

DIFFERENCES IN TIME USE BETWEEN INTERNET USERS AND NONUSERS IN THE NETHERLANDS

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ABSTRACT

Differences in time use between Internet users and nonusers in the Netherlands are found mainly in the productive activities of paid work, childcare and household chores. Internet users spend two hours less per week on paid work and almost two hours less on childcare and domestic tasks. On the other hand, because more Internet users are students, they spend an hour more on education than nonusers.

Thus, Internet users have approximately three hours more free time than nonusers. However, hardly any differences in specific free-time activities can be identified, except that users spend more time on reading books and visiting cultural institutions and nonusers spend less time attending to children and helping adults.

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The rapid diffusion of information and communication technology (ICT) is assumed to be changing the ways in which people live, work, learn and spend their leisure time. Mastering digital skills increases peoples' labor market chances and offers opportunities for tele-working and community commitment. ICT creates new trade circuits through e-commerce and makes lives and lifestyles seem inextricably intertwined with technology.

The rapid changes in technology notwithstanding, time-diary and other studies suggest most patterns of behavior tend to be remarkably stable. This holds for the influence of ICT on labor, as well as for the organization of daily life (Frissen 1999). Although the large-scale introduction of the personal computer (PC) in the workplace and in the homes of working people offers opportunities to adopt a more flexible pattern of working hours, people mostly work during the same time periods prior to using the PC (De Haan et al. 2001). It seems that ICT only gradually imposes on everyday human routines. Likewise, the Internet is becoming normalized, as it becomes incorporated into everyday life (Wellman et al. 2001). ICT becomes part of existing rhythms and is adapted to the wishes and needs of people. In this process of mutual shaping, the technology becomes increasingly user-friendly and offers more opportunities for application. Man adapts to the machine and the machine to man.

Yet, not everyone owns a personal computer or has access to the Internet at home. In fact, in the Netherlands 59% of the population aged 18 and over had Internet access at home in 2001 (De Haan 2003). Not everybody with access takes advantage of this opportunity; some consciously refuse to use the Internet and others just don't feel tempted enough to try. Some of today's regular Internet users might be considered as early adopters, leading the way for others. Focusing on this group might give better answers to questions about whether lives are changing with the advent of these new media. To the extent that the diffusion models of technology apply, others might follow in the footsteps of the early adopters, adapting their behavioral patterns of those leading the way.

On the other hand, it is also plausible that groups in the different stages of the diffusion process are characterized by distinctive social, economic and cultural characteristics that have more effect on their behavior than does new technology. At present this question remains unresolved, but one can assess whether differences exist between Internet users and nonusers, not knowing whether these differences will lead to social change.

PC OWNERSHIP AND USE

In an age in which virtually every Dutch household has one or more television sets, and almost all households are connected to cable TV and a telephone network, there has been a rapid diffusion of PCs in households.

After a slow start in the first half of the 1980s, PC penetration grew rapidly in the 1990s, as shown in Table 1, with the number of computer households rising from 18% in 1985 to 70% in 2000, with 18% of Dutch people having two or more PCs at home.

The telephone network is a particularly important part of the infrastructure of the information society. This network has ceased to be used exclusively for telephones. Digitization has enabled text and data communication via that network. The number of Internet connections has increased from 4% in 1995 to 21% in 1998 to 59% in 2001 (Van Dijk et al. 2000; De Haan 2003), indicating how fast the digitization of daily life has continued. It is likely that lower prices, increased user friendliness and an increased applicability of the technology have contributed to this diffusion.

Not all population groups are equally benefiting from these new developments, because the spread of PCs proceeds more rapidly in some segments of the population than in others. On average, the higher one's educational level, the higher one's income and the younger one is, the greater is the chance that one will have a PC and access to the Internet. In addition, men, parents of children in the household, and students more frequently possess a PC and Internet access. Through the possession of modern communication and information resources, higher-status groups and young people seem to benefit more from the opportunities the information society offers.

The social stratification of the diffusion process has been described as a principle of trickle-down: higher-status groups (especially high-income groups) buy these products first, and, in due time, the lower-status groups follow (Van Dijk et al. 2000). A number of groups emerge time and again as slowest to participate in the information society—in order, people in low-income households (lagging behind most); (single) women; the elderly over age 65; people with a lower (secondary) educational level; and the unemployed (Van Dijk et al. 2000).

Additionally, the TUS described below offers information on the use of the PC during leisure time using time diaries. Table 2 shows that in 2000 45% of the population used the PC at least for a quarter of an hour in the TUS week, almost double the 1995 percentage of 23%. The weekly use increases faster than the spread of the PC itself, implying that non-use of PCs at home is declining. The percentage of PC-owners active in the TUS week increased from 40% in 1995 to 60% in 2000. The rise of PC use between 1995 and 2000 did not result in a further increase in the number of hours that PC users are active. This number remained constant at an average of 4 hours per week.

In the first years of the 1990s, the PC was used as a stand-alone device. Partly due to an increase in 'free' Internet providers and the advent of the World Wide Web, the number of households with Internet access has risen rapidly since the mid 1990s. Most households connected to the Internet

TABLE 1: POSSESSION OF A HOUSEHOLD PC BY BACKGROUND CHARACTERISTICS—POPULATION AGED 12+, 1985-2000 (IN PERCENTAGES, INDEX 1995=100)

	1985	1990	1995	2000	Index
Population aged 12+ years	18%	30%	51%	70%	137
Gender					
Males	20	34	57	75	133
Females	17	25	46	65	141
Age					
12-19 years	34	46	72	90	125
20-34 years	16	30	54	76	140
35-49 years	25	43	68	85	125
50-64 years	10	16	40	69	172
65 years and older	6	4	9	24	263
Family status					
Living with parents	31	43	69	84	122
Single	6	14	28	41	147
With partner, without kids	8	19	38	63	169
Parents with kid at home	22	36	62	84	136
Education^a					
Lower	17	20	36	53	150
Middle	22	36	56	78	139
Higher	20	44	71	84	118
Labor market position					
Student	32	47	75	88	118
Worker	19	35	60	82	136
Housewife	13	18	37	62	169
Unemployed, disabled	13	26	38	51	135
Retired	8	7	18	30	166
^a Completed or present education					
Source: SCP (TUS)					

already had a PC at home. The early adopters of the PC were the ones who also gained access to the Internet first. In order to measure the use of Internet separately from other PC use, a distinction between these two categories was made in TUS 2000. This analysis investigates these time

**TABLE 2: COMPUTER USE AMONG POPULATION AGED 12+ 1985-2000
(IN PERCENTAGES AND HOURS PER WEEK)**

	1985	1990	1995	2000
Has a PC at home (in %)	18.0	30.0	51.0	70.0
Uses PC during leisure in TUS week (in %)	4.0	13.0	23.0	45.0
PC use (see B) among PC owners (in %)	18.0	33.0	40.0	60.0
Average hours PC use/user (in TUS week)	3.5	3.7	4.0	3.9
<i>Source: SCP (TUS)</i>				

differences between Internet users and nonusers in the context of their differing social groups, using Multiple Classification Analysis (MCA; Andrews et al. 1973).

THE DUTCH TIME-USE SURVEY (TUS) METHODOLOGY

This investigation is based on time-diary research conducted by the Dutch Social and Cultural Planning Office (SCP). The SCP has been engaged, together with other parties, in a series of time-use studies (TUS) that started in 1975. This person-based survey has been repeated every five years (in 1980, 1985, 1990, 1995 and 2000) with a sample size of roughly 3000 respondents, except in 1975 and 2000 when approximately 1300 and 1800 (respectively) respondents participated. Each fieldwork was conducted in the first two weeks of October (with an additional November week in 1980). Respondents keep a paper-and-pencil weekly diary with fixed, 15-minute intervals, starting on a Sunday and ending on a Saturday. In the diary, respondents identify a primary activity, its location, and (if applicable) a secondary activity, using precoded activity codes based on Szalai's (1972) grouping of ten major activity types. The only secondary activity reported involves the use of media (before 1990 only watching television or listening to the radio, after 1990 including reading). Location codes separate activities: 1) at home, 2) outside the home, 3) within one's place of residence or 4) outside one's place of residence.

In addition to the diary, a one-hour questionnaire is administered, so that after a respondent is contacted, the interviewer goes to the home of the respondent, administers the questionnaire with the respondent, explains and leaves behind the diary, and collects the diary again some one to three weeks later. The design of the time-diary study has remained largely the same, allowing rich opportunities for comparisons over the years. There have been some minor changes in adding and removing codes in the diary, as well as changing, adding and removing questions in the questionnaire.

The sampling procedure has also remained largely the same over the years. In 2000, as in the earlier years, a representative sample of households was drawn from the address registry of the Dutch postal services. Within each household willing to participate, one household member aged 12 or over was randomly selected using CAPI software. From an acceptable figure of 76% in 1975, response rates continually dropped to 54% in 1980 and 1985 and to 49% in 1990, reaching a very low 18% in 1995 and recovering somewhat to 25% in 2000.

With these figures, the question of whether the obtained response can be considered representative for the population is, of course, crucial. A nonresponse survey—conducted with respondents not willing to participate in the TUS but willing to answer a short list of questions on background characteristics and time use—was administered to 43% of the nonrespondents. Analyses of these data show that it is the *more* active segment of the population that seems more willing to participate in the Time Use Survey. This result is in line with earlier findings in the Netherlands and elsewhere (Van den Broek et al. 1999; Huysmans 2001; Robinson and Godbey 1999). Those who travel a lot, read a newspaper, watch TV daily, feel stressed and have a higher educational level are somewhat more inclined to take part in the survey. A multivariate weighting procedure that adjusted for household size, gender, age, degree of urbanization, family status and labor market position/source of income yielded a sample whose characteristics deviate only marginally from population distributions. Ethnic minorities, however, remain underrepresented in the sample after weighting. For a more detailed English description of sampling and nonresponse issues in the TUS 2000, see <http://www.tijdsbesteding.nl>.

New diary activities that were added include use of a PC (in 1985) and the Internet (in 2000) for leisure purposes. In 2000, respondents were also asked in the questionnaire about the possession and use of their PCs for various purposes. These additions make it possible to distinguish PC and Internet users from nonusers, as operationalized in terms of those people who in their free time had actively used the PC or the Web for at least a quarter of an hour during the time-diary week; this applies to 45% and 24%, respectively, of the sample aged 12 years and over. One can thus show to what extent the use of the PC and the Internet have penetrated different population groups, before drawing conclusions from the comparison of Internet users and nonusers. Users and nonusers aged 12 years and older are mainly compared, but in order to see if the results also hold for those in the productive life stage, additional analyses were performed for those aged 18-64 years. Where the controlled outcomes differ, they will be mentioned in the text.

RESULTS

Free Time: Starting from 1975, the amount of free time of the Dutch has remained fairly stable over the years up to 1995 at some 47 hours a week—or almost 7 hours a day (Table 3). In 2000, however, the number dropped to 44.8 hours a week, a finding that deviated from the state of affairs in the United Kingdom as reported by Gershuny (2002) and in the US (Robinson and Godbey 1999). Both productive time and personal time can be held responsible for this drop. In the last five years of the 20th century, labor-market participation grew considerably by a net 12 percent. Most of the new jobs were part-time positions occupied by women. Whereas the total amount of working hours rose, the work time of both employed men and women dropped somewhat. Because the employed constitute a larger segment of the population, and because they have less free time on average than other segments, the average amount of free time for the population as a whole is reduced. The decrease in free time cannot, however, be attributed solely to the increase in work time. Another factor to take into account is the remarkable rise in sleeping time. Analyses have shown that differing weather conditions can be held responsible for part of the 1995-2000 difference (Breedveld and Van den Broek 2001; <http://www.tijdsbesteding.nl>). The drop in free time is therefore partly compensated for by longer sleeping hours.

IT and Internet Time: The average number of hours spent on PC use by the whole population during leisure time increased from 0.1 hours a week in 1985 to 1.8 hours in 2000 (Table 4). In the latter year, approximately half an hour was spent on the Internet. That year, 24% of the population aged 12 years and older used the Internet for at least a quarter of an hour in the TUS week. PC time rose between 1985 and 2000 among all population groups, with an accelerating rise since 1995 (Table 4). Between 1985 and 1995, this rise was due to a combination of increased participation and increased amount of time spent by users. Since then, the rise has solely been the result of more people using a PC, and not of a greater amount of time spent on the PC per user (see Table 2). Substantial differences between population groups continue to exist, with young people between 12 and 19 years (who often still live with their parents while still in school) as the most frequent PC users in 2000, spending on average 3.4 hours per week using their PCs. The groups that are the first to possess ICT products are the same that use their equipment more often and for a wider variety of purposes. Again, the groups lagging behind in usage are (single) women, the over-65s, people with a lower (secondary) educational level and the unemployed.

**TABLE 3: TIME USE IN THE NETHERLANDS
POPULATION AGED 12+, 1975-2000 (IN HOURS PER WEEK)**

	1975	1980	1985	1990	1995	2000
Total productive time	40.7	40.8	40.7	42.0	42.6	43.9
Paid work	14.8	14.0	14.1	16.6	17.3	19.4
Household care	19.1	19.5	19.4	18.5	18.9	19.0
Education	6.7	7.3	7.2	6.9	6.4	5.5
Total personal time	76.3	76.8	75.3	75.5	75.0	76.6
Sleep	60.5	60.5	59.4	59.7	59.4	60.9
Personal hygiene	5.6	5.9	5.8	5.9	6.1	5.9
Eating (at home)	10.3	10.5	10.0	9.9	9.5	9.9
Free time	47.9	47.0	49.0	47.2	47.3	44.8
<i>Note: Totals do not add up to exactly 168 hours/week, due to unclassifiable activities.</i>						
<i>Source: SCP (TUS)</i>						

The differences appear to be widening, with differences in the use of ICT adding to the differences in possession. The continuing diffusion of PC ownership may gradually reduce differences between groups, but differences in time use and type of use are likely to remain. However, the constant average of time-use-per-user may indicate that some kind of saturation occurs, once users have access to a PC at home. As noted, Internet use is relatively low among women, the elderly and the lower educated, as shown in Table 4. During a normal week, men surf the Internet twice as long as women. Working people and students also use the Internet above average, while the retired lag far behind. The Internet use among the unemployed and disabled is remarkably high.

Online use is an important aspect of the growth in PC time use, because access to the Internet opens a wide variety of opportunities for PC use. The use that is made of these opportunities is measured better by the additional questions that were posed in the questionnaire. Table 5 shows the frequency of use of seven online services, with Web surfing and email clearly the most popular. Currently, more than half of the PC owners surf the World Wide Web (WWW), and 47% do so at least once a week. Nearly half of the PC owners (48%) use email. The other online services are used by smaller groups of PC owners. The Dutch seem particularly skeptical about e-commerce, with only 8% of the PC owners shopping on the Internet.

TABLE 4: USE OF PC AND INTERNET (AS A PRIMARY ACTIVITY DURING LEISURE TIME) BY BACKGROUND CHARACTERISTICS: (POPULATION AGED 12 +, 1985-2000; IN HOURS PER WEEK)

	PC use				PC use 2000	
	1985	1990	1995	2000	Internet	Other PC use
Total population aged 12+ years	0.1	0.5	0.9	1.8	= 0.5	+ 1.3
Gender						
Males	0.3	0.8	1.5	2.5	0.7	1.8
Females	0.0	0.1	0.4	1.0	0.3	0.7
Age						
12-19 years	0.4	0.8	1.9	3.4	0.7	2.7
20-34 years	0.1	0.5	1.3	1.6	0.6	1.0
35-49 years	0.1	0.5	0.8	2.0	0.6	1.4
50-64 years	0.1	0.5	0.5	1.7	0.5	1.2
65 years and older	0.0	0.1	0.3	0.6	0.1	0.5
Family status						
Living with parents	0.3	0.7	2.0	2.7	0.6	2.1
Single	0.1	0.5	0.9	1.5	0.5	1.1
With partner, without kids	0.1	0.3	0.7	1.4	0.5	1.0
Parent with kid at home	0.1	0.5	0.6	1.8	0.5	1.3
Education^a						
Lower	0.1	0.2	0.7	1.4	0.3	1.1
Middle	0.3	0.5	0.9	2.1	0.6	1.5
Higher	0.1	1.1	1.4	1.9	0.7	1.2
Labor market position						
Student	0.4	0.9	2.2	3.4	0.7	2.6
Worker	0.1	0.6	0.9	1.7	0.6	1.2
Housewife	0.0	0.1	0.3	1.1	0.3	0.8
Unemployed, disabled	0.2	0.8	1.3	3.0	1.1	1.9
Retired	0.0	0.2	0.6	0.7	0.1	0.6
^a Completed or present education						
Source: SCP (TUS)						

TABLE 5: PC USE OF ONLINE SERVICES, POPULATION AGED 12 YEARS AND OLDER, 2000 (IN PERCENTAGES OF PC OWNERS)

	Daily	One/some times per week	Less than once per week	Never	TOTAL
Internet (WWW)	17%	30%	7%	46%	= 100
Email	16	24	8	52	100
News groups	2	5	2	90	100
Chatting/chatbox	2	5	4	89	100
Download software	3	10	13	74	100
Telebanking	2	13	5	81	100
Teleshopping	0	1	7	92	100

Source: SCP (TUS)

Time Use of Internet Users vs. Nonusers: Since the advent of the Internet, the Netherlands has witnessed a period of increasing labor participation (Breedveld and Van den Broek 2001). Although Internet-related activity is often seen as a central factor behind the economic growth of the 1990s, it does not necessarily follow that people using the Internet are working longer hours.

Yet, an initial inspection of the time-use data in Table 6 suggests that Internet users spend significantly more time on paid work than do nonusers, although Internet access may not be the cause of this difference. Working people are more often male, young and highly educated—characteristics that also pertain to people having access to the Internet at home. While controlling for the influence of these social and demographic characteristics does not settle the question of causality, it does present a clearer picture of the difference between Internet users and nonusers. As noted above, multivariate controls for social and demographic differences were introduced by using Multiple Classification Analysis (MCA) within the SPSS program ANOVA. This MCA procedure developed by Andrews et al. (1973) provides differences in categorical predictor variables, while holding constant the statistical effects of other predictors.

After MCA adjustment, a quite different picture of differences in paid work time emerges. Internet users turn out to spend two hours *less* on paid work than nonusers. The high proportion of explained variance and the low value of the beta coefficient indicate that the differences in paid work time are mainly attributable to social and demographic characteristics, and not so much to Internet use. Given the low value of the beta of the variable

TABLE 6: DIFFERENCES IN THE TOTAL TIME BUDGET (PRODUCTIVE TIME, PERSONAL CARE AND LEISURE), POPULATION AGED 12 AND OVER, 2000 (IN HOURS PER WEEK)

	Before MCA controls				After MCA controls ¹				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
Productive:	46.7	43.0	3.7**	.09	42.1	44.5	-2.4**	.06	.38
Paid work	23.9	18.0	5.9**	.12	18.0	20.0	-2.0*	.04	.38
Child/ house	14.8	20.3	-5.5**	.16	17.7	19.4	-1.7**	.05	.47
Education	8.0	4.7	3.3**	.11	6.4	5.2	1.2*	.04	.49
Personal:	74.9	77.2	-2.3**	.09	76.1	76.8	-0.7	.03	.07
Sleeping	59.6	61.3	-1.7**	.08	60.3	61.1	-0.8	.03	.08
Grooming	5.9	5.9	0.0	.00	6.1	5.8	0.3	.03	.03
Eat at home	9.5	10.0	-0.5*	.05	9.8	9.9	-0.1	.01	.07
Free time	43.8	45.1	-1.3	.04	47.2	44.1	3.1**	.09	.32

¹ Controlling for gender, age, education, family status and labor market position
** Difference significant at $p < .01$ level
* Difference significant at $p < .05$ level
Source: SCP (TUS 2000)

“user/nonuser,” the original relationship can mainly be attributed to demographic differences.

Taken together the time spent on work, study and the household is categorized as ‘productive time’ in Table 6. Mainly due to paid work, Internet users seem to be busier than nonusers, but after MCA controls, it is the nonusers who are actually busier, not only with more time on paid work, but with more time on childcare and household chores as well. This difference holds after MCA adjustment. On the other hand, Internet users devote more time than nonusers to education, even after their age is controlled.

Given the zero-sum fixed total of 168 hours per week, more work time inevitably means that fewer hours are available for personal time and leisure activity. Internet users do spend fewer hours on personal time (sleeping, eating and personal care). Again, MCA adjustment makes a difference. The amount of time spent on sleeping and eating is the same for Internet users and nonusers, after controlling for social and demographic variables.

FREE TIME

As described above, Dutch people in 2000 had less free time than in 1990. An increase in labor-market participation (mainly in part-time jobs occupied by women) is one of the reasons, but longer sleeping hours is another. Internet users appear to have somewhat less free time (1.3 hours)

than nonusers. After MCA adjustment, however, Internet users have more free time (3.1 hours) than nonusers, and the amount of free time is also strongly related to social and demographic characteristics. This accounts for the fact that uncontrolled differences between users and nonusers differ strongly from the controlled differences.

A detailed comparison of the weekly, free-time activities of Internet users and nonusers is shown in Table 7, with statistically significant bivariate differences ($p < .05/.01$) visible for the number of hours spent on electronic media (television, radio and stereo), on social participation and on hobbies other than sports, culture and church attendance. After MCA adjustment, these differences are no longer significant, leading to the conclusion of actually no difference in the use of free time between users and nonusers. Again, another exception appears after controls—Internet users spend more time on print media than nonusers.

MEDIA USE

The 'media time budget' of the Dutch has remained stable at 18-19 hours per week since 1975. While the reduction in the amount of free time between 1995 and 2000 did not affect this media budget, shifts did take place within that budget in the type of media used. These changing preferences reflect the emergence of new media at the expense of old, with PCs (with or without Internet connection) acquiring a place in the media budget since 1985 (Huysmans and De Haan 2001). Given the advent of the Internet and the constant media budget, one might expect differences between Internet users and nonusers in the use of other media, such as the significant difference in the use of print media. What more detailed differences are found? Table 8 shows that the significant difference after MCA adjustment in the use of print media is due to the reading of books, with no differences found in the reading of newspapers, magazines and advertisements. Among 18-64 year olds, however, the discrepancy in book reading, as in reading as a whole, did not reach significance.

SOCIAL LIFE

Discussions on the effects of Internet have given much attention to its influence on social contacts (e.g. Kraut et al 1998; Nie and Erbring 2000; Robinson and Nie 2002). The advocates of computer-mediated communication expect tremendous new opportunities for expanded social contacts, exemplified in the lyrical descriptions of virtual communities by Rheingold (1993). On the other hand, the Internet is criticized for being just another technological tool that induces individualistic activity, rather than denser

**TABLE 7: DIFFERENCES IN USE OF FREE TIME, POPULATION AGED 12 +, 2000
(IN HOURS PER WEEK)**

	Before MCA controls				After MCA controls				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
Total free time:	43.8	45.1	-1.3	.04	47.2	44.1	3.1**	.09	.32
Print media	3.7	4.0	-0.3	.03	4.3	3.9	0.4*	.05	.25
TV, radio, stereo	11.5	13.5	-2.0**	.10	12.8	13.1	-0.3	.02	.13
Social contacts	9.7	10.2	-0.5	.03	10.1	10.1	0.0	.00	.05
Soc volunteer	1.3	2.0	-0.7**	.03	1.5	2.0	-0.5	.04	.05
Going out	2.8	2.5	0.3	.04	2.5	2.6	-0.1	.01	.06
Sport/exercise	2.0	1.7	0.3	.03	1.8	1.8	0.0	.00	.04
Other hobbies	5.4	7.3	-1.9**	.11	6.8	6.9	0.1	.01	.16
Free travel	3.1	3.0	0.1	.01	3.1	3.0	0.1	.01	.05

¹ Controlling for gender, age, education, family status and labor market position
 ** Difference significant at $p < .01$ level
 * Difference significant at $p < .05$ level
 Source: SCP (TUS 2000)

**TABLE 8: DIFFERENCES IN USE OF MEDIA, POPULATION AGED 12 AND OVER
2000 (IN HOURS PER WEEK)**

	Before MCA controls				After MCA controls				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
Print media	3.7	4.0	-0.3	.03	4.3	3.9	0.4*	.05	.25
Books	1.0	0.9	0.1	.02	1.2	0.9	0.3*	.05	.05
Newspapers	1.6	1.9	-0.3*	.05	1.9	1.8	0.1	.02	.26
Magazines	0.8	0.9	-0.1	.04	0.9	0.8	0.1	.02	.07
Advertising	0.3	0.3	0.0	.05	0.3	0.3	0.0	.03	.08
Electronic media	11.5	13.5	-2.0**	.10	12.8	13.1	-0.3	.02	.13
Television	11.0	12.8	-1.8**	.09	12.2	12.4	-0.2	.01	.12
Radio	0.5	0.7	-0.2**	.05	0.6	0.7	-0.1	.03	.02

¹ Controlling for gender, age, education, family status and labor market position
 ** Difference significant at $p < .01$ level
 * Difference significant at $p < .05$ level
 Source: SCP (TUS 2000)

and more intense bonds between people. Kraut et al. (1998) showed that communication between family members decreased, social networks got smaller and feelings of loneliness increased after people started to use the Internet.

Four years later, Kraut et al. (2002) revised their conclusions, claiming that their previous results were mainly due to methodological artifacts. They now found positive effects of Internet use on social contacts, although this conclusion was restricted to socially extraverted people; that is, people who would benefit more from the new technology. Most research, however, shows that computer-mediated communication supplements existing social patterns (Wellman et al. 2001; De Haan and Huysmans 2002; Kestnbaum et al. 2002). In line with most of the studies contributed to the first issue of *IT&Society* (see Robinson and Nie 2002), including the methodologically most convincing among them (Gershuny 2002), Table 9 shows hardly any differences between Internet users and nonusers in various forms of social activity. Statistically significant bivariate differences ($p < .05/.01$) are visible for the number of hours spent on talking to household members and for the general category of contacts with others, but these differences are not statistically significant after MCA adjustment.

The results are very similar to those for the United States, although Kestnbaum et al. (2002) found that IT users spent more time on conversation at home than nonusers did. Again a Dutch exception: after MCA controls, Internet users spend less time on attending to children (reading to them, games, talks and walks) than nonusers. Among 18-64 year olds, however, this discrepancy did not reach significance. On the contrary, in this age group Internet users did use the telephone for longer hours than nonusers. That aggregated categories of time use do not show significant differences between Internet users and nonusers does not imply that differences in activity at a lower level of aggregation are also automatically not significant—as with time spent on attention for children. Other more detailed time-use categories (than in Table 7) that deviate from the general conclusions drawn above are described next.

VOLUNTEER PARTICIPATION

From an international perspective, participation in voluntary work is high in the Netherlands, and while until 1995 no decline was visible in this form of participation, the latest Dutch Time Use Survey again points to a reduction—mainly concerning organized, voluntary activities (De Hart and Breedveld 2001). In general, Table 10 shows there is no difference in volunteer participation between Internet users and nonusers after MCA adjustment. However, at a lower level of aggregation, there is a difference—

TABLE 9: DIFFERENCES IN TIME SPENT ON SOCIAL CONTACTS POPULATION AGED 12 +, 2000
(IN HOURS PER WEEK)

	Before MCA controls				After MCA controls				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
Total social contact	10.5	11.0	-0.5	.03	10.8	10.9	-0.1	.01	.07
With householders	2.5	2.3	0.2	.03	2.3	2.4	-0.1	.01	.16
Talking	1.5	1.3	0.2*	.06	1.4	1.3	0.1	.03	.05
With kids	0.8	0.8	0.0	.00	0.7	0.9	-0.2*	.05	.19
Playing games	0.2	0.2	0.0	.03	0.2	0.2	0.0	.01	.01
With others	8.0	8.7	-0.7*	.05	8.5	8.6	-0.1	.00	.05
Visitors	1.9	2.1	-0.2	.03	2.3	2.0	0.3	.04	.06
Visiting others	4.0	4.5	-0.5	.05	4.2	4.4	-0.2	.02	.03
Party/dinner/rcp	1.3	1.4	-0.1	.02	1.2	1.4	-0.2	.04	.01
Telephone	0.8	0.7	0.1	.03	0.8	0.7	0.1	.05	.09

¹ Controlling for gender, age, education, family status and labor market position
 ** Difference significant at p<.01 level
 * Difference significant at p<.05 level
 Source: SCP (TUS 2000)

not with the organized voluntary work, but with the informal help given to neighbors, the elderly and the handicapped. Here, Internet users turn out to spend less time helping others.

GOING OUT

Within the shrinking amount of Dutch free time, free time spent outside the home decreased particularly, but decreased only slightly for going out to social events. The time spent on going out remained reasonably stable after 1995, with cultural visits in particular holding up well (De Haan 2001). Table 11 shows no difference in time spent on going out between Internet users and nonusers. The exception here is for time spent visiting museums, concerts, plays and movies. Internet users are more culturally active than nonusers after MCA adjustment, although the difference is fairly small and disappears among the 18-64 year olds.

**TABLE 10: DIFFERENCES IN TIME SPENT ON VOLUNTEERING AND SOCIAL PARTICIPATION
POPULATION AGED 12 +, 2000 (IN HOURS PER WEEK)**

	Before MCA controls				After MCA controls				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
Total participation	1.3	2.0	-0.7**	.07	1.5	1.9	-0.4	.04	.05
Volunteer work	0.9	1.3	-0.4*	.04	1.1	1.3	-0.1	.01	.04
Helping neighbors, etc.	0.4	0.7	-0.3**	.07	0.4	0.7	-0.3**	.06	.02

¹ Controlling for gender, age, education, family status and labor market position
** Difference significant at $p < .01$ level
* Difference significant at $p < .05$ level
Source: SCP (TUS 2000)

**TABLE 11: DIFFERENCES IN TIME SPENT ON GOING OUT POPULATION AGED 12 +, 2000
(IN HOURS PER WEEK)**

	Before MCA controls				After MCA controls				
	Internet users	Non-users	Internet difference	Eta	Internet users	Non-users	Internet difference	Beta	R ²
All social events:	2.8	2.5	0.3	.04	2.5	2.6	-0.1	.01	.06
Bar/restaurants	1.8	1.6	0.2	.03	1.5	1.7	-0.2	.03	.08
Culture	0.6	0.4	0.2*	.05	0.6	0.4	0.2*	.05	.01
Others	0.4	0.4	0.0	.01	0.4	0.4	0.0	.01	.01

¹ Controlling for gender, age, education, family status and labor market position
** Difference significant at $p < .01$ level
* Difference significant at $p < .05$ level
Source: SCP (TUS 2000)

SUMMARY AND CONCLUSIONS

The central question addressed in this analysis is whether the time use of Dutch Internet users differs from that of nonusers. The Internet is often treated as a breakthrough technology, transforming the ways people live, work, learn and spend leisure time. Whether the Internet is really a change agent can only be properly investigated with panel data (see Gershuny 2002), but because these data were not available for the Netherlands, a comparison of Internet users and nonusers can be highly instructive. It should be borne in mind, however, that comparing them also means comparing different social groups, noting that diffusion of home personal computers at home and home Internet access advance faster in some

socio-demographic groups—men, the young, people with a higher (secondary) educational level and the employed—than in others. Given the inequalities in the composition of the user and the nonuser group, much attention was devoted to controlling for such social and demographic characteristics by MCA.

This new technology is continually becoming part of existing daily rhythms. After statistical adjustments, the conclusion on differences in time use in the Dutch population aged 12 years and over confirms many of the conclusions drawn from earlier research—particularly that the Internet has not dramatically changed peoples' lifestyles. Internet users and nonusers do, however, spend different amounts of time on productive activities like paid work, childcare and household tasks. Home Internet users spend two hours less on paid work and almost two hours less on childcare and domestic tasks, offset somewhat by their spending an hour more on education than nonusers.

Thus Internet users have approximately three hours more free time than nonusers. However, few differences exist in their specific free-time activities, except that Internet users spend more time on reading books and visiting cultural institutions. As in most of the studies discussed in the first issue of *IT&Society*, no differences are found in the amount of time Internet users devote to social life or social participation (Robinson and Nie 2002). When looking more closely into certain subcategories of time use, Internet users do spend less time attending to children and helping neighbors, the elderly and the handicapped than nonusers. This might point to one less 'social' way of using time.

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