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The Changing Digital Divide in Germany

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Abstract

The German Socioeconomic Panel Study (GSOEP) allows a detailed analysis of PC ownership and Internet use by means of 12,000 households which were surveyed in 2000 (in 1998 and 1999 about 7,000 households were surveyed). Private Internet use in Germany is spread across all social strata, however, there are substantial differences with respect to the level of education and age. Use of the PC and the Internet at home and in the workplace is more prevalent in West Germany than in East Germany and Germans also use computers more than foreigners living in Germany. There appears to be strong evidence for the hypothesis that teens who use a PC and/or the Internet do not do so at the expense of what most would consider desirable "leisure activities" such as reading or playing sports.

Introduction

With the ever-growing importance of the computer at home and the workplace, there are emerging concerns of a stratification of the population by a new "digital divide." The case of Germany is of interest in several respects. First, it is an open question whether there is indeed a "digital divide" along social strata in Germany. Given that around 1990 Germany had higher rates of immigration influx than the USA, it is especially of interest to know whether there are identifiable effects for the huge immigrant population in Germany. Second, German data allow one to analyze whether Internet use discourages other leisure activities, which belong to the "social capital" of a society. Using a large German household panel data set,

one is able to describe not only recent trends in computer and Internet usage, but also the dynamics since PCs were introduced in the 1980s.

Data and History

Although a large number of surveys have been conducted (see, for example, van Einerem et al., 2001), primarily for marketing purposes, on the use of computers and the Internet, their results do not permit highly differentiated analyses of the socioeconomic aspects of these new technologies in Germany. The German Socio-economic Panel (GSOEP) (see Wagner et al., 1993) provides samples for 1998, 1999, and 2000 that encompass for the year 2000 12,500 households and permit a detailed analysis of Internet use. Within the surveyed households, all 16-year and older household members are interviewed. Thus information for about 24,000 persons is available for 2000. In the years before, the sample sizes were about half as much, but still large enough for in-depth analyses.

By means of a retrospective question, the GSOEP provides unique information about PC use for the past. As current and past PC usage at the workplace was only first asked in 1997, we are at least able to identify usage information directly for those individuals who were in the panel up to that time.[1] Thus the GSOEP clearly provides a unique data set to study PC dissemination, with the complete household context since PCs became widely available in the early 1980s with MS-DOS as a standard operating system.

Examining the absolute levels of PC usage rates at the workplace between 1984 and 1997, Haisken-DeNew and Schmidt (2001) conclude that highly educated employees at all time periods dominate all others, as shown in figure 5.1. Further, usage growth over time is also dominated by the highly educated. Thus, there seems to be the prevalence of complementarity between high levels of education (perhaps computer skills) and computer usage. These developments are further pushed by the steady movement of the economy into services, where PCs are an integral part of the office production function, and away from manufacturing. This leads to an ordering of usage,

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1   In addition, using standard matching techniques, such as regression-based, "hotdeck" and "nearest neighbor" methods, usage information was imputed for those respondents exiting the panel before 1997.
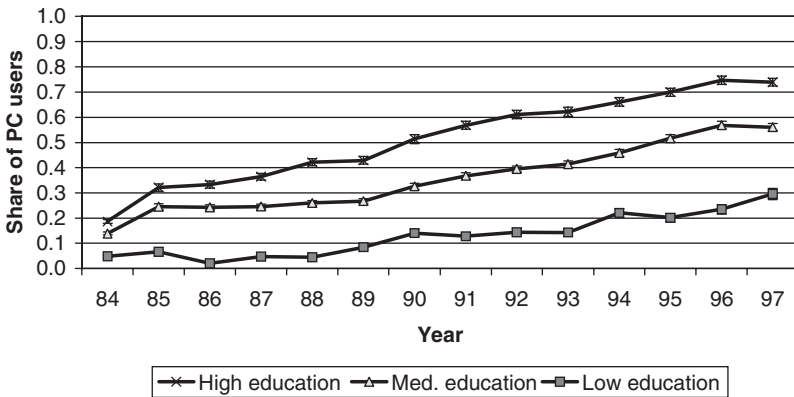
Figure 5.1   Dissemination of PCs at the workplace
Source: GSOEP (Haisken-DeNew and Schmidt, 2001)

increasing by job status and educational background: blue collar–low skill, blue collar–high skill, white collar–low skill, white collar–high skill.

"Digital Divides"

PC ownership in private households

In spring 2000, about 43 percent of the households (17 million) in Germany had at least one PC with Internet access at home (see table 5.1). This has increased since 1998, when 35 percent had private access (see Haisken-DeNew et al., 2000).

Examining the population in Germany according to various social indicators reveals several aspects of a "digital divide" between certain segments of the population, including differences between east and west Germany, between German nationals versus non-nationals, by income level, and presence of children in the household.

East–west differences

Due to the economic and social problems which came with German unification for people in east Germany – the former socialist GDR – as

Table 5.1 % of private households in Germany with personal computers, spring 2000 (N = 12,024)

	Total		West Germany		East Germany	
	PC ownership	PC with Internet connections	PC ownership	PC with Internet connections	PC ownership	PC with Internet connections
Total	43	23	45	25	38	17
Nationality bracket						
German household	44	24	48	27	38	17
Foreigner household	38	20	38	20	.	.
Income bracket						
Social benefit recipient	26	11	25	11	30	9
Low-income household[a]	35	15	35	17	34	12
Middle-income household[a]	41	21	42	22	37	17
High-income household[a]	61	37	61	38	66	34
Household type						
One-person household	30	19	31	20	22	13
(Married) couple without children	38	21	40	23	27	12
Single-parent household	47	21	46	22	51	17
(Married) couple with oldest child younger than 16	68	34	69	36	65	26
(Married) couple with youngest child older than 16	61	28	60	29	64	28
(Married) couple with children in both age groups	76	36	75	36	80	33
Multi-generation household	53	20	75	18	54	25

[a] Low-income households are classified as those with less than half of average equivalent income. High income households are those whose income is more than 150% of the average. The remainder are considered as middle-income households.

Source: GSOEP 2000

outlined in Schwarze and Wagner (2001), east–west differences are of special interest in Germany. The 1998 and 2000 SOEP surveys show significant differences between eastern and western Germany in both computer ownership and Internet access. In 2000, 48 percent of west German households had at least one PC, whereas in east Germany only 38 percent were equipped with a computer. This is a true east–west differential, not primarily an income effect.[2] Beyond these numbers there is no apparent reason for the east–west difference – perhaps there is still an "echo effect" of the socialist economy which was far less modern than the western economies.

German nationals versus non-nationals

As west Germany has a large migrant community,[3] differences in the lifestyles of Germans and immigrants are of interest. This is especially true because, due to German citizenship laws, most of those immigrants still hold their foreign citizenship (normally for a foreigner to become German, he must relinquish his foreign citizenship, which often proves to be a difficult hurdle for many foreigners). Compared to German households in west Germany (with east Germany having historically almost no guest-workers) far fewer households of foreigners own PCs (38 percent ownership by foreigners vs. 48 percent by German households) and fewer have private Internet access (20 percent vs. 28 percent). However the foreign community in west Germany has about the same level of PC ownership as compared to the east Germans. Furthermore, private access to the Internet is slightly better for foreigners than for East Germans. Multivariate analysis shows that the lower ownership rates and access rates are not due to education and income only, but that there is a true immigration effect, although it would go beyond the scope of this survey to clarify this in detail here. We believe that this differential effect might be due to cultural preferences of foreigners. (See table A5.1 and table A5.2, column 1.)

2   For results of multiple regression analysis see for example table A5.2.
3   Due to the immigration of the so-called guest-workers from Mediterranean countries in the 1960's (see Reitz et al., 1999) who along with their children still to a large extent stay in Germany.

Income

Differentiation by household income[4] reveals that PC ownership in low-income households[5] is lower at 35 percent compared to the average household at 41 percent, whereas computer ownership by wealthy households[6] is far above the average at 61 percent. Households which receive (means tested) social assistance have by far the lowest ownership rate (26 percent). In 2000, one out of six households in western Germany was classified as wealthy, whereas in eastern Germany, only one out of twenty belonged to this group.

Looking at private access to the Internet reveals even larger differences by income. The gap between wealthy households (at 37 percent) and those on social assistance (11 percent) and low-income households in general (15 percent) is huge. This is true for west as well as east Germany.

Children

Households with children have an above average rate of PC ownership and private access to the Internet. These shares among single-parent households are, however, relatively low, although higher than the overall average, with 47 percent owning a PC, and 21 percent with Internet access. In this sense, the children of single parents are at a disadvantage compared to children in two-parent households.

Personal use of the computer and the Internet

Table 5.2 provides information about the use of the PC and the Internet on a personal level. Here we see substantial differences between men and women. On average, 39 percent of men living in Germany use a PC in their leisure time, whereas only 26 percent of women. The difference between men and women is in fact larger in west Germany (41 percent vs. 26 percent), whereas in east Germany the difference is not nearly so pronounced (34 percent vs. 26 percent).

4 A needs-weighted income is calculated. This "equivalence income" takes account of the size and structure of households rather than per capita income.
5 A household is classified as "poor" if it has less than half of the average equivalence income at its disposal.
6 A household is classified as "wealthy" if it has at least 150 percent of the average equivalence income at its disposal.

Table 5.2 % using computers for leisure, 2000 (N = 22,414)

	Total		Men		Women		Foreigners	
	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access
Total	32	16	39	20	26	11	23	10
Region								
West Germany	33	17	41	22	26	12	22	10
East Germany	30	11	34	13	26	9	—	—
Age								
16–29 years	50	26	56	29	45	23	28	10
30–44 years	48	24	53	30	42	18	30	15
45–59 years	32	15	39	19	25	10	13	5
60 years and older	8	3	13	4	5	2	12	—
School-leaving certificate								
Minimum school-leaving certificate	16	6	22	9	11	3	14	3
Lower secondary	39	16	45	21	34	13	26	10
Technical college	52	27	59	32	41	20	39	23
University entrance certificate	60	38	67	44	52	31	61	34
Occupational status								
Full-time	45	23	48	25	38	18	27	12
Regular part-time	42	20	58	48	39	16	31	14
Marginal part-time	41	21	49	32	39	17	32	—
In training	49	19	53	21	43	16	44	—
Unemployed	18	8	22	10	16	6	15	6

—: not displayed due to small number of cases.

Source: GSOEP 2000

Table 5.3   % of young people aged 16 and 17 using the Internet, 2000 (N = 226)

(Intended) school-leaving certificate	Internet use (% share)			Internet users' average weekly use in hours		
	Total	Male	Female	Total	Male	Female
Minimum leaving certificate	45	60	25	4	4	5
Lower secondary	67	74	59	10	13	4
University entrance ("prep schools")	75	77	72	9	14	6
Total	68	73	63	9	12	5

Source: GSOEP 2000 (youth questionnaire)

As found in other studies, there are stronger computer preferences for males under 45 than for females of the same age group. Foreigners do use the computer and the Internet less frequently than the average person living in Germany (compare column "foreigners" with column "total" in table 5.2). This holds true for all breakdowns of the population.

Corroborating the evidence found in Haisken-DeNew and Schmidt (2001) for PC usage at work, PC leisure usage increases with educational level (see table 5.2). In 2000 some 60 percent of those with the highest level of high school use a PC during leisure, compared to only 16 percent who have only the mandatory minimum high school level. Although German men who work full time have almost double the PC usage rates as compared to foreigners (48 percent vs. 27 percent), at least for those German men and foreigners who are currently in vocational training, the 5 percent differential is almost negligible. This at least shows some "catch up" in the younger cohorts of foreigners.

In the 2000 GSOEP, a detailed in-depth survey of 226 teenagers, aged 16 and 17 was made by means of a special questionnaire (see table 5.3) which clearly shows that two-thirds of this age group make use of the Internet. Here too, there are substantial differences between those with different levels of education, which prove significant, although the sample size is small. Only 60 percent of the young men and as few as 25 percent of young women either holding or about to receive the minimum school-leaving certificate use the

Internet. Use rates are highest among advanced level high school (grammar school and sixth form college pupils), 75 percent of whom are Internet users.

In terms of the intensity of use, there are significant gender-specific differences. At 12 hours per week on average, young men who surf on the Internet, do so for approximately twice as long as young women. Within the group of Internet users, the education-specific differences are not especially pronounced. Only young men with the minimum school-leaving certificate, at 4 hours per week, spend significantly less time on the web than those with a higher level of education.

Computers and Internet use at work

According to table 5.4, in 2000 around one-half of those in employment use a computer at work; a little bit more than one in five also has access to the Internet. The use of a computer is not different for female and male workers, but Internet access by women is 18 percent, compared to 26 percent of men). This seems to be due to the lower *level* of jobs (compared to men) in which women work (distribution of job levels is not displayed in the table).

As is the case with computer use for leisure, the level of educational attainment is an important determinant of use at work. Some 78 percent of workers with an upper-secondary school-leaving certificate used a computer at work, compared with only just 27 percent of those with the minimum leaving certificate. (This is corroborated in table A5.3 with binary logit estimation, which is explained in the note of the table). The influence of education is even more evident if employees are classified according to the requirements of their work. Occupations demanding a university degree also require, in more than 81 percent of cases, the use of a computer. On the other hand, less than 24 percent of those with no training required need a computer for their job.

Given that experience using modern information technology is expected to become increasingly important, it is interesting to look more closely at the use of the Internet by employees aged less than 30. In 2000 in Germany around one in two workers aged less than 30 used a computer at work.

The differences due to educational level are no less pronounced among younger workers than among the working population as a whole (see last column of table 5.4). Whereas only 30 percent of those

Table 5.4 % using computers at work, 2000 (N = 13,811)

	Men		Women		Foreigners		Workers under 30 years	
	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access
Total	49	26	49	18	22	15	50	25
Region								
West Germany	51	22	49	19	22	15	51	26
East Germany	39	18	50	15	—	—	45	20
Age								
16–29 years	45	25	55	25	24	19	50	25
30–44 years	53	29	54	19	26	16	N/A	N/A
45–59 years	47	24	43	13	14	7	N/A	N/A
60 years and older	39	19	27	—	—	—	N/A	N/A
School-leaving certificate								
Minimum school-leaving certificate	27	9	27	6	9	4	21	7
Lower secondary	50	23	54	17	36	20	51	21
Technical college entrance certificate	70	43	56	20	35	30	64	28
University entrance certificate	81	56	74	37	58	48	82	54

Table 5.4 Continued

	Men		Women		Foreigners		Workers under 30 years	
	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access	PC use, total	With Internet access
Required qualification for task performed								
No training	25	13	22	8	8	4	36	22
Vocational training	46	20	56	17	31	18	51	21
Technical college	84	49	69	29	—	—	89	58
University	83	60	78	44	—	—	90	66
Enterprise size								
Fewer than 5 workers	45	27	45	16	36	—	40	24
5 to 20 workers	37	21	42	15	13	7	42	19
20 to 100 workers	41	22	45	17	13	8	45	22
100 to 200 workers	44	21	48	16	20	—	48	23
200 to 2000 workers	52	28	57	18	21	14	54	26
More than 2000 workers	63	32	61	25	33	23	63	32
Self-employed	68	44	38	19	—	—	—	—
Occupational status								
Full-time	50	26	58	23	22	15	52	25
Part-time	45	27	41	11	23	—	49	32
In training	40	17	46	13	—	—	43	15
In marginal employment	40	28	29	12	—	—	54	43

—: not displayed due to small number of cases.
Source: GSOEP 2000

young workers with minimum school qualifications require computer knowledge for their work, the figure for those with university entrance school qualifications is 80 percent.

Less use of computers is made in small enterprises. In plants with fewer than 5 workers, 54 percent have nothing to do with computers, and a similar figure (58 percent) applies to enterprises with between 5 and 20 workers. In large firms, by contrast, the proportion of non-users is much lower (34 percent in firms with 200–1,999 workers and 40 percent in those with 2,000 or more).

Competition between Internet Use and Social Capital

The world over, there is a discussion whether heavy Internet use "discourages" other activities, especially those which are part of the most important "social capital" (Nie, Hillygus, and Erbring, this volume; Kraut, Patterson, Lundmark, Kiesler, Mukhopadhyay, and Scherlis, 1998). In particular, there are objections about the use of Internet by teenagers who are in the process of accumulating social capital, and thus a lack of this kind of capital could have a negative impact on there future life. Table 5.5 shows differences in leisure activities by age groups. All in all, we did not find any evidence for the discouragement hypothesis, but we can conclude that those who use a PC and the Internet are more active in cultural activities.

The GSOEP data also show that use of the Internet does not prevent 16- and 17-year olds from engaging in activities in other areas. Table 5.6 illustrates that, for example, teenage Internet users have similar reading habits to non-users. For both groups, "playing a musical instrument" is of equal importance. It might be a surprise for many readers that active sport has a larger importance for Internet users than for other teenagers, although Internet users are typically thought to be "stay-at-homes." However, due to the fact that the Internet is used more heavily by teenagers in prep-school, who have more time for active sports than other teenagers, this effect of a positive correlation between Internet use and active sport is not surprising. An ordered logit analysis (see top row of table A5.5) reveals that there is no negative partial effect of Internet use on how *important* teens *consider* sport activities to be. (Here we use standard controls for gender, nationality, born abroad, education status, along with Internet usage. As the dependent variable is defined in *decreasing* levels of importance, negative coefficients indicate an increase in importance.) However, adults

Table 5.5 Private PC and Internet use and other leisure activities by sex and age (% who perform named activity at least once a month) (N = 12,403)

Visits to cultural events, e.g., concerts, theatre, presentations	Total Using PC or Internet	Not Using PC or Internet	Male Using PC or Internet	Not Using PC or Internet	Female Using PC or Internet	Not Using PC or Internet
Age 16–29	24	15	21	17	28	12
30–44	16	10	17	7	16	12
45–59	20	12	15	9	27	14
60 and older	32	13	24	12	46	14
Total	20	12	18	11	23	13
Active sport						
Age 16–29	62	45	63	53	61	38
30–44	48	35	49	36	48	34
45–59	40	22	35	20	48	23
60 and older	32	16	35	17	27	15
Total	48	25	47	27	50	23
Participation in public initiatives, in political parties, local government						
Age 16–29	2	1	3	1	2	1
30–44	2	1	3	1	2	1
45–59	6	3	8	3	3	2
60 and older	9	2	10	4	7	1
Total	3	2	4	3	2	1
Church-going, visits to religious events						
Age 16–29	9	13	10	9	8	16
30–44	12	14	11	13	16	15
45–59	22	20	23	14	22	24
60 and older	26	28	25	24	29	30
Total	15	21	15	17	15	24

Source: GSOEP 2000

Table 5.6 Importance of activities to 16 and 17 year olds in 2000 (% responding about each category among PC/Internet users and non-users) (N = 226)

	Not using a PC / Internet			Using a PC / Internet		
	Very important/ Important	Less important	Not important	Very important/ Important	Less important	Not important
Watching TV /Videos	52	43	5	53	45	2
Playing computer games	10	45	44	41	43	16
Listening to music	96	4	0	88	12	—
Playing a musical instrument	16	21	63	17	19	64
Playing sports	65	26	9	75	18	7
Being with boy/girl friend	91	7	3	92	7	2
Being with friends	78	9	13	70	17	14
Reading	31	47	22	39	38	22
Doing nothing, hanging around	45	42	12	37	40	22

—: not displayed due to small number of cases.
Source: GSOEP 2000 (youth questionnaire)

Table 5.7 Use of the PC/Internet and other activities by young people aged 16 and 17, spring 2000 (n = 226)

There are many different ways of being active at school in addition to actual classes. Are you or have you ever been involved in one or more of the following areas?	Those not using PC or Internet (%)	Those using PC or Internet (%)
Yes, I was:		
• class representative to the student council	21	29
• student body president / president of the student council	6	2
• involved in the school newspaper	2	9
• involved in a school theater or dance group	4	21
• involved in a school orchestra, chorus or other type of music group	18	26
• involved in a sports group at school	18	40
• involved in some other type of group	13	19
No, none of these	49	33

Source: GSOEP 2000 (youth questionnaire)

(and also teens specifically) who use the Internet or a computer at home play sports more often, go more often to cultural events and are more active in politics as shown at the bottom of table A5.4. (Here the model with controls for demographics, household composition, income explains intensity of doing a particular activity, and similarly the dependent variable is coded in *decreasing* intensity, such that *negative* coefficients indicate *increasing* intensity.)

There is no negative impact of Internet use on extra-curricular activities in school (table 5.7). As many Internet users are "class presidents" as non-users; Internet users are involved more heavily in school theater or dance groups than other pupils. The same is true for playing music in the school orchestra or exercising sports in special groups. However, again this is not a pure effect of Internet use, but an effect of differences in the composition of users and non-users. Although the Internet does not facilitate or encourage more leisure activities which accumulate social capital, it does not discourage either. For 16- and 17-year-old teenagers in Germany there is, on average, no danger of acquiring insufficient amounts of "social capital" due to the emergence of the Internet and its heavy use by teenagers.

Conclusions

Private Internet use in Germany is spread across all social strata. However, there are substantial differences with respect to the level of education and age. As might be expected, the Internet has so far bypassed most older people. In the spring of 2000, among the top age group (60 and older), the user share was only at a significant level among the relatively small circle of those with a high educational level.

Wealthy parents are far more likely to place a computer at their children's disposal and thus a regular Internet connection than those on lower incomes. Private computer access is particularly relatively low in single-parent households, most of which are on low incomes. Thus schools should have the capacity to offer *all children*, irrespective of their social background, access to computers and the Internet. That implies not only a better endowment with hardware and software, but also funding for maintenance and providing teachers with the required skills.

The lack of experience with the use of computers could exacerbate the difficulties on the labor market already experienced by those with only a minimum school-leaving certificate. Given the discussion in the economic literature concerning "skill-biased technological change," and the resulting increasing skill premium awarded to highly educated employees, getting school children "computer trained" before they go onto the job market could prove to be a crucial career path step.

Use of the PC and the Internet at home and in the workplace is more prevalent in west Germany than in east Germany. Germans also use computers more than foreigners living in Germany. Considering the fact that many foreigners have been living in Germany for generations, one might think of them as being effectively German. However, the multivariate results show clear cultural differences. Further research should analyze the impact of the numbers of years living in the country (degree of cultural assimilation).

There appears to be strong evidence for the hypothesis that teens who use a PC and/or the Internet do *not* do so at the expense of what most would consider desirable leisure activities such as reading or playing sports. Indeed, such "computer kids" are indeed *less likely* to just "hang around" and "do nothing."

Appendices

Table A5.1 Binary logit estimation: PC-Internet-access ownership of households, 2000

	(1) PC, no Internet access	(2) PC and Internet access
Household in West Germany	0.108 (0.049)*	0.296 (0.058)*
German nationality	0.934 (0.077)*	0.663 (0.095)*
Equivalence household income	0.000 (0.000)*	0.000 (0.000)*
Size of household	0.184 (0.039)*	0.026 (0.041)
Gets social assistance	−0.642 (0.132)*	−0.483 (0.178)*
Married couple without children	0.168 (0.068)*	0.180 (0.078)*
Single-parent household	1.087 (0.107)*	0.485 (0.127)*
Married couple with oldest child younger than 16 years	1.525 (0.123)*	1.048 (0.131)*
Married couple with oldest child older than 16 years	1.240 (0.119)*	0.853 (0.128)*
Married couple with children in both age groups	1.835 (0.175)*	1.164 (0.180)*
Multi-generation household	0.933 (0.231)*	0.556 (0.265)*
Other combinations	0.392 (0.183)*	0.142 (0.231)
Constant	−3.256 (0.117)*	−3.462 (0.134)*
Observations	12,024	12,024
Pseudo R^2	0.1279	0.0583

(Standard errors in parentheses, * = significant at the 10% level). The binary dependent variable is coded as (0) No, (1) Yes. *Therefore, larger positive coefficents indicate a higher probability of a particular activity*!

Table A5.2 Binary logit estimation: Internet access of adults at home, 2000

	(1) Home PC / Internet	(2) Home PC	(3) Home Internet
Men	0.380	0.632	0.689
	(0.039)*	(0.037)*	(0.046)*
Household in West Germany	0.206	0.137	0.362
	(0.043)*	(0.041)*	(0.053)*
German nationality	1.237	1.082	0.866
	(0.061)*	(0.063)*	(0.087)*
Equivalence household income	0.000	0.000	0.000
	(0.000)*	(0.000)*	(0.000)*
Size of household	0.118	0.170	0.090
	(0.015)*	(0.014)*	(0.017)*
Age of employee (16 years and older)	0.023	0.049	0.052
	(0.008)*	(0.008)*	(0.011)*
Age * age	−0.001	−0.001	−0.001
	(0.000)*	(0.000)*	(0.000)*
Part-time	−0.089	0.156	0.031
	(0.061)	(0.059)*	(0.076)
In training	−0.287	−0.081	−0.380
	(0.105)*	(0.097)	(0.123)*
In marginal employment	−0.194	0.360	0.330
	(0.095)*	(0.091)*	(0.109)*
Minimum school-leaving certificate	−0.436	−0.353	−0.467
	(0.069)*	(0.069)*	(0.096)*
Lower secondary certificate	0.519	0.367	0.284
	(0.069)*	(0.069)*	(0.092)*
Technical college entrance certificate	1.030	0.881	0.840
	(0.096)*	(0.090)*	(0.109)*
University entrance certificate	1.575	1.083	1.161
	(0.079)*	(0.073)*	(0.092)*
Constant	−1.933	−3.277	−4.345
	(0.187)*	(0.183)*	(0.243)*
Observations	22,313	22,414	22,414
Pseudo R^2	0.3249	0.2160	0.1976

(Standard errors in parentheses, * = significant at the 10% level). The binary dependent variable is coded as (0) No, (1) Yes. *Therefore, larger positive coefficents indicate a higher probability of a particular activity*!

Table A5.3 Binary logit estimation: Internet use at work, 2000

	(1) Work PC	(2) Work Internet
Men	−0.134	0.449
	(0.043)*	(0.052)*
Household in West Germany	0.601	0.689
	(0.047)*	(0.059)*
German nationality	1.207	0.748
	(0.079)*	(0.101)*
Age of employee (16 years and	0.048	0.028
older)	(0.012)*	(0.014)*
Age * age	−0.001	−0.001
	(0.000)*	(0.000)*
Full-time (reference)	—	—
Part-time	−0.561	−0.560
	(0.059)*	(0.077)*
In training	−0.200	−0.461
	(0.105)*	(0.133)*
In marginal employment	−0.945	−0.321
	(0.092)*	(0.110)*
No certificate (reference)	—	—
Minimum school-leaving	−0.074	−0.211
certificate	(0.104)	(0.152)
Lower secondary certificate	1.079	0.851
	(0.104)*	(0.148)*
Technical college entrance	1.670	1.486
certificate	(0.122)*	(0.159)*
University entrance certificate	2.309	2.163
	(0.109)*	(0.148)*
Constant	−3.168	−3.944
	(0.267)*	(0.332)*
Observations	13,811	13,811
Pseudo R^2	0.1528	0.1473

(Standard errors in parentheses, * = significant at the 10% level). The binary dependent variable is coded as (0) No, (1) Yes. *Therefore, larger positive coefficents indicate a higher probability of a particular activity*!

Table A5.4 Ordered logit estimation: effects of PC or Internet use (2000) on leisure activities of adults, 1998 (16 years and older)

	(1) Cultural events	(2) Active in sports	(3) Active in politics	(4) Active in church
Men	0.1924	−0.2914	−0.4209	0.2603
	(0.037)*	(0.037)*	(0.065)*	(0.037)*
Household in West Germany	−0.1087	−0.5827	−0.0509	−1.3757
	(0.043)*	(0.045)*	(0.075)	(0.048)*
German nationality	−0.6217	−0.5298	−0.6833	0.2185
	(0.063)*	(0.063)*	(0.141)*	(0.058)*
Equivalence household income	−0.0003	−0.0002	−0.0001	0.0000
	(0.000)*	(0.000)*	(0.000)*	(0.000)
Size of household	0.0332	0.0383	−0.1645	−0.2610
	(0.016)*	(0.016)*	(0.028)*	(0.016)*
Age of employee (16 years and older)	−0.0122	0.0355	−0.0707	−0.0123
	(0.006)*	(0.006)*	(0.012)*	(0.006)*
Age * age	0.0002	0.0001	0.0005	−0.0001
	(0.000)*	(0.000)	(0.000)*	(0.000)*
Minimum school-leaving certificate	−0.2303	0.0744	−0.0921	−0.0520
	(0.075)*	(0.077)	(0.158)	(0.071)
Lower secondary certificate	−0.7385	−0.3940	−0.3494	−0.0157
	(0.080)*	(0.080)*	(0.163)*	(0.077)
Technical college entrance certificate	−1.0452	−0.3706	−0.5363	−0.1555
	(0.111)*	(0.107)*	(0.199)*	(0.105)
University entrance certificate	−1.5973	−0.7886	−0.8264	−0.2754
	(0.088)*	(0.086)*	(0.167)*	(0.084)*
Using a personal computer or Internet at home	−0.3524	−0.3578	−0.3599	0.0656
	(0.043)*	(0.041)*	(0.074)*	(0.044)
Observations	12,403	11,982	12,006	12,043
Pseudo R^2	0.0848	0.1016	0.0401	0.0626

(Standard errors in parentheses, * = significant at the 10% level). The ordered dependent variable is coded as (1) Every week, (2) Every month, (3) Less than once a month and (4) Never. *Therefore, negative coefficents indicate more of a particular activity*!

Table A5.5 Binary logit estimation: effects of Internet use on importance of other activities, 2000 (16 and 17 year olds)

	(1) Watch TV	(2) Play computer Games	(3) Listen to music	(4) Play musical instrument	(5) Play sports	(6) Boy/girl friend	(7) Being with friends	(8) Reading	(9) Doing nothing
Using a personal computer or Internet	0.106 (0.268)	-1.592 (0.288)*	0.063 (0.275)	-0.002 (0.292)	-0.162 (0.257)	-0.446 (0.282)	-0.129 (0.259)	-0.249 (0.262)	0.486 (0.263)*
Men	-0.540 (0.267)*	-1.944 (0.295)*	0.658 (0.277)*	-0.139 (0.292)	-0.458 (0.260)*	1.217 (0.287)*	0.785 (0.259)*	1.255 (0.273)*	0.631 (0.262)*
German nationality	-0.393 (0.415)	-0.665 (0.435)	-0.281 (0.427)	-0.025 (0.461)	-0.170 (0.404)	0.131 (0.438)	-0.269 (0.385)	1.324 (0.419)*	-0.384 (0.412)
Born in Germany	0.461 (0.710)	0.261 (0.716)	0.024 (0.668)	1.269 (0.734)*	0.639 (0.638)	-0.422 (0.656)	-0.120 (0.634)	-0.852 (0.624)	-0.067 (0.660)
Minimum leaving certificate (Hauptschule)	-1.233 (1.182)	-1.649 (1.199)	-1.931 (1.115)*	0.568 (1.278)	2.490 (1.265)*	-1.701 (1.049)	1.192 (1.082)	0.837 (1.213)	-1.043 (1.155)
Lower secondary certificate	-0.815 (1.142)	-1.068 (1.155)	-0.818 (1.053)	0.069 (1.200)	1.799 (1.225)	-0.952 (0.980)	0.711 (1.017)	0.242 (1.156)	-0.567 (1.111)
School for technical college entrance certificate	-0.278 (1.171)	-1.269 (1.181)	-0.484 (1.089)	0.085 (1.239)	1.731 (1.253)	-1.195 (1.026)	0.430 (1.051)	0.081 (1.186)	-0.095 (1.147)
School for university entrance certificate	-0.725 (1.147)	-1.109 (1.158)	-0.660 (1.062)	-1.116 (1.203)	1.454 (1.233)	-0.646 (0.987)	0.905 (1.029)	-0.714 (1.165)	-0.849 (1.119)
Other school	-1.474 (1.479)	-1.321 (1.518)	1.327 (1.605)	—	2.918 (1.506)*	-1.364 (1.406)	3.659 (1.520)*	-0.277 (1.473)	-2.278 (1.518)
Observations	227	224	226	221	225	222	226	226	225
Pseudo R^2	0.0224	0.1668	0.0432	0.0507	0.0243	0.0512	0.0401	0.0884	0.0374

(Standard errors in parentheses, * = significant at the 10% level) In model (4), there were no teens with "Other certificate." The ordered dependent variable is coded as (1) very important, (2) important, (3) less important and (4) completely unimportant. *Therefore, negative coefficents indicate increasing importance of a particular activity!*

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