

Changing times: home life and domestic habit

Lynne Hamill

3.1 Introduction

Why should this book include a chapter on time? Because how people use time tells us much about the prevailing social and economic conditions. In opening his book, *Changing Times*, Gershuny (2000: 1) argued that “if we can measure how the members of a society spend their time, we have the elements of a certain sort of account of how that society works”. Thus, in a sense, this survey of time use sets the scene for the later chapters.

Wacjman (2008) suggested that “the temporal perspective in sociological theory” has been neglected and “there is an urgent need for increased dialogue to connect social theory with detailed empirical studies”. However, this Chapter deals not with social theories but with empirical evidence. There are many ways to look at time use. Nansen et al (2009) argued that when looking at the pattern of domestic life it is important to distinguish between “chronometrics (time-measured), chronaesthetics (time-felt) and chronomanagement (time-ordered)”. Fine (1996: 55) identified five dimensions of time:

“Periodicity refers to the rhythm of the activity; tempo, to its rate or speed; timing to the synchronization or mutual adaptation of activities; duration, to the length of an activity; and sequence to the ordering of events.”

The evidence discussed below focuses on just one of Fine’s dimensions, duration, collected through large surveys, to which thousands of respondents contributed. With such large scale surveys, it is impossible to collect details of who did what with whom when and whether they felt hurried for instance. For such analysis small scale studies have to be used, such as Southerton’s (2006) interviews with 27 people or Nansen et al’s (2009) in depth study of just five families. The evidence presented in this Chapter is largely drawn from UK Government sources: the Office for National Statistics (ONS) and Ofcom, the UK communications’ regulator.

This Chapter focuses on how British people spend their time and how this has changed since the mid-1990s. During this period the technology found in homes changed and new technology means new activities. In particular, the internet arrived and the internet is now used for a range of domestic activities from entertainment to maintaining social relationships and shopping. Yet there are only twenty-four hours in the day: time, said Juster and Stafford (1991), is the ultimate scarce resource. So, putting aside multi-tasking, a new activity can only be undertaken by giving up an old activity. This Chapter therefore examines both the changes in domestic technology and the changes in what is done at home. In passing, it also considers the so-called work-life balance and why we feel pressed for time.

Section 2 briefly discusses the problems of measuring time use. Section 3 presents basic data on time use. Section 4 examines the division between paid work and other activities and discusses the rise of telework. Section 5 shows how time is used at home, which is, of course affected by the adoption of new domestic technology. Section 6 then focuses on the biggest recent change in domestic technology, the arrival of the internet. Section 7 concludes.

3.2 Measuring Time Use

Measuring how people spend their time is surprisingly difficult. There is a large literature on the subject and this Section does no more than to highlight some of the major problems.

We spend our time doing all sorts of things. Time-use researchers have to try to classify these many and various activities and often end up with a list of hundreds. For example, in ONS's 2000 survey, 250 activities were coded; for the 2005 survey, the number of activity descriptions were reduced to 30 (ONS, 2006a: 74). But to make sense even of 30 activities we have to reduce these categories further. There are, of course, many ways this can be done. The first cut is to divide time use between paid work and other activities. Differences tend to arise between how those other activities are further divided (See Kaufman-Scarborough (2006)'s list for example.) I have chosen Gronau's (1977) approach. As usual, Gronau divided time between paid work and other activities, but then divided those other activities between those which a third party could be paid to do, or a machine could be used to shorten the time required – such as washing the dishes – and those for which third party production is conceptually impossible, such as sleeping or enjoying leisure. So, for example, child care, or pet care, becomes domestic work because you could pay someone else to do it even though you may enjoy the activities.

But there is a fundamental problem of defining what people are doing at any given point in time due to polychronicity or, more colloquially, multi-tasking. For example, if you are doing online shopping, are you shopping or using your computer? If you are doing the ironing while listening to the radio, are you doing housework or enjoying leisure? Or if you are watching a DVD with your kids, does that count as childcare or leisure? Different surveys treat this polychronicity in different ways and this is discussed further later in the Chapter.

Then there is the issue of how best to collect the data. For instance, respondents were asked to recall the previous day in the ONS's 2005 *Time Use Survey* – which is extensively quoted in this Chapter – or by diaries, as used in the ONS's previous time survey (ONS, 2006a: 74). How finely time use is reticulated can vary too: the 2005 ONS *Survey* used ten minute slots for instance.

3. 3 Time use in Britain in the First Decade of the 21st Century

3.3.1 The Average Day

According to ONS's 2005 *Time Use Survey* (2006a) about half of the average day was spent in personal and biological maintenance (such as eating and sleeping), a quarter was spent in leisure and the remaining quarter was equally divided between "paid work, study and commuting" and domestic work. But these figures are averages: averages over those in paid work and those who are not, averages taken over weekdays and weekends, (ONS, 2006a: x). It is unlikely that anyone actually experienced this average day. So as well as showing the time spent on each of the 30 activities identified in the survey – plus travel allocated according to its related activity – Table 3.1 also shows what proportion participated in the activity and the average time spent by these participants. There is no difference between the overall average time spent sleeping and the average for participants because everyone slept. There is little difference in the time spent watching TV and the like because four out of five people did that. But for those activities where the participation rates were low, there is a large difference. For example, overall on average only 11 minutes were spent using a computer, but only 11 percent did so and those that did, used it on average for about 1½ hours a day. The fact that nine out of 10 spent no time at all on their computers has very different social (and policy) implications than if everyone spent 11 minutes.

Activity	Participation rate	Average minutes per day		
		Participants	All	
			Of which at home	
	(1)	(2)	(3)	
Personal maintenance			663	618
Sleep	100%	491	491	
Rest	51%	89	46	
Eating & drinking	97%	85	82	
Personal care ie wash/ dress	92%	48	44	
Paid work, study and commuting			199	17
Paid work	39%	434	170	
Formal education	4%	269	11	
Commuting	29%	62	18	
Domestic work			193	132
Cooking, washing up	70%	59	41	
Cleaning, tidying	38%	82	31	
Shopping, appointments	37%	90	34	
Travel for shopping	26%	42	11	
Washing clothes	19%	61	11	
Caring for own children	16%	148	24	
Pet care	13%	52	7	
Repairs and gardening	13%	126	17	
Escorting someone	10%	50	5	
Caring for other children	6%	141	9	
Caring for adults in own household	2%	95	1	
Caring for adults other household	2%	120	2	
Leisure			371	233
TV & videos/DVDs, radio, music	80%	196	157	
Miscellaneous travel eg visit friends	58%	83	48	
Spending time with family/friends at home	33%	152	50	
Going out with family/ friends	14%	172	24	
Contact with friends/family	15%	55	8	
Reading	28%	88	24	
Hobbies	14%	136	19	
Using a computer	11%	97	11	
Sport & outdoor activities	10%	100	10	
Travel for exercise/pleasure	7%	71	5	
Entertainment and culture	3%	153	5	
Attending religious and other meetings	3%	99	3	
Voluntary work	2%	153	3	
Recreational study	2%	177	4	
Other specified/not specified	10%	141	14	14
Total			1440	1004

Table 3.1. Minutes per day: average and by participants, UK, 2005

Source: ONS (2006a: 11, 13, 64)

Note: Average time by those who participated in the activity (col 3) = (average time per day for all people (col 2) / proportion of people who participated in the activity (col 1)) * 100

Time use also varies over the day as shown in Figure 3.1. What is striking is the large area that represents leisure: indeed, leisure accounts for almost half the time compared to a quarter in Table 3.1. This is because in this data set those who report multi-tasking are counted more than once. So that if someone was ironing and listening to the radio say, they would be counted as doing both activities.

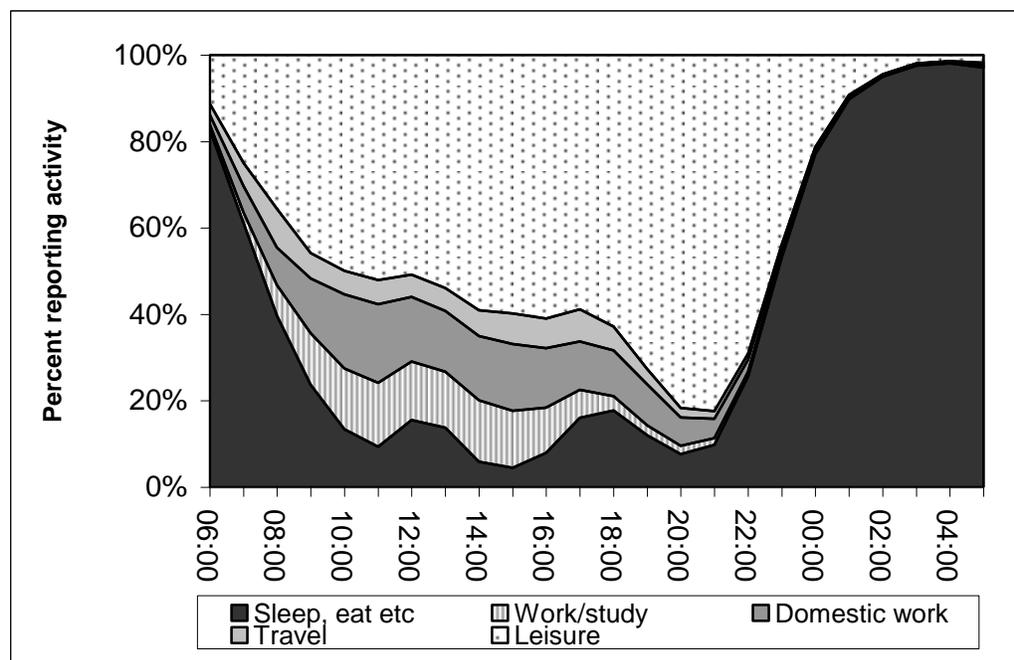


Figure 3.1. Activity by time of day, 2010.

Source: Ofcom, 2010: 29

3.3.2 Changes in Time Use

Identifying changes in time use is not straightforward due to the differences between surveys. Data is available for 1995 but is not strictly comparable with that for 2000 and 2005 (Table 3.2).

In broad terms using the five basic categories – personal maintenance, paid work and study, domestic work, travel and leisure – the only major change between 1995 and 2000 was a doubling of time spent travelling. But whether this change is the result of differences in the survey techniques or reporting rather than a real difference in time use is not clear: in the reporting of the 1995 survey results, over an hour a day is described as “other”.

ONS has itself compared the results from its 2000 and 2005 surveys (ONS, 2006a: 17) and two changes in the overall averages are striking. The average amount of time spent socialising increased by about half an hour a day while that spent on domestic work (excluding childcare) fell by a similar amount. Changes in the overall average can occur because the proportion reporting the activity changes or the amount of time they spend on it changes, or both change. For domestic work, not only did fewer report doing it in 2005, but those that did spent less time on it. Fewer reported socialising too, but those who socialise spent longer in 2005 than in 2000. Indeed, participation rates for all the leisure activities fell while time spent by those who did participate increased. This suggests that leisure activities are becoming more specialized in the sense that people spend longer on fewer activities.

ONS (2006a: 47, 69) also noted the “considerable growth” in the use of computers over the 5 years 2000 to 2005. “On any given day in 2000, around 12 per cent of the population used a computer outside their workplace (workplace use is not recorded in the diaries). By 2005, some 16 per cent of the population were doing so each day”. Also, those using computers spent longer doing so thus overall, averaging over computer users and non-users, “computing time increased from an average of 12 minutes per day in 2000 to 20 minutes per day in 2005.” (However, it is not clear how this 20 minutes a day fits with the 11 minutes shown in Table 3.1, which is based on a different table in ONS’s report.)

Activity	1995	2000			2005			Change 2000-2005		
	Average mins/day All (Approx)	Participation rate	Average mins/day Participants	All	Participation rate	Average mins/day Participants	All	Participation rate	Average mins/day Participants	All
Personal maintenance	627			664			663			-1
Sleep & rest		100%	530	530	100%	537	537	0%	7	7
Personal care ie wash/ dress		96%	49	47	92%	48	44	-4%	-1	-3
Eating & drinking		98%	89	87	97%	85	82	-1%	-4	-5
Paid work & study	181			190			184			-6
Employment		39%	446	174	39%	434	170	0%	-12	-4
Study (including recreational)		6%	267	16	6%	233	14	0%	-33	-2
Domestic work	197			193			166			-27
Care of own children		20%	100	20	16%	150	24	-4%	50	4
Other domestic work		91%	190	173	85%	167	142	-6%	-23	-31
Travel	46	88%	97	85	86%	102	87	-2%	5	2
Leisure	310			297			325			28
Social life		60%	93	56	50%	164	82	-10%	71	26
Hobbies & games		24%	88	21	24%	125	30	0%	38	9
Voluntary work & meetings		16%	100	16	12%	142	17	-4%	42	1
TV/video/DVD/radio/music		<i>na</i>	<i>na</i>	156	80%	196	157	<i>na</i>	<i>na</i>	1
Entertainment and culture		6%	100	6	3%	153	5	-3%	53	-1
Reading		43%	65	28	28%	88	24	-15%	22	-4
Sport & outdoor activities		15%	93	14	10%	100	10	-5%	6	-4
Other specified/not specified	79	29%	31	9	10%	141	14	-19%	110	5
Total	1440			1440			1440			

Table 3.2. Detailed change in time use. GB. 1995 to 2005.

Source: ONS (1998: 216; 2006a: 17)

3.4 Work Life

3.4.1 Time Poor – Money Rich?

As people became better off, it was expected that they would enjoy more leisure. In his 1931 *Economic Possibilities for Our Grandchildren* – that’s us! – Keynes suggested that “with no important wars and no important increases in population” by 2030 there would be a 15 hour working week with the main problem being how to use our leisure (Keynes, 1931: 369). There has, of course, been a major war – World War 2 – and the UK population has increased. So, it is perhaps not surprising that although working hours have fallen, they have not fallen as much as Keynes predicted. From the time Keynes wrote to 1979 the average hours worked per person fell by about a third, and since 1998, this trend to shorter hours appears to have continued (Matthews et al, 1982: 66-67; Castells, 2000: 469; Gallie, 2000: 306-7; ONS, 2007: Table 8). Yet we are much richer: real GDP per head, a common measure of how well off we are, has more than quadrupled since Keynes wrote (Feinstein, 1972: Table 42; ONS, 2010c). We could therefore afford to ‘buy’ more leisure but it appears that we, as a society, have chosen to take the benefits of economic growth in terms of more consumption rather than more leisure. Put another way, people have in effect chosen to be money-rich and time-poor.

In the previous Section, it was noted that on average people spent one seventh of their time working, nearly 3 hours a day. This may seem surprisingly low. But not everyone works and for some of those who do work, the day on which the data was collected was not a working day. Thus only four out of 10 reported undertaking paid work, and on average this took up $7\frac{1}{4}$ hours of their day (Table 3.1): and for those who worked full-time and reported working on the survey day, work took up nearly one third of their day, as one would expect. Figure 3.2 compares the average day for everyone, for those who worked full-time and for those who were retired. Because the average day for the full-timers includes weekends and holidays, work accounted for only about a fifth of their time.

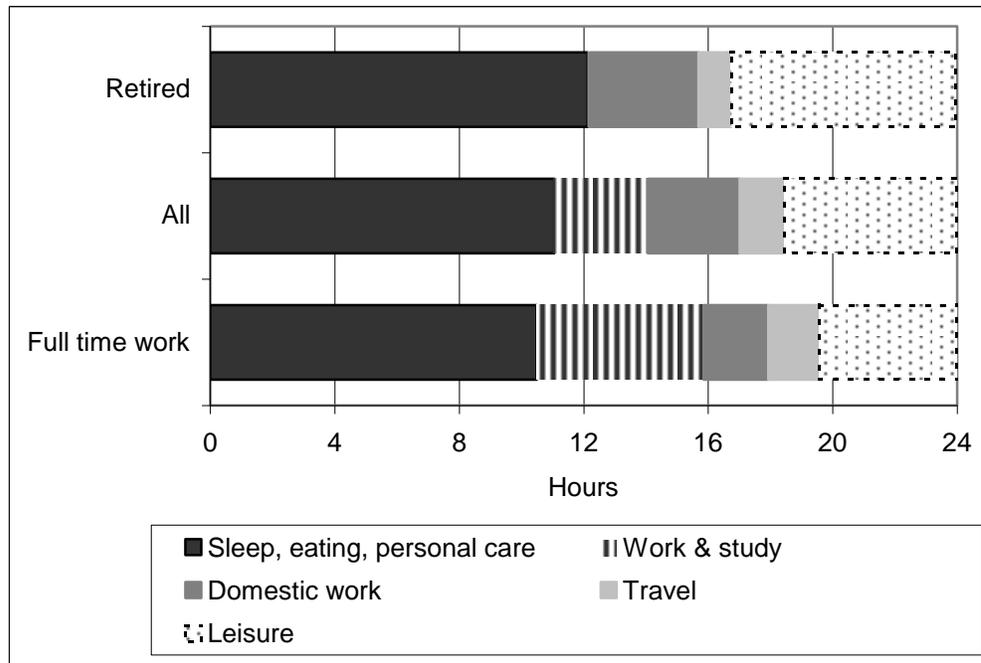


Figure 3.2 Time use by economic status, 2005.

Source: ONS, 2006: Table D9501

So why do we often hear that we have ‘busy lifestyles’, that we are somehow more rushed, more pressed for time than people were in the past? According to Glennie and Thrift (2009: 51) this idea that “the everyday world is intensifying and speeding up; becoming ever more frantic, and producing a general shortage of time” is not new, and has in fact been repeated “across several centuries”. Even in medieval times, time was structured into weekly, lunar, seasonal and religious cycles: certain jobs, ploughing for example, had to be done by certain times (Thrift, 1996: 180-206). But while there may be nothing new in complaints of ‘too little time’, what in particular has prompted the current complaint? The answer appears to be the distribution of leisure.

Gershuny (2000: 5-7) argued that in “the developed world in the last third of the twentieth century”, there has been “a reversal of the previous status-leisure gradient. Those of higher status previously had more leisure, and subsequently had less of it than those of lower social status”. Partridge (2005) argued that it is because it is these “high status” individuals who write academic and media articles that there is a perception that

there is a shortage of time. Taking highest educational achievement as an indicator of status, in 2005 on average those with degrees did work much longer hours than those with no qualifications: nearly 4 hours a day compared to about 1½ hours. But half of those with degrees reported working compared to only a fifth of those with no qualifications and if we just compare these workers, those with degrees worked only half an hour longer on average than those who had no qualifications (ONS, 2006: online table D9505). Clearer support for Gershuny and Partridge comes from Tam's (2010) analysis of data from the Labour Force Survey (LFS). Tam looked at the proportion of workers who would prefer to work fewer hours for less pay, who she labeled "the overemployed". According to Tam since 2001, 1 in 10 of workers in the UK have been overemployed and, perhaps not surprisingly, this rose to almost 1 in 6 of those who were working more than 48 hours a week. In line with Gershuny and Partridge, the overemployed were older, better educated, better paid and more likely to do managerial and professional jobs. Overemployment reflects the inflexibility in the labour market; people cannot choose their hours, particularly at more senior levels where part-time work is simply not an option and there is a general expectation that you work far longer than your contracted hours. At the other end of the scale were the "underemployed" who wanted and were available to work longer. (Underemployment is in effect hidden unemployment.) The underemployed, too, accounted for about 1 in 10 of the workforce. Those in 'elementary occupations' (such as labourers) and those working part-time are most likely to be underemployed.

Since 1961, for men on average, there has been a reduction in paid work while for women, there has been an increase: but despite this, by 2000, women of working age had more leisure than in 1961 (Partridge, 2005; Gershuny, 2002). So why the reported time pressure? Partridge (2005) suggested that moving from single to dual income households has, by reducing the time that neither partner is working, created the perception of lack of leisure time. There is support for this idea too in Tam's data. Tam (2010) found that women, especially those of child-bearing age, were much more likely to be overemployed: 1 in 7 women working full-time were overemployed and "the gender

difference was most evident in the age range 25-34, with women around twice as likely as men to be overemployed”.

3.4.2 The Rise of Teleworking?

It is often argued that the industrial revolution resulted in paid work leaving the home for the factory, thus separating people’s work lives from other aspects of their lives but that new technology has reversed this trend. In his 1967 seminal paper, *Time, Work-Discipline and Industrial Capitalism*, Thompson argued that “mature industrial societies... are marked by a clear demarcation between ‘work’ and ‘life’” (although Thompson’s view is now questioned by, for example, Thrift, 1996: 169-212). New communications technology, it is argued, reverses this. Forty years ago, in 1970, Toffler wrote in *Future Shock*:

“Machines and men both, instead of being concentrated in gigantic factories and factory cities, will be scattered across the globe, linked together by amazingly sensitive, near- instantaneous communications. Human work will move out of the factory and mass office into the community and the home” (Toffler, 1972 edition: 402)

By the 1980s, it was being suggested that a large proportion of white-collar workers would in future work at home (Pratt, 1984). The arrival of “interactive technologies” have revived this argument: for example, according to Kaufman-Scarborough (2006) this demarcation between work and home can be “bridged once again”. As I sit in my home-office, writing this Chapter, looking out over the fields between accessing articles from journals, maybe held the other side of the world, then yes, it seems this has indeed happened. But how typical is my experience?

To measure something, we first have to define it. Is someone who works at home the occasional day a teleworker? Or is a teleworker someone who works entirely from home making intensive use of the internet? Haddon & Brynin (2005) concluded that “teleworking should be *defined* by technology and location but *qualified* by timing” (their italics). However, twenty years ago, in 1990, the ILO’s definition of telework focused on new communications technology enabling people to work away from their co-workers

with no reference to timing (Ruiz & Walling, 2005). In 1994, the UK is reported to have been ahead of other European countries in adopting telework, with some 1 in 20 workers “doing some kind of telework” (ECaTT, 2000: 6) although it is not clear whether this was based on the ILO definition.

In Britain in 2001, if doing any work at home was counted, then, just under half of workers were teleworkers (Haddon & Brynin, 2005). But on closer inspection, some of these are best regarded as mobile workers. Only one in five relied on the internet or personal computer to work at home, and this takes no account of how much time was spent working at home (although it did exclude occasional overtime).

In 2002, the EU produced a definition of telework that did at least cover the frequency with which people worked away from their employer’s premises: telework was “a form of organising and/or performing work, using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer’s premises, is carried out away from those premises on a regular basis” (EU Article 2 of the *European Framework Agreement on Telework of 2002* (Eurofound, 2009: 3)). In 2005 8 percent of UK workers – the same as five years previously – were teleworkers defined as an employee working “with a personal computer away from the employer’s premises at least a quarter of the time” and 2½ percent teleworked “almost all of the time” (Eurofound, 2009: 4-6).

However, to observe long term trends we need a run of data based on consistent definitions and this is provided by the Labour Force Survey (LFS), a major national survey which has been conducted since 1979 (ONS, 2010d). The LFS first included a question about where people worked in 1981 and this showed that 4 percent of workers worked mainly from home or used their home as a base (Felstead et al, 2003). Unfortunately, the question was not repeated until 1992, by when the figure had risen to 5½ percent. But in 1997 new questions were added allowing the identification of teleworkers (Felstead et al, 2003). Taking a broad definition of teleworker, as those who work mainly in their own home, or use their home as a base, and who use a phone and

computer, then 3½ percent were teleworkers in 1997. By 2009, this figure had risen to 10 percent and almost all of these could not telework without both a phone and a computer – so-called “TC teleworkers”. However, about two-thirds of these TC teleworkers were using their home as a base while the popular conception of a teleworker is someone who actually works mainly at home. On this very narrow basis – TC teleworkers working mainly from home – the figure falls to only 2 percent of the British workforce – about ½ million people – in 2005 although the numbers have probably risen since. Details are shown in Figure 3.3.

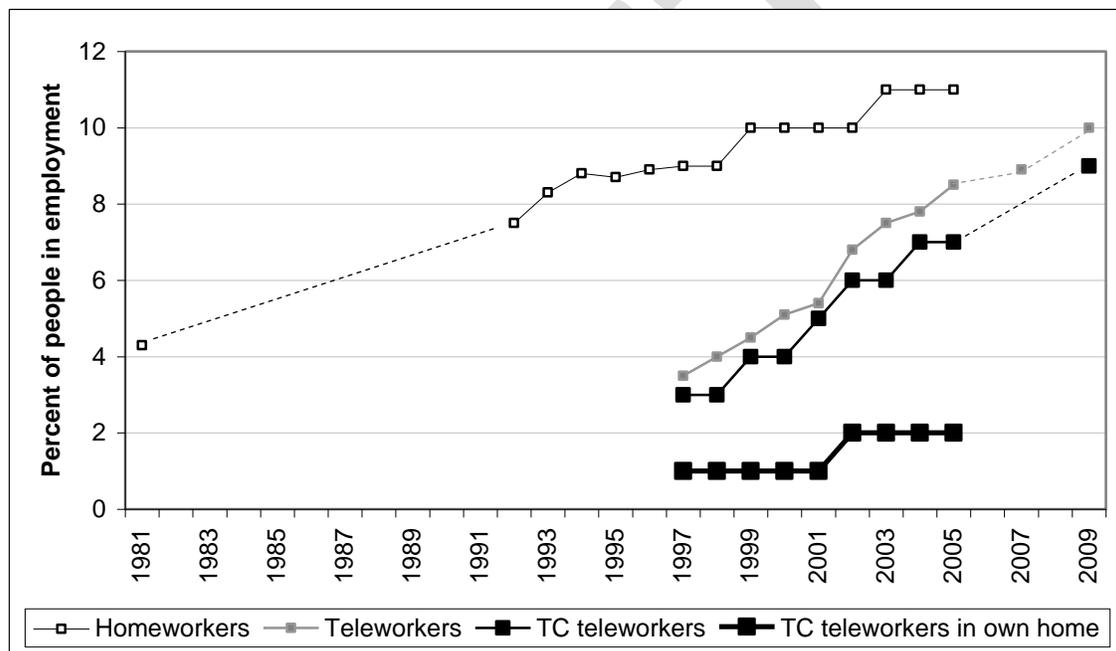


Figure 3.3. Homeworkers and teleworkers as a proportion of people in employment, UK: 1981-2009.

Note: “TC teleworkers” work at home or use their home as a base and could not do so without a phone and a computer. Data not available for all years.

Sources: Based on LFS data from Felstead (2003), Ruiz & Walling (2005), ONS (2006), Randall (2010).

Who are these teleworkers? Haddon & Brynlin (2005) noted that the wider the definition used, the more heterogeneous will be the groups labeled as ‘teleworkers’. They found that in 2001 those who used the internet tended to be relatively well paid professional men

while other teleworkers tended to be more typical of the working population as a whole. Similarly according to the LFS data, by 2005 homeworkers were more likely to be self-employed men than workers in general but had similar occupations. In contrast, those “TC teleworkers” who worked mainly at home were more likely to be self-employed women in the higher occupational groups as shown in Table 3.3. Thus rather than being adopted as a new way of managing staff in large corporations, the ability to work at home appears to have facilitated self-employment.

	All in employment	All homeworkers	TC teleworkers	
			Home as base	Mainly at home
Percent				
Men	53	68	78	44
Self-employed	13	64	60	60
Full-time	72	72	82	54
Occupation				
Managers & senior officials	16	16	23	24
Professionals	13	13	20	17
Associate professional/technical	17	17	22	27
Skilled trades	27	27	23	7
Estimated number (million)	28.0	3.1	1.5	0.5

Table 3.3. Characteristics of homeworkers compared to the working population, UK, 2005.

Source: Ruiz & Walling (2005)

How do these findings relate to the time survey data quoted above in 2005? Of the 170 minutes in the average day spent working, 133 minutes were done away from home. Only 15 minutes of paid work was done at home but the location of the balance, another 22 minutes, was not recorded (ONS, 2006a: 13). Another clue from the 2005 survey is that 18 minutes of computer time was in paid work mostly at home, adding another 10 percent to work time for computer users (ONS, 2006a: 47 & 70). This suggests that, roughly, between a tenth and a fifth of work was done at home, which is broadly consistent with the LFS data.

3.5 Home Life

In 2005, on average people spent 70 percent of their time – nearly 17 hours a day – at home. Of course, much of this time, some 10 hours, was spent sleeping, eating and bathing. Some two hours a day was spent in domestic work. But nearly four hours a day was leisure time and this was dominated by watching TV or DVDs, listening to the radio and music. (See Table 3.1.) Home-based activities will in part depend on what technology is in the home. It is obvious that, for example, prior to arrival broadband internet in 2000 (Connected Earth, 2010), people could not watch TV at home if there were no TV set in the home. So this Section starts with a review of the adoption of domestic technology before turning to look at time use.

3.5.1 Innovators and Laggards

The diffusion of innovations of all kinds has been studied since the mid-twentieth century and a considerable literature has developed (see Rogers, 2003: 39-101). Adoption of new technology is essentially a social process, which can be only partly explained by economics (Douglas & Isherwood, 1996: xx-xxvii; Rogers, 2003: 289). Rising incomes and falling prices do not of themselves create demand for new domestic technology or anything else as, rather to their dismay, economists Deaton and Muellbauer, (1985: 71-72) found. Economists can provide useful assessments of the short term impact of changes in prices and incomes but not the longer term question of why some goods come to be adopted by the majority of the population while others do not (Douglas and Isherwood, 1979: 99).

On the basis of many studies over many years of many different types of innovations, Rogers (2003: 281-2) divided adopters into five groups; innovators, early adopters, early majority, late majority and laggards.

- Innovators account for 2½ percent or 1 in 40 of the population. They have wide social networks, financial resources and technical knowledge but they are not necessarily respected within their social system. They can be likened to Simmel's stranger (ibid: 42, 290-1), i.e. people who are in a sense on the margins of the

social system.

- Early adopters account for about 1 in 7 of the population. They are somewhat similar to innovators but are more embedded in the social system, being opinion leaders and respected role models for whom status is likely to be important (ibid: 251, 316-319). Early adopters are better educated, of higher social status, and more likely to be upwardly mobile and wealthy (ibid: 288).
- The early majority comprise about a third of the population. They interact frequently with their peers but are rarely opinion leaders.
- The late majority account for another third and are persuaded to adopt by peer pressure although they have limited resources.
- Laggards are the last sixth of the population to adopt, and they tend to interact with other laggards.

During the majority phases – both early and late – the rate of growth of adoption is usually fast while at the start and at the end, it is usually slow. This produces the well-known S-curve.

A good example of this pattern is the adoption of black-and-white television in Britain from when transmissions were resumed after the Second World War in 1946 to when adoption peaked at 93 percent in 1970, after which black-and-white TVs were replaced by colour sets This is shown in Figure 3.4.

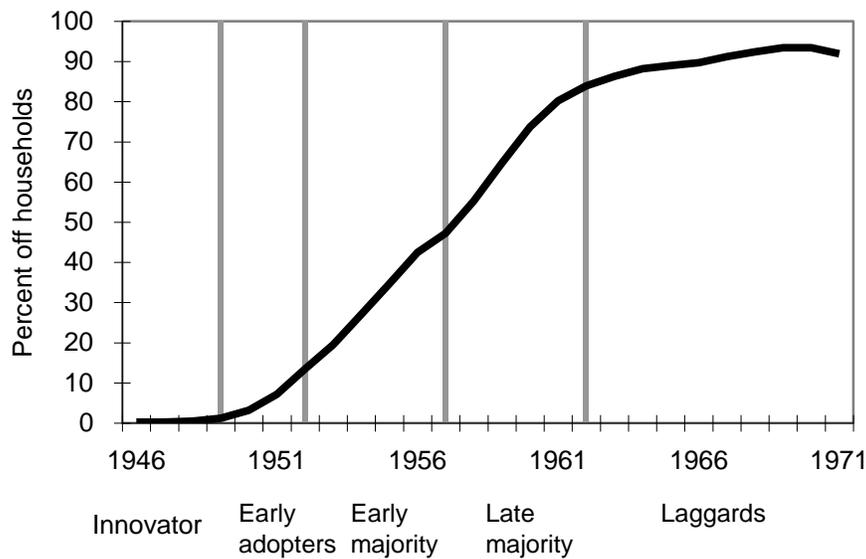


Figure 3.4. Adoption of black and white television in England & Wales, 1946-1971
(Source: Bowden & Offer, 1994)

Table 3.4 shows the length of Rogers' phases and the time needed to reach saturation (defined as 95 percent adoption) for various domestic technologies. Data on the length of the 'innovators' phase is rare because the adoption of new technology is usually not monitored until adoption has reached early adopters or even the 'early majority' so Table 3.4 combines innovators and early adopters. For instance, colour TVs were launched in 1967 and in four years, by 1971, had reached 16 percent of households and in another five years, had reached 50 percent, thus taking nine years in total. But it took another 15 years for adoption to reach saturation.

As noted in the previous Section, we appear to live in a money-rich time-poor culture. People prefer to earn more money and, it is argued, have less, but higher quality, leisure rather than having less money but more time. This apparent desire for high quality leisure time emerges from studies of consumption: it is claimed that time-using goods that increase the quality of time spread much faster than time-saving goods that increase the quantity of free time (Bowden & Offer, 1994; Tellis et al, 2003). And Table 3.4 shows

that it took more than 10 years for many time-saving appliances to reach the early majority – starting at 16 percent of households – while it took less than 10 for many entertainment technologies to reach that stage. But after that early majority is reached, the distinction between time-savers and time-users is not so clear.

DRAFT

	Year product launched	Year adoption reached				Length of phase (years)			
		Early majority (16%)	Late majority (50%)	Laggards (84%)	Saturation (95%)	Innovators and early adopters (0 to 15%)	Early majority (16 to 49%)	Late majority (50 to 84%)	Laggards (85 to 95%)
TV: colour	1967	1971	1976	1985	1991	4	5	9	6
Video recorder	1979	Early 80s	Late 80s	1997-8		<i>Under 5</i>	<i>5-10</i>	<i>About 10</i>	
Home computer	Early 1980s	1986	2002-3			4	16		
TV: B&W	1946	1953	1958	1963		7	5	5	
Internet connection	1992	1999-0	2004-5			7	5		
Satellite receiver	1982	Early 90s	2004-5	2009		10	15	5	
Mobile phone	1985	1996-7	2001-2			11	5		
Fridge	1946	1960	1968	1975	1980	14	8	7	5
DVD player	1997		2003-4	2007				4	
CD player	1982		1995-6	2003-4				8	
Microwave oven	Mid 1970s		1990	2000-1				10	
Washing machine	1933	1955	1964	1987	2004-5	22	9	23	17
Tumble drier	1950	Late 70s	1994-5			30	15		
Dishwasher	1957	1993				36			
Telephone	1880	Late 50s	1974	1988	1998-9	80	15	15	10

Table 3.4. Time taken for selected domestic technologies to reach key adoption levels

Sources: Launch of Telephones: The Telephone Company, 1880. Mobile phones: Agar, 2003: 81. Others: OPCS, 1995; Table 2.6; ONS, 1997 Table A10; ONS, 1999 Table 9.4, ONS 2010a and 2010e: Tables A50 & A51; Bowden & Offer, 1994.

Note: italics indicate estimates, rounded to nearest 5 years.

3.5.2 What has changed since 1998?

Why start with 1998? The short answer is the availability of consistent data. In 1998, the ONS revamped their method of calculating household adoption rates and started collecting data on household internet connections. So starting with 1998 facilitates comparisons both over time and between adoption of the internet and other household appliances.

Now even though economic growth does not guarantee increased adoption of any particular item of domestic technology, it does tend to make these technologies more affordable. By 2007, households were about one fifth better off in real terms (i.e. after inflation) than they had been 10 years previously, although by 2009, this had fallen to about one sixth¹. While prices in general rose by almost a third, the prices of consumer durables fell by a fifth, and in particular the prices of “audio-visual equipment” and “information processing kit”, fell dramatically: audio-visual equipment that cost £1,000 in 1998 cost only about £20 in 2009 and information processing kit that cost £1,000 in 1998 cost only £80 in 2009². There are of course difficulties in measuring price changes when products are changing rapidly as technology develops (see, for example, Brand, 2001). Nevertheless, it is hardly surprising that the proportion of households owning domestic technology generally rose over the period given this growth in real incomes together with the fall in prices of these goods relative to other goods.

Three groups of domestic durables can be distinguished by the change in the proportion of households adopting them over the 11 years, 1998 to 2009, shown in Table 3.5:

- Falling adoption: those items for which the adoption rates were high in the late 1990s but declined due to some degree of technological obsolescence: video

¹ As measured by the growth in real GDP per head, IHXW on the ONS database (ONS, 2010c).

² “Prices” measured by the all items RPI (CHAW on the ONS database); “Consumer durables” (CHBY), “audio-visual equipment (DOCZ) and “information processing kit”, which includes personal computers, by CPI 9.1.3 (D7EP) (ONS, 2010c)

recorders, which were superseded by DVDs, and fixed line phones, superseded by mobile phones;

- Moderate risers, for which adoption increased by less than 20 percentage points: washing machines and tumble driers, microwaves, dishwashers and CD players. Except CD players, these are all time-savers.
- Fast risers, for which adoption rates increased by more than 40 percentage points: home computers, mobile phones, satellite receivers, internet connections and DVD players. With, arguably, the exception of mobiles, all these were all time-users.

	Percent of households adopting			Percent Change
	1998-99	2002-03	2009	1998-2009
Video recorder	85	90	61	-24
Telephone	95	84	88	-7
Washing machine	92	84	96	4
Tumble drier	51	56	58	7
Microwave	79	87	93	14
Dishwasher	23	29	39	16
CD player	68	83	84	16
Home computer	33	55	75	42
Mobile phone	27	70	81	54
Satellite receiver	28	45	86	58
Internet connection	10	45	71	61
DVD player	(1)	31	90	90

(1) Data starts 2002-3

Table 3.5. Adoption of domestic technology by British households, 1998-2009

Source: ONS 2010e: Table A50.

But the averages shown in Table 3.5 hide the sometimes large difference in adoption between rich and poor households. Figure 3.5 shows how the difference in adoption between the poorest and richest households has changed in the last 11 years. The left edge of each bar shows the percentage of households adopting in the lowest decile – the poorest – while the right edge shows the percentage in the highest, richest, decile. This is a rather unusual presentation and some explanation may help.

- The longer the bar, the greater the difference between the richest and poorest households: the longest bars are for internet connections and dishwashers.

- The shorter and further to the right the bar, the closer is adoption to saturation: as for microwaves and washing machines in 2009.
- The less the overlap between the pair of bars for each item, the more the change between 1998 and 2009: for example for satellite and cable TV, where there is no overlap at all!

This presentation allows us to distinguish between three broad groups:

- Where there was a narrowing of the difference in adoption rate between rich and poor households – the length of the bars shortened – washing machines, microwaves, DVD players, CD players, satellite/cable TV and mobiles;
- Where the length of the bars did not change much between 1998 and 2009 although they tended to shift to the right as more households in all income groups adopted: tumble driers, dishwashers, and home computers.
- Where there was an increase in the difference in adoption rate between rich and poor households, the length of the bars increased: fixed-line phones and internet connections. For fixed-line phones, the increase in the gap between rich and poor was small, and the overall adoption rate fell as poorer households substituted mobile phones. For internet connections, the difference increased dramatically as the overall adoption rate rose. The gap between rich and poor households increased because internet connections were found in only a third of the richest households in 1998, but 11 years later they were almost ubiquitous in better-off households but found in only one third of poorer households.

However, it is necessary to introduce a word of caution about these figures. The bottom decile, the poorest ten percent of households, is dominated by retired people living alone: indeed, in 2009, nearly half of the households in the bottom decile were headed by someone aged 60 or over and 80 percent comprised of just one person. In contrast, only some 10 percent of households in the top decile, the richest, are headed by someone aged 60 and only some 5 percent or comprised just one person (ONS, 2010e: Table 54). So the differences in adoption rates do not just reflect income, but also age (and probably other characteristics). Nevertheless, while those who have lower incomes are less likely to adopt, it is not simply the case that older people are less likely to adopt new things.

Rogers (2003: 288) reported that the relationship between age and “innovativeness” is not clear because where older people are better off, they can better afford the risks of innovation.

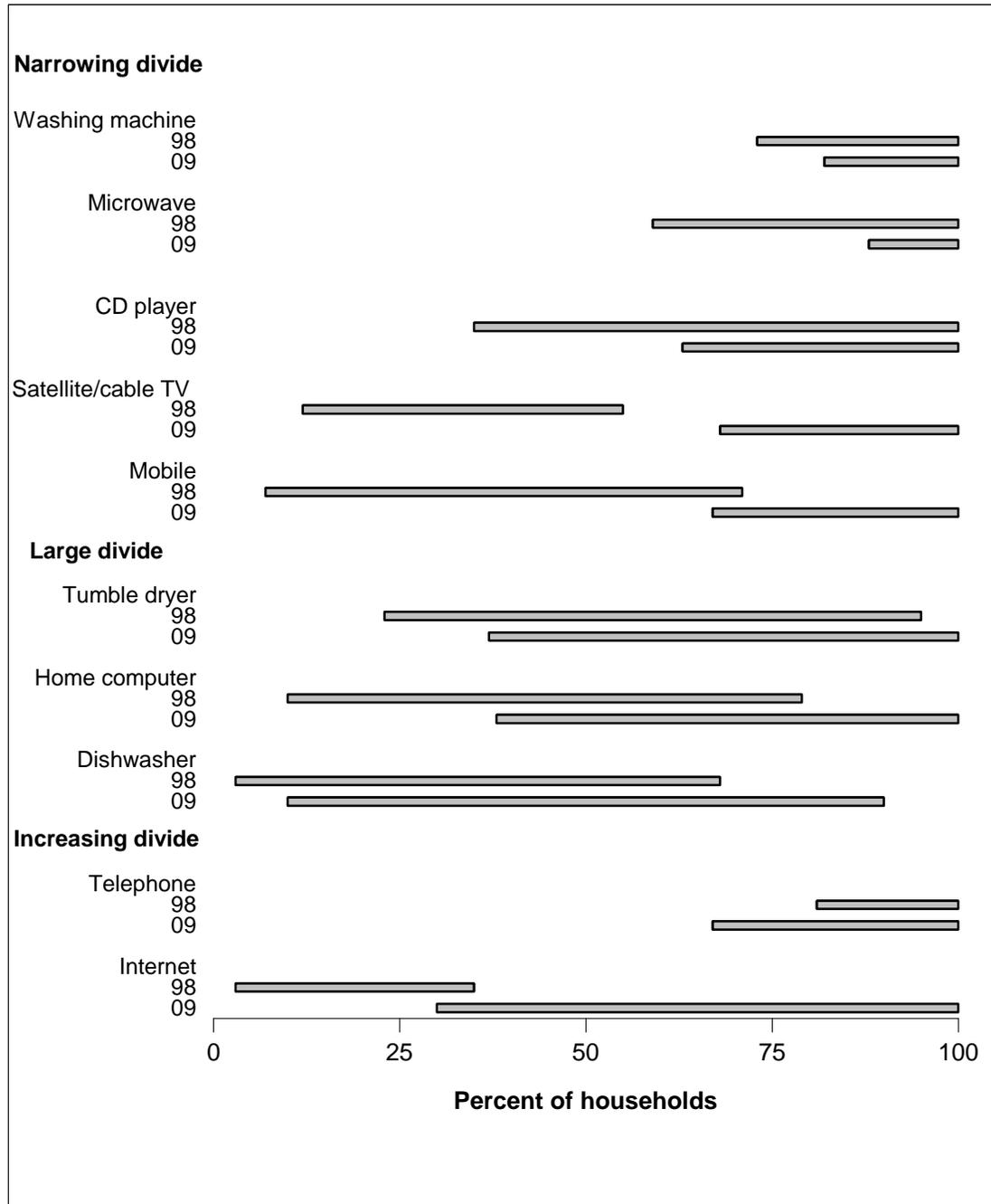


Figure 3.5. Change in adoption among poorest and richest households: 1998-9 to 2009
Sources: ONS, 1999; ONS, 2010a

To sum up, by early 2009, 99 percent of households had either a fixed line or mobile phone, and 4 out of 5 had both (Ofcom, 2009: 248). Almost all households probably had TV sets too, although data is no longer collected: 98 percent of people reported watching TV on a TV set sometime during the survey week (Ofcom, 2010: 38). Indeed, Ofcom (2010b) estimated that there were some 60 million TV sets in the UK at the end of 2009, which would suggest that on average there were about three per household. Devices that save time on domestic chores were very common: fridges were probably ubiquitous although again, data is no longer collected and over 90 percent of households had washing machines and microwave ovens. More than four out of five households had CD and DVD players and satellite (or cable) TV; and more than seven out of ten, home computers and internet connections (Table 3.5).

3.5.3 Impact on Time Use

But how has this affected time use? Today's luxuries tend to become tomorrow's necessities (Douglas & Isherwood, 1979: 99, 121-2): "the poor", Douglas and Isherwood argued, are "periodicity-constrained" and have to spend more time doing chores while the rich can afford new technology to free them. In a similar vein, Urry (2000: 10) argued that money is time: it is "access to money which enables time to be put to good use". In other words, the rich buy time.

What evidence is there about the money-rich time-poor? Although the 2005 survey did ask about respondents' income, 40 percent declined to provide any information (ONS, 2006: online table D9503). Given this poor response poor, data on time use by highest educational qualification is arguably better. Of course a high educational qualification does not ensure a high income, nor lack of qualifications a low income. Nevertheless, the results (not published in the report but available online) are interesting. The quarter of the sample with degrees spent more time working and travelling than the quarter with no qualifications; and those with degrees spent less time on housework (other than child care) and had less leisure time than the unqualified. Furthermore, that leisure time was less dominated by TV and associated media: fewer of those with degrees reported watching TV and those who did watch did so for less time. (See Figure 3.6.) The findings

are consistent with the idea that the better off ‘buy’ leisure time reducing the time needed for housework. So does the increase in adoption of the time-saving technology between 2000 and 2005 (shown in Table 3.6) explain the apparent reduction of half an hour a day spent on housework (shown in Table 3.3)? Maybe. The impact of labour-saving domestic technology, such as washing machines, on the time spent doing housework is not obvious. Indeed, it is claimed that the time spent on housework has not been reduced by new domestic technology (Bowden & Offer, 1994; Gershuny, 2000: 54). The better off work longer, and therefore have less time for other activities and can afford more domestic technology. But is there not a chicken-and-egg situation here? Is it that more technology enables them to work longer or that the longer working hours means the technology is more affordable?

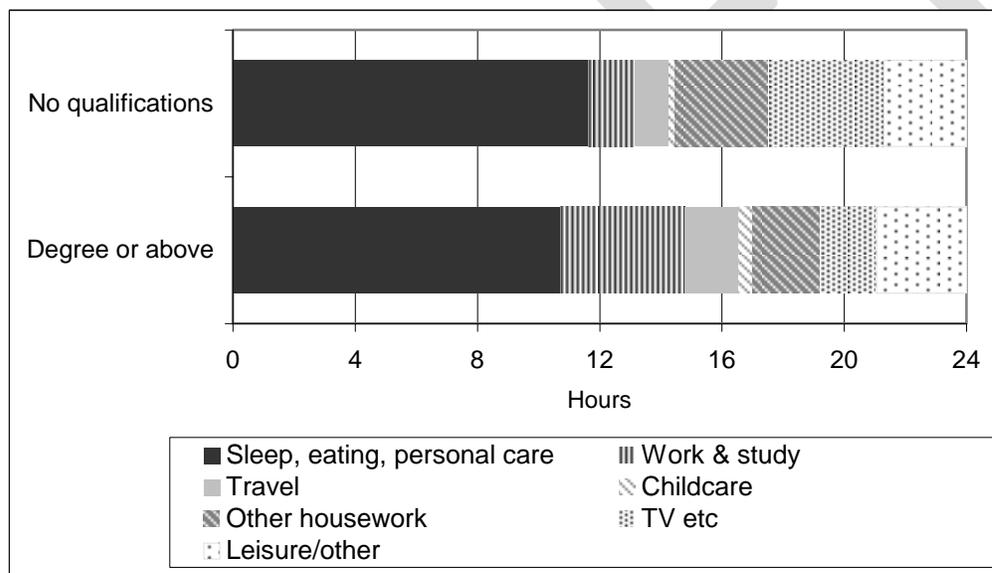


Figure 3.6. Time use by highest qualification. GB. 2005.

Source: ONS (2006: online table D9505).

3.6 The Internet at Home

3.6.1 The Arrival of the Internet

The internet arrived in 1992 but by 1998-9 only 10 percent of households had internet connections; by 2009, this had risen to 71 percent (as shown in Figure 3.7).

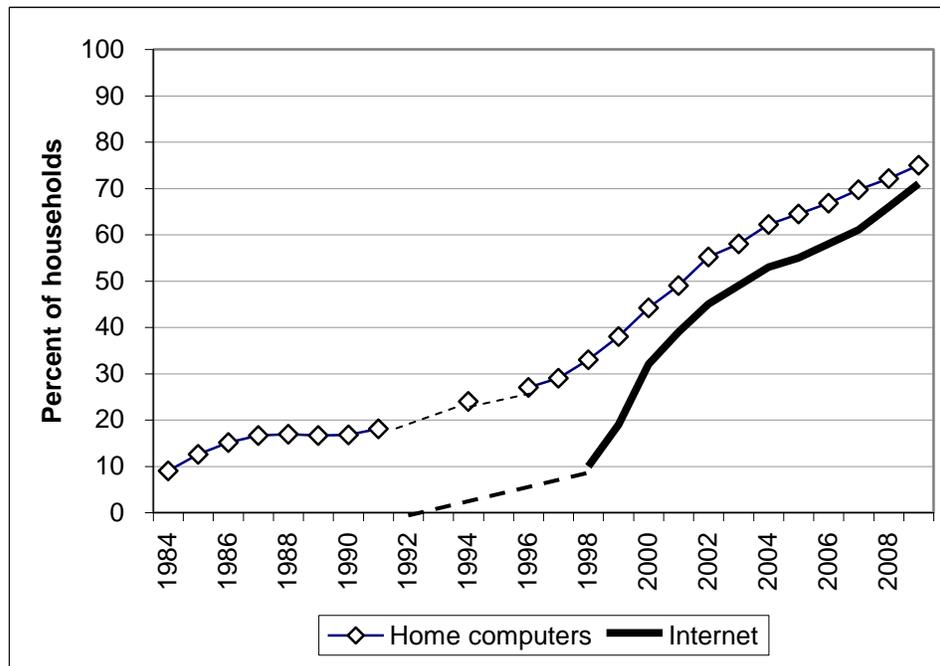


Figure 3.7. Adoption of home computers and the internet in the UK: 1984-2009.

Sources: as Table 3.5 (Data for home computers not available for all years.)

The adoption of new communication technologies differs from that of items such as washing machines because of “network externalities”, that is, the value of joining the network depends on the number of people who have already joined (Varian, 2003: 631). When a network is small, there is little value to be had from joining it. But the more people who join, the more valuable it is to join. How much more valuable is debatable. Metcalfe’s Law says that “the value of a communications network is proportional to the square of the number of its users” (Briscoe et al, 2006). However Briscoe et al (2006) argued that Metcalfe’s Law produced too high a value because it is based on the idea that all connections are equally valuable while it does not matter if a billion people have

email; what matters is whether the people you want to contact – your friends and family – are connected.

Another way of looking at this is to argue that a “critical mass” is needed for diffusion to take-off. (See, for example, Valente, 1995: 79, 87, 130.) But how many need to adopt for a critical mass to be reached? Rogers (2003: 360) suggests that “take off” typically occurs when between 5 and 20 percent have adopted. However, Valente (1995: 83) suggested that it might be around 50 percent adoption for phones as people will then feel that it is necessary to have one when so many others have.

When there are “network externalities”, Rogers (2003: Fig. 8-5) suggested that diffusion may follow a more pronounced “S” curve for than for other types of technology: a slower start followed by a more rapid growth to saturation. Table 3.4 does show that the adoption of the internet did move quickly through the early adopters phase compared to the time taken by some other technologies: just five years compared to nine for washing machines for example. My own modelling work (Hamill, 2010: 299) suggested that without a critical mass of sufficiently digitally literate people, adoption of the internet would not have taken off. And this in part came about because by the time the internet arrived in 1992, around a fifth of households in the UK already had home computers (as shown in Figure 3.7). The adoption of home computers and the internet then grew together. Indeed, I think it is likely that the adoption of home computers would not have risen as shown in Figure 3.6 had they not been transformed into interactive communication devices by the internet!

In 1998-9, almost no households in the bottom half of the income distribution had an internet connection; but by 2009, a third of the poorest households were connected as were almost all those in the top half of the income distribution (Figure. 3.8). But even in 2009, the majority of households with internet connections were better-off: the richest half of households accounted for about two-thirds of internet connections. Nevertheless by 2009, a third of poor, single pensioner households had an internet connection as did 9 out of 10 two parent households with children (ONS, 2010e: Table A51).

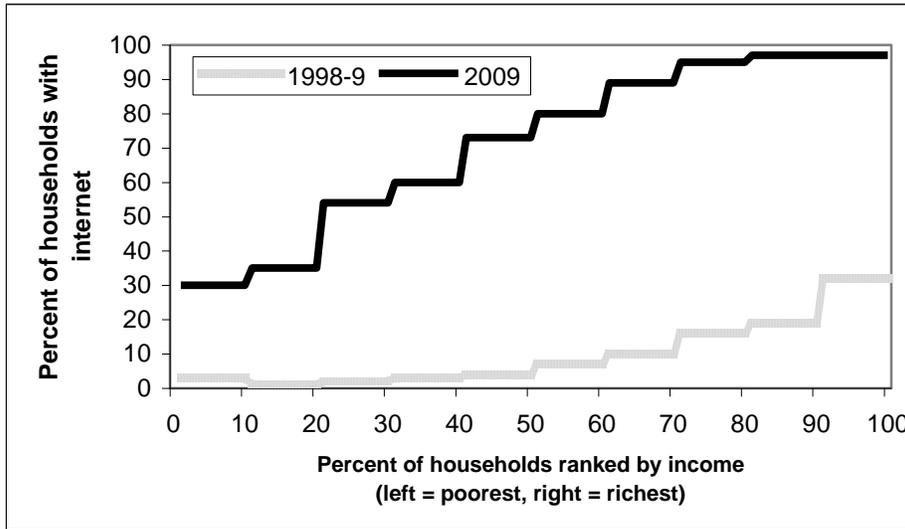


Figure 3.8. Percentage of households with an internet connection by gross income decile: 1998-9 and 2000.

Sources: ONS (1999, 2010e).

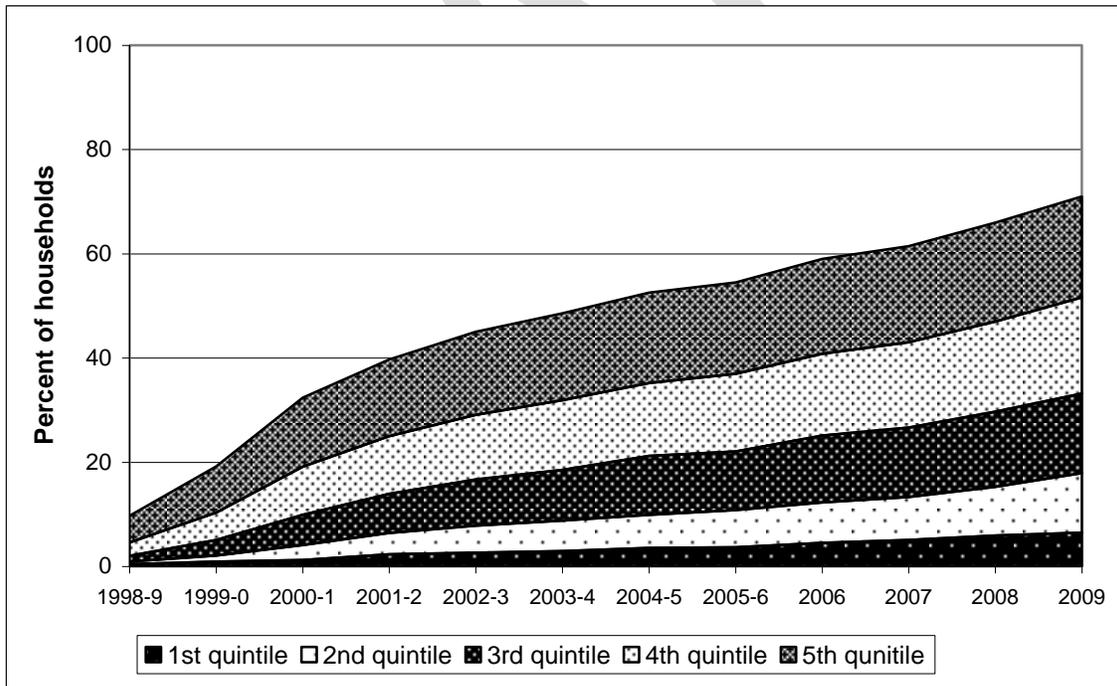


Figure 3.9. Internet connection by gross income quintile: 1998-9 to 2009 (1st quintile is poorest.)

Sources: ONS (1999, 2000, 2002, 2003, 2004a, 2004b, 2005, 2007, 2008a, 2008b, 2010a, 2010e)

The younger and the better educated are most likely to use the internet.

- In 2010 99 percent of people aged 16 to 24 had used the internet, only 40 percent of those aged 65 and over had done so. There is, however, a wide difference between those in their 60s and those in their 80s. Special analysis of the 2007 *Family Spending Survey* showed that only 15 percent of households headed by people aged 80 and over were connected compared to just under half of households headed by people aged 65 to 69 (Hamill, 2010: 283). Furthermore, internet non-users are not confined to older age groups: in 2008, half were under the age of 65 (Morris, 2009: 35).
- In 2005, those with degrees were four times more likely to use a computer: 1 in 6 compared to 1 in 25 of those without qualifications (ONS, 2006: online table D9505). By 2010, 97 percent of people with degrees had used the internet, but only 45 percent of those with no qualifications had done so (ONS, 2010b).

In 2010, 9 million adults in the UK had never used the internet (ONS, 2010b). Of course, this will fall over time. Morris (2009: 35) estimated that the proportion of the adult population who are “digitally excluded” – apparently defined as those who have not used the internet in the previous three months – would, if all other factors remain constant, fall from 29 percent in 2009 to 15 percent in 2021, due to demographic change, but half of those aged 65 and over would be digitally excluded.

3.6.2 Effect of the Internet on Time Use

Gershuny (2007: 277-8) noted that while the proportion of people using a home computer had risen markedly between 1985 and 2005, the time spent using a PC remained at about two hours a day. As noted in Section 3, ONS’s 2005 *Time Use Survey* found that more time was spent using computers in 2005 than in 2000 but we don’t know how much of this time involved use of the internet.

For internet data, we need to turn to Ofcom (2009: 279; 2010: 19). According to Ofcom, internet users spent on average about 1½ hours a week online in 2004. However, by autumn 2007, half of internet users were spending more than 5 hours a week online at

home; and 1 in 10 were spending more than 15 hours a week online. By 2009, the average was reported to be over 3 hours a week, more than double the 2004 figure.

Where had this time been found? There is a fundamental problem in teasing out the impact of a new technology on time use. Simply comparing the time use patterns of users and non-users at a given date does not allow for the many other differences between the two groups: I call this ‘the heterogeneity problem’. For example, the ONS did just that in their 2005 *Time Use Survey* (2006a: 47, 69). Statistical techniques can be used to try to overcome this problem (as for example in Nie, Hillygus & Erbring, 2002). An alternative approach is to undertake a longitudinal study (as for example, in Anderson and Tracey, 2002); but then the problem is to adjust for the other changes that have occurred such as marriage or retirement. A variation on this is simply to ask people how, for example, the internet had affected their use of time, although this has obvious problems in that people may simply not know. Nevertheless Anderson and Tracey (2002) did just that, but with inconclusive results in part, at least, because on average use was then still very low.

Can we learn anything from past experience? When TV arrived, people found time to watch it. What was given up to accommodate this new activity? The BBC conducted time budget studies in 1939 and 1952 when there were virtually no TVs, and compared the results with a similar study conducted in 1975, when almost every household had one. The BBC concluded that time for TV was found by working fewer hours and by spending less time ‘doing nothing in particular’ (BBC, 1978: 641). However, the world in 1975 was very different to that before the Second World War in 1939, and so it really is not possible to argue that TV caused these changes. (For a more detailed discussion, see Hamill, 2003).

In the 1980s, adoption of home computers was reported to result in less TV watching (Dutton et al, 1987). For instance in 2005, computer users watched TV for an average of 135 minutes while non-users watched for 160 minutes (ONS, 2006: 69). But as noted above, it is the better educated, who are known to watch less TV, are also more likely to use also use computers, so we have the heterogeneity problem and although the use of

computers is associated with less TV watching, it has not necessarily caused it. (See also Gershuny, 2002; Gershuny, 2003) This heterogeneity problem also arises in relation to the impact of broadband on internet use where it was found that broadband users spent longer online than narrowband users (Ofcom, 2007: 21; Anderson & Raban, 2007: 47). It is not clear to what extent this finding due to the fact that those who were keener users of the internet were more likely to move to broadband rather than to changes in behaviour (due, for instance, to lower marginal costs when narrowband access is charged per minute and broadband is not).

On average the number of hours spent watching TV in the UK did not change between 2004 and 2009, at about 3.7 hours a day. But once again, this average is misleading: for those under the age of 35, time watching TV fell and for those aged 45 and over, it rose (Ofcom, 2010: 160). Time may, however, have been taken from non-leisure activities. While Gershuny (2000: 5) argued that the time spent sleeping can be treated as a constant, Taheri (2006) suggested that children and adolescents found time for TV, computer games and use of the internet and mobile phones at the expense of sleep. According to Dutton et al (2009: 5), by early 2009, a third of internet users thought they spent too much time online!

As mentioned in the introduction, one of the difficulties with time use studies is the fact that people do more than one thing at once, they multi-task. In the analysis of the *2005 Time Use Survey* (ONS, 2006: 7-8) where possible the purpose was recorded as the primary activity with the fact of computer use as secondary so that for online shopping the primary activity would be coded as shopping and computer use the secondary activity. In contrast, Ofcom (2010) simply double-counted so that if someone reports watching TV while sending text messages, then both activities are included. Ofcom (2010: 43) reported that “The TV set, radio set, print, music centres and portable devices (other than mobile phones) tended to be used for activities undertaken on their own.” Indeed, more than 80 percent of TV watching and radio listening was undertaken as an activity on its own (Ofcom, 2010: 44). In contrast, computers and mobile phones were used at the same time as other media activity. Kenyon (2008) argued that “virtual

mobility, via Internet use, loosens the traditionally close links between activity, space and time” and internet increases the number of activities that that are both amenable and accessible for multi-tasking. Kenyon found that multi-tasking added 60 percent to the time reported spent on online activities and argued that undertaking more than one activity at a time is common and can in effect add some 7 hours to the day.

What did people do online? Almost all internet users – 90 percent – use email (ONS, 2010b) and there is some suggestion that email has reduced telephone and face-to-face contact (in the US, Quan-Haase & Wellman, 2002; Boneva et al, 2001; and in the UK, Stoneman, 2008). “Two-fifths of people’s time spent on a computer is spent communicating with other people”: more for younger people than for older people (Ofcom, 2010: 3, Fig 1.21.) Furthermore, older people spent much less time using computers on average because they are less likely to have computers.

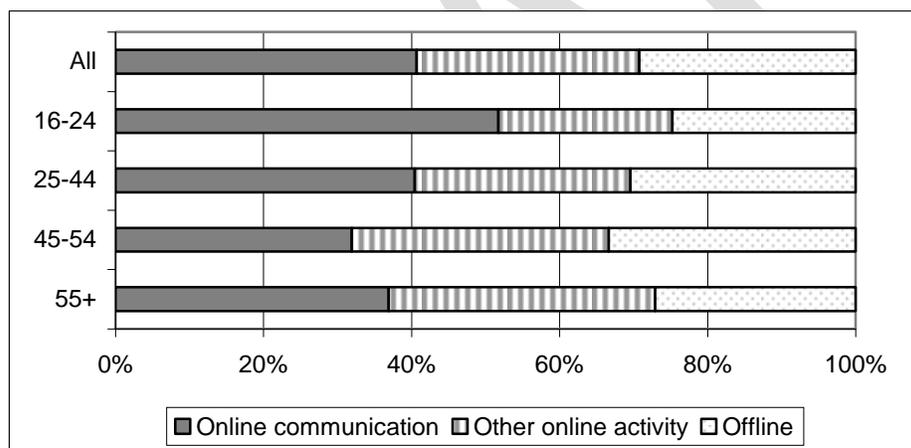


Figure 3.10. Time using a computer by age, 2010.
(Based on data from Ofcom, 2010)

“Communicating” means using email, social networking, instant messaging and phone (such as Skype).

Stoneman (2008) suggested that, initially at least, internet usage simply facilitates already existing practices but that the impact of the internet will change as people become more proficient users, and substitution effects may take time to evolve. Brynin & Kraut (2006:

4 & 6) said that to argue that the new technology only enables people do the same things in new ways is to take a narrow view and that the internet could result in “qualitative changes in daily life” in which people accomplish new goals.

Anderson & Raban (2007: 59) argued that “there is simply not that much slack in most people’s lives for major shifts in behaviour in the short term”. Experience with the internet shows that this is not the case. This is because people are doing things differently. The 2005 *Time Use Survey* suggested that, for example, if computer use as a secondary activity was included in social life, it would increase the average time spent socialising by computer users from 62 to 69 minutes; and for, hobbies and games from 13 minutes to 21 minutes (ONS, 2010a: 47 & 70). By 2010 (ONS, 2010b):

- instead of walking round the shops, people go online: three-quarters of those who had accessed the internet in the last three months of 2010 had looked for information about goods and services;
- instead going to the travel agent, they go online: almost two-thirds of those used travel-related services;
- instead of going to the newsagent or the library, they go online: half downloaded news or magazines;
- instead of going to the bank, they go online: half had used internet banking.

3.7 Summary and Conclusion

Measuring time use is surprisingly difficult and the data that is collected has to be presented and interpreted very carefully. The average day is very likely never to be experienced by anyone! Nevertheless, it can throw light on the way we live.

The fact that people feel pressed for time is a paradox. We enjoy longer and healthier lives than at any time in history, are spending less time in work and have homes full of time-saving domestic technology. Indeed, the survey data suggests that the spread of time-saving domestic technology might have enabled people to have more leisure in the early years of the twenty-first century (but we need to see if this is a real change or an artifact of the survey). Some people would like to work shorter hours – especially those in senior positions and women trying to combine careers and children – and their volubility may be behind the reported feelings of being ‘time-poor’. Yet if Glennie and Thrift are right and people have felt time-poor down the ages, then maybe there is a more fundamental issue here. Thrift (2002) suggests that it may be due to nostalgia for a past when, it is thought, life was simpler and slower. Or maybe it is connected to our human condition, to our mortality?

Time use is not fixed: it does change, and can do so quickly. It changed when TV was introduced and it is changing now due to the internet. Although the internet arrived in the 1990s, it was very different then. Access was slow and in Britain, charged per minute. Only with the arrival of broadband for domestic users in the UK in 2000 (Connected Earth, 2010), providing much greater speeds at a flat rate price, did the internet as known today truly start. By December 2008 95 percent of households in the UK with internet connections had broadband (ONS, 2009e). Broadband enables activities that were not previously possible: Di Gennaro & Dutton (2007) argued that it enabled users to “better integrate the technology into their everyday lives”. In my view, the impact of the internet on our social and domestic life has yet to be seen.

The arrival of the internet has reinvigorated talk about the blurring of work and ‘life’ by enabling the spread of telework. But teleworking is an elusive concept. Nevertheless, howsoever it is measured, it has probably increased in the UK over the past decade. But if narrowly defined as someone working mainly from home and relying on phone and computer, clearly teleworking remains a minority activity. The twentieth century visions of pervasive teleworking have not materialised.

It is easy to forget that even as the second decade of the twenty-first century starts, there are still many people who are not part of the ‘digital world’; in particular, there is a significant minority who have never used the internet. By 2010, while 60 percent were daily internet users, 18 percent had never used it (ONS, 2010b). So while the readers of this book are likely to live in a digital, connected world, something approaching Castell’s (2000) *Network Society* or even Toffler’s 1970 vision of the future, a small but significant proportion of our neighbours still live as our parents or even grandparents did.

Word count: 9,100

References

- Agar, J. (2003) *Constant Touch*. Cambridge: Icon.
- Anderson, B. & Tracey, K. (2002) 'Digital Living: The Impact (or Otherwise) of the Internet on Everyday British Life' in B Wellman and C. Haythornthwaite, *The Internet in Everyday Life*, pp. 139–63. Oxford: Blackwell.
- Anderson, B. & Raban, Y. (2007) The social impact of broadband internet. In Anderson, B., Brynin, M. Gershuny, J. & Raban, Y. eds, *Information and Communication Technologies in Society: E-living in a digital Europe*. London: Routledge, pp.46-61.
- BBC (2007) *Compact disc hits 25th birthday*
<http://news.bbc.co.uk/1/hi/6950845.stm?lsm> [Accessed 14 October 2010]
- Boneva, B.; Kraut, R. & Frohlich, D. (2001) Using E-mail for Personal Relationships: The Difference Gender Makes. *American Behavioral Scientist* 45, pp.530-549.
- Brand, M. (2001) *Historical Revision to Computer Produce Prices*. [Online] Available at: http://www.statistics.gov.uk/articles/nojournal/historical_rev_computer_ppi.pdf [Accessed 29 September 2010].
- Briscoe, B., Odlyzko, A. & Tilly, B. (2006) Metcalfe's Law is Wrong. *IEEE Spectrum* (July), pp.26-31
- Brynin, M. & Kraut, R., 2006. Social Studies of Domestic Information and Communication technologies in Kraut, R, Brynin, M. & Kiesler, S., eds, *Computer, Phones and the Internet*. Oxford: Oxford University Press, pp.3-18.
- Castells, M. (2000) *The Rise of the Network Society. Vol I: The Information Age, Economy, Society and Culture*. 2nd ed. USA: Blackwell.
- Connected Earth (2010) *History of the Internet: Timeline* [Online] Available at: <http://www.connected-earth.com/LearningCentre/Historyoftheinternet/Timeline/index.htm> [Accessed 3 November 2010].
- Deaton, A. & Muellbauer, J., 1985. *Economics and consumer behaviour*. Cambridge: Cambridge University Press.
- Douglas and Isherwood
(1979) *The World of Goods*. London: Routledge.
(1996) *The World of Goods*. London: Routledge.
- Di Gennaro, C. & Dutton, W., (2007). Reconfiguring friendships: social relationships and the internet. *Information, Communication & Society*. 10(5), pp.591-618.
- Dutton, W. Rogers, E M, Jun, S-H. (1987) Diffusion and Social Impacts of Personal Computers. *Communication Research* vol. 14 no. 2 pp219-250
- Dutton, W., Helsper, E. & Gerber, M. (2009) *The Internet in Britain 2009*. Oxford Internet Institute. Available at: http://www.oii.ox.ac.uk/research/oxis/OxIS2009_Report.pdf [Accessed 1 December

2010].

- ECaTT (2000) *Benchmarking progress on new ways of working and new forms of business across Europe*. Available at <http://www.ecatt.com/freport/ECaTT-Final-Report.pdf> [Accessed 22 October 2010]
- Eurofound (European Foundation for the Improvement of Living and Working Conditions) (2009) *Telework in the European Union*. Online <http://www.eurofound.europa.eu/docs/eiro/tn0910050s/tn0910050s.pdf> [Accessed 29 September 2010]
- Felstead, A., Nick Jewson, Sally Walters (2003) *The Changing Place of Work Working Paper No. 28* {Downloaded 14 November 2010} http://www.clms.le.ac.uk/projects/esrc/changing_place_of_work.pdf
- Feinstein, C.H. (1972) *National Income, Expenditure and Output of the United Kingdom: 1855-1965*. Cambridge: Cambridge University Press
- Fine, G. (1996) *Kitchens: The Culture of Restaurant Work*. Berkeley: University of California Press.
- Gallie, D. (2000) The Labour Force. In Halsey, A.H. & Webb, J. eds, *Twentieth Century British Social Trends*. London: Macmillan, pp.281-323.
- Gershuny, J. (2000) *Changing Times: Work and Leisure in Postindustrial Society*. Oxford: Oxford University Press.
- Gershuny, J. (2002) Mass Media, Leisure and Home IT: A Panel Time-Diary Approach. *IT and Society*. 1(1), Fall, pp.53-66. [Online] Available from: <http://www.ITandSociety.org>. [Accessed 24 September 2007].
- Gershuny, J. (2007) Conclusion: A slow start? In Anderson, B., Brynin, M. Gershuny, J. & Raban, Y. (eds) *Information and Communication Technologies in Society: E-living in a digital Europe*. Routledge. London pp 274-280
- Glennie, P. & Thrift, N. (2009) *Shaping the Day: A History of Timekeeping in England and Wales, 1300-1800*. Oxford. Oxford University Press.
- Gronau, R. (1977) Leisure, Home Production, and Work - Revised Theory of the Allocation of Time Revisited. *Journal of Political Economy*, 5(6), pp.1099-1123.
- Haddon, L. & Brynin M. (2005) The character of telework and the characteristics of teleworkers. *New Technology, Work and Employment* 20:1 pp34-46
- Hamill, L. (2003) Time as a Rare Commodity in Home Life. In Harper, R. (ed) *Inside the smart home* pp63-78.London. Springer.
- Hamill, L. (2010) *Communications, Travel and Social Networks since 1840: A Study Using Agent-based Models*. PhD thesis. Available from www.hamill.co.uk.
- Juster, F. T. & Stafford, F. P. (1991) The Allocation of Time: Empirical Findings, Behavioral Models and Problems of Measurement. *Journal of Economic Literature*. Vol XXXIX, pp 471-522
- Kaufman-Scarborough, C. (2006) Time Use and the Impact of Technology: Examining workspaces in the home *Time & Society* 15 pp57-80

- Kenyon, S. (2008) Internet Use and Time Use: The importance of multitasking. *Time & Society* 17: 283-318
- Keynes, J.M. (1931) Economic Possibilities for Our Grandchildren. In *Essays in Persuasion*. London: Macmillan, pp.358-373.
- Matthews, R.C.O., Feinstein, C.H. & Odling-Smee, J.C. (1982) *British economic growth, 1856-1973*. Oxford: Clarendon Press.
- Morris, E. (2009) *Independent Review of ICT User Skills*. Department for Business, Innovation & Skills. [Online] Available at:
<http://www.dius.gov.uk/~media/3F79A51589404CFDB62F3DA0DEBA69A1.ashx>
[Accessed 20 October 2010].
- Nansen, B., Arnold, M., Gibbs, M. & Davis, H. (2009) Domestic orchestration : Rhythms in the mediated home. *Time & Society*. 18. pp 181-207
- Nie, N. H., Hillygus, D. S. & Erbring, L. (2002) 'Internet Use, Interpersonal Relations, and Sociability', in B Wellman and C. Haythornthwaite (eds) *The Internet in Everyday Life*, pp. 139–63. Oxford: Blackwell
- Office for National Statistics (ONS)
- (1997) *Living in Britain: Preliminary Results from the 1996 General Household Survey*, London: TSO
- (1998) *Social Trends 28: 1998 edition*. London: TSO
- (1999) *Family Spending: A Report on the 1998-1999 Family Expenditure Survey*. London: TSO
- (2000) *Family Spending: A Report on the 1999-2000 Family Expenditure Survey*, London: TSO
- (2002) *Family Spending: A Report on the 2000-2001 Family Expenditure Survey* London: TSO
- (2003) *Family Spending: A Report on the 2001-2002 Expenditure and Food Survey* London: TSO
- (2004a) *Family Spending: A Report on the 2002-2003 Expenditure and Food Survey* London: TSO
- (2004b) *Family Spending: A Report on the 2003-2004 Expenditure and Food Survey* Basingstoke. Palgrave Macmillan.
- (2005) *Family Spending: A Report on the 2004-2005 Expenditure and Food Survey* Basingstoke. Palgrave Macmillan.
- (2006a) *Time Use Survey 2005* London. HMSO.
http://www.statistics.gov.uk/articles/nojournal/time_use_2005.pdf [Downloaded 25 November 2010]
- (2006b) *Social Trends 2006*. Basingstoke. Palgrave Macmillan.
http://www.statistics.gov.uk/downloads/theme_social/Social_Trends36/Social_Trends_36.pdf [Downloaded 11 November 2010]

- (2007) *Family Spending: A Report on the 2005-2006 Expenditure and Food Survey* Basingstoke. Palgrave Macmillan.
- (2008a) *Family Spending* Basingstoke. Palgrave Macmillan. (Reports on 2006)
- (2008b) *Family Spending A report on the 2007 Expenditure and Food Survey* Basingstoke. Palgrave Macmillan.
- (2009) *Internet connectivity*. December 2008. [Online] Available at: <http://www.statistics.gov.uk/pdfdir/intc0209.pdf> [Accessed 23 September 2010]
- (2010a) *Family Spending: A Report on the 2008 Living Costs and Food Survey* Basingstoke. Palgrave Macmillan.
- (2010b) *Internet Access 2010*. August 2010. [Online] Available at: <http://www.statistics.gov.uk/pdfdir/iahi0810.pdf> [Accessed 23 September 2010]
- (2010c) Time series database. <http://www.statistics.gov.uk/StatBase/>
- (2010d) *Labour Force Survey* [Accessed 14 November 2010] <http://www.statistics.gov.uk/StatBase/>
- (2010e) *Family Spending: A Report on the 2009 Living Costs and Food Survey* [Accessed 17 January 2011] http://www.statistics.gov.uk/downloads/theme_social/family-spending-2009/familyspending2010.pdf
- Office of Communications (Ofcom)
- (2009) *Report of the Digital Britain Media Literacy Working Group*. 27 March 2009. [Online] Available at: http://www.ofcom.org.uk/advice/media_literacy/media_lit_digital_britain/digitalbritain.pdf [Accessed 19 June 2009].
- (2010a) *The Communications Market 2010*. <http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr10/> Data: <http://stakeholders.ofcom.org.uk/binaries/research/cmr/753567/A1-UK-CON.csv> and <http://stakeholders.ofcom.org.uk/binaries/research/cmr/753567/B1-UK-TV.csv> [Accessed 22 September 2010]
- (2010b) *Facts and Figures*. <http://media.ofcom.org.uk/facts/> [Accessed 19 October 2010]
- Office for Population, Census and Surveys (OPCS) (1995) *Living in Britain: Results from the 1994 General Household Survey*, London. HMSO
- Parker, J. (2008) *Teleworking in the UK* <http://www.eurofound.europa.eu/eiro/2007/11/articles/uk0711039i.htm> [Accessed 29 September 2010]
- Partridge, C. (2005) *Social Change, Time Use and ICTs – A Literature Review*, Chimera Working Paper, 2005-05. Ipswich: University of Essex. [Online] Available at: <http://www.essex.ac.uk/chimera/content/Pubs/wps/CWP-2005-05-eSocTU-Lit-Review-FINAL.pdf>. [Accessed 1 December 2010]
- Pratt, J. (1984) http://www.joannepratt.com/pdf/teleworking_pioneers.PDF

- Randall, C. (2010) *e-Society. Social Trends 4*. ONS [Downloaded 11 November 2010]
http://www.statistics.gov.uk/articles/social_trends/e-society-2010.pdf
- Quan-Haase, A. Wellman, B. (2002) Capitalizing on the Net. In Wellman, B. & Haythornwaite, C., eds, *The Internet in Everyday Life*. Oxford: Blackwell, pp.291-324.
- Rogers, E.M., (2003) *Diffusion of Innovations*. 5th ed. New York: Free Press.
- Ruiz, Y. & Walling, A. (2005) Home-based working using communication technologies. Office for National Statistics: *Labour Market Trends*. October pp 417-426 Online
http://www.statistics.gov.uk/articles/labour_market_trends/teleworking_Oct05.pdf
[Accessed 29 September 2010]
- Southerton, D. (2006) Analysing the Temporal Organization of Daily Life: Social Constraints, Practices and their Allocation. *Sociology* 40(3) pp 435-454
- Stoneman, P. (2008) Exploring Time Use. *Information, Communication & Society*. 11(5), pp.617-639
- Tam, H. (2010) Characteristics of the underemployed and the overemployed in the UK. *Economic & Labour Market Review*, 4 (7) pp 8-20
- Tellis, G. J., Stremersch, S. & Yin, E. (2003) The International Takeoff of New Products: The Role of Economics, Culture, and Country Innovativeness. *Marketing Science*. 22(2), pp.188–208.
- The Telephone Company (1880) *London Exchange Stations*. April. [Online] Available at:
<http://www.ancestry.co.uk> [Accessed 9 July 2007]
- Thompson, E. P. (1967) Time, Work-Discipline and Industrial Capitalism. *Past & Present* 38. pp56-97
- Toffler, A. (1970) *Future Shock*. Bantam edition, published 1972.
- Thrift, N. (1996) *Spatial Formations*. London. Sage.
- Thrift, N. (2002) A Hyperactive World. In Johnston, R J Taylor, P J & Watts, M J (eds) *Geographies of Global Change*. Oxford. Blackwell. pp 29-42 [Available on Google Books.]
- Urry, J. (2000) *Sociology beyond Societies: Mobilities for the Twenty-first Century*. London: Routledge.
- Valente, T. (1995) *Network Models of the Diffusion of Innovations*. Cresskill (NJ): Hampton Press.
- Wacjman, J. (2008) Life in the fast lane? Towards a sociology of technology and time. *British Journal of Sociology*, Vol 59(1) pp59-77