Social Aspects of Computing

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Computing in the Home: Shifts in the Time Allocation Patterns of Households

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ABSTRACT: An empirical study of 282 users of home computers was conducted to explore the relationship between computer use and shifts in time allocation patterns in the household. Major changes in time allocated to various activities were detected. Prior experience with computers (i.e., prior to purchase of the home computer) was found to have a significant impact on the time allocation patterns in the household. The study provides evidence that significant behavior changes can occur when people adopt personal computers in their homes.

INTRODUCTION

Since their inception, computers have generally been viewed as time saving devices. In reality, however, computers are also very effective time consuming devices which force users to reallocate their limited time and change the ways they perform tasks. This fundamental paradox is simultaneously the promise and the frustration of computing.

In a very important sense, time underlies many of the issues related to the impact of computers on human life. Since time is a finite human commodity, computer use forces the reallocation of time from other activities. In some cases, time reallocation can lead to greater productivity caused by shifting routine and repetitive tasks to the computer. In short, computer use can subtly and implicitly move users to reprioritize their activities and change their behavior. From this perspective, time is the invisible hand by which computer use rearranges social action.

The time allocation phenomenon in computing is especially poignant with respect to personal computers, where personal, in operational terms, means a one-to-one real-time interaction with the machine. This fundamental link is perhaps the strongest in the context of computing in the home, where the user lacks the resources to delegate his or her interaction to someone else. The popular example of the personal computer "widow" exemplifies this dilemma. In the household context, computer use entails a change in the time allocated to other household activities.

To better understand the relationship between computer use and time allocation patterns, this article investigates the time shifts that occur when household members use personal computers.

The household is often associated with the consumption of goods, but, in reality, it is an arena for a variety of economically significant activities such as food production, entertainment, raising children, and so on [3, 6, 8]. These varied activities require *time*. Since the total amount of available time is finite, the distribution of time across activities and the impact of new technology on time allocation has much significance for household dynamics and the feasible set of hardware and software functions.The focus on time allocation patterns is central to understanding the role of computing in households.

Most research to date on computing in the home has been conducted by marketing organizations interested in the number of units sold and the buying behavior patterns of the market or speculations about the home of the future [17]. A second line of research has focused on the work-at-home (telecommuting) experience [10, 19, 20, 26]. Although some researchers [12, 13] have discussed the relationship of computer use and time allocation, it is limited to industrial and governmental organizations with little research focused on the

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home computer as a *computing package* embedded in a social organization.

This article is based on the premise that the role of computing in households is a function of both the technology and social environment of the household, and that the household computing experience is qualitatively different from that of large-scale organizations. Although the impacts of computers on large organizations may be generalizable to smaller social systems such as households, the pattern of impacts may not be the same. The household is a microsocial system and is similar in behavior to small, shared work settings and other reference groups [25]. Household membership is less voluntary; entry and exit requirements are different, and authority patterns are more rigid. Households follow a natural but predictable life cycle, and relationships for the most part are not contractual but conform to unwritten rules. As Kerr and Hiltz [11] have noted, computing in such social settings has received less research attention and most studies of the impacts have been speculative.

CONCEPTUAL FRAMEWORK

The conceptual framework for this study is presented in Figure 1. It is general insofar as it covers many technologies, including computers. The impact of technology may be viewed as a time-dependent process in which the technology has various effects on the social unit depending on its tenure in that unit (see Figure 1a). Initially, an organization adopts a given technology based on its perceived need. It is important to note that the perception of need does not occur in a vacuum. The perceived need for technology in a social unit is the result of a complex interaction of the value systems of the society, the value systems of the designers, the attributes of the technology, and the social makeup of the host organization. The value systems of the designers and the dominant values of a given society shape the technology, the expectations about the technology, and, in turn, the use of the technology [7, 9, 14, 16, 18]. In this sense, technology is not a neutral agent but is embedded with values representing the culture in which it developed. In the short term, the organization learns to use the technology and adapts by reallocating time according to the technology's requirements. In the long term, other adaptations, including changes in organizational structure, roles, values, relationships, or possibly reduction and termination of use, can occur. In most cases, the short-term impacts of the technology are not the same as the long-term impacts and vice-versa.

We contend that a similar progression occurs in the household computer use case. Figure 1b illustrates this evolutionary process. First, the household engages in a decision process to acquire the new technology. Second, after the technology is adopted, the household de-

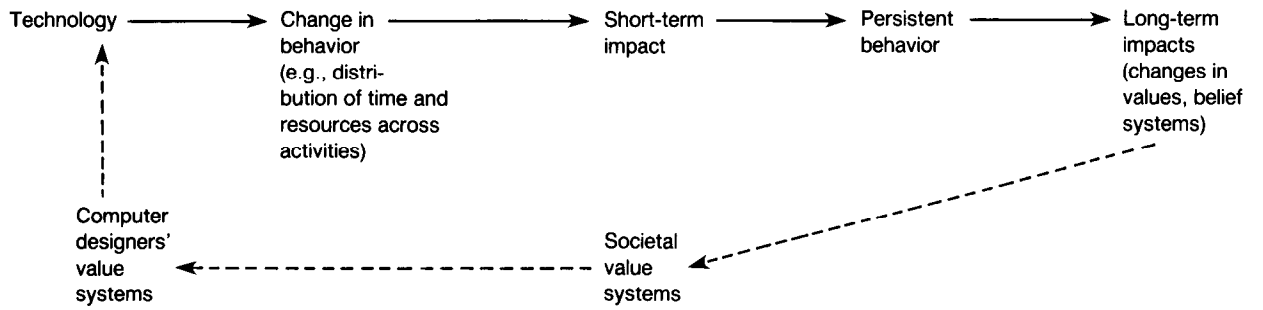

FIGURE 1a. General Computer Use Impact Process

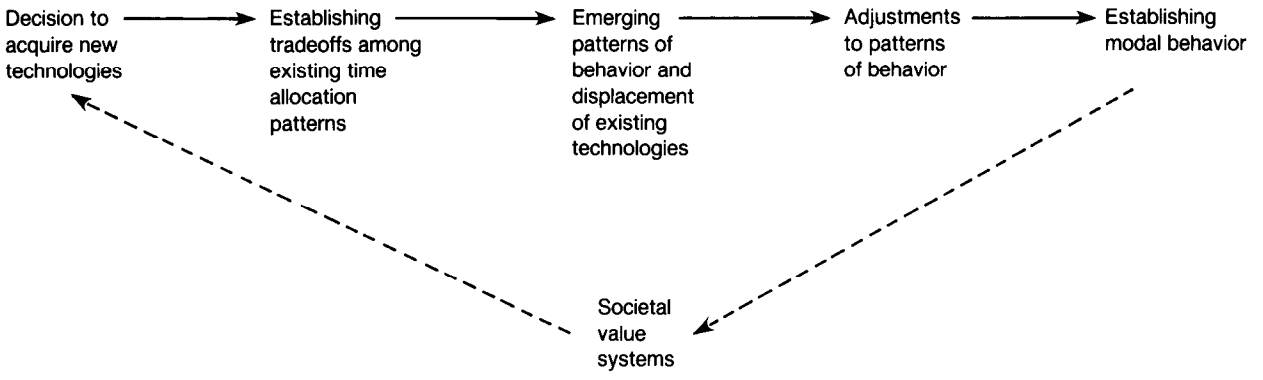

FIGURE 1b. Household Computer Use Impact Process

termines how the technology is to be used, how much time should be spent, and what tradeoffs should be established.[1] In the last phase, the household begins to manifest some form of modal behavior which accounts for changes in lifestyles, household beliefs, and value systems. This may be considered the long-term impact engendering a new form of social life.

It is interesting to look at the adoption of television and automobiles as an illustration of the time-dependent effects of technology on households.

When television was introduced years ago, similar impact issues were discussed and several studies were conducted over the years. Two particularly relevant studies found that television had a great impact on radio listening and magazine and book readership, but not on newspaper reading [2, 5]. There was an initial impact on attendance at spectator sports and reasonably long-term impact on motion picture attendance. Although television allowed family members to come together, the increased family unity was "passive" rather than "active." Meals and bedtime suffered rearrangement, but interest in other recreational and social activities was not seriously affected.

Coffin [5] found that after three or four years of television adoption, families rearranged their lives and resumed their leisure activities. In the case of automobiles, Robinson [21] suggested that the effect of the automobile on time allocation in household activities followed a homeostatic pattern: The household mix of activities changed, but the overall time pattern returned to an equilibrium position. For example, Robinson found that the total travel times of automobile owners and nonowners were the same [22].

A parallel may exist between the time shifts seen in the cases of television and automobiles and the time shifts due to computing in the home. Computing, however, is a qualitatively different activity in a number of ways. First, computing in the home demands a higher level of interaction and involvement than television. Second, computing has very strong instrumental and task-oriented problem-solving features rarely exhibited by television. Automobiles differ also. As a mode of transportation, the automobile is simultaneously a means of conveying image and prestige, recreation, pleasure, and escape [24]. In other words, the automobile satisfies a multitude of human needs. Computing in the home, on the other hand, presently satisfies a narrower range of human needs. Home computing needs to be examined empirically and systematically. Our exploratory study is a response to that need.

METHODOLOGY

Sample Selection

The sample selected for this study consisted of 282 members of active computer clubs in Orange County, Calif. We contacted the clubs and asked for the names of people who would be willing to participate in the study. Slightly over 300 members responded to our request for participation. Although this is an availability sample, respondents were distributed across different computer clubs and different computer systems. We collected standard demographic data, such as age, sex, income, household type, and occupation.

Item Selection

The questionnaire contained several items relating to computer use, attitudes, levels of satisfaction, and demographics.

The respondents were given a list of ten activities to gain insight into the effects of computer use on the allocation of household time[2]:

watching television
reading
leisure spent with family.
leisure spent with friends
outdoor recreation
sports
hobbies
sleeping
time spent alone
studying/homework

These activities can be classified into three types: (a) activities which involve the individual only, (b) activities which involve the individual with others, and (c) activities with both possibilities. Although the list is not exhaustive, it represents the type of activities that are most likely to be affected by computer use.

We asked each respondent: "Compared to the time before you had a computer in your home, how has the time spent for the listed activities changed?" (For each of the activities, the response alternatives were: 1. increased, 2. about the same, and 3. decreased.) The measure used was self-anchored, where the "reference point" is left to the respondents. Thus, only the direction of the time changes can be investigated (ordinal scale). We chose this measurement to simplify the data gathering at this exploratory stage of the research.

The final category, studying/homework, was included to collect general information about potential changes in time use for people working at home. The popular literature suggests that individuals who own personal computers do more work at home and engage in additional professional education. We felt that a simple question about time shifts on this variable would provide a directional measure of change in time spent working or studying at home.

FINDINGS

Characteristics of the Adopters

The majority (73 percent) of the adopting households consisted of married couples. Children were present in 48 percent of the households. Ninety-six percent of the

[1] Decision process in this context may be implicit or explicit depending on the decision style of the household. However, household members often implicitly allocate time by choosing to engage in different activities. Sometimes this is a joint decision process with other members; at other times it is a unilateral decision process.

[2] For a complete list of household activities, see Robinson [21].

TABLE I. Percent Frequencies of Primary Computer Use by Occupational Group

	Entertainment use	Finance use	Word processing use	Business use	Hobby use	Row total
Engineer/technical (n = 110)	23.4	3.2	22.3	26.6	26.6	100[1]
Programmer/systems analyst (n = 22)	31.8	0.0	13.6	22.7	31.8	100
Professional/managerial (n = 58)	15.4	7.7	30.8	25.0	21.2	100
Salesperson (n = 12)	25.0	12.5	50.0	12.5	0.0	100
Student (n = 13)	50.0	0.0	8.3	0.0	41.7	100
Miscellaneous—Blue/White collar (n = 25)	20.0	5.0	35.0	20.0	20.0	100
Self-employed (n = 5)[2]	25.0	0.0	25.0	50.0	0.0	100
Retired (n = 17)	0.0	10.0	10.0	20.0	60.0	100
Percent distribution of primary uses across the entire sample	22	5	24	26	24	100

[1] May not add up exactly to 100 percent because of rounding errors.
[2] Because of the small value for this category, any interpretation may be misleading.

respondents were men! Ages varied from under 18 years to over 65. Most respondents (55 percent) were between 26 and 45 years old. They were well educated, and 91 percent completed at least "some college." A very high fraction of the respondents (63 percent) worked in technical professions; but students, retired persons, and others were also in the sample. The typical family income (54 percent) was between $30,000 and $49,999. Finally, a large proportion (77 percent) of the respondents had used computers prior to purchase.

Rankings of Computer Use

Respondents were asked to rank their computer uses. Rank measures were chosen over time estimates due to the measurement problems encountered with retrospective self-reported time estimates. Ranks provide a relative measure of the importance and priority of computer use.

Rank data on actual computer use was collected for five types of computer activities:

1. entertainment/games
2. finance
3. word processing
4. business use
5. hobby/education.

Table I provides crosstabulated percentage figures representing the number of respondents, by occupational group, that assigned a rank of 1 to each use. The primary use differs according to occupational group. Business use is high for engineers, self-employed people, and professionals. Hobby use is high for engineers, programmer/systems analysts, students, and retired persons. Use of the computer for word processing is ranked high by professionals, salespersons, and blue collar respondents. Entertainment use is high for programmer/system analysts and students.

The data in Table I also indicate that approximately 26 percent of the respondents primarily use their computer for business. This 26 percent is a conservative figure. If word processing use is included, we speculate that work at home is probably a primary use for 45 percent of the respondents. Furthermore, if approximately 45 percent of primary computer use is spent on work-related activities, then work life is a dominant feature of home life in technical and professional/managerial households, at least for now and maybe in the near future.

Changes in Allocation of Time

Table II reports changes in time allocation due to home

TABLE II. Percent Changes in Time Allocation by Activities

	Watching television (1)	Reading (not computer related) (2)	Leisure (time with family) (3)	Leisure (time with friends) (4)	Outdoor recreation (5)	Sports (6)	Hobbies (7)	Sleeping (8)	Time spent alone (9)	Studying/ homework (10)
Increase	2.5	12.6	4.3	10.6	1.2	2.7	8.6	0.8	34.6	24.1
Same	31.2	69.8	76.9	73.9	76.7	79.5	48.0	73.0	53.5	69.0
Decrease	67.4*	17.6	18.9*	15.5	22.1*	17.8*	43.4*	26.3*	11.9*	6.9*
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Reported increases and decreases are significant at .01 level.

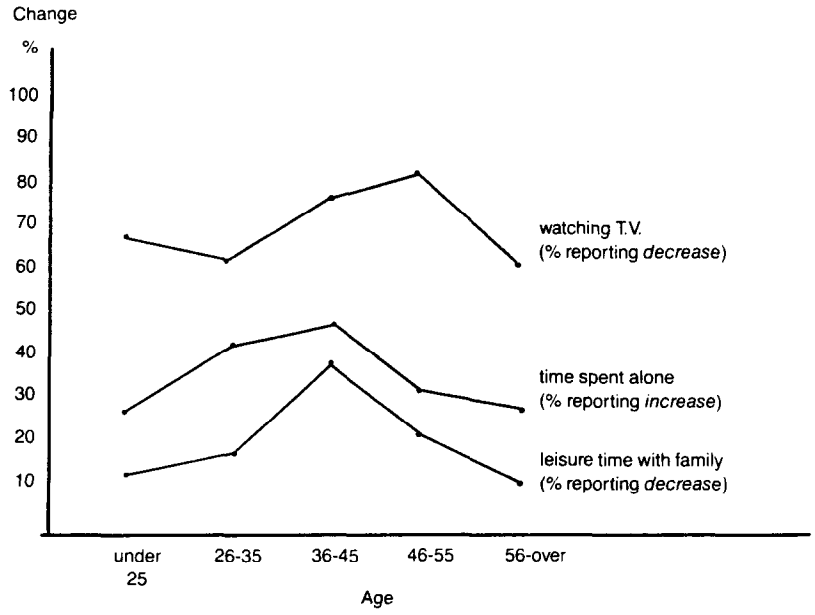

FIGURE 2. Changes in Time Allocation on Selected Activities by Age Groups

computer adoption. It reveals several dramatic time changes for home activities. The response category "about the same" provides a gross measure of the degree of change in the time allocated to the ten activities. At the lower end of the range only 20.5 percent (100–79.5) of the respondents report a change in sports activities. At the high end of the range, however, 69.9 percent experienced a change in time spent watching television. Based on this gross measure, the perceived impact (short term) of home computer use may be considered significant.

It is also noteworthy that increases as well as decreases in time allocation are reported for all of the activities. Using a standard Chi-square test we found that the decrease fractions are significantly higher than the increase fractions for eight of the ten activities (Table II). Specifically, the fraction of respondents reporting decreases as well as increases in time spent for each activity, respectively, are: television watching, 67 percent and 3 percent, hobbies, 43 percent and 9 percent, leisure time with family, 19 percent and 4 percent, outdoor recreation, 22 percent and 1 percent, sports, 18 percent and 3 percent, and sleeping, 26 percent and 1 percent.[3]

Time spent on the activities time spent alone and studying/homework reportedly increased for more respondents than those who indicated a decrease.

These values are significant and dramatize the impact of the home computer on the household or at least the principal user in the household. The results show that time spent with family and friends decreased and time spent alone increased. In terms of our conceptual framework (Figure 1), it is worth asking if this is a long-term or a short-term impact. If, indeed, these changes persist over time, one wonders if computers encourage social isolation. This is a question which may have some policy implications.

Demographics and Time Allocation

In this section, we report the results describing the relationship between some key demographic variables and time allocation shifts across some home-centered activities.[4]

We found the relationship between age and changes in time allocation to be somewhat curvilinear (Figure 2). For example, adults below 25 and adults above 56 reported smaller decreases in television watching and leisure time spent with family, and smaller increases in time spent alone than adults between 26 and 55. This may reflect the different lifestyles of the younger and older groups. Both groups are more involved in activities external to the household, presumably because of fewer family responsibilities associated with their stage in the life cycle. Finally, it appears from Figure 2 that across the three activities (watching television, time spent alone, and leisure time with family) the 26–35, 36–45, and 46–55 age groups were affected most.

Higher income respondents report a greater decrease in television watching (Figure 3a). Married people re-

[3] The factor analysis was performed using varimax rotation to generate orthogonal dimensions rather than oblique rotation which would be difficult to interpret because of nonorthogonality. To explore possible patterns between the changes, we factor analyzed the original and transformed variables (i.e., the various time changes were turned into dummy-variables). However, no distinct patterns between the time changes emerged.

[4] A correlation analysis using the eta statistic was performed to explore the relationship between demographics and time allocation patterns. Since more than 90 percent of our respondents were male, the correlation between gender and the time changes was not considered meaningful. Also, the education level does not appear to make much difference in regard to which activities are affected the most, across different educational groups. Because of the nonlinear nature of the eta statistics, standard hypothesis testing was not appropriate, consequently significant levels were not meaningful [15].

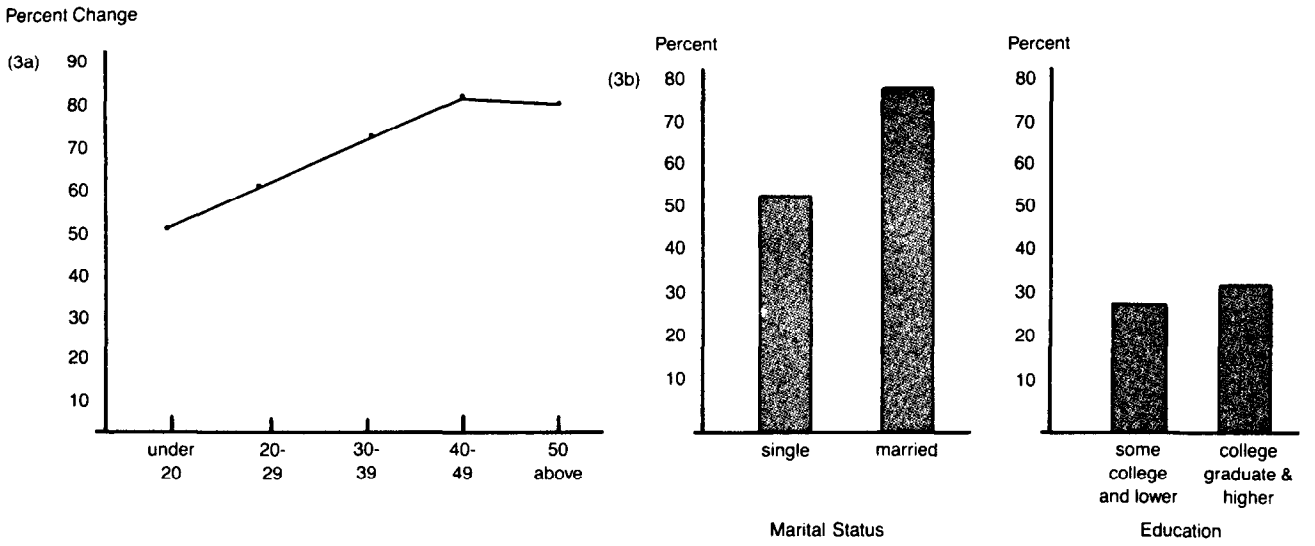

FIGURE 3. Reported Decrease in Time Allocation on Watching Television Across Three Variables

port a much greater decrease in television watching than unmarried people (Figure 3b).

The presence of children in the family is most interesting. The activities most affected are watching television, leisure time with family, time spent alone, and sleeping (Figure 4). Families with no children report a smaller decrease in time spent watching television, leisure time with family, and sleeping. At the same time, respondents with children report a greater increase in time spent alone.

We expanded the analysis concerning families with (or without) children to examine the differential impact on families of varying sizes (Figure 5). As in Figure 4, the families without children report the lowest changes. A different pattern emerges, however, in the case of families with one child in contrast to those with two or three children. Families with one child report the greatest disruption in existing activities when compared to families with two, three, or more children. This is probably because the single child demands more attention from his/her parents, whereas in families with multiple children the companionship is shared among children.

In summary, the activities affected the most were watching television, leisure time with family, sleeping, and time spent alone. All these activities are internal to the household. External activities, however, that is, outdoor recreation and sports, were affected to a lesser extent. Also, the demographic variables which matter the most were age, income, and presence of children, and, to a smaller extent, martial status. More specifically, households in the middle of their life cycles, involved in raising and socializing their children, have felt the greatest impact.

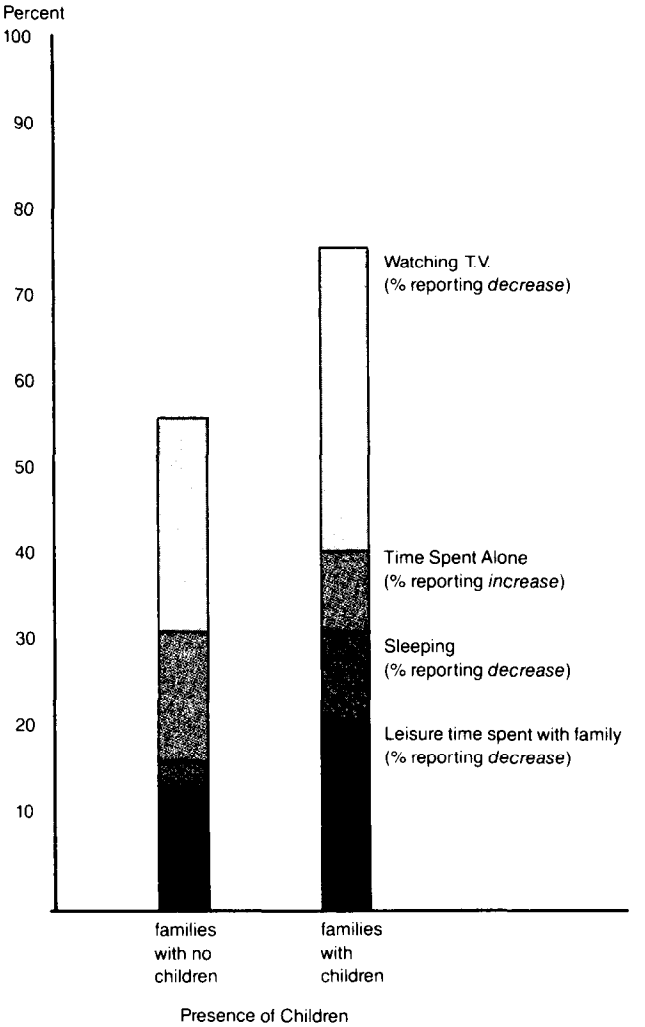

FIGURE 4. The Impact of Presence of Children on Time Spent on Selected Activities

The Effect of Length of Ownership on Time Allocation Changes

Next, we investigated the differences between people

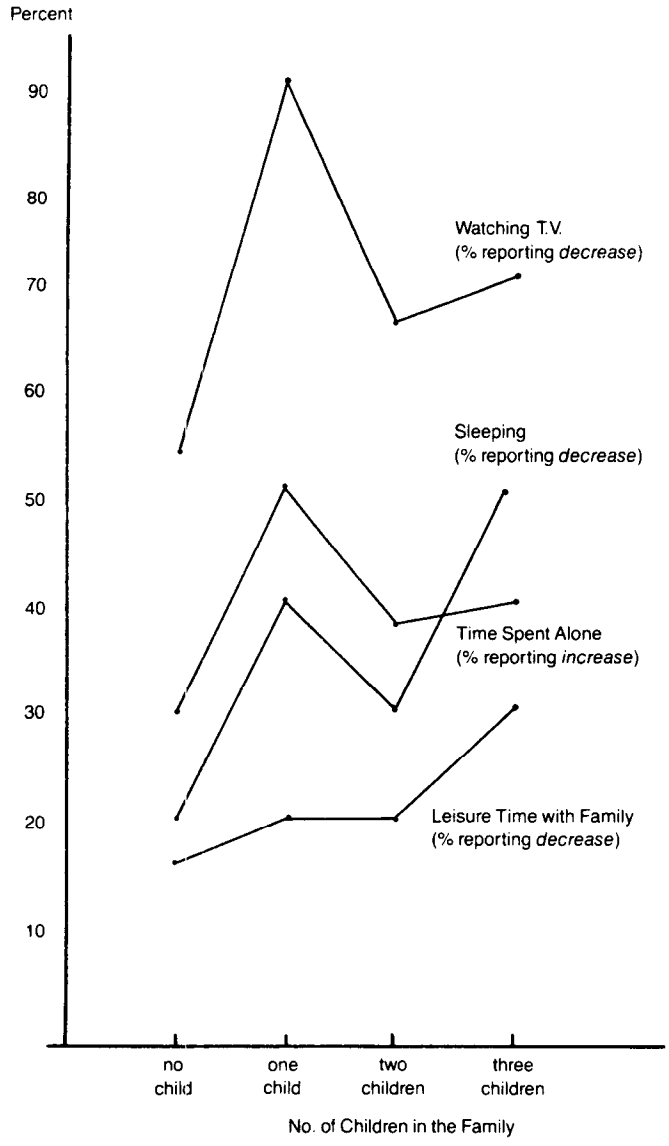

FIGURE 5. The Impact of Number of Children on Time Spent on Selected Activities

who recently purchased computers and those who were longer term users. The underlying hypothesis is that changes in activities should change over time. Initially, we would expect a noticeable impact on home-centered activities, but later, when computer use is integrated into the household, the impact would be less pronounced. To examine this relationship, we crosstabulated length of ownership and reported changes in activities. The results are not statistically significant (Table III).

Intuitively, we questioned the finding that the length of ownership would not be significant. We wondered if the large proportion of computer users who have had previous experience (77 percent) would influence this finding. We separated the sample into two groups, those with previous experience and those without. The results reveal some dramatic differences (Table IV). For example, during the first year of ownership, television watching decreased to a greater extent among the no-previous-experience group (100 percent) as opposed to the experienced group (67 percent). Such differential impact can also be found in other categories, such as leisure time with family (40 percent and 11 percent, for the no-previous-experience group and the experienced group, respectively) and leisure time with friends (30 percent and 13 percent, for the no-previous-experience group and the experienced group, respectively). Length of ownership is an important variable when "previous experience" is held constant. A possible explanation for this phenomenon is that users with no previous experience would invest more time to learn than users with previous experience. Also, the novelty of the technology probably played an important role in the no-previous-experience households. As more households begin to adopt computers, they are more likely to resemble the group without previous experience and more likely to feel the impact to a greater extent. Additional research is needed to explicitly examine this underlying process.

DISCUSSION OF THE RESULTS

An Evaluation of the Homeostasis Model

Our findings have relevance for the homeostasic relationship between technology and time change discussed by Robinson [22]. Two assumptions underlie this relationship. First, all systems tend to be at an equilibrium; this is especially true of natural systems, such as households. Second, any new changes in the system are localized to a few factors and such changes are compensated for by adjustments in similar but already existing factors in the system, thus restoring the equilibrium condition.

The first assumption implies that all changes occur gradually, and only rarely do we find sudden shifts of a permanent nature, especially in the short run. The second assumption implies that the system components that are most affected are the ones which closely resemble the elements of the new phenomenon. For our study, the implication is that the introduction of computers in the home may not bring about radical changes in time allocation or activity patterns except, perhaps, in the long run. Of course, following the initial impact, there will be short-term perturbations; that is, some activities will manifest greater changes than others. Also, the activities which are likely to be affected are the ones which are in the same task environment (e.g., homebound) as computing activities, such as watching television, hobbies, etc. On the other hand, there will be less impact on activities such as socializing with friends, sports, eating, etc., which exist in a different task environment. Our findings also suggest that activities which are affected the most are internal, rather than external, to the household.

To capture the dynamics of this homeostasic relation-

TABLE III. Percent Change in Time Allocation and Length of Computer Ownership

Changes in time spent on selected activities	Length of ownership			
	(Group 1) less than a year	(Group 2) 1–2 years	(Group 3) 2 years or more	Chi-square
Watching television (−)[1]	70[2]	64	64	n.s.[3]
Reading (−)	22	14	17	n.s.
Leisure time with family (−)	17	18	20	n.s.
Leisure time with friends (−)	15	17	14	n.s.
Sports (−)	24	18	13	n.s.
Sleeping (−)	24	29	25	n.s.
Hobbies (−)	35	45	41	n.s.
Outdoor recreation	26	22	28	n.s.
Time spent alone (+)	36	35	34	n.s.
Studying/homework (+)	23	24	27	n.s.

[1] (−) indicates decrease; (+) indicates increase in time spent.
[2] Read as follows: Of those who have owned a computer for less than a year, 70 percent reported that the time spent on television watching decreased.
[3] n.s. = not significant

TABLE IV. Length of Ownership with Previous Experience Held Constant (in percent)

Changes in time spent on activities	Previous experience with computers				No previous experience with computers			
	Length of ownership							
	1 year or less	1–2 years	3 years or more		1 year or less	1–2 years	3 years or more	
Watching television (−)	67[1]	66	65	n.s.	100	60	60	*
Reading (−)	18	11	18	n.s.	44	25	14	*
Leisure time with family (−)	11	18	25	*	40	17	11	*
Leisure time with friends (−)	13	17	11	n.s.	30	18	21	*
Outdoor recreation (−)	24	23	20	n.s.	44	24	18	*
Sports (−)	21	18	17	n.s.	44	21	7	*
Hobbies (−)	35	53	43	n.s.	33	47	42	n.s.
Sleeping (−)	25	31	30	n.s.	33	18	14	*
Time spent alone (+)	36	34	30	n.s.	20	33	21	n.s.
Studying/homework (+)	24	31	22	n.s.	40	9	0	*

* Significant at .05 level or less.
[1] Read as follows: Of those who had previous experience with computers and those who owned a computer for one year or less, television watching reportedly decreased among 67 percent of the respondents.

ship, we propose a model in Figure 6. The model starts with an equilibrium position [A] which characterizes the household just prior to the introduction of a computer. When computers are introduced, we postulate three possibilities: (a) absence of change in existing patterns of household behavior, (b) short-term perturbations in household behavior, and (c) changes that signal long-term impact.

We contend that the first outcome (i.e., no change) may occur for two reasons. (1) The household characteristics are such that they elicit a low level of interest in the technology. (2) The principal user(s) in the household has had much experience with the computer prior to its introduction in the home and consequently has not felt any impact. The second outcome (i.e., short-term perturbations) occurs when the household is subjected to unpredictable and somewhat random adjustment patterns. In this situation, computers

can have an impact on both cognate activities (e.g., television watching, hobbies, and reading) and differentiated activities (e.g., sports, outdoor recreation, etc.). Cognate activities are contextually similar and are more likely to be displaced for that reason. In the short run, however, noncognate activities are also affected because households are experimenting with the computers and have not fully evaluated their time allocation patterns. The third possibility suggests some long-term changes in the household behavior patterns. Here, we hypothesize that the changes are gradual and the impact is cumulative rather than abrupt. When these changes solidify, a new order emerges yielding a new equilibrium position (Figure 6, [B]).

Although the model attempts to simplify the technology/household interface, we feel that it is reasonable in its assumptions. For example, most of what we see now are short-term effects and any predictions about long-term time patterns are, at best, imperfect.

CONCLUDING REMARKS

This study is an exploratory attempt to determine the impact of home computers on time allocation patterns in the household. The following is a summary of our findings with implications for future research.

The sociodemographic profile helps characterize early adopters of home computing. The fact that 63 percent of the adopters are engaged in technical professions, are well-educated, and have above average incomes is noteworthy. At present, the home computer is a rather complex product requiring special skills and, possibly, some training. For well-educated persons with technical backgrounds, this complexity seems manageable, and they are better able to appreciate the benefits and challenges the new technology offers. Also, from a time management perspective, it is apparent that the technical professional will need to invest less time in learning to use the computer and integrate it productively into the household task environment. This coincides with a major conclusion from the innovation literature, that is, adoption will be positively related to perceived relative advantages associated with the innovation [23].

For systems designers, the findings indicate that the time dimension should be explicitly brought into account when developing programs to increase consumer welfare and efficiency in the marketplace. The fact that computers may lead to social isolation should be of primary concern to policy makers.

It was also demonstrated that home computers may cause some changes in time allocation. The results suggest that home computers engender a shift from recreational or pleasure-oriented activities to task-oriented activities (i.e., more time spent alone, less time spent on leisure activities). The result is probably best explained by the mix of applications currently available on home computers. With the exception of game software, most home computers are patterned after their office counterparts, in architecture, program behavior, and application.

The study also provides evidence that computers may have the potential to change household lifestyles. If the current technological progression in home computers continues, it is likely that they will become more sophisticated and more versatile. Households may find it useful to permanently reallocate time to activities performed by the computer. If, as hypothesized by the model presented in Figure 6, the changes persist in the long term, we may see a new equilibrium position with new time allocation patterns and a new mix of activities.

For example, the high level of change in television watching, regardless of the length of ownership, suggests that the role of television will change in the household of the future. Television's dominance as the central feature of the home may change and it may be transformed through integration with other computer-based task and pleasure-oriented activities.

The study also indicates that business and word processing are dominant uses for home computers. If this indicates a trend, the household of the future may be the site of more task-oriented behaviors. It appears that, at least among technical occupations and the professions, work at home has strong normative support.

Another long-term trend is suggested by the data on households with children. Households with children report a greater magnitude of change across activities (see Figures 4 and 5). In the long term, the greatest impact on the household may be seen in households with children.

The final area of speculation concerns the relationship between users with prior computer experience and changes in household activities. We hypothesize several trends. First, since most households have yet to adopt a computer, and the majority of those households have limited experience with computing, many future adopters will probably experience more changes in their activities, and at a less stable rate, because of their lack of experience. They will also have to allocate more time to learning, and therefore may experience greater disruption in their normal household activities until a new steady state is reached.

Finally, the study is not without its limitations. Although the findings are generalized to the household, the information was obtained from the principal user of the home computer. Second, the sample is not a probability sample and was selected from members of computer clubs who are probably highly interested in the technology and thus self-selected. Finally, the study is based on self-reports and recall measures rather than diaries or first-hand observation. One solution to these methodological limitations is to perform a longitudinal study of home computer use and include multiple waves crossmeasured with diaries or logs. We view a longitudinal study as the next logical step in this area of research as it will permit the exploration of some of the more long-term speculative questions raised by this study.

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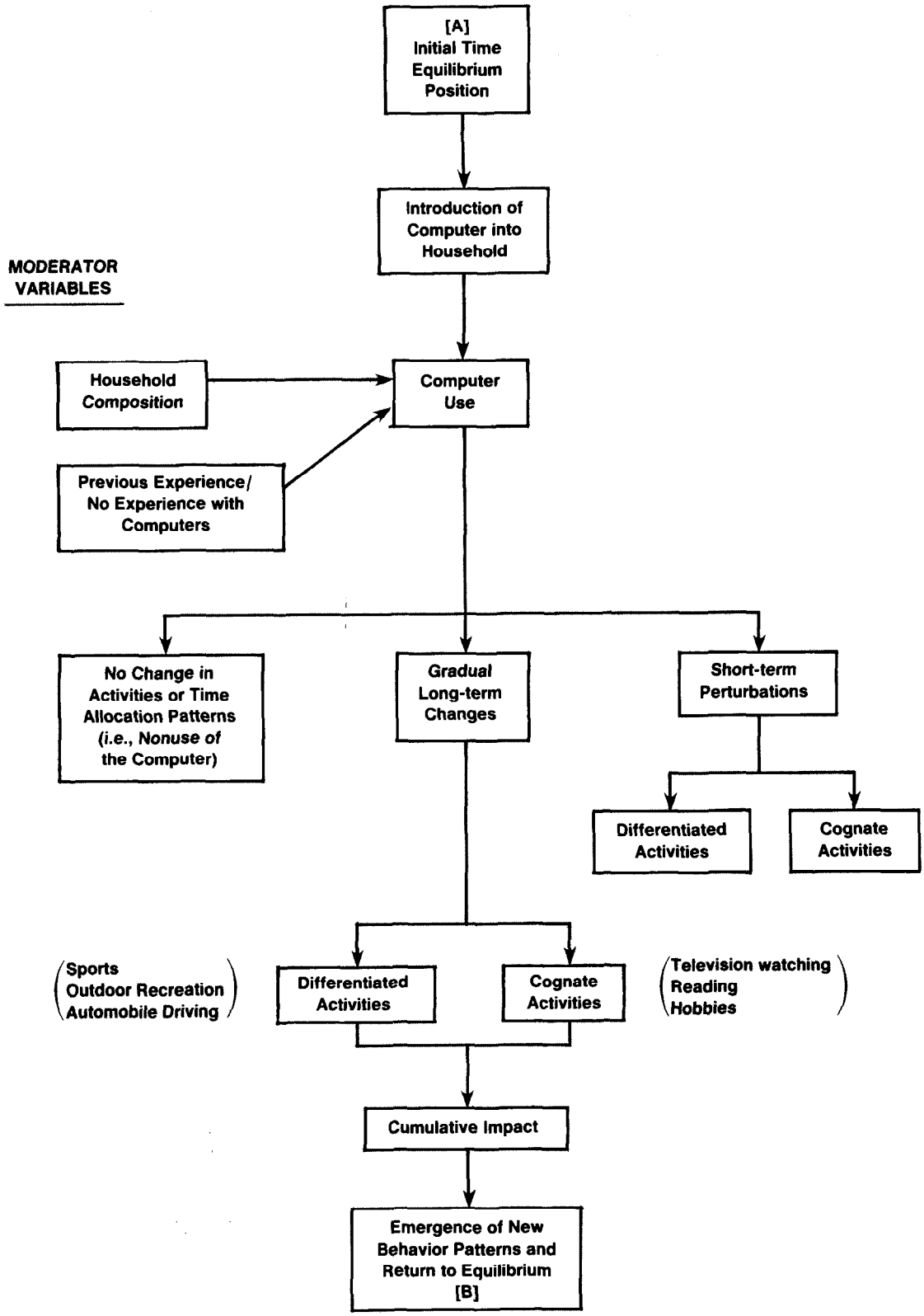

FIGURE 6. Homeostatic Model of the Effect of Computer Use on Household Time Allocation Patterns

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