

# Computer utilization in later-life: Characteristics and relationship to personal well-being

Edith Blit-Cohen

Howard Litwin

Paul Baerwald School of Social Work and Social Welfare

the Hebrew University of Jerusalem, Mount Scopus, Jerusalem 91905-IL, Israel

e-mail: mshowie@mssc.huji.ac.il

*E.Blit-Cohen, H.Litwin. Computer utilization in later life: Characteristics and relationship to personal well-being. Gerontechnology 2005;3(3):138-148.* The study examined 200 functionally independent members of senior citizen centers in Israel in the year 2000. Half of the stratified respondent sample was actively involved with computers and half was not. A structured questionnaire queried respondents' background characteristics, a measure of personal well-being and several characteristics of computer utilization, including extent and the types of computer applications pursued. Computer users were found to be younger and more frequently men. Moreover, users reported a greater sense of personal satisfaction and held fewer negative stereotypes about old age. Examination of the types of computer use indicated that the most frequent utilizations were off-line. Factor analysis further revealed two main patterns of utilization, identified as 'utilitarian' and 'pleasure-oriented'. Men made greater utilitarian use of the computer than women. The findings suggest that promotion of computer utilization in later-life is possible, but that many of the older computer users still do not engage in the full potential of the medium.

**Keywords:** computers, utilization patterns, well-being, senior centers, Israel

Computer technology allows people of all ages to engage in a wide range of undertakings, as for example, playing computer games for pleasure, word processing, conducting information searches, sending e-mails and participating in multi-user chats on the Internet. Moreover, computer-based communication allows people to freely disseminate their own ideas, to acquire new social ties and to even establish new identities<sup>1</sup>. However, the use of computers requires access to and knowledge of computer technology<sup>2,3</sup>. As a result, many older people today are unable to participate in computer-based activity.

The entry of computers as a component of social engagement took place after many members of the current older cohort had already retired from employment<sup>4,5</sup>. In

addition, older people who remain actively employed often do not engage in computer-generated tasks as part of their work<sup>6</sup>. Consequently, access to computer technology among the older generation is still limited. It is important, therefore, to better understand the factors that facilitate computer utilization among older people today. It is also important to clarify whether computer-based activity is associated with a good old age.

This article presents the results of a study that examined the correlates of computer usage by elderly persons, the association of computer utilization with personal well-being and the different ways in which older users actually use the computer. The study examined some 200 functionally independent elderly Jewish people who reside in the central region of

Israel. One half of the study sample took part in computer training at a number of senior centers. The other half of the sample attended these same centers, but either did not take part in computer training or dropped out from such activity.

Two main hypotheses were examined in the current study: (i) Elderly people who use computers have different background characteristics from elderly individuals who do not use computers; (ii) There is a positive relationship between computer usage and personal welfare in later-life.

In addition, the study sought information as to whether there are different patterns of computer usage among older computer users, and whether computer usage can be characterized according to different utilization criteria. Before detailing the modes of analysis and the results of the study, however, the following paragraphs examine the literature regarding the current state of knowledge about computer-utilization on the part of older people.

The phenomenon of computer involvement among older adults has been variously addressed in the literature and the results of the reports are mixed. For example, a survey in Australia that examined the extent to which older people used modern communication technology found that respondents expressed interest and confidence in learning to use modern devices. However, few of them owned or used a computer<sup>7</sup>. Other reports present evidence that counters the stereotype that older adults are resistant to trying new information technologies<sup>8</sup>.

The literature also suggests that computer users generally differ from non-users in terms of their socio-demographic characteristics. Findings from different studies

support the fact that not only age but different background characteristics distinguish the users from the non-users. For example, a study using data from the September 2001 Current Population Survey in the United States and its supplement on computer and Internet use examined age differences in home computer use. The analysis revealed that even though home computer availability declined with age, part of this relationship was due to the effects of such factors as employment status, marital status, race, gender, family income, living arrangements, education, and number of disabilities. Interestingly, use also declined with age among persons who owned a computer, irrespective of socio-demographic differences. The analysis concluded that age-related computer availability is influenced by socio-demographic factors, but that computer use indeed declines by age<sup>9</sup>.

Beyond age-related differences, research demonstrates other differentiating characteristics. A study that examined access and use of computer technology in England and Wales found that using a computer was indeed a minority activity amongst older adults. However, utilization was also highly stratified by gender, marital status, and educational background<sup>10</sup>. Another study reinforced the gender factor as a determinant of utilization. In that study men were more likely to own a computer<sup>11</sup>.

The literature also relates to the association between computer utilization and the personal well-being of older computer users, but mostly in terms of online applications. One article noted that use of the Internet and e-mail can improve the quality of elderly peoples' lives by providing a new connection to the outside world. The Internet promotes virtual social networks that cross generations. In addition, the web provides a wide range of

information regarding health, travel, and hobbies. In this way, participation in computer-mediated communication can enhance the social well-being of older adults<sup>12</sup>.

Another study examined Internet use among some three hundred residents of assisted and independent living facilities in California<sup>13</sup>. In this experiment, participants attended a weekly training program that was specially designed for older learners. Those who gained the skills to utilize the Internet reported higher levels of social connectivity, higher levels of perceived social support and more positive attitudes toward aging. A positive association was also found between time spent online and positive attitudes toward aging.

Yet another study assessed the psychosocial impact of providing Internet access to older adults over a five-month period. Participants from congregate housing and nursing facilities were randomly assigned to a two-week Internet training course or to a waiting list. In addition, computers were made available to participants for continued use over five months, with accompanying help from the trainer. Following the trial, there were trends toward less loneliness among the regular Internet users compared to the less regular users, as well as less depression and more positive attitudes toward computers. On the other hand, no significant changes were evident on the outcome variables between the intervention group and the controls from baseline to the end of trial<sup>14</sup>.

Finally, the literature relates to the various types of use that older people make of the computer, again primarily with a focus on the online applications. Thus, for example, a study of elderly computer users from a mid-size Midwestern American sample found that respondents considered e-mail with family and friends to be the most important Internet function. They used the

Web less frequently as a source of information. When they did, it was most often to seek information about special interests as opposed to visiting mass media sites<sup>15</sup>. A study carried out in south-eastern Michigan examined World Wide Web use patterns among middle-aged, young-old and old-old adults. The examination revealed distinct age and demographic differences in the use of the Web, but among middle-aged and older Web users similar use patterns were observed. The main content areas in learning how to use the Web were learning how to use electronic mail and accessing information on health and travel. Among the respective age groups, the old-old had the least interest in using the Web<sup>16</sup>.

As the above review reveals, most of the literature on types of computer utilization among older adults and its association with well-being relates primarily to computer-mediated communication, that is, web-based utilization of computer technology. To the best of our knowledge, there is little reported research that considers factors associated with other kinds of computer utilizations, those that can be executed off-line. This lack is an important gap in the literature, in that off-line computer utilization may constitute the major current mode of involvement in the computer world by members of the cohort of older adults. In order to address this gap, the present research study considers all computer utilizations, whether online or off-line, and their association with well-being in later-life. As such, it hopes to shed new light on the significance of computer utilization among the elderly population.

As noted, the analysis reported here addressed computer utilization among Jewish older adults in Israel. It compared the characteristics of a sample of users and non-users, considered the association of computer-utilization and personal well-being in later-life, and examined the

patterns of utilization among the computer users. The mode of inquiry and means of analysis are spelled out next

## METHODS

The field research for the present inquiry was executed in the year 2000 among low-to-moderate income Jewish adults who constitute the majority segment of the older cohort in Israel. Data were collected at senior centers that maintain special computer training programs for older adults. Four centers were selected in the central region of the country to serve as sampling sites. Attending each center were elderly participants in the computer classes and members who participated in other activities of the center, but not in computer classes. This setting allowed the recruitment of a sample of computer-users and non-users whose characteristics and personal well-being could be compared.

Study respondents were administered a structured questionnaire that gathered background characteristics, information on respondents' state of well-being and, for those who utilized computers, information on the forms and extent of utilization, the amount of time and longevity of computer usage, and the levels of enjoyment, difficulty, and benefit that the responding computer user felt regarding different uses.

## Sample

One hundred computer-users and a comparative sample of one hundred non-users were randomly selected from the membership lists of the respective centers. The control group was comprised of people who attended these same senior centers and either had begun to learn about computers and had ceased for a variety of reasons, or did not use computers at all. Viewed as a whole, more than two-thirds of the combined sample was composed of women (68%). The age

of respondents ranged from 60-91, with an average of 71.5 (SD=6.8). Years of education ranged from 0 to 22, with the average being 11.4 years of study (SD=3.8). More than half of the sample lived together with a partner. In terms of self-rated health, the average score was about 12 (SD=2.98, range = 5-20), indicating that on the whole, the health of the sample was a bit better than fair. The comparative characteristics of the respective groups of computer-users and non-users are presented in Tables 1 and 2.

*Table 1. Computer-users and non-users by background characteristics: Cross tabulations; \*\*  $p < .01$*

Variable	Users (N=100) %	Non-Users (N=100) %	Total (N=200) %	Chi squared
<b>Gender</b>				
Men	73.4	26.6	100.0	
Women	39.0	61.0	100.0	20.7**
<b>Marital Status</b>				
Married	59.8	40.2	100.0	
Not married	36.1	63.9	100.0	10.9**
<b>Housing</b>				
Lives alone	36.6	63.4	100.0	
With others	59.3	40.7	100.0	10.0**

*Table 2: Computer-users and non-users by background characteristics: T-tests; \*  $p < .05$*

Variable	Users (N=100)		Non-users (N=100)		T
	Mean	S.D.	Mean	S.D.	
Education	12.8	3.3	10.0	3.7	5.66*
Age	70.3	6.4	73.1	7.4	-2.85*
Self-rated health	12.8	2.9	11.9	3.0	3.09*

## Variables

As indicated above, the background characteristics of the computer-users and non-users included categorical variables: gender, marital status and living arrangements, and ordinal or continuous variables: age, years of education, and self-rated health. The self-rated health variable was measured by five questions relating to the respondent's perception of his or her health. The scores on each item ranged from 1, "very bad," to 4, "excellent." The sum of the answers resulted in a score that ranged from a minimum of 5 to a maximum of 20, the higher the score, the

better one's health. This measure was drawn from early work done by Foley<sup>17</sup>, and later research by Auslander and Litwin<sup>18</sup>.

The measure of personal well-being was measured on the Morale and Attitude Scale that was first formulated by Clark and Anderson, in 1967, in a study of mental health among elderly people<sup>19</sup>. Pierce and Clark expanded the instrument in 1973, addressing additional variables related to personal well-being, such as personal satisfaction from life and opinions regarding old age<sup>20</sup>. In 1998, Sherer used this instrument to study the impact of using computers on the lives of nursing-home residents<sup>21</sup>. It was this recent application of the scale that encouraged its use in the present study.

The entire instrument is comprised of 45 statements that examine different aspects of personal welfare. The current study chose to focus on the four dimensions of personal well-being that were most relevant for this analysis (22 statements). These included: (i) personal satisfaction; (ii) negative age (that is, negative stereotypes respondents have regarding the aging process); (iii) positive age (positive opinions regarding old age); (iv) cognitive welfare, or assessment of cognitive capability in old age. The scores on each statement in the scale ranged from 1, 'highly disagree' or 'never', to 4, 'highly agree' or 'very often'. Higher scale scores reflected higher moral and well-being in the dimensions of personal satisfaction, positive age, and cognitive welfare. In the dimension of negative age, on the other hand, the score was recoded so that here too, a higher score reflected a higher sense of well-being.

The final group of variables was employed to examine and describe the nature of computer usage among the sample of elderly respondents who took part in the

computer-training program. They were asked about the place at which they made use of computers (home, senior-center, a relative's home and/ or at work), and about the different computer applications in which they engaged. The options were word-processing, games, graphic software such as PowerPoint, Photoshop etc., listening to music, and a series of other uses related to the Internet: search for information, e-mail, chat, advice from experts, shopping and forums. Extent of utilization of each computer application was calculated by both the number of times per week and the number of hours per week. Length or duration of computer utilization was measured as the number of months that the respondents had used each of the computer applications.

Finally, three additional computer utilization variables were addressed in the present inquiry. The degree of enjoyment experienced from computer utilization was measured on a scale that ranged from 1, 'does not enjoy at all', to 5, 'enjoys very much'. The degree of difficulty in dealing with computer tasks was tapped on a scale that ranged from 1, 'not difficult at all', to 5, 'very difficult'. The extent of utility that was derived from computer utilization was measured on a scale that ranged from 1, 'no utility at all', to 5, 'a great deal of utility'. These three criteria-enjoyment, difficulty, and utility-were measured in relation to each of the types of computer utilization separately. The score for each variable constitutes the average score for each respondent.

## Analysis

In the first stage of the analysis, an initial comparison was made between the computer-users and the non-users, in terms of their background and socio-demographic characteristics. These comparisons were first carried out by means of cross tabulations and T-tests, according to the level of measurement of

the respective variables. Each of these tests reveals whether any of the respondent groups differed in a systematic or significant way from the sample as a whole, according to the overall distribution or mean scores of the sample. In the second stage of the comparison, binary logistic regression was employed to identify the specific background characteristics that most predicted computer utilization among respondents.

The next stage of the analysis examined the association of computer utilization and personal well-being. Users and non-users were compared on each of the four indices of personal welfare adopted from the Morale and Attitude Scale. T-tests and multiple regression analyses were employed for this purpose.

Finally, a description of the nature of respondents' computer usage was performed. In this last set of analyses, only computer-users were taken into account (n=100). Ownership of computers was queried in this regard, as were the different places in which the users used computers, the different uses they made, and the degree of enjoyment, difficulty, and utility they experienced regarding the different kinds of uses.

Factor analysis was also performed in order to find if there were characteristic patterns of different types of computer usage. The extent of utilization of each computer application, as measured by the time devoted to each application, was the basis for the analysis. In this procedure, certain computer uses were omitted from the analysis insofar as it was found that 90 per cent or more of the sample did not use them at all. This included the following four on-line functions: chat, advice from experts, shopping, and forums. In order to further clarify the patterns of usage, a cluster analysis was also carried out using a hierarchical tree to detect the existing

clusters (branches) among computer users.

## RESULTS

The first question addressed in the study concerned the differences in background characteristics between computer-users and non-users. Tables 1 and 2 present these data. As may be seen, and according to our hypothesis, users significantly differed from non-users. This was apparent in regard to age, gender, marital status, housing arrangements, educational level, and health. The computer users were more often younger, men, and married, and were characterized as not residing alone, having higher education, and enjoying better health. All these differences were statistically significant at the bivariate level.

In a multivariate examination of the computer-utilization outcome, computer usage was regressed on the background variables (Table 3). The binary logistic procedure revealed that the chief explanatory variable was gender; men were six times more likely than women to use computers. Age and education were also significant explanatory factors, but to a much lesser degree. Younger respondents and, unexpectedly, those with lower education were slightly more likely to use computers. Together, these three variables explained 40 percent of the variance, according to the Nagelkerke pseudo R squared statistic.

The next area of inquiry in the analysis addressed the association between computer-utilization and personal welfare. Table 4 shows that computer-users had a greater sense of personal satisfaction and held fewer negative stereotypes about old age than the non-users. The differences were statistically significant. In the other two dimensions of well-being, that is 'cognitive welfare' and 'positive age', no significant differences were evident between the users and non-users.

*Table 3: Factors associated with computer utilization: binary logistic regression; \*\*p<0.01*

Variable	B	Exp(b)
Gender (male)	1.86**	6.42
Education	-0.30**	0.74
Age	-0.10**	0.91
Marital Status (married)	0.35	1.43
Housing (lives alone)	-0.32	0.72
Health	-0.36	0.97
Chi Squared	69.90**	
d.f.	6	

*Table 4: Well-being among users and non-users: T-tests; \*\*p<.01*

Well-being Measures	Users		Non-users		T
	Mean	S.D.	Mean	S.D.	
Personal Satisfaction	2.1	0.4	2.4	0.6	-3.57**
Negative Age	1.9	0.4	2.1	0.6	-2.89**
Cognitive Welfare	2.8	0.6	2.9	0.6	-1.34
Positive Age	2.2	0.5	2.3	0.5	-2.58

*Table 5: Computer utilization by time of utilization: Mean hours per week*

Type of Utilization	Mean	S.D.	N of Participants
Listen to Music	4.7	4.8	21
Software	4.6	7.8	49
Word-Processor	3.6	5.1	78
Games	3.6	3.8	61
Search for Information	3.2	2.8	38
E-mail	2.3	2.0	29

Subsequent multivariate analysis of the two indicators that revealed significant differences between computer-users and non-users at the bivariate level-personal satisfaction and negative age-clarified that computer-utilization per se had no association with the respective personal well-being outcomes after controlling for such factors as health status. Consequently, these analyses are not presented in tables here.

The final area of investigation addressed the kinds and extent of computer utilization reported by respondents. Among the 100 participants, 74 percent owned a computer at home. The average length of computer utilization was 4 years and ranged from one month to 25 years. Fifty four percent of the participants used computers from one to three times a week and 46 percent used them from four times

a week and more (Mean=4). Regarding where computer-users made use of computers, 70 percent reported using the computer at home and 60 percent used the computer at the senior-center. Respondents were able to indicate more than one place, which accounts for the overlap.

Table 5 summarizes the frequencies of the utilizations that were reported by at least 10 percent of the respondents. The most common use of the computer among the sample was for word-processing followed by games. The less common uses were listening to music and sending or receiving e-mail. Additional analysis revealed that overall, 44 percent of the participants accessed the Internet in their computer utilizations. Moreover, more men used the Internet than women (T=2.35, p < .01).

As noted, respondents were asked about the degree of enjoyment, difficulty, and utility regarding each of the computer utilizations in which they engaged. Table 6 summarizes these data. In general, the various uses all yielded a fairly high degree of enjoyment. As for difficulty, a fairly low ranking was given to the respective uses. Most difficult for respondents was doing information searches while listening to music caused the least difficulty. In regard to utility, most computer utilizations were seen as useful. Use of e-mail was considered to provide the greatest utility, and playing computer games the least.

In order to identify the salient patterns of computer-utilization among respondents, factor analysis of the extent of utilization of the respective computer applications was performed. Table 7 lists the various factor loadings and shows that it was indeed possible to divide the respective uses into two principal types of computer usage. The first type had high loadings on the following utilizations: search of

Table 6: Characteristics of computer utilization by measures of enjoyment, difficulty, and utility

Utilization	Enjoyment		Difficulty		Utility	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Software	4.2	0.9	1.7	0.8	3.8	1.2
Games	4.1	0.9	1.2	0.5	3.4	1.2
E-mail	4.1	1.1	1.4	0.8	4.0	1.4
Listen to Music	4.0	1.2	1.1	0.3	3.6	1.3
Search for Information	3.9	1.2	1.9	1.2	3.7	1.3
Word Processor	3.8	1.1	1.8	0.9	3.7	1.3

Table 7: Factor loadings obtained with factor analysis by computer uses and time

Computer use	Utilitarian Factor	Pleasure Factor
Search for information	.78	.20
E- mail	.76	.07
Software	.60	-.31
Word-processor	.56	.37
Games	-.06	.78
Listen to music	.20	.70
% of Variance	31.55	22.95

Table 8: Cluster analysis by pattern of computer usage

Pattern of computer usage	Group 1		Group 2		Group 3		Total
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean S.D.
Pleasure-oriented usage	2.83	.26	.90	.53	.41	.42	.68 .73
Utilitarian usage	.96	.84	1.52	.47	.45	.32	.74 .61
Total	6		24		70		100

information, e-mail, word-processing, and software. We termed this type of use utilitarian, given the concrete utility received from each of these uses. The second factor had high loadings on games and listening to music. Consequently, it was termed pleasure-oriented utilization, as these particular uses were related more to leisure use than to concrete utility.

As noted earlier, a cluster analysis was also carried out. Its results are presented in Table 8. As may be seen, three different branches were found: the first group had a high level of pleasure-oriented computer usage and a low level of utilitarian usage. The second group had a low level of pleasure-oriented computer usage and a high level of utilitarian usage. The third and last group had low levels of both kinds of computer usage. It was the largest group and was composed of 70 persons. This is the same group that made less on-line usage.

The final round of analyses examined the association between respondents' background characteristics and patterns of computer use. For the most part, no relationship was found between the various background variables and the respective utilization patterns. However, gender emerged as a significant correlate of the utilitarian pattern of use. That is, men tended more than women to engage in the utility-oriented computer applications ( $t=3.47, p<.01$ ). No gender differences were evident, on the other hand, in regard to the pleasure-oriented pattern.

**DISCUSSION**

This study demonstrates that there are indeed significant differences between elderly people who are involved in computer utilization and older persons who do not use computers. These differences are reflected not only in several background characteristics but also, to some degree, in the relationship towards old age and to the perception of personal welfare. As was noted earlier, differences in background factors between computer-users and non-users were evident not only in relation to age, but also in particular, in relation to gender. These results support the hypothesis in the current study, as well as findings from other research studies. For example, several surveys indicate age as one of the most salient characteristics that distinguish between participants and non-participants in the world of computer-mediated communication<sup>9,16</sup>. Differences cited in the research literature in regard to educational status<sup>10</sup> were not found here in the same direction, but gender differences were<sup>11</sup>.

The current study also points to the importance of housing arrangements, at least at the bivariate level of analysis. It underscores the fact that respondents who did not live alone tended to use computers to a greater extent than those who lived alone. Bardini argues that there is a rela-



tionship between the existence of a social network and the assimilation of computer technology<sup>22</sup>. That is, people who have social networks are more likely to accept and to use a new technology. The assumption is that the presence of another person in the same household can strengthen one's security about trying a new technology, even if this other person doesn't use computers at all.

The second goal of the current study was to consider the relationship between computer-utilization and personal well-being in later-life. The main findings in this regard provide partial support at the bivariate level for the second hypothesis examined in this study. That is, computer-users reported a greater degree of personal satisfaction and held fewer negative stereotypes about old age. Two other personal welfare indicators in the analysis showed no significant differences across the two study groups, however. These results thus reflect findings from other studies in this area, at least to some degree. Furlong argued, for example, that computer utilization allows older people to hold a positive approach towards life and to benefit from the excitement that can result from participation in the realm of electronic technology<sup>23</sup>. Cody found that elderly persons who obtained the necessary skills to utilize the Internet reported having higher levels of social connectivity, higher levels of perceived social support, and generally more positive attitudes toward aging<sup>13</sup>. Nahm and Resnick contend that Internet utilization can improve the quality of elderly people's lives by providing a new connection to the outside world<sup>24</sup>.

On the other hand, it should be noted that as in other studies, the current research also found that computer-users were younger and more frequently male. It cannot be overlooked that these same characteristics may explain why the

computer-users in question were more satisfied with their lives than the non-users. That is, the same background characteristics may be associated with both computer utilization and personal well-being. Future research is needed to address this issue. Longitudinal analysis can help untangle the association of computer utilization and well-being, clarifying particularly the direction of the association.

The issue of directionality must be considered, particularly in relation to the association between computer utilization and the relative absence of negative stereotypes relating to old age. It could be that computer usage allows older people to experience more safety and greater self-confidence than those who don't use computers, resulting in fewer negative stereotypes about later life. However, it could also be that people lacking negative age-related stereotypes are those who tend to learn about computers and to use them in the first place. Older people whose ideas about getting old are not negative may more freely use computers as a means of taking part in modern society. That is, elderly persons who want to remain connected to society and who are capable of being a part of the 'technology-era' may also feel that being elderly doesn't limit them from being 'computer-users'.

Another point worthy of note is that the findings in the current study point to the prevalence of off-line computer applications among the group of computer users. This is line with some previous findings that underscore the lesser use of web-based functions among older people. For example, as in the research carried out in the American Midwest<sup>15</sup>, the elderly respondents of the current study made less utilization of the information search function. In contrast, word-processing and game playing were the most common utilizations reported in the current study.

Thus, among the older Israeli respondents, the off-line applications were apparently more accessible or more user-friendly.

The question of type of computer utilization raises an issue that has implications for both research and practice. The current study demonstrates that even among the older people in Israel who used computers, utilization was focused mainly on the off-line functions. However, research on computer use primarily documents the benefits of online applications for older people. While online computer-based communication does provide numerous opportunities for networking, for social inclusion, and for personal involvement on the part of older people, this is not what most of the current elderly cohort in Israel seems to be doing with their computers.

Thus, future research needs to address both web-based computer use and non-web-based functions, if it is our aim to better understand the potential and the pitfalls of computer utilization in later-life. Though elderly people frequently do not engage in the full range of possibilities that the computer provides, this study shows that off-line computer usage may nevertheless be positive in the lives of the old people in that they find it enjoyable, easy, and beneficial.

Beyond verification of some of the findings that have already been reported in the research literature on computer utilization, this study provides some new insights regarding the different patterns of computer use. As was shown, the various uses can be divided into utilitarian and pleasure-oriented patterns. Focusing on each pattern separately can help to identify the unique characteristics associated with each utilization pattern. It may also provide some clues as to how to promote the entry of older users into online computer utilization.

Given the findings regarding the potential role of computer utilization in enhancing the personal well-being of older people, it is important to develop programs that are geared to stimulating elderly persons to use computers, and particularly, the online applications. Respondents in the current inquiry reported a low degree of difficulty in learning the new technology, and a high degree of enjoyment and utility gained from various uses. The fact that each 'user' chose different utilization patterns seems to be related to his or her different necessities and expectations.

We conclude with the conviction that there is much benefit to be gained from computer utilization by older people. In our opinion, greater access of the elderly to computer technology can be enhanced in two main ways. First is the assigning of resources that will enable more members of the elderly cohort to study and to operate computers. Second is the elimination of negative stereotypes about the elderly and about their ability to learn new technology and to use computers. The attainment of these goals is not beyond the realm of possibility.

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