities.

The girls less often had access to computers during lessons, 12% as opposed to

Figure 19. Computer accessibility among students and pupils aged over 10 years by the level of school, %



21% for the boys, a discrepancy which is partly due to differences in the subjects they chose, i.e. studies connected with information technology itself may be more popular among boys. Only 43% of the respondents reported that computers were available only in the computer classroom, which would seem to suggest that they have become a basic tool in a variety of classes.

4.2. Use of information technology in schools

A total of 72% of the pupils and students had used a computer at school during the autumn term preceding the interview (approximately 3 months), the figures being 73% for primary school pupils aged over 10 years, 84% for the secondary school pupils, but only 50% for students at the upper secondary school. Among the girls studying at the upper secondary level, 57% reported that they had not used a computer at all dur-

ing the autumn term, which is quite surprising in that the use of e-mail, for example, tends to increase with the level of education, a trend to be discussed in more detail below.

The respondents who had used a computer during the autumn preceding the interview were asked to indicate the subjects in which this had happened and the type of work done on the computer.

The most widely reported task was word processing, the second most popular use were exercises of various kinds, mainly at the comprehensive school. The latter use was most common in mathematics and languages, subjects which often also make use of teaching games. Information technology thus seems to represent a fairly important teaching tool.

Other significant uses were graphics and drawings, games and network-based uses, although each of these was mentioned only a third as often as word processing or subject-specific exercises. Network-based uses

usually involved data acquisition and the browsing of WWW pages. Some secondary school pupils in particular also reported having compiled home pages. Other rarer, more specialised uses were spreadsheet functions, music production and listening, programming and bookkeeping.

The question regarding the lessons during which the pupils had personally used a computer during the autumn term pointed to four major subject categories. Approximately every fifth respondent mentioned information technology, and the same number the mathematical subjects, including physics and chemistry, and Finnish and foreign languages, and some biology, geography, environmental studies, civics, history, tutoring, art and music. Some of the pupils had used a computer on their own during breaks and in their leisure time.

The replies to the question regarding the subjects in which a computer had been used by teachers during the autumn fell into different categories in the same manner as above, i.e. the highest figures were recorded for information processing, mathematics, physics and chemistry, Finnish and foreign languages. Information technology and Finnish were the subjects in which computers were used most by both the teacher and the pupils. All in all it seems that the use of information technology has already established itself even as an integral part of foreign language studies.

A total of 70% of the school pupils and students, representing 350,000 on a national scale, reported that they had used a word processing program at some point during their studies. No appreciable differences were observed between the sexes in this re-

Figure 20. Use of computers, by the level of school, %

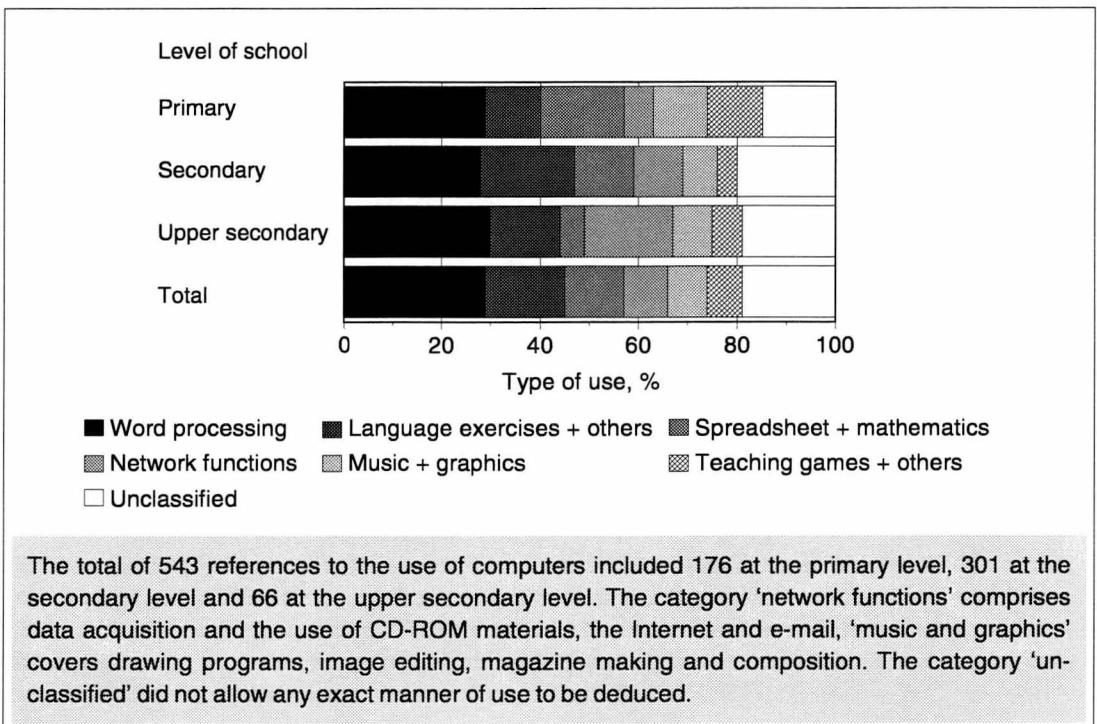


Figure 21. Use of computers by pupils in given lessons, by the level of school, %

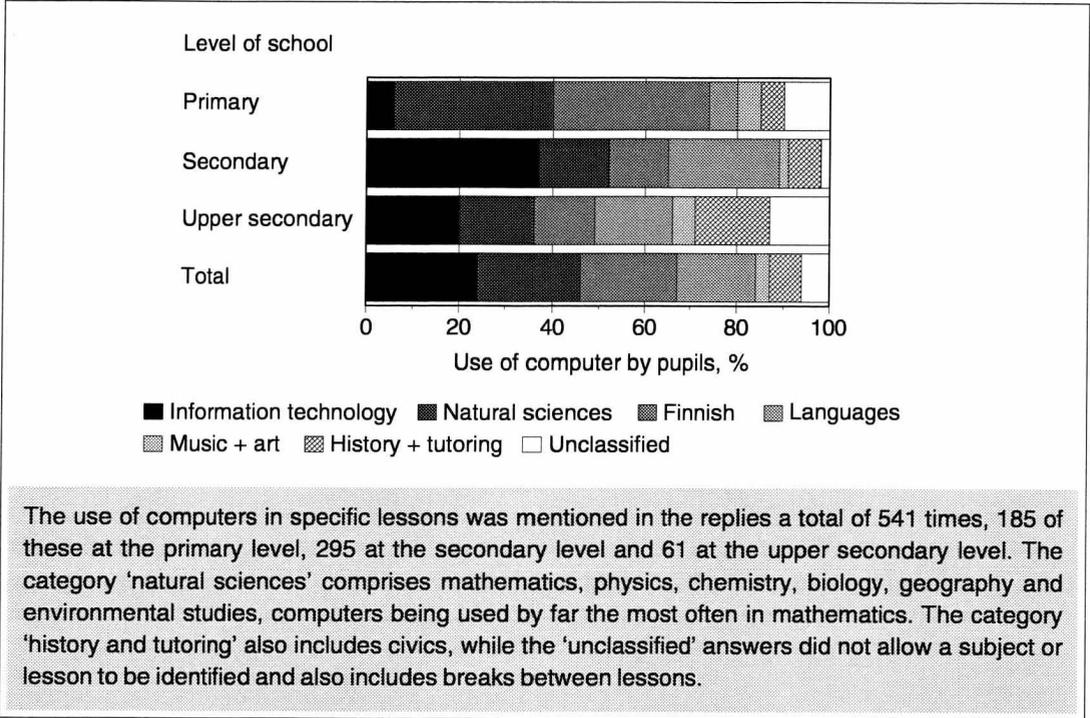
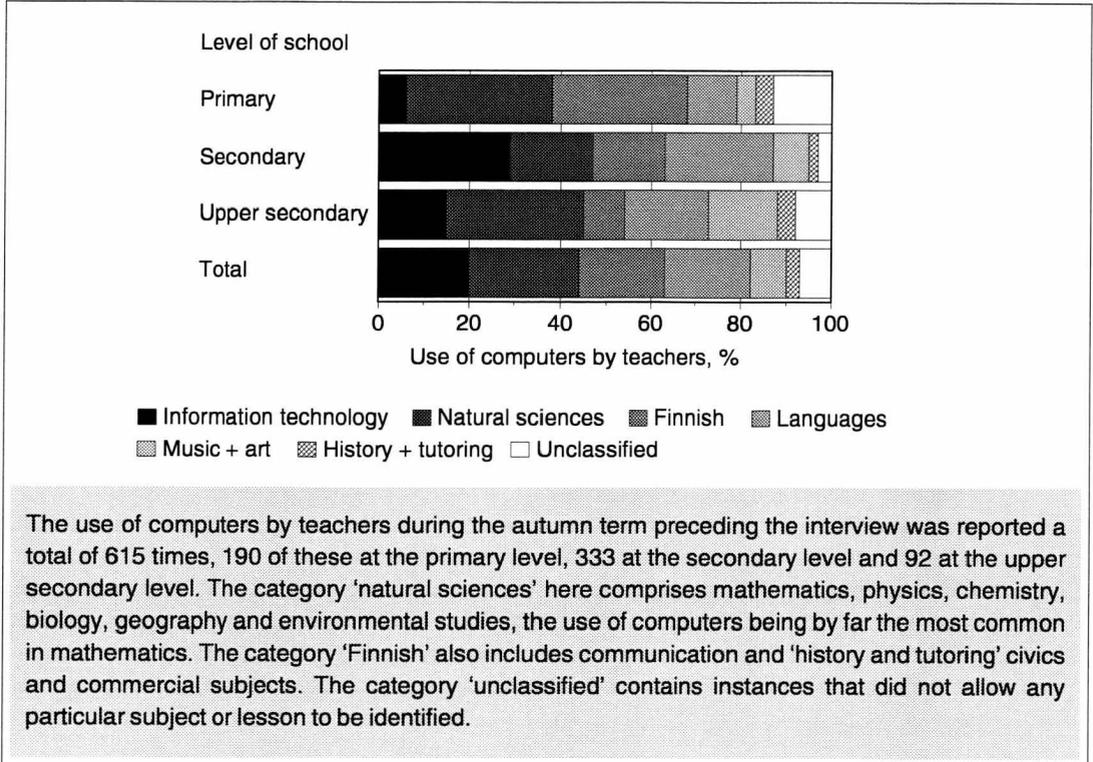


Figure 22. Use of computers by teachers in given lessons, by the level of school, %



spect, though some differences did emerge between the levels of school, as it is quite natural for students at the higher levels to be more experienced in the use of computers. The use of drawing and other corresponding programs was as common as was that of word processing programs.

Only 29% reported that they had used modem connections (e.g. Freenet, Internet or e-mail) at school, two in three were boys. 34% of those who had done so had sent or received e-mail messages (representing a population of 50,000), and slightly less than a half of these had an e-mail address of their own. The level of education seems to play a role in this respect, as only a third of those with a personal e-mail address were girls and 97% were studying at the secondary or upper secondary school. This was also true for the use of the Freenet. Of the boys and girls with some experience in the use of the Freenet, 77% had sometimes browsed WWW pages, this being almost equally common among both sexes and at all three levels of school.

4.3. Studying of information and communications technology in schools

Of the pupils who had studied information technology during the autumn term or the preceding spring term, 60% were boys. Altogether 57% of the respondents, corresponding to 290,000 in the total population, had studied some form of information technology during that period, this being slightly more common among boys and in the comprehensive school than in the upper secondary school.

30% of the pupils and students had studied the making of video programmes during

the term preceding the interview or were doing so at the time. This was most common among boys at secondary school. Similarly, 27% of the respondents had studied the production of a newspaper and 7% the making of radio programmes. The primary school pupils had studied communications the most. Only 1% of the school population had been introduced to the use of a mobile phone at school.

Experiences of the teaching of the use of computers were all in all fairly positive. The respondents were satisfied with it whenever it had been arranged. There were 18% of the pupils, however, who had never received any such instruction. Of those who had done so, 40% rated its quality as either excellent or good, almost one pupil in three perceived the quality as average, while one in ten was dissatisfied. The most critical were the boys and the upper secondary school pupils. 2% of the pupils did not dare to comment on the quality of the teaching at all. The number of girls who had not received any instruction in the use of computers was one third greater than that of boys. Could this be attributable to sex-specific subject preferences and interests?

4.4. Information technology skills and their acquisition

The replies received from 55% of the students proved that they had acquired their computer and modem skills from outside the school. Learning these skills at home independently, with friends or in special computer clubs was nevertheless much more common among the boys than among the girls, who made up 63% of those who had learned it at school. Where girls had learned these skills outside the school, it had usually been at home, with the help of other family

members. It would seem that the boys begin to use computers actively in their leisure time at an earlier stage and that this is more extensive in nature, so that their acquisition of the basic skills is less attributable to the instruction given at school.

In addition to the prevailing cultural differences between the sexes, the above may be regarded as one reason for the boys usually possessing a considerably more positive picture of their computer skills and regarding themselves as superior to the girls in this respect. Of all the girls interviewed, as many as 53% regarded their skills as markedly inferior on average to those of the boys in the same class, a trend that gaining in currency as time went by, so that the figure was as high as 77% in the upper secondary school. Only 5% of the boys felt that their computer skills were inferior to those of the girls. Comparison of one's skills with those of others of the same sex produced a very much more even distribution, with approximately two thirds of both sexes viewing their computer and modem skills as being on average just as good as those of the other

representatives of the same sex and age.

The replies to the question 'Should you be able to qualify for a computer driving licence at school?' yielded a fairly even distribution between affirmative and negative opinions, although with 56% of the respondents entirely or somewhat in favour of the idea. No appreciable differences were observed between the sexes in this respect, though the number of the boys entirely in favour exceeded that of the girls who were of this opinion by one third. A total of 5% of the respondents were unable to state their opinion on the matter, the majority of them being pupils of primary school aged over 10 years.

Most of the respondents, a total of 72%, felt that not having a computer available at home did not hamper their studying, whereas approximately one in four, more commonly a girl, considered this to be a slight disadvantage. This was evidently dependent on the level of education of the respondent, for as many as 42% of the upper secondary school students regarded the lack of a home computer as detracting from their studies.

5. Opinions on the threats posed by information technology and the information society

The questions discussed here were asked of all the subjects aged 15–74 years, representing approximately 3.9 million Finns. The replies are analysed below in terms of sex and the age categories 15–30 and over 31 years.

Life-long information technology learning. Only 13% of the respondents disagreed to some extent or completely with the statement that *'The earlier children and young people get a feeling for computers and network connections, the better they will succeed later in life'*. The subjects over 31 years of age more often agreed either completely or almost completely, especially the men.

32% of the respondents disagreed with the statement *'All adults should be given free instruction in the basics of computer use and information network connections'*, with no appreciable differences between the men and women in this respect. Here the respondents aged 15–30 years agreed slightly more often than did those aged over 31 years.

It seems on the basis of these claims that others or outsiders are slightly more worried about the survival of the 'target group' than are the members of the group itself, i.e. persons aged over 31 years about those aged 15–30 years and vice versa.

Lack of confidence in the expertise of sales staff. The respondents found it difficult to comment on the third statement, that *'You can usually trust completely in the expertise of PC sales staff'*, as indicated by the

fact that as many as 22% were unable to give an opinion. 27% of the women did not express an opinion at all, with many more in the age category over 31 years than in the younger category. Persons aged 15–30 were much more convinced of the expertise of sales staff than were those in the higher age category. It is evident that this is also attributable to the fact that younger people have more experience in computer purchases, so that they are also more eager to express their opinions about the matter. 71% of the women and 61% of the men who stated an opinion agreed with the statement either completely or almost completely. It is difficult to say in the absence of any reference data whether the opinions are more favourable than public opinion of ironmongery sales staff, for example, but they are certainly not as high as they could be.

Favouring simplicity and ease of use. Only 12% of the respondents disagreed completely or almost completely with the fourth statement, that *'Computers and information network connections should be as easy to use as TV channels'*, while 4% did not express an opinion at all. Since more than a half of all the age and sex groups fully agreed with the statement, there would apparently be quite a demand for very easy-to-use hardware in Finland.

Opinions of technical innovations. The next set of five statements was used to describe the Finns' basic attitudes towards novelties and innovations, as a general attitude of this kind may contribute to how ra-

pidly and through what 'adoption channels' new appliances enter households.

47% of the respondents aged 15–74 years identified well or fairly well with the statement that *'I am interested in new technology and purchase it according to what I can afford'*. Only slightly over one third of the women completely agreed with it, whereas over a half of the men agreed with it at least fairly well. Of the men aged 15–30 years, almost 71% agreed with the statement, whereas the smallest figure in this respect, 24%, was recorded for women aged over 31 years. The opinions of the young women resembled those of men aged over 31 years.

In the light of the fact that almost 2/3 of the respondents agreed with the statement *'I am interested in social issues and culture more than in electrical appliances and technology'*, it must be assumed that the Finns do not consider themselves technology enthusiasts. A dramatic difference was observed between the women and the men in this respect, however, as over 3/4 of the former felt that the statement applied to them well or fairly well, the women aged 15–30 years resembling those aged over 31 years in this respect more than they did the men. More than 2/3 of the men aged 15–30 years considered that the statement applied to them poorly or fairly poorly.

The next statement, *'I am a do-it-yourself person'*, could well indicate a route by which innovations could enter households. Some 75% people of both sexes recognised that the statement to them applied either completely or fairly well, though the men were more convinced of the matter than the women. Small differences between the age groups were recorded in both sexes, persons aged 15–30 years being slightly less certain of their 'do-it-yourself' skills than the

older ones.

The purpose of the statement *'I only purchase new appliances if my friends and relatives already have them'* was to identify the group of cautious shoppers. Only 18% considered it to apply to them well or fairly well, with no appreciable differences with sex or age. It can thus be assumed that the Finns do not possess any major factor of social conformity in their attitude towards technical appliances of a kind that would be likely to slow down the introduction of innovations.

The fifth statement *'I am satisfied with simple appliances without sophisticated features'* was used to account for a social 'norm' of another type which may contribute to the purchase of technical devices. Some 2/3 of the respondents considered this statement to apply to them well or fairly well, the figures being over 70% for women and 60% for men. Where more than 70% of the women aged over 31 years were of this opinion, the proportion among men aged 15–30 years was less than half.

It can be concluded from the above that the Finns do not have any strong faith in technology but rather possess a do-it-yourself interest which may also be reflected in their purchases of new equipment. They value simplicity and moderate pricing more than they do advanced performance, a trend backed up by their emphasis on ease of use in the case of computers.

Annoyed by rapid technological progress. The above statements were tested at the beginning of the interview, before the respondent had said anything about his/her personal experiences with using computers. Their experiences and evaluations of information technology will be discussed briefly below. These questions were put after the

respondents had answered those concerned with their use of information and communications technology and their skills in doing this. The approximately 45% of the respondents who had already answered the household questionnaire had in a way had a better introduction to the topic, and this may have affected the replies to some extent.

The first statement, *'I feel I have not been able to keep pace with the progress of modern information technology at all'*, is not in line with the Finns' experiences, for as many as 57% of the respondents disagreed with it entirely or almost entirely. A major difference was observed between the men and women, however, the figures being 61% and 52%, respectively. In addition, the age groups were found to differ notably in terms of their experiences, as the subjects aged 15–30 years did not feel to any appreciable extent that they were unable to keep pace with the progress of information technology. This was true of both sexes.

The purpose of the statement *'They advertise and sell us new equipment even we don't need it'* was to examine the extent to which the Finns are annoyed by the rapid rate at which new equipment become obsolete, a feature typical of modern technological devices. A total of 62% agreed with this entirely or almost entirely, with no appreciable differences between the sexes. Persons aged 15–30 years (men in particular) did not consider the seemingly excessive promotion of devices as annoying as those aged over 31 years did.

The statement that *'New technologies do not help me to save money or time'* elicited agreement from 54% of the respondents; 57% of the women and 50% of the men. By far the majority of the men aged 10–30 years, 60%, disagreed either completely or

almost completely, while the figure for women of the same age was 47%. Young people felt that information technology helped them to save time and money.

No faith in the effect on employment.

Less than a third of the respondents completely or almost completely agreed with the statement *'I simply do not have enough time to learn about the latest information technology'*, with a mere 4% difference between the sexes. Women aged 15–30 years reported being busy with other things as the major obstacle to learning about information technology, so that 40% of them agreed with the statement entirely or almost entirely.

Opinions to the effect that modern information technology will not have a marked impact on employment have been taken up in public discussion. The statement *'Modern information technology will increase the number of jobs available'* met with agreement from only 26% of the respondents, while 7% of whom would not comment on it at all. The men showed faith in the statement slightly more often than the women did (a 4% margin). Only approximately one third of the persons aged 15–30 years believed that information technology would increase the number jobs.

The statement *'An interest in modern information technology at home does not help me to cope at work'* was introduced in order to examine the respondents' opinions of their own activity in this field. Since only 25% of the respondents agreed with the statement completely or almost completely, the Finns seem to be quite unanimous about the potential for their interest in information technology to benefit their work. This opinion was stated by as many as 87% of the persons aged 15–30 years, and by the women

slightly more often on average than the men.

Satisfied with the current number of TV channels. The following two statements were used to examine the extent to which the respondents follow entertainment programmes and how they experience the present flow of information. As many as 58% of the respondents agreed completely and 13% almost completely with the statement *'The current three national TV channels are quite enough for me'*. There were major differences of opinion between the sexes and age groups on this matter, however, for where some 40% of the men aged 15–30 years agreed with the statement, the figure was as much as 85% for women aged over 31 years. This suggests that many of the new digital TV channels cannot be expected to attract a very large number of viewers in the near future.

Not afraid of the flood of information. 65% of the respondents agreed entirely with the statement *'I am not bothered about the present flood of information'* and 23% almost entirely. The extensive public debate on this matter, even claiming that it is a threat to the identity of the individual, proved to be something of a fabrication of the media when looked at in the light of the Finns' experiences in general. Perhaps the largest group to be affected by the flood of information was that of women aged over 31 years, 14% of whom disagreed with the statement entirely or almost entirely. It can be estimated in absolute terms that there are some 120,000 persons in Finland who are really bothered by this aspect of modern life. Is this a group for which special provision should be made as we move into the information society?

The telephone still important. The last two sections of this set of statements were concerned with preferences in the use of communications media and the possible avoidance of advanced technology. As many as 69% of the respondents fully agreed with the statement *'I'd rather use the phone than write a letter or use an information network'* and 20% almost entirely agreed with it. This may be taken to suggest that the Finns regard the telephone as an integral part of their daily lives, though a weak signal of change may be seen in the fact that 16% of the women and 12% of the men aged 15–30 years disagreed with the statement completely or almost completely. The results mean that if the information society wishes to provide services for the elderly population, it should rely on the telephone as the primary medium. It is impossible to state on the basis of the replies whether the respondents feel that their calls should be answered live rather than by an answering machine.

The statement *'Some people avoid learning to use modern information technology even though they have access to the necessary equipment'* elicited complete or almost complete agreement from 71% of the respondents. This implies that the respondents personally behave in this manner or that they know that their colleagues, relatives or friends do so. As many as 13% would not comment on the statement at all, the number being still greater in the age group over 31 years, whereas those aged 15–30 years were more prone to believe it.

Realistic impressions. It can be stated on the basis of these replies that the Finns seem to have quite a realistic impression of modern information technology and that

some of their concerns and development demands expressed in the media are not in line with general opinion. This may be due to the fact that the issues concerned are new and the respondents have no real experience of them, or that the media simply turn cer-

tain issues into problems. As stated above, the majority of these questions were asked at the end of the interview, so that the respondents may perhaps be assumed to have given them more careful 'thought' than usual.

6. Finns' opinions of the registration of personal data and the protection of privacy

Risto Heinonen

The essential criteria for assessing the success of measures to ensure the protection of privacy with respect to official data registers are the opinions of the parties involved in the registration process, i.e. those who maintain the registers and above all those who are registered. An important tool from the point of view of this protection is provided by the relevant legislation. Any assessment of the extent to which this legislation corresponds to the values and opinions of the persons registered with regard to protection of their data privacy and of the direction in which this should be developed requires information on what the citizens think about existing safeguards, i.e. whether they consider them sufficient or insufficient and how they would like them to be developed. Their opinions should also serve as an aid to practical application of the legislation.

Little is known of the Finns' attitudes and opinions regarding the protection of privacy in the context of modern information technology. The way in which they perceive registration and use of their personal data will be discussed below. The interpretation has been simplified here by combining the proportions of respondents who fully and or partly agree/disagree with each of the statements. The results suggest that sex does not play any appreciable role in the relevant attitudes, but age does in some cases.

The authorities have the right to collect information for supervision purposes. An essential dividing line from the point of

view of the protection of privacy is the way in which people perceive the collection and use of personal data by the authorities. The results indicate that the respondents are in fact divided over this, so that just a half of them do not approve the statement that this data collection would endanger their privacy. The youngest age groups in particular and persons who believe in modern information technology and use it actively seem to trust the authorities' register better than the other groups. The replies obtained represent the intermediate range on the evaluation scale, indicating that respondents tend to avoid expressing any extreme opinions.

Even those who regarding registration as interfering with their privacy do not question its necessity for certain justifiable purposes, as indicated by the fact that the majority of respondents, 88%, were not bothered by the general flow of registration and other data nor do they feel that this interfered with their privacy.

A large majority of the respondents, 86%, evidently feel that information technology and registers should be used for investigating crimes, corruption and other such issues even if this were to increase the level of general supervision.

This reflects a major dividing line as far as the protection of privacy is concerned, a point at which supervision takes precedence over privacy. Given this situation, the authorities would be entitled to infringe a citizen's privacy even if he were leading a respectable life. He could no longer ensure privacy by his

own means and yet he would be obliged to accept increased supervision.

The use of information technology and personal data files for the prevention of corruption, even at the expense of data privacy, is supported still more strongly (87%) by those who trust in modern technology, the younger age groups in particular. This suggests that the younger generation do not experience fears of the 'Big Brother' kind.

It is evident that even if new technologies and personal data files may be considered questionable in principle from the point of view of privacy, attitudes are bound to change as such records are perceived as a means of performing certain concrete tasks, for example. Similar results have also been obtained in a survey carried out in Denmark.

People want know about things and influence them. Although people do not seem to be worried about the recording and utilisation of their personal data, they are keen to know the types of information that are being collected. More than half of the respondents (58%) reported that they are interested in knowing what information is compiled on their movements within information networks and the transactions that they carry out via these.

Although young people are on average less concerned about data privacy, they are more than usually interested in knowing about the registers that are kept and the use that is made of their personal data. The fact that the older age groups are less interested in the data recorded in information networks may be attributable to the fact that they make little use of such networks.

A clear majority of the respondents not only wished to be aware of the registration of their personal data but also wanted to be

able to influence the use made of them, for as many as 76% felt that the authorities should not make decisions regarding them on the basis of register data alone but should also listen to their opinions.

The respondents thus seem to accept registration, supervision and interference with privacy, provided that they are personally allowed to influence the process. The fact that most of them considered this matter important and that it is of relevance to most of them was suggested by the 'radical' nature of their opinions, which were not even affected by age or attitudes towards modern information technology.

The replies suggest that although data protection is not generally considered important, the opportunity to be informed of the compilation of registers and to influence the process is. As people are not concerned so much about privacy, they regard the current opportunities to influence these matters sufficient. If they were to feel differently about this, they would surely consider the role of data privacy more important and be more concerned about it.

Not worried about privacy in information networks. People do not generally perceive information networks as a threat to privacy, a situation which may partly be attributable to the fact that most of the respondents were unfamiliar with the Internet, for example. It should be noted, however, that the items of information that circulate in the networks do arouse suspicion, as indicated by the fact that 39% of the respondents had more confidence in newspapers or the TV and 33% less confidence, while the rest did not comment the statement at all. The latter was true of the older age groups in particular, possibly due to their lack of knowledge of net-

works and failure to relate them and the data available from them to their prevailing situation in life or to the question of personal privacy. 54% of the respondents aged over 65 years did not comment on this matter at all.

High levels of suspicion of network data were reported both by those who did not use network services at all and by those who did use them. Persons who use information services and the Internet are usually aware of the elements of uncertainty involved in them and their data, and thus evidently do not trust the information they obtain.

Electronic transactions not a threat to data protection. Citizens seem to have complete trust in various electronic cards and their security when using administrative, banking and other services. In fact, as many as 75% feel that there is no reason to avoid the use of bank cards or credit cards for reasons of privacy. This confidence can also be extended to cover information technology in general. Confidence in smart cards and the like tends to be greater in the younger age groups who have grown up in a plastic card society, whereas the oldest age groups view the use of these with suspicion. It seems that at least the attitudes of the general public will not constitute a barrier to the introduction of smart cards.

The replies obtained allow a variety of interpretations. Smart cards are being used, and people trusted in their security all the more as they become more familiar with their use. This would seem to suggest that those who lack faith in their security do not use them at all. Although not indicated by the results directly, the absoluteness of this faith may suggest that people are not familiar with all the security properties built into smart card technology.

The results also imply that although people do not trust in the information derived from data networks, they do trust network services. Thus 34% of the respondents considered e-mail, for example, just as safe as ordinary mail, but 29% regarded it as poorer. An interesting finding is that even persons who do not use e-mail feel that the information communicated through it is fairly well protected.

E-mail services are obviously not known very well or very widely, as a large number of people had no opinion on their reliability. Young people, who are the most active users, trust the system more than do older people. It should be noted, however, that e-mail is not important from the point of view of confidentiality, for a person does not have to use it if he does not trust in its security.

The use of information networks, modern information technology and electronic transactions seems to be spreading through everyday technological applications such as bank cards, the users of which trust the network and its services, such as e-mail, more than do people who do not use cards.

Not everyone regards their social security number as a threat to privacy. The respondents can be divided into two groups on the basis of their responses to the statement that they are too often asked for social security number. The issue is evidently a familiar one and thus easy to comment on. It should be noted here that the youngest age groups (aged under 25 years) do not hesitate to give their social security number or to use it, as indicated by the fact that 57% of them did not accept the statement, i.e. they do not regard use of their social security number as an infringement of their privacy.

It is apparent that people are largely un-

familiar with the uses that can be made of social security numbers, e.g. as a key for combining data from different registers, nor are they presumably aware of the data privacy risks involved.

The respondents similarly regarded the fact that their own telephone number could be detected by the receiver of the call as interfering with their privacy only to a minor extent. The majority (82%) were not bothered by this at all, even when there was no arguable need for displaying the number of the caller at all. Many people in any case do not perceive this as a data privacy issue, and again it is the younger age groups that are leading the way.

Privacy is not a problem particular to the information society. Data privacy is not regarded today as problem when moving in information highways, and the majority of the respondents (70%) felt that an honest citizen had no cause for alarm on this account. As many as 75% of the youngest respondents (aged under 25 years) were of this opinion, and were also prepared to maintain that a person can prevent threats to his data privacy through his own actions, i.e. by leading a respectable life. It is uncertain whether the implication here is that dishonest people have every reason to be afraid of the danger of a loss of privacy.

The younger age groups in particular trust in information technology, use it actively and are not worried about data registers or their use for supervision purposes. How will the role of data protection measures change in time? Will the attitudes of the young people change with age and experience, or will the general attitude come to resemble that of our present young people? The survey results are unable to provide an answer

to this question of major importance for the role of data protection in the 21st century.

Although the questions employed here were quite restricted in nature and the replies contained much that was a matter of interpretation, three features that are essential from the point of view of data protection and its development can be identified. The replies emphasised differences between groups that have contrasting outlooks on life with regard to their attitudes towards registers containing their personal data and the data protection in general. It can be concluded as a generalisation that forward-looking young people and those engaged in using information technology are the ones who are most inclined to accept the recording, combination and utilisation of personal data for supervision purposes, for example. Old people who look to the past and persons who tend to avoid information technology, on the other hand, will emphasise data privacy as a virtue in itself that is threatened by all forms of acquisition and use of information. Young people who feel that they are masters over their cognitive lives are not worried about the data protection at all.

Another essential feature reflected in the responses was that it is impossible to define any absolute form of protection for data, and that it is difficult to pinpoint exactly how given forms of recording and use of data will infringing upon data privacy, for what person perceives as an insult to his privacy may be completely meaningless to another. There are in fact a number of forms of register that contain personal data that many people do not even regard as falling under the scope of data protection at all.

The third important, unanimous outcome was that people consider it important that they should be aware of the registers in

which their personal data are recorded and that they should be given a chance to influence the process. This means that they

accept the registers as such and the use of data for supervision purposes, provided that they can be personally involved.

7. Summary and conclusions

The aim of this survey was to assess the types of communications and information technology available in households and the extent to which the Finns make use of these at home, at work and at school. Attention was also paid to their attitudes towards technology, the information society and the data protection of privacy.

The survey took the form of personal interviews conducted in November 1996. Replies were obtained from a total of 2,360 persons aged 10–74 years representing 1,080 households. The interviews were based on an extensive sample covering the entire country and the results were adjusted to apply to all inhabitants by using non-response and correction coefficients. The admittedly high costs of collecting this material and reporting on the results were covered by a number of ministries and teleoperators.

The information society can be regarded as something that is emerging or developing in our midst. The content and role attached to it would seem to vary from one writer or speaker to another, though an essential point would seem to be that it is often considered to involve the adoption and mastery of new instrumental skills. The aim is that a maximally large number of Finns should adopt these skills, which in turn requires that they should consider the new information and communications technology useful for their own activities and work.

As all this involves an extensive innovation diffusion process, one should take into consideration basic population features which contribute to a background effect. The number of small, ageing households comprising one or two persons will increase quite rapidly in the next couple of decades, with

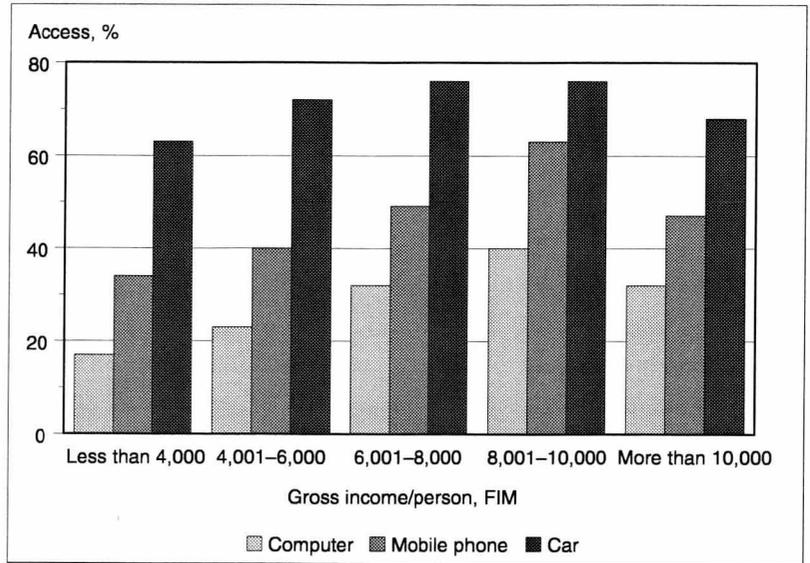
the consequences that an increasingly smaller number of persons will be available in each household to perceive and learn the use of new facilities, and more of these devices will be required to guarantee good accessibility for the whole population.

It should be noted when planning the focus of information networks and other services that pensioners constitute the major target group for a number of services, so that their information handling capabilities should in fact determine the types of 'user interface' through which these services are offered. It may not be a very far-fetched analogy to state that all citizens should have access to public services, at least, irrespective of their communications and information technology skills, in the same way as all disabled people should have access to public buildings.

The information society skills of future pensioners will largely be those of the working-age people of today, for the majority of these skills can be preserved and maintained into retirement age. The size and age structures of the country's households can be regarded as factors of importance from the point of view of progress towards the information society.

Communications and information technology seem to enter households through families, so that mobile phones and computers with their peripherals are most common in households comprising three or four persons. The number of devices owned is also increased by a good income level, and a further reason for purchasing computer equipment is for use by the children in the family. Even a mobile phone, however, is not as common in households as a car. It is true, of course, that the car has been an integral

Figure 23. Computers, mobile phones and cars by gross income/person



part of the structure of Finnish society for more than 30 years whereas the mobile phone and home computer are only at the beginning of their life span, having now been on the market for 10 years. The introduction of various machines and appliances as part of our everyday lives through a process in which they start out simply as playthings and ending up being structurally obligatory purchases is well described by Mika Pantzar (1996).

Slightly less than a million households in Finland had a mobile phone in November 1996 and 560,000 a computer. Of the latter, 270,000 had a CD-ROM unit and about 230,000 a modem. As there were some 2.3 million households in Finland at that time, the above technology was available to less than a half of them, whereas 67% had a car. The number of computers and mobile phones was smallest in households located in Northern Karelia, the population and household structure of which may not favour such investments on account of long-term net out-migration.

Of the households with no mobile phone, 19% intended to purchase one, and 15% of those lacking a computer reported similar plans. They were prepared to pay some FIM 9,300 for a computer.

More than half of the Finns make less than 10 calls a week from home in their leisure time, the number being the same for incoming calls. Mobile phone calls were usually shorter than wired calls. As much as 77% of the respondents considered the phone an essential part of the Finnish way of life. Women were more prone to simply 'chat' on the phone than men, whereas the men more often reported that they 'only made a phone call when they had to'. Three Finns out of four evidently find it easy to phone a stranger. Young people were more likely to use the phone to keep in touch with friends than older people were.

Although the phone seems to be a highly popular means of maintaining contacts at home and in leisure-time, people seldom call the service numbers, either fee-paying and free ones. Directory inquiries was the only

number which more than a half of the respondents had called at least once or twice.

A total of some 1.3 million Finns aged 10–74 years have access to a computer at home, including approximately 650,000 who also have access to a CD-ROM unit and about some 550,000 to a modem.

When examining only those who have the possibility of using different facilities, the following conclusion can be drawn. Analysis of computer use by age and sex confirmed the general belief that men aged 10–30 years use computers and their peripherals by far the most and that their skills as users are the best. Women aged over 31 years made little use of computers, modems or CD-ROM units, although they used the last-mentioned substantially more often than they did a modem.

The respondents' skills in using a keyboard and a mouse were quite good, and only about 10% of the users considering them slow and laborious to use. Women aged over 31 years mastered the use of a keyboard the best. An evident problem, however, is the fact that the programs are usually available only in English. Only one fourth of the users did not consider this a difficulty, whereas some 40% of them felt that it was a serious problem. It is evident that measures should be taken to improve the situation by other means than simply increasing the teaching of English if the aim is to promote the use of computers to any appreciable extent. Most of the respondents felt that the guidance and support received from other people was an important aid to learning to use a computer. Women aged 10–30 years often possessed the poorest skills at using computer programs. The network services offered by libraries have rapidly reached an extensive target group, as indicated by the

fact that 16% of the respondents aged 10–74 years had used them during the past 6 months, the women being as active as the men in this respect.

E-mail systems have not yet become as popular as the telephone at workplaces, though approximately one fifth of the respondents used it more than the phone. Persons aged over 31 years read their e-mail most often. The Internet is beginning to redeem the expectations set for it, for as many as 40% of those who used an Internet browser at work or for study purposes frequently used it for data search.

Approximately 200,000 Finns regarded full-time or part-time distance work as a realistic alternative in their occupation, and an equal number though it possible for short periods of time if special arrangements could be made. The results also indicated that some 200,000 Finns would be willing to do distance work, while some 18,000–30,000 regarded themselves as doing this on a full-time or part-time basis in November 1996.

Finnish pupils were found to have fairly good access to use information technology in schools. The most use was made of information technology in teaching by teachers of Finnish and the second most by teachers of mathematical subjects, excluding specialised computer teaching. Pupils used the computer most for word processing in Finnish lessons in particular, but also for exercises in mathematics and the natural sciences.

It can be stated regarding the Finns' attitudes towards the information society that almost 90% of them feel that the use of computers and network connections should be made as easy as the selection of TV channels. Approximately two out of every three felt that they would be satisfied with simple

equipment without any sophisticated features. The Finns do not feel that they have been overrun by information technology nor do they think that they are prevented from learning it by a shortage of time. Only a fourth of them saw modern information technology as likely to increase the number of jobs available. Most people were not bothered by the current flood of information, and it can be estimated on the basis of the replies that only about 120,000 Finns consider this a personal problem.

Three features that are essential from the point of view of personal privacy and its improvement arise out of the results obtained here. It can be stated as a generalisation that forward-looking young people and those using information technology the most accept the recording of personal data in registers, the combination of these and their utilisation for supervision purposes, for example, whereas old people who look to the past and those who avoid information technology emphasise privacy as a value in itself that is threatened by the computerised recording and use of personal data.

Another feature that manifests itself in the replies is that it is impossible to define any absolute form of protection for data, any more than it is possible to define precisely the manner in which a given form of recording and use of such data might interfere with data privacy. An issue which one person regards as infringing his privacy may not mean a thing to somebody else. There are some forms of recording and use of personal

data which many people do not even consider to fall within the scope of the data protection at all.

The third indisputable finding was that people consider it important that they should be informed of the recording of their personal details in a computer register and that they should be given a chance to influence the process. They thus approve of the use of such data for supervision purposes, for example, provided that they can personally be involved in it.

The next stage of the investigation, which will be completed by the end of 1997, will provide a more detailed analysis of information society capabilities, the use of information technology and the experiences of various sectors of the population regarding its use, with the aim of indicating how serious a problem failure to adopt the necessary information society skills may in fact be. 71% of the respondents felt that some people are reluctant to learn to use modern information technology even if they have access to the necessary equipment. It seems on the basis of the present results that writing-based technical devices seem to discriminate between people both in households and at places of work more than do speech-based ones. Another reason for failure to adopt the necessary skills may be a lack of financial resources. The roles of these factors in the dissemination of modern information technology will be discussed in more detail in the next report.

Sources

Korpela Juhani: Paper presented at the Tutkas Seminar at the Finnish Parliament on 19.4.1995. (In Finnish only)

Koulutuksen ja tutkimuksen tietostrategia. (A Strategy for Education and Research in the Information Society.) Ministry of Education. Helsinki 1995. (In Finnish only)

Kuusela Vesa (1997): *Puhelinpeittävyys ja puhelimella tavoitettavuus Suomessa.* (Telephone Coverage and Accessibility by Telephone in Finland.) Reviews 1997/1. Statistics Finland. Helsinki. (In Finnish only)

Nurmela Juha (1996): *Kotitaloudet ja energia 2015.* (Households and energy in 2015). Research Reports 216. Statistics Finland. Helsinki. (In Finnish only)

On the Road to the Finnish Information Society. Statistics Finland. Helsinki 1997.

Pantzar Mika (1996): *Kuinka teknologia kesytetään.* (How can technology be tamed?) Hämeenlinna. (In Finnish only)

Suomi tietoyhteiskunnaksi – Kansalliset linjaukset. (Finland's way to the Information Society – a national strategy.) Helsinki 1994. Ministry of Finance. Helsinki 1994. (In Finnish only)

The topics of the questions asked in the survey are presented below in order of their occurrence in the questionnaire. This commenced with the household section, the purpose of which was to assess the types of equipment acquired for households, the times and reasons for their purchase and future intentions regarding such purchases. After this was the personal section.

Photocopies of translations of all questions are available (subject to charge). Please contact the author (juha.nurmela@stat.fi). Total number of questions is about 400.

Household section

- AS1–AS7: Family structure, basic background information and distance from services**
- A1–A22: TV, video and accessories**
The purpose was to assess the number of appliances, their purchase times and the reasons for their purchase, or for not purchasing them. Purchase times were also used to trace the diffusion of new products in the various population categories, and the ‘Why not purchased?’ questions to identifying any fears associated with modern technology.
- B1–B3: Telephones, mobile phones and answering machines**
Criteria as above.
- C1–C36: Computers, peripherals and software.**
Criteria as above. There was also a question on why the respondent did not have a computer.
- D1–F5: Radio, music, photography, audiovisual and writing hobbies, estimated in numbers**
- H1–H5: Use of the computers and mobile phones among persons aged under 10 years**
To be asked of the persons replying to the questions on equipment in general – not of the children themselves.

The household section ends with a question on incomes and the sum of money available monthly for fairly free consumption.

Personal section

- TH1–TH12: Place of work, occupation and education**
- TH13–TH16: Parents' education and occupation**
Also asked of persons aged 10–22 years.
- TU1–TU4: Outlook on the future**
These questions were intended to elicit the respondents' attitudes towards the future.
- GH1a–GH2e, TH17, TH18: Friends and attitude towards innovations**
The purpose was to examine the diffusion of innovations.
- HH1–HH25: Information society at school**
The aim was to ask pupils how much use is really made of computers at school.
- AH1–AH18: Use of the telephone**
The questions covered both conventional phones and mobile phones. Of special interest for this research were the questions regarding interaction. The same structure was also used to ask about telephone calls made from the respondent's workplace.
- AH19–AH34: Use of telephones and accessories/services, skills required**
- AH19–AH21: New types of question regarding use of the telephone, approached from the point of view of the respondent's way of life**
- AH35–AH57: Telephones and e-mail at places of work**
The openness of the e-mail systems at places of work is usually a highly interesting feature, as is the use of the Internet at work.
- BH1–BH22: Use of computers and network connections at home and in leisure time**
- BH12–BH16: Distance work**
No exact information is available on the number of persons engaged in distance work. An attempt was made here to examine this by means of questions on the applicability of the concept to the respondent's own work and his personal interest in working in this way.
- BH23–BH40: Computers at work and mastery of their use**
This section included questions aimed at examining the extent to which the Finns master basic computer skills. There was also a question providing information on the type of person from whom the respondent had received guidance and hints on using computers.

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- CH1–CH4: Use of bank cards, etc.**
The most interesting question here was concerned with why the respondent did not have a bank card.
- DH1–DH15: Ways of using TV, a video recorder and teletext facilities**
Not all of these were asked of computer users, but the idea was rather to find out the number of persons possessing skills that could be of use in starting to use a computer.
- DH16–DH28: Hobbies and personal privacy**
The questions were intended to provide information on what else people do apart from watching TV and using computers. Some questions were also concerned with the respondents' opinions on privacy with regard to use of personal data.
- FH1–FH18: Opinions about the prices of telephone calls**
Free competition has increased interest in the Finns' awareness of the price of telephone calls. The essential thing here was the respondents' images of the size of their telephone bill or the prices of the various services, as these contribute to telephone behaviour.
- GH3a–j: Attitudes towards changes**
The interview ended with a set of attitudinal statements aimed at examining the respondents' attitudes towards change.

KATSAUKSIA – ÖVERSIKTER – REVIEWS

Leena Timonen

Energiatilastojen kehittämisohjelma:
Tarveselvitys. 1996/1.

Pekka Rytönen

Konsernirekisterihanke
– yleissuunnitteluvaiheen raportti. 1996/2.

Vesa Kuusela

Puhelintehtävyys ja puhelimella tavoitettavuus Suomessa. 1997/1

Timo Byckling (toim.)

Tilastokeskuksen tutkimustoiminnan päälinjat vuosina 1997–1999. 1997/2.

Minna Hänninen

Tilastolliset tietosuojamenetelmät ja niiden käyttö. 1997/3.

Pekka Lith

Konsernirekisterihanke
Pilottirekisterivaiheen raportti. 1997/4.

Pirkko Hemmilä, Matti Kauhanen

Julkisten menojen hintaindeksi 1995 = 100. 1997/5.

Timo Byckling (ed.)

Statistics Finland:
Main Lines of Research and Development in 1997–1999. 1997/6.

Juha Nurmela

Suomalaiset ja uusi tietotekniikka. 1997/7.

Mia Suokko (toim.)

Energia-alan työllisyysvaikutukset. 1997/8.

Anita Heinonen

Yritysrekisterin kehittämisprojekti
– yleissuunnitteluvaiheen raportti. 1997/9.

Anita Heinonen

Yritysrekisterin kehittämisprojekti
– suunnitteluvaiheen 1. osaraportti. 1997/10.

Risto Lehtonen (toim.)

Taloushistorian tutkimusta ennen ja nyt –
100 vuotta Tekla Hultinin väitöksestä
Kooste 12.12.1996 pidetyn Tilastokeskuksen tiedeseminaarin aineistosta.
1997/11.

Juha Nurmela

The Finns and Modern Information Technology.

Report 1 of the project "The Finns and the Future Information Society".
1997/12.

Lea Parjo

Tietoyhteiskuntatilastojen kehittäminen

– Projektin loppuraportti. 1997/13.

Jukka Hoffrén

Luonnonvarojen käytön verotus

Tarpeiden ja vaikutusten arviointia. 1997/14.

Pekka Lith

Konsernirekisterihanke

Perustamisvaiheen raportti. 1997/15.

KATSAUKSIA

The Finns and modern information technology

The report provides data on the extent to which Finnish households were making use of modern information technology in November 1996, to use being made of E-mail at workplaces and the respondents' opinions on distance work. A separate chapter is devoted to the comprehensive schools and upper secondary schools as links in the chain involved in creating the information society, and finally, a survey is made of the Finns' attitudes to the information society and the data protection.

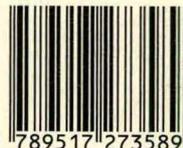
The data were collected by interviews with 2,360 persons representing 1,080 households.

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ISSN 1239-3800
ISBN 951-727-358-4



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