

REPORTS AND COMMUNICATIONS

The Personal Computer, Culture, and Other Uses of Free Time

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This report compares the cultural participation and other free time activities of heavy users, light users, and nonusers of personal computers, based on a 1997 national survey of more than 6,000 respondents age 18 years or older conducted for the National Endowment for the Arts. No significant or consistent evidence of time displacement of such leisure activities was found. Indeed, heavier computer use was associated with significantly greater participation in cultural and other free time activities, even after multivariate adjustment. These results reinforce conclusions from earlier surveys showing higher mass media use among home computer users rather than displacement, as occurred with the introduction of television. These results reinforce the conclusion that personal computers might have more in common with “time-enhancing” home appliances such as the telephone than they do with television.

Keywords: personal computers, information technology, social impacts, arts participation displacements, mass media

Insightful and unambiguous behavioral evidence to test hypotheses about the impact of home computers is difficult to locate. One individual-level variable that is most useful in this regard is time, more specifically the time that individuals devote to a new technology compared to that devoted to existing technologies and to other daily activities. Perhaps the most important measurement feature of time for social scientists in this regard is its “zero-sum” property because of the way in which it brings differences into bold relief. Thus, if consumers spend more time on some new activity or technology, then that must necessarily displace time spent on some other technology or activity.

One major question is whether owners of personal computers and users of on-line services are reducing their participation in cultural, media, and other free time activities. These include activities undertaken at home and away as well as consumption of both information and entertainment media. More to the point, which types of activities or media are likely to have been affected by the arrival of these new technologies and how?

This study examines the question of how the home computer and on-line services may have affected Americans’ cultural and other free time activities. Although it does not use the complete “time diary” approach that is needed to capture the full impact of these technologies, it does incorporate enough of the microbehavioral features of a diary approach to

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provide a sound basis for appreciating and understanding some of its most likely effects or correlates.

METHODOLOGY

Whereas many general national surveys have asked respondents about their use of personal computers or the Internet, a particularly attractive feature of the 1997 Survey of Public Participation in the Arts (SPPA) is its focus on a broad range of daily activities (Bradshaw, 1998). Instead of being asked how their lives have changed as a result of computers, respondents were asked to engage in the easier microbehavioral task of simply reporting what they did. Here, we have the opportunity to see whether some earlier 1-day results in Robinson, Barth, and Kohut (1997) seem to hold for other cultural behavior and for longer range periods of behavior. Whereas the activity questions asked in this survey do not cover all aspects of daily life, the activities examined often are seen as those most "at risk" from the new information technology. Moreover, they consume more than half of the free time that respondents report in full-time diaries (Robinson & Godbey, 1997).

Basically, what the 1997 SPPA allows us to examine is whether those people who use home computers for hobbies and enjoyment more than others over longer time periods also report lower levels of participation in other free time activities. It also allows us to examine whether the differences are direct and "monotonic"; that is, do we see proportionately less participation as home computers are used progressively more? As noted earlier, the annual reporting period employed in the SPPA questions means that the respondents are put minimally in the position of trying to make complex, and perhaps inaccurate, judgments on how this new home technology has affected their other activities. They simply have to report their activities; they do not have to connect these time estimates to the presence of the technology.

Survey Design and Execution

The 1997 SPPA was conducted by telephone with a national probability sample of 12,376 respondents age 18 years or over from July through October. Households were selected using the random digit dial method, with at least 10 follow-up attempts. Special procedures using highly trained and skilled interviewers were employed to convert refusals. A household cooperation rate of 65% was achieved, with a final overall respondent response rate of 55%. To adjust for the disproportionately lower proportions of males, Blacks, and younger and less educated respondents in this telephone survey, the data were weighted to 1997 census characteristics on these factors, and these weights are applied to our analyses.

The 1997 SPPA began with questions on live annual participation in seven "benchmark" activities and then turned to a series of "module" questions, some on media participation in these art forms via television, newspapers, magazines, books, and radio and some on other free time activities including personal computer use. For the module on other free time activities, roughly one random half of respondents were simply asked whether they played sports, did gardening, and the like in the past year. Among these free time questions, respondents were asked about their computer use.

For those who responded positively to the question "Not counting using a computer at work or at school, did you use a personal computer for hobbies or for enjoyment such as playing games or surfing the Internet?," a follow-up question was asked about how many hours a week they devoted to those activities. The distribution of responses to this two-part question was as follows:

Did not use personal computer	62%
Used 1 hour/week	10%
Used 2 hours/week	8%
Used 3 hours/week	4%
Used 4 to 5 hours/week	7%
Used 6 to 10 hours/week	6%
Used 11 to 20 hours/week	2%
Used 21 or more hours/week	2%

Thus, of the nearly 40% of the SPPA sample who said they had used computers for hobbies or enjoyment, about one quarter used them for only 1 hour per week. These responses translate to an overall average of 2.1 hours per week for the whole sample and of 5.2 hours per week for those who used home computers during their free time.

Similarly broad respondent categories were used to calculate mean values of the respondents' extent of daily television use and annual attendance at sports events and movies.

RESULTS

Table 1 arrays the different levels of participation in attendance at various cultural and arts events for these different levels of home computer use. The table is split into four parts, depending on whether the activity concerns (a) attending live performances, (b) reading general or arts-related content, (c) participating in other, mostly non-arts activities (e.g., sports, gardening), and (d) watching television.

In general, rather than time displacement, the pattern of results is similar to that found in Robinson et al. (1997). There are *increasing* levels of participation in cultural and arts activities among home computer users, and these levels increase as the number of hours of computer use increase. That is reflected as well in the correlation coefficient (Pearson's *r*) shown in the last column of Table 1.

Nonetheless, the correlation coefficients are not high, vary across activities, and often depart from monotonicity (i.e., from the regular linear pattern of continued increase for each category increase in home computer use). Thus, even though they are statistically significant, the correlations of computer use with attending classical concerts and listening to poetry are less than .05. Moreover, the correlations with attending opera, ballet, and other dance; with listening to novels; with gardening; and with watching television during the week are not significant. Even when significant, one can note important non-monotonicities such as the drop to 12% of jazz attendance among those estimating use of home computers for 6 to 10 hours per week, compared to a 19% rate for the 3 to 5 hours per week group and to 22% for the 11-plus hours per week group. A similar discontinuity appears for the 6 to 10 hours per week group in attending classical concerts, plays, art museums, and art fairs.

Nonetheless, none of the 33 correlations in Table 1 is in the expected zero-sum or negative direction, that is, *lower* cultural and arts participation use associated with higher use of computers. Moreover, most of these positive correlations are statistically significant, with some of them impressively so (e.g., for visiting historic parks). At the same time, the biggest difference accounting for these correlation coefficients clearly comes from the initial category distinction between computer users and computer nonusers.

Similar correlations of computer use with arts-related use of the media of television, radio, and recordings (records, tapes, or CDs) also are found (e.g., listening to radio opera, watching television dance performances). Here, the correlations are lower, and fewer are significant than for attending live performances.

TABLE 1
Bivariate Differences in Annual Arts/Leisure Activities
by Leisure Use of Home Computer (percentages)

	<i>Estimated Weekly Hours of Use of Home Computer for Hobby or Enjoyment</i>						<i>r</i>
	<i>Nonusers</i>	<i>1</i>	<i>2</i>	<i>3-5</i>	<i>6-10</i>	<i>11+</i>	
Arts attendance							
Jazz (benchmark)	9	18	18	19	12	22	.06**
Classical (benchmark)	14	22	22	23	15	23	.04*
Opera (benchmark)	4	6	7	9	7	6	.03 (n.s.)
Musical (benchmark)	21	36	33	33	34	29	.05*
Play (benchmark)	12	17	24	26	12	19	.05*
Ballet (benchmark)	5	11	8	6	5	7	.01 (n.s.)
Other dance	11	17	14	16	17	16	.03 (n.s.)
Art museum	30	49	50	52	46	46	.10**
Art fair	42	65	59	60	55	59	.08***
Historic park	43	62	59	56	64	67	.10***
Any benchmark	44	66	66	69	64	61	.09**
Number of benchmark activities	0.4	1.2	1.3	1.3	0.9	1.1	.11
Reading							
Read book	62	76	79	77	83	80	.10**
Read play	4	6	8	7	10	17	.07**
Read poetry	25	32	34	33	44	44	.06**
Read novel	54	71	72	75	75	66	.10***
Read critics	14	20	18	20	21	30	.06**
Listen to poetry	7	8	7	8	13	11	.03*
Listen to novel	7	9	8	11	10	7	.01 (n.s.)
Read literature	58	76	76	78	77	77	.10***
Number of books	10	12	13	15	24	25	.04*
Other free time activities							
Movies	57	85	86	85	78	76	.13***
Attend sports	35	59	50	59	50	48	.08**
Amusement park	52	69	70	65	68	61	.07**
Jog/exercise	71	86	87	90	75	74	.07**
Play sports	37	62	63	69	58	50	.13***
Outdoors	38	62	87	86	65	55	.10***
Volunteer	39	56	51	54	44	54	.06**
Home improvement	63	79	71	73	69	73	.06**
Gardening	65	65	68	64	64	66	-.01 (n.s.)
Television viewing							
Television, weekdays	3.0	2.0	2.4	2.5	2.6	2.9	.00 (n.s.)
Television, weekends	3.0	2.4	2.8	2.9	3.0	3.5	.05*
Television, average day	3.0	2.1	2.5	2.6	2.7	3.1	.01 (n.s.)
Television, weekly hours	21.1	15.0	17.4	18.3	19.0	21.6	.01 (n.s.)

*Statistically significant at .05 level; **statistically significant at .001 level; ***statistically significant at .0001 level; n.s. = not significant.

A somewhat lower pattern of correlations also is found for more intense arts participation at the individual level, namely actual personal production of art, whether for public display or sale or for personal pleasure. Whereas again the major difference is between computer

users and computer nonusers, for *no* activity does one find *lower* arts or cultural participation use among computer users.

MULTIVARIATE CONTROLS

The rather convergent results in Table 1 hold only at the bivariate level and could result from common correlates of both home computing and arts participation. The most obvious common correlate is social status, with people of higher status being more likely to engage in computer use and cultural participation, both of which are innovative, intellectually stimulating, cost-intensive behaviors. In particular, the status factor of education is a major predictor of engaging in nearly all such exploratory or innovative behaviors. Income also can play an important role in providing the resources needed to engage in both behaviors.

Another factor associated with both behaviors is age. Younger people are more likely to be interested in novel or pioneering behavior in that they are more open to experiences that help to identify themselves in the changing world they are now entering. These factors may play a similar role for minority-status respondents, possibly playing a role in their adopting less conventional behavior.

In addition to social status, age, gender, and minority status, the number of work hours is an important factor to control. Time can limit participation in both activities because of its zero-sum property. Thus, spending more time at work limits one's ability to engage in both activities, although the amount of time involved in either activity for most people is only a few hours per week. Nonetheless, there is a broad range of activities listed in Table 1, and engagement in many of them ultimately should be limited by available time.

How much, then, can the differences in activities we observe be explained by these social class variables rather than by new technology? To answer that question, the bivariate correlational data in Table 1 were subjected to a multivariate regression program called MCA (Andrews, Morgan, & Souquist, 1973) to adjust differences across multiple independent variables. To simplify and keep the number of such analyses more manageable, several of the activities were combined into indexes. Thus, an index of arts participation was constituted to reflect the extent of participation in the seven benchmark activities in Table 1.

The results of these MCA adjustments are shown in Table 2 for the various cultural activities in Table 1. In each MCA computation, the control variables for activities included age, gender, education, income, ethnic group, and work hours. The correlation coefficient η for each relation is shown in the last two columns of Table 2, indicating the magnitude of correlation before and after multivariate adjustment.

It can be seen that these MCA adjustments do, indeed, lower the associations between home computer use and cultural and arts participation, cutting the η relation in half for some activities (e.g., attending movies, exercising). Nonetheless, for none of these activities does one find *lower* cultural or media participation for computer users after MCA adjustment. Indeed, for several of them, there is a clear tendency for increased participation with increased computer use—for numbers of books read and movies attended, for use of the mass media for jazz and classical music, and for personal participation. For most free time activities in Table 2, the pattern is a clear jump in cultural and arts participation among those who use computers for 1 hour per week, as opposed to those who are nonusers, and is little increase for those reporting more than 1 hour per week of computer use. Except for the non-user group, even the television variable shows highest use among those most frequently using home computers.

TABLE 2
MCA Multivariate Difference in Arts and Other Leisure Participation by Home Computer Users (percentages unless otherwise indicated)

	Nonusers	Hours						Eta	
		1 Hour	2 Hours	3-5 Hours	6-10 Hours	11+ Hours	Before	After	
Arts attendance									
Any benchmark	46%	52%	55%	50%	56%	47%	.11	.09*	
Number of benchmarks	1.3	1.5	1.6	1.5	1.6	1.4	.09	.07*	
Reading									
Read literature	61	69	73	73	72	71	.11	.11*	
Read book	67	71	76	79	73	79	.10	.09*	
Number of books read	11	12	12	15	15	16	.05	.04*	
Other free time									
Attend movies (number/year)	6.0	6.2	6.8	6.8	7.5	7.7	.12	.06*	
Sports events (number/year)	2.4	2.8	3.4	3.0	3.8	2.5	.05	.06*	
Amusement parks	52	59	66	60	54	52	.19	.09*	
Jog	70	77	79	76	78	70	.18	.08*	
Sports	39	50	53	53	57	47	.28	.13*	
Outdoors	40	54	61	48	53	49	.22	.11*	
Volunteer	38	52	51	49	50	47	.14	.11*	
Home improvement	60	67	62	65	67	63	.11	.06*	
Gardening	66	66	67	68	64	64	.02 (n.s.)	.03 (n.s.)	
Television time									
Television hours	3.0	2.7	2.9	3.1	3.3	3.5	.01 (n.s.)	.01 (n.s.)	

*Statistically different at .01 level; n.s. = not significant.

If anything, then, participation in most free time activities is slightly higher among computer users after controlling for their most important predictors. There is little evidence for the computer having reduced time spent in these other forms of spending free time.

SUMMARY AND CONCLUSIONS

In contrast to the expected zero-sum lower participation in most free time activities by users of new computer technologies based on the simple time displacement model, data from the 1997 SPPA suggest a more reinforcing or supplemental pattern of activities. In general, new technology users are *more* likely to engage in other cultural and leisure activities as well, using their time particularly for the printed medium of reading, for movies, and for personal arts production. That is not an unfamiliar finding among researchers in leisure behavior in which activities follow a "rich get richer" pattern through which those already active become more active (Meyersohn, 1968; Robinson & Godbey, 1997).

The multivariate MCA reinforces the conclusion that computer users and heavier computer users are at least as active as, if not more active than, nonusers in most arts-related activities. The relations tend to be higher for the print medium of books and for "serious" content in that medium, namely novels, poetry, and plays. They also are higher for attending art museums and historic parks and for going to jazz concerts, as opposed to attending opera, ballet, and other dance performances.

Computer users also are more active users of the mass media for arts content, although the relations here tend to be less pronounced than for attending live performances. Computer users also report being more active in non-arts free time activities as well, particularly going to movies, playing sports, and engaging in outdoor activities. The one major exception is for gardening activities, which is virtually invariant by amount of computer use.

The practically complete picture of "more-more" relations in Tables 1 and 2 does raise the question about the plausibility of these behavioral patterns and whether the results are simply a function of social desirability or other "response set" reporting on the part of SPPA respondents. The high participation of heaviest television users seems particularly unusual, although television usually is not thought of as a socially desirable activity to report. Could these results be simply a function of some such response set because not all activities can rise simultaneously given the (total) 168-hour constraint on weekly behaviors?

Although that always is a possibility, it also is important to remember that there are many other free time activities that are not covered in Table 2. These include visiting and socializing (both in-person and by telephone), educational activities, church attendance, walking for pleasure, nonvolunteer organizational activities, and playing cards and other games. These average about 15 hours per week for most respondents in recent time-diary studies (Robinson & Godbey, 1997).

Moreover, it also is possible that the time for all these activities comes from non-free time activities. Here, the potential number of hours involved in "other activities" comes closer to 100 hours of the available 168 hours each week. A prime candidate here is sleep. Other personal care activities that could be affected by computer use are eating and grooming. There also are the nearly 25 hours per week spent on shopping, child care, house cleaning, and other family care that could be sacrificed to accommodate life with a personal computer. Perhaps the travel time of personal computer users also is being curtailed.

The final answer, then, should be found in data sources that cover the complete range of daily activities such as the time-diary method. The present results, however, do not support the role of computers as displacing other activities. Unlike television (Robinson, 1972) and

more like the telephone, home computers have a facilitative, infrastructural quality that goes hand in hand with leisure diversions.

Over the past century in the United States, another ubiquitous piece of high technology currently found in the home is the telephone. With the initial penetration of the telephone into homes, it was feared that face-to-face social interaction might simply be pushed aside in favor of apparently quicker, easier means of engaging in what today we might call real-time interpersonal communication. Rather than displacement, however, in telephone use we again see a pattern of augmentation in which the telephone emerged as one of several means to achieve sociability. What the new technology offered was a novel way in which to do old things, adding dimensions of interest as well as utility while not detracting from previous face-to-face communication.

The dangers inherent in extended historical analogies notwithstanding, widespread use of the telephone involved a threefold transformation not unlike what can be observed in embryo in home personal computer use. The telephone offered a new manner in which to participate in an activity of value and interest to users, permitting them to appreciate and invest in these activities in new ways that multiplied their other investments and potentially enriched their experiences. Moreover, the telephone expanded the sphere in which users could pursue a valued end—friendship in this case—while at the same time spurring new demand to enjoy these things by more traditional avenues, all consistent with what the data show concerning computer use and cultural participation. And by virtue of its ability to be employed for other ends altogether, perhaps most especially economic transactions, the telephone made some increment of additional time available in which it could be used for leisurely pursuits. That is something that we might begin to see emerge more clearly with respect to home computer use.

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