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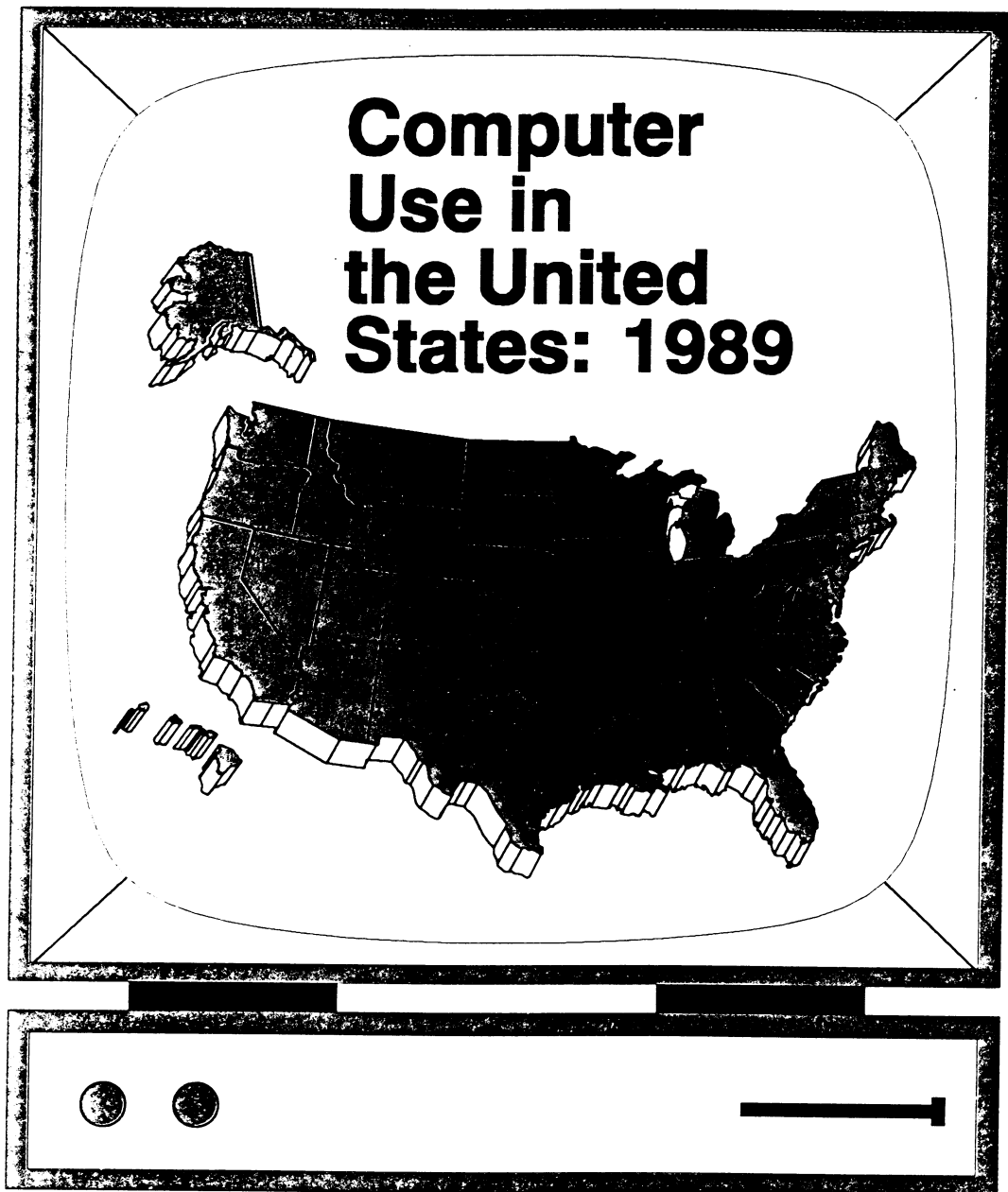


CURRENT POPULATION REPORTS

**Special Studies**

Series P-23, No. 171

by  
Robert Kominski



U.S. Department of Commerce  
BUREAU OF THE CENSUS

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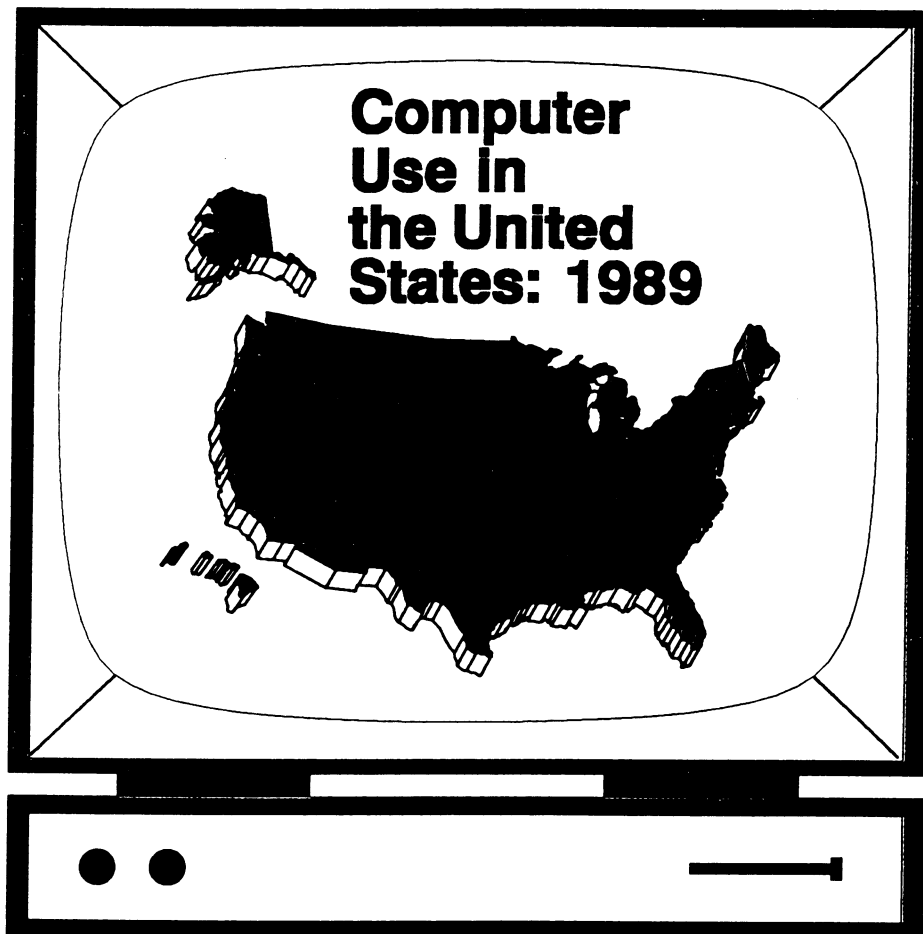
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**Special Studies**

Series P-23, No. 171

Issued February 1991

by  
Robert Kominski



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# Computer Use in the United States: 1989

## HIGHLIGHTS

(Figures in parentheses denote 90 percent confidence intervals. For details of calculation and interpretation, see Appendix B, Source and Reliability of Estimates.)

- Between 1984 and 1989, there was a substantial increase in the levels of computer ownership and use in the United States.
- In October 1989, 13,683,000, or 15.0 ( $\pm$ .3) percent of all U.S. households reported they had a computer; this is a significant increase from the 8.2 ( $\pm$ .2) percent who reported ownership in 1984.
- Among children 3 to 17 years old, 24,216,000, or 46 ( $\pm$ .6) percent used a computer either at home or at school (some in both places). This was a significant rise from the level of 30.2 ( $\pm$ .5) percent in 1984.
- For children in school, access to computers rose to 46 ( $\pm$ .6) percent in 1989, up from 28 ( $\pm$ .5) percent in 1984.
- About 50,668,000 persons aged 18 and over, 28.1 ( $\pm$ .5) percent of the adult population, reported they use a computer either at home, at work, or at school (or some combination). This was a significant increase from the level of 18.3 ( $\pm$ .5) percent in 1984.
- Of the over 115 million employed adults, 36.8 ( $\pm$ .4) percent said they used a computer at work. This is a significant increase from the 24.6 ( $\pm$ .3) percent reported in 1984.
- By the fall of 1989, computers were a part of many lives: of the 232,790,000 persons aged 3 and over, 74,884,000 (32.2 ( $\pm$ .3) percent) reported using a computer in some way.

## INTRODUCTION

Nearly 10 years after their introduction, small "personal" computers are now an established part of many lives. At work, at school, and at home, the computer is a basic tool that many of us use daily. In October 1984, a series of questions was administered in the context of the Current Population Survey (CPS) to assess the level of use and ownership of computers. The report based on that survey, *Computer Use in the United States:*

*1984*, Series P-23, No. 155, established that even then a significant proportion of homes had computers, and that many individuals used computers in the workplace or at school.

This report is based on a similar set of questions asked as part of the October 1989 CPS. The 5 years that have passed since the original (1984) study have witnessed a wide array of changes in computing hardware, software, and applications. While this report cannot begin to fully describe the multitude of ways that computers affect our lives, it does provide some basic estimates of the levels and kinds of uses of computers in the Nation today.

The tabulations in this report are produced from data collected in the October 1989 CPS. The CPS, a monthly survey of the U.S. civilian noninstitutional population, is designed to provide estimates of the labor force and employment conditions in the Nation. In some months, additional questions are asked on special topics; in October 1989, the National Center for Education Statistics sponsored the inclusion of a series of items on computers. These questions concerned the availability of computers to persons at home and the use of computers when one was present at home, work, or school. Computers may be of any type or size, but it is reasonable to assume that most home use is of the smaller home, or personal, computers ("PC's"). Further information about the survey and the specific questions asked is provided in Appendix A, Survey Definitions and Explanations.

## SUMMARY OF NATIONAL ESTIMATES

Computers may be used in any of several different settings. For children, use is possible both at home and in school, while adults may also use a computer at work. The different tables in this report provide information that touch on each of these domains. For example, table 1 shows the number of households that had computers. In October 1989, 13,683,000, or 15.0 percent, of all U.S. households reported that they had a computer; this was a significant increase from the

6,980,000 (8.2 percent) households who reported ownership in 1984.<sup>1</sup> About 29 percent of the computers had been bought in 1988 or the first 10 months of 1989 (since the survey was administered in October of that year). Ownership of a computer was most likely (45.6 percent) in households with yearly incomes of \$75,000 or more; only 4.8 percent of households with income below \$15,000 owned a computer. Households with school-age children were more than twice as likely as those without to have a computer (25.7 vs. 11.4 percent). Comparison of household estimates with those obtained in 1984 indicate that computer ownership rose in general across many segments of the society.

The past few years have not only witnessed a rise in the number of computers, but an increasing number of applications for these machines as well. Some of these applications require additional components for computers. Respondents were read a short list of "hardware components" (see question 46, appendix C) and were asked to identify which of them their home computer had. Table A shows the distribution of these additional components of home computers. Many persons reported that they had either a floppy or hard disk attached to their computer. Since these mechanisms are the primary means for storing and retrieving data, these large proportions seem reasonable. Many persons also reported having a dot-matrix or laser printer for producing output. Laser printers are newer and costlier, relative to dot-matrix technology, and the number of each reported (1.6 million lasers vs. 7.8 million dot-matrix) reflect this. A large number of computers also had a color monitor and many had a joystick or mouse control. While both of these peripherals have many possible applications, both are commonly used with many computer games. In short, this list of peripherals helps to illustrate the point that home computers are used for a wide array of applications.

A different way to look at computer use is in terms of the numbers of persons who use them. The other tables of this report concentrate on use in this context, with separate tables about children and adults. The results are briefly summarized here. Table 2 shows that 24,216,000, or 46 percent, of children aged 3 to 17 used a computer either at home or school (some in both places). At home, 24.2 percent had a computer available, and 71.1 percent of these children used it. In school, 46 percent of the 47.1 million students enrolled were reported to use a computer. (The survey did not assess the number of students with a school computer available, but simply the number who used one at school.) Both the school and home estimates indicate that access to computers for children was substantially greater than in 1984 (as

<sup>1</sup>About 3.3 percent of the households did not respond to the survey items about computers. This nonresponse has not been removed by imputation; percentages in this report exclude nonresponse.

**Table A. Hardware Components of Home Computers**

(Numbers in thousands)

| Component                   | Number | Percent |
|-----------------------------|--------|---------|
| All computers.....          | 13,683 | 100.0   |
| Floppy disk drive.....      | 10,137 | 74.1    |
| Hard disk drive.....        | 5,613  | 41.0    |
| Telephone modem.....        | 3,149  | 23.0    |
| Laser printer.....          | 1,571  | 11.5    |
| Dot matrix printer.....     | 7,812  | 57.1    |
| Joystick/mouse control..... | 6,681  | 48.8    |
| Color monitor.....          | 6,962  | 50.9    |
| Plotter.....                | 719    | 5.3     |
| Don't know.....             | 1,127  | 8.2     |

shown in table B), when 15.3 percent of children had at home, 28 percent had access at school, and 30.2 percent had access in either or both of these places.

Table 4 shows similar access and use data for adults. About 50,668,000 persons aged 18 and over, 28.1 percent of the adult population, reported that they used a computer somewhere, either at home, at work, or at school (or some combination) in 1989. This is up from the 18.3 percent reported in 1984 (as shown in table B). Over 29 million adults (17.3 percent) had a computer at home (compared with 9.1 percent in 1984), and of those, 58.4 percent said they used it. Among the over 115 million employed adults, 36.8 percent said they used a computer on the job, and 43.6 percent of the 14.4 million adults enrolled in school said they used one there; both of these levels represent significant increases from the 1984 levels of 24.6 and 30.8, respectively. Of the 232,790,000 persons aged 3 or above, 74,884,000—nearly one-third of the population—said they used a computer in some way. As with ownership, the 1989 estimates indicate a continuing large-scale general increase in the use of computers since 1984.

## ACCESS AND USE BY CHILDREN

About 24.2 percent of all children 3 to 17 years of age had access to a computer at home, and of these, 71.1 percent used the machine; this was a sizable increase over the 15.3 percent who had access at home in 1984. Of course, access and use continue to vary depending upon other life circumstances and situations, much as was true in 1984.

Columns 2 and 3 of table 2 show the number and percent of children of various characteristics who had access to a computer at home. In terms of age, for example, access was more likely for children 13 to 17 years old (27.7 percent) than for children 3 to 7 (17.3). Overall, home access ranged between 16.8 and 31.5 percent for persons between 3 and 17 years of age.

As in 1984, White children were more likely to have a computer at home (26.7 percent) than Black children (10.6 percent), but Whites were not statistically different

from children of other races in their level of access (28.1 percent). Hispanic children were still far less likely to have a computer at home than non-Hispanic children (9.6 vs. 25.9 percent). Boys were also still more likely to have a computer at home than were girls (25.2 percent vs. 23.1).

Regional differences first noted in 1984 continued to exist; 30.4 percent of children in the Northeast had a computer at home, as opposed to only 20.6 percent of the children in the South.

There also continued to be a strong relationship between the educational attainment of the family householder and the presence of a computer. While just 3.6 percent of children in households where the householder had 0 to 8 years of schooling had a computer, nearly half (48.6 percent) of the children in households where the householder had 4 or more years of college had a computer available to them. A similarly strong relationship is seen with family income; just 6.5 percent of children in households with income under \$10,000 had a computer, but 62.8 percent of those living in households with income above \$75,000 had one. Also as in 1984, children of householders in managerial and professional positions were the most likely to have a computer at home (45.4 percent).

While the general trend was that of increasing access to computers, many differentials across groups remained in 1989. Some of these differences are apparent in usage levels as well. Columns 4 and 5 of table 2 show the use of computers by children who had one at home. Overall, 71.1 percent of children with computers at home were reported to use them; this is a slight decrease from 1984, when 74.2 percent of children with a computer at home said they used it.

Among age groups, use was relatively low among the very young (43.4 percent for persons 3 to 5), but ranged between 62.8 and 81.8 percent for all other ages. Rates

of use were higher for Whites than Blacks, but children of other races were not significantly different than either Whites or Blacks. This pattern is different from 1984, when White and Black levels were about the same. As in 1984, however, there was no difference between Hispanics and non-Hispanics in their levels of use. Gender differences, with higher rates for boys, continued to exist in 1989.

As with ownership, use varies strongly with the education of the householder. Children of householders with 4 or more years of college reported usage rates close to 75 percent, while only 53.4 percent of the children of low education householders said they used an available home computer. Similar differences in use were also evident in terms of family income; 56 percent of those in families with less than \$10,000 said they used the computer at home, but 77 percent of those with family incomes of \$75,000 or more said they used their home computer. As in 1984, family income continues to distinguish levels of access to and use of computers.

For many children, exposure to a computer occurs in the classroom. The data indicate that the overall level of access to computers by children at school has risen substantially since 1984, from 28 percent to 46 percent. Columns 9 and 10 of table 2 show the number and percentage of students using computers at school. Of course, the kinds and levels of use at school are varied, and can range from simple drills or amusement exercises, to serious programming activities or computer-assisted instruction. Additionally, as in 1984, there continued to be some differences between social and demographic groups in terms of the level of use.

In terms of age, persons 9 to 12 had school use rates around the 60 percent level, while only 14.4 percent of 3- to 5-year-olds used a computer at school. In general, however, all ages experienced increases in their level of use, with young children (3 to 7) doubling their level of use since 1984 (13.9 to 29.3 percent).

While increases were the apparent norm for all groups, differences still remain; Whites experience significantly higher levels of school use (48.2 percent) than either Blacks (35.1) or persons of other races (43.6), and non-Hispanic persons had higher levels of use (47.0) than Hispanics (37.5). Unlike 1984, however, males and females were not different in their level of computer use in school - 46 percent.

Regional differences in school use still exist in 1989, but the difference in the level of use between the Midwest and South has gone from 12.6 percentage points to 7.9.

Also, as in 1984, school use appears strongly related to both family income and the education of the family householder. These patterns indicate a possible indirect effect of family socioeconomic status on computer use through the kind of schools people choose or have available for their children. Thus, while it might be

**Table B. Levels of Access and Use of Computers: 1984 and 1989**

(In percent)

| Access, use, and age                      | 1984 | 1989  |
|---|------|-------|
| Households with computer .....            | 8.2  | *15.0 |
| 3 to 17 years:                            |      |       |
| Access to a home computer .....           | 15.3 | *24.2 |
| Use home computer <sup>1</sup> .....      | 74.2 | *71.1 |
| Use computer at school <sup>2</sup> ..... | 28.0 | *46.0 |
| Use computer at home or school .....      | 30.2 | *46.0 |
| 18 years and over:                        |      |       |
| Access to a home computer .....           | 9.1  | *17.3 |
| Use home computer <sup>1</sup> .....      | 53.3 | *58.4 |
| Use computer at school <sup>2</sup> ..... | 30.8 | *43.6 |
| Use computer at work <sup>3</sup> .....   | 24.6 | *36.8 |
| Use computer at home, school or work.     | 18.3 | *28.1 |

\*Indicates value is significantly different from 1984.

<sup>1</sup>Of persons with a computer at home.

<sup>2</sup>Of persons enrolled.

<sup>3</sup>Of persons with a job.



expected that within schools equal use across population subgroups is promoted, observed differences in school use may be due to factors outside, or between, schools.

One way of considering the indirect effect of family background as reflected across schools is by looking at differences between public and private schools. Private school generally involves some direct monetary cost on the part of families, as does the acquisition of a computer. Both items (private schools and computers) might be viewed as investments families may make in furthering the education of their children. Consequently, differences in computer access that are cost related also be reflected by the public-private dimension.

Table C shows the level of computer use by school children, distinguished by grade levels and type of school. In general, private school students have consistently higher levels of computer use at home, in school, and in the combination of both places. Differences in home use, however, are much larger than in school use, indicating that public schools may be doing a reasonable job in keeping up with private schools in providing computer resources to students.

The final two columns of table 2 show the overall rates of computer use when both home and school use are jointly considered. In general, 46 percent of all children use computers, either at home or in school. This is a 50-percent increase since 1984, when 30.2 percent of all children were reported to use a computer in one of these two locales. Many of the differences in access and use already noted are echoed in these data. Most notable are the race and Hispanic origin differences, indicating greater overall usage patterns by Whites and non-Hispanic children. A small estimated difference between males and females is not statistically significant. In addition, strong relationships of use with both family income and education of the householder are also present. These relationships may reflect the fact that the ability to afford a home computer is an important force in determining who ultimately uses them.

Table 3 shows the various uses of home computers that were reported by children. The list of uses is somewhat longer than that used in 1984, reflecting the increase in home computer applications in the last 5 years. Despite the longer list, the most frequently identified use was for games (as it was in 1984), given by 84.3 percent of all children. About 40 percent of children said they used the computer at home for school assignments, and 25 percent said they were "learning to use the computer" (down significantly from the 71.4 percent who gave this response in 1984). About one-fourth of all children said they used a computer for word processing; 12 percent reported using it for graphics. Relatively sophisticated applications, such as bulletin boards, spreadsheets, and electronic mail, were only reported by small proportions of children (2.3, 1.3, and .5 percent, respectively.)

Despite the increased presence of computers among children, there does not appear to be a significant change in the proportion using them at home, or what they are used for. Games are a predominant use, along with schoolwork. A sizable minority of children have begun using computers for word processing activities, presumably school reports and the like. Relatively few children use computers for moderately sophisticated activities like programming and electronic communications.

## ACCESS AND USE BY ADULTS

Overall, access and use of computers by adults continued to be somewhat less than that experienced by children; nevertheless, significant proportions of the adult population were using computers in some way in 1989. Tables 4 and 5 detail access and use patterns for persons ages 18 and above, similar to those shown for children in tables 2 and 3. Tables 6 and 7 detail the ways that computers are used by adults in specific occupations and industries.

About 28 percent of the adult population used a computer either at home, at work, or at school in 1989,

**Table C. School and Home Computer Use by Public and Private School Students, Grades K-12: October 1989**

(Numbers in thousands)

| Type of school and grade | All students | Use at school |         | Use at home |         | Use at home and school |         |
|--------------------------|--------------|---------------|---------|-------------|---------|------------------------|---------|
|                          |              | Number        | Percent | Number      | Percent | Number                 | Percent |
| <b>Public school:</b>    |              |               |         |             |         |                        |         |
| All grades .....         | 39,938       | 18,339        | 45.9    | 6,890       | 17.3    | 4,226                  | 10.6    |
| Grades K-4 .....         | 16,697       | 7,239         | 43.4    | 2,140       | 12.8    | 1,402                  | 8.4     |
| Grades 5-8 .....         | 12,474       | 6,805         | 54.6    | 2,509       | 20.1    | 1,695                  | 13.6    |
| Grades 9-12 .....        | 10,767       | 4,295         | 39.9    | 2,241       | 20.8    | 1,129                  | 10.5    |
| <b>Private school:</b>   |              |               |         |             |         |                        |         |
| All grades .....         | 4,068        | 2,028         | 49.9    | 1,140       | 28.0    | 717                    | 17.6    |
| Grades K-4 .....         | 2,100        | 988           | 47.0    | 447         | 21.3    | 264                    | 12.6    |
| Grades 5-8 .....         | 1,213        | 717           | 59.1    | 411         | 33.9    | 296                    | 24.4    |
| Grades 9-12 .....        | 755          | 323           | 42.8    | 282         | 37.4    | 157                    | 20.8    |

up from 18 percent in 1984. Increased use was observed in each of the three domains separately as well as combined. While 17.3 percent of all adults had a computer in their home, this proportion varied considerably with other characteristics. In terms of age, persons 35 to 44 were most likely to have a home computer (26.9 percent), and persons 65 and older were the least likely (4.6 percent). At least part of this may be because the 35- to 44-year-olds are also among those most likely to have children at home.

The probability of having a computer at home was closely associated with both family income and the education of the individual, with 47.2 percent of persons in households with yearly incomes of \$75,000 or more reporting ownership, and 33.7 percent of persons with 4 or more years of college living in a household where a computer was available. Across occupational categories, a computer at home was most likely for persons who held managerial or professional positions (33.2 percent). In terms of regional differences, adults in the South were the least likely to have a computer in their home, just as in 1984.

Not all adults who had a computer in their home actually used it. Overall, 58.4 percent of adults with a home computer reported using it. At least part of the reason for this "nonuse" may be that many home computers are bought for children; higher levels of access in households of with four to five persons as opposed to one to three persons reinforce this point, since these large households also tend to have more children.

Other differences in use among adults are also present in the data. While about two-thirds of persons 25 to 34 years old use an available home computer, only 36 percent of those 65 or older do so. Whites (59.2) had higher rates of use than Blacks (50.6), and Hispanics (54.0) lower rates than persons who were not Hispanic (58.6); neither of these differences existed in 1984. Males (65.2) continued to have higher rates of use than females (51.4), but the difference (13.8 percent) was considerably less than in 1984 (20.3).

As with access, use also increases with the education of the individual; however, unlike access, use is just as likely for persons of the lowest family income category (58.6 percent of those with access) as it is for persons in the highest (60.4 percent). Rates of home use were very high (above 70 percent) among persons who used a computer at work (75.1 percent), had 4 or more years of college (71.2 percent), or who held a managerial or professional position (71.3 percent).

Persons reported a wide variety of uses for their home computers, as detailed in table 5. The most frequent use was word-processing, reported by 61.6 percent of all adults who used a computer at home. Other commonly-reported uses included games (44.1 percent) and household record-keeping (36.2).

One often-speculated use of home computers is the ability to do one's job at home, or to conduct a business from the household. Among persons using a home computer 12.5 percent said they used it to work at home or connect to their computer at work, while 11.4 percent said they used it to run a home-based business. Of the 9.3 million people who said they used a computer at work and also had a computer at home, one-fifth said they used the home computer to do their job. Relatively high levels of use of home computers for work purposes were also reported by persons with 4 or more years of college (17.7 percent), persons in managerial and professional occupations (18.2), and persons employed in manufacturing (18.4) or real estate (18.2). With regard to the use of a home computer for a home-based business, 31.8 percent of persons in agricultural industries gave this response, as did 25.6 percent of those persons who said their occupation was in farming, forestry or fishing, indicating that many of today's family farms have implemented computer technology at some level.

In addition to the now-commonplace uses such as word processing, games and household record-keeping, other activities point to the expanding role of the home computer. These include such uses as databases, desk top publishing and newsletters, bulletin boards, and electronic mail.

Another location of computer use for adults is at school. While there are not nearly as many adults as children in school, Table 4 shows that for those 14.4 million adults who were enrolled (mostly in college) in the fall of 1989 a substantial proportion, 43.6 percent, used a computer at school. Characteristics of persons with relatively high levels of use in school indicate that use was most likely for young adults 18 to 21 (48.4 percent), males (46.5 percent), persons who were not married (47 percent) and persons of other races (53.4 percent). In addition, half (48.5 percent) of persons aged 18 to 21 who had a computer at home and who were enrolled in school said that one of the uses of their home computers was to do schoolwork.

A far more likely locale for computer use by adults is in the workplace. Table 4 indicates that of all adults with a job, over 40 million, or 36.8 percent, said they used a computer at work. This represents a 50-percent increase in the proportion who responded this way in 1984 (24.6 percent).

Use of a computer at work was significantly more likely with higher levels of education; 57.8 percent of persons with 4 or more years of college reported use of a computer at work, as opposed to 29 percent of high school graduates. Among general occupational categories, persons in managerial and professional positions (56.2 percent) and technical and administrative positions (55.1 percent) had by far the highest rates of use at work.

Differences in the level of use of computers at work may reflect as much on the distribution of computers in the workplace as it does on the distribution of persons across different occupations. For example, high rates of computer use at work were reported by Whites (37.8 percent) and persons of other races (36.4), women (43.0), persons with 4 or more years of college (57.8), and those with family incomes of \$50,000 or more (52.6).

In the comparison of women and men, the higher rate of use at work among women (which is not mirrored for all women in general) may be determined in part by the type of jobs they hold. Table D shows the number of employed adult men and women by general occupation and industry categories. While the occupational category, "technical, sales, and administrative support" accounts for 19.6 percent of all working men, it represents 43.6 percent of all working women. This category includes such specific occupations as sales clerks, secretaries and administrative clerical workers. Within this category, computer use at work was reported by 58.2 percent of women, as opposed to 49.4 percent of men. Table 6 provides even more detail of this distinction, using intermediate occupation classifications. About 6 percent of all men using computers at work were in one of the two occupations of secretary or other administrative support (including clericals). However, about 35 percent of all the women who used computers at work were in these same occupations.

The second panel of table D shows a similar male-to-female comparison for workers by general industry classifications. The notable aspect of this part of the

table is that women register consistently higher levels of computer use at work regardless of industry type. This is likely due to the fact that within an industry many women hold technical or administrative jobs which, as has been shown, tend to have high levels of computer use. In industries such as mining and construction, for example, male workers are more likely to be machine operators or craft workers, and women, office workers, accounting for the very sizable gender differences in computer use. Table D shows that among males in mining and construction, 24.0 and 8.9 percent, respectively, use a computer at work, while for the women in these industries the rates are 68.9 and 47.9 percent, a sizable difference. Another example is in the category of "finance, insurance and real estate", where 78.3 percent of all women used a computer, as compared with 59.3 percent of men. Workers in these industries include persons such as bank tellers and data keyers.

Of course, while many individuals use a computer at work, the types of uses are quite varied. Tables 6 and 7 show the specific uses of computers at work by intermediate occupation and industry categories. Examining table 6 first, it is seen that the most frequently-mentioned use by all workers is word processing, at 14.3 percent. This is true for both men (11.2 percent) and women (18.1) as computer-based word processing programs continue to eliminate traditional typewriters from many offices. In the intermediate occupational category of secretaries, stenographers, and typists, for example, 54 percent said they use a computer for word processing at

**Table D. Computer Use at Work, by Sex, Occupation and Industry: October 1989**

(Persons aged 18 and above. Numbers in thousands)

| Occupation and industry                                   | Men    |         |                      |         | Women  |         |                      |         |
|---|--------|---------|----------------------|---------|--------|---------|----------------------|---------|
|   | Number | Percent | Use computer at work |         | Number | Percent | Use computer at work |         |
|   |        |         | Number               | Percent |        |         | Number               | Percent |
| All persons .....   | 85,543 | (X)     | 18,960               | 22.2    | 94,581 | (X)     | 21,285               | 22.5    |
| All persons with jobs .....                               | 63,416 | 100.0   | 18,960               | 31.6    | 52,253 | 100.0   | 21,285               | 43.0    |
| Occupation:   |        |         |                      |         |        |         |                      |         |
| Managerial/professional .....                             | 17,061 | 26.9    | 9,325                | 57.4    | 14,169 | 27.1    | 7,371                | 54.7    |
| Technical, sales, administrative support .....            | 12,400 | 19.6    | 5,816                | 49.4    | 22,783 | 43.6    | 12,645               | 58.2    |
| Service .....   | 5,485  | 8.6     | 728                  | 14.2    | 8,871  | 17.0    | 640                  | 7.7     |
| Precision, production, craft, and repair .....            | 12,674 | 20.0    | 1,827                | 15.2    | 1,222  | 2.3     | 189                  | 16.6    |
| Operators, laborers, fabricators .....                    | 13,010 | 20.5    | 1,149                | 9.4     | 4,644  | 8.9     | 414                  | 9.6     |
| Farming, forestry, fishing .....                          | 2,786  | 4.4     | 114                  | 4.3     | 564    | 1.1     | 26                   | 4.9     |
| Industry:   |        |         |                      |         |        |         |                      |         |
| Agriculture, forestry, fishing .....                      | 2,642  | 4.2     | 192                  | 7.3     | 754    | 1.4     | 122                  | 16.2    |
| Mining .....  | 557    | 0.9     | 128                  | 24.0    | 103    | 0.2     | 69                   | 68.9    |
| Construction .....  | 7,165  | 11.3    | 602                  | 8.9     | 715    | 1.4     | 326                  | 47.9    |
| Manufacturing .....                                       | 14,562 | 23.0    | 4,905                | 35.4    | 6,870  | 13.1    | 2,463                | 37.8    |
| Transportation, communication, and public utilities ..... | 5,816  | 9.2     | 1,662                | 30.6    | 2,216  | 4.2     | 1,348                | 64.7    |
| Wholesale and retail trade .....                          | 12,011 | 18.9    | 3,075                | 27.0    | 10,782 | 20.6    | 2,933                | 28.9    |
| Finance, insurance, and real estate .....                 | 3,229  | 5.1     | 1,810                | 59.3    | 4,653  | 8.9     | 3,484                | 78.3    |
| Services .....  | 14,259 | 22.5    | 4,964                | 36.9    | 23,794 | 45.5    | 8,895                | 39.5    |
| Public administration .....                               | 3,175  | 5.0     | 1,622                | 53.7    | 2,364  | 4.5     | 1,644                | 73.1    |

work. While word processing is the most popular current application, many other activities also have high proportions of use among workers. Between 8 and 9 percent of workers use bookkeeping, inventory control, or spreadsheet programs. Activities such as communications (connecting to other computers and bulletin boards) are used by 9 percent of workers, while electronic mail is used by fewer, about 5.3 percent. More "traditional" computer applications, such as programming, databases, and analysis were also reported by sizable proportions of workers.

Levels and types of use vary considerably across different occupations. Among the major occupation categories, those in executive, administrative and managerial positions have some of the highest rates for specific uses. For example, 23.2 percent of executives use spreadsheets, 14 percent use computer calendar or scheduling programs, and 17.9 percent use communications packages. Among the intermediate occupation categories, however, mathematical and computer scientists tend to have the highest rates for many of the uses listed. This is not too surprising, since over 90 percent of persons in this occupation report that they use a computer at work.

Table 7 shows the range of uses as tabulated by intermediate industry classifications. As with occupations, word processing is a high usage activity in most industries as well. In this table, the relationship between certain types of computer uses and kinds of work are somewhat clearer than in the intermediate occupation table. For example, one of the most common uses of computers in manufacturing is for inventory control. About 13.2 percent of the workers in durable goods report this use, as do 10.2 percent of those in nondurable goods. In the transportation, communications, and other public utilities industry, one often reported use is for communications (12.7 percent), and in wholesale and retail trade industries the activities of inventory (14.1) and sales (11.3 percent) are the most frequent uses.

The industry with the overall highest level of usage is that of finance, insurance and real estate, where 67.2 percent of all workers say they use a computer. Within this industry, high levels are reported for many specific uses as well, including word processing (28.2 percent), analysis (22.6), bookkeeping (21.3), communications (19.9), and databases (21.0). These levels are among the highest given by any major industry grouping for these uses.

The simultaneous consideration of all possible areas where persons might use computers—home, work, and school—shows that 28.1 percent of the adult population uses a computer in at least one of these places; this is a sizable increase from 1984, when 18.3 percent of all adults said they used a computer in some capacity. Usage rates were highest among persons aged 35 to 44, Whites, and persons of other races, non-Hispanics,

and unmarried persons. Computer use is strongly associated with both the education of the individual and family income. High rates of use were reported by persons working full-time, in managerial/professional occupations; and in the finance, insurance, and real estate industry. These data also indicate in general that when all three locales of use are considered, many disparities remain in terms of who uses computers. These distinctions (for example, race differences) do not stem from use patterns in a single setting, but are often apparent in more than one place.

## SUMMARY

In the 5 years that have passed since the first report on computer ownership and use, we have seen a continuing increase in both the number of people using computers and the things they use them for. This general pattern of increase is the rule for virtually all segments of the population, and usage levels at home, school and work have all risen accordingly.

The increased availability and use of computers has been brought about primarily because of substantial price reductions and increased applications. Activities such as desktop publishing, computer-assisted design, and electronic mail have all been made possible by hardware and software innovations in the past few years. Uses such as these, now reported by a small but growing number of persons, would have elicited few responses had they been included in the 1984 survey. Some activities have become commonplace among computer users. For example, consider that the proportion of adults with home computers who use them for word processing rose from 32.9 to 61.6 percent between 1984 and 1989.

Despite the increase in the availability and uses of computers, there is still substantial variation between groups in terms of access and use. In terms of home use, much of this variation appears related to income and education. Although substantial price reductions have occurred, home computing equipment still represents a sizable investment for many families. In addition, while the applications for computers are more numerous than even a few years ago, many households still have little, or no, need for a computer.

In fact, two of the highest levels of computer ownership are reported by persons who used a computer at work (31.7 percent), and in households where school-age children were present (25.7 percent). These estimates point, as they did 5 years ago, to two different groups that represent the leading edge of computer users: people who use computers on a daily basis in their job, become comfortable with them and find uses for them at home; and people with children who are trying to better prepare them for the workforce of tomorrow. Of course, as the data show, the computer-based "workforce of tomorrow" is more rapidly approaching than many would have suspected even 5 years ago.

One cannot say with certainty that the growth of computer ownership and use will continue at the same healthy rate of the past 5 years. Nevertheless, innovation and improvements in this industry continue to occur at a rapid pace. Small inexpensive desk-top computers have now reached the point where they are capable of performing much faster and more efficiently than many of the old, large "mainframe" computers which ruled the computer industry for so many years. Advances in software development continue to bring many tasks and jobs into a computer based or assisted context. Continued improvements such as these may well eventually make computers as commonplace as calculators or telephones. Future studies of this topic will allow us to determine the progress of this technology's diffusion.

## **USER COMMENTS**

We are interested in your reaction to the usefulness of this information, and to the content of the questions used to provide the results contained in this report. (Appendix C contains a facsimile of the questionnaire.) We welcome your recommendations for improving our survey work. If you have suggestions or comments, please send them to:

Current Survey Comments  
Population Division  
Bureau of the Census  
Washington, DC 20233