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Social Change, Daily Life and the Internet

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The increasing pervasiveness of Information and Communication Technologies (ICTs) has fuelled a major academic controversy about their social consequences. Despite ICTs encompass various technologies which are now widely available, the debate has been crystallizing on the narrower question of the consequences of the Internet on social capital. In this paper I review the theoretical and empirical background of this debate and outline a set of methodological innovations that need to occur before it can be empirically resolved.

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1 The controversy about the consequences of ICTs on daily life

The increasing pervasiveness of Information and Communication Technologies (ICTs) has fuelled a major academic controversy about their social consequences. Despite ICTs encompass various technologies which are now widely available, the debate has been crystallizing on the narrower question of the consequences of the Internet on social capital. For some theorists, the advent of cheap access to the Internet has made the dream of the rise of a network society come true (Castells, 1996). The arrival of this "information age" is supposed to disrupt the previous forms of inequalities and of social organization but also to remodel identities.

This e-revolution is the premises of the controversy between utopians, who consider that this revolution has positive effects on daily life, and dystopians, who claim the opposite (Wellman et al. 2001): according to the formers the Internet is a new and better way of communication whereas to the latter it is more a passive leisure stealing time to families and communities. Putnam (1996, 2000), following the Tocqueville tradition, has been arguing that the decline in association participation and in local community life that can be observed in the USA is also a collapse in social capital. If Putnam considers that the "social capital" downward trend is to a large extent the result of the emergence of two-career families he nonetheless puts the blame on television (and on the Internet): there would be a time displacement from community participation to television (and the Internet).

The controversy between utopians and dystopians has relied extensively on considerations about the potential use of the Internet. With e-mail, the Internet provides indeed new ways of communication. First, electronic mail (and mailing lists) is postal mail in much faster but retains its primary quality of being asynchronous, i.e. of not requiring the simultaneous availability of the correspondents. Instant messaging on the World Wide Web (or Web) is also a new synchronous way of communication. The Voice over Internet Protocol (VoIP) converts the voice signal from telephone into a digital signal that travels over the internet and is then converted back at the other end into standard telephone signal. Videophones, telephones with video capabilities long awaited for, are also finally appearing thanks to the steadily increasing Internet bandwidth. Other applications on the Internet are file transfers, on-line gaming², and the Web. These other use have been considered by some scholars as a potential threat to social contact, in particular because using the Internet is considered as worse than television: browsing the web is supposedly as passive as watching TV but is less a group activity (Nie, 2001).

Fortunately, the controversy became quite rapidly less ideological and solely based on the social potential attributed to the Internet and moved on to the empirical ground. One of the first empirical studies addressing this issue found that despite its communication potential, Internet use decreased social involvement and had positive effects on loneliness and depression (Kraut et al. 1998). The authors offered a computer and a free Internet access to an opportunity sample of households of the Pittsburgh area in exchange for their participation to the survey (which included the computer recording of Internet use): although a control group was not included, the design was quite experimental. Nie and Erbring (2002 [2000]) used a quite similar design: they offered a WebTV with an unlimited Internet access as a compensation for participating to the survey, potential participants being randomly selected. Only households with previous Internet connection were interviewed. The analysis of respondents' self-estimates of the effects of the Internet on their daily life shows that social isolation increases with more Internet use. These two studies support the displacement theory which contends that the more time spent on the Internet, the less time is available for interacting directly with family, friends, and community.

With data from the main Swiss Internet provider but with respondents' self-estimate of time used on the Web, Franzen (2000) found that e-mail increases social involvement and regression analysis shows that Internet users have 24% more friends. However, more time on the Internet means less friends, though not less time spent with friends. Also using observational data, this time not from an Internet Provider but from a survey of the visitors of the National Geographic Society Web site, Wellman et al. (2001) analysed the consequences of the frequency of Internet use (self-estimate questions) on three dimensions of social capital: network capital, participatory capital, and community commitment. Their main findings are that Internet use supplements network capital, increases participatory capital and is unrelated to community commitment.

² On-line gaming can be considered as a form of communication though, since it is often possible to exchange text messages or even dialog with other players.

These results have been criticized, in particular on their methodological grounds. First, Kestnbaum et al. (2002) questioned “the representativeness of a sample that was given the technology before they decided to adopt it solely on their own.” (p. 26). In addition, they emphasized that self-estimate of time spent on the Internet or visiting friends has been proven unreliable. Time-budgets self-estimates (also known as ‘stylised estimates’) transfer all the burden of calculations to respondents who have to understand and adapt to the system of activities proposed by the survey and then to provide quality estimates of the time they spent on them (Kestnbaum et al. 2002, Gershuny 2003). Time-use surveys rely on an original device, the diary, which contains the description of a particular day—as opposed to the vague reference to ‘usual’ or ‘typical’ days in the self-estimate studies—with the words of the respondents: instead of giving an estimate of how much time they spent eating, respondents are asked to link the different events of their days by focusing on their sequence rather than on their overall durations. This information is subsequently coded into a system of activities and possibly transformed into time-budgets.

In response to the criticisms underlying the methodological flaws associated with using time self-estimates, Nie and Hillygus (2002) proposed the analysis of a new survey incorporating a diary-like device. It is worth mentioning here the features of the sample provided by Knowledge Network. In compensation for the participation to surveys, this commercial firm has offered a WebTV along with a free Internet connection to a USA representative national sample. Every adult of the selected households is asked to respond via WebTV to weekly, short (15 minutes) surveys. In order to lighten the burden of households, Nie and Hillygus decided to restrict the diary to a few hours instead of the whole day: respondents were asked to describe six hours randomly selected among six groups of hours with the help of pre-coded activities. Day estimates are then extrapolated assuming a normal distribution. It was possible to declare browsing the web or e-mailing whichever was the main activity first chosen: for instance, it was possible to select housework but to end up declaring Internet/e-mail, as the program asked respondents to refine this first response and proposed systematically Internet/e-mail. Respondents could even declare social time as a primary activity and refine it as Internet/e-mail time: potential social Internet time could be coded as anomic web nerd time.

It goes without saying that the very structure of this survey destroys the main advantage of the diary approach: “The diary keeper’s task is to recall all of only one day’s activities in sequence. This may be similar to the way the day was structured chronologically for the respondent and to the way most people store their activities in memory. Rather than having to consider a long time period, the respondent need only to focus attention on a single day (yesterday). Rather than working from some list of activities whose meanings vary from respondent to respondent, the diary keepers simply describe their day’s activities in their own words.” (Kestnbaum et al., p. 30). It is hard to tell what is worse between being asked to give directly time use self-estimates and having to give a detailed description of six particular and completely disconnected hours. Moreover, contrary to their first use of the Knowledge Network sample, experienced Internet users are mixed with newbies so that the survey is neither observational nor experimental. Using this rather special survey and regression analysis, the authors demonstrate that social isolation increases with time spent on the Internet.

Using a three-wave longitudinal survey carried out between 1999 and 2001 in the UK with true week diary, Anderson and Tracey (2001) show that gaining or losing Internet access at home is not significantly related to changes in time use. On the contrary, qualitative interviews show that changes in time use are triggered by significant events related to education or work and not by getting or dropping an internet connection. They conclude that interpreting time use change using panel data without taking into account other life transitions can be misleading and suggest that instead of focusing on the “impact” of the Internet, analysts should turn their efforts towards a better understanding of the different use of the applications or services provided by the Internet.

With the same data but with more sophisticated tools (regression analysis), Gershuny (2003) reaches the same conclusions: the time-displacement theory is rejected and web use appears to be even slightly positively correlated with sociability. This finding supports Gershuny’s more general theoretical model of the relation between technological innovation and daily life (see Gershuny 2000 for a more detailed presentation): technology alters the relative efficiency of the various chains of provisions in competition to satisfy social wants. The slight positive correlation between web use and sociability suggests that browsing the web is partly integrated into existing chains of activity in order to improve them in such a way that some time is freed up for other activities, some of them related to sociability.

Time use of Internet users and non-users in the USA (1998-2001 nationally representative time use survey), controlled for education attainment and demographic characteristics appear to be very similar (Kestnbaum et al. 2002): the displacement hypothesis is rejected, as well as the theory of the Internet as a “time enhancer”.

The contradictory results of these pioneer studies suggest that the consequences of the Internet on social capital depend a lot on methodology. First, there is the issue of survey design which can be either pseudo-experimental or observational. Second, surveys can be either panel or cross-sectional. Third, the way Internet use is measured varies a lot: time use self-estimates, diaries, frequency estimates, and recordings of Internet activity. This great diversity of methodologies reflects also different and potentially conflicting academic traditions. Psychologists swear only by “true experiments” (Shklovski et al. 2004), time-use analysts condemn any other method than time-use diaries and others think they just have to ask directly if the Internet has consequences on social capital. But, as we announced at the beginning of this short review of the literature regarding this question, they all agree on the importance of evaluating the consequences of the Internet on social capital or daily life: why is it so crucial?

2 The social construction of the “consequences of the Internet” debate

The justifications of carrying on a research about the social impacts on the Internet appear clearly in the very first papers addressing this question. Katz and Aspden (1997) start by mentioning New York tabloids and stories in the news media about Internet friendships and dating. Robert Kraut et al. (1998) cite a Rand report, some essays and the Katz and Aspden paper. Nie and Erbring never published their first research demonstrating the devastating effects of the Internet on sociability: they published a press release in 2000, cluttered with 3-D bar and pie charts, but with no real research question and a total lack of references to previous scientific work. It was only two years later than excerpts were published in *IT & Society*.

The article Franzen published in the *European Sociological Review* (2000), quite ignored in this very North American debate, is an exception: after claiming that “social scientists are, of course, concerned with social consequences of new technologies” he tries to link this question to the literature on social networks and social capital, in particular to Robert Putnam’s work. This is also what Wellman et al. (2001) do. In the broader review DiMaggio et al. (2001) dedicated to the “Internet’s implications for social change”, they mention the debate on the consequences on social capital and start their review by... Kraut et al. 1998 and Nie and Erbring 2000.

Consequently, by 2001, the question of the consequences of the Internet on social life had won acclaim: a quite vigorous scientific debate rapidly appeared with, in particular, interesting exchanges on methodology. Nonetheless, the fact remains that the original research question was driven more by media-like interests than by a true scientific questioning. When Nie and Erbring (2000) claim that “over the last five years, the revolution in information technology (IT) has resulted in innovations that are having increasingly visible effects on the life of the average American”, they are using as a fact precisely what is to be demonstrated.

Yet, questioning questions is the very basis of science (Bourdieu et al., 1983): it is necessary to put into question the obvious to avoid the pitfalls of preconceptions and good sense. Here, the original question came almost directly from American tabloids and was in a few years transformed into a major social science question by the sole virtue of citation. Once a couple of academic articles had given some credibility to this question, the only justification to present was to refer to these studies and to the “burgeoning literature” on the subject. Once started, this strand of research became self-sustained, authors referring to one another despite the quite ascientific original questioning.

The “consequences of the Internet on sociability” issue contains indeed a certain number of presuppositions that we propose now to uncover. First, this question entails clearly a causal standpoint on the Internet and sociability and an associated oversimple anthropological model. Second, this research question relies on a quite strange assumption of homogeneity of the time spent on the Internet. Eventually, there is often an implicit agreement on what is good for individual well-being: *Bowling alone* (Putnam, 2000) played certainly a prominent part in reducing social capital to participation to local community life.

2.1 A mechanistic anthropology

Two main forms of causation can be found in statistics (Goldthorpe, 2001): causation as consequential manipulation and causation as robust dependence. The first type of causation is directly connected to experiments : the main idea is to manipulate the causes to measure their effects on the outcome of interest. The only way to be certain that results observed can be attributed to the postulated causes is to design an experiment where the subjects are randomly assigned to either a treatment or a control group : this is the only way to suppress spurious correlation between the outcome and unmeasured or unknown factors. Classical examples are Fisher’s agricultural experiments or drug effectiveness testing. Robust dependence causation is the observational equivalent of experiments: instead of manipulating causes to measure their effects on an outcome, observed correlation between causes and effects is controlled for a series of variables which are thought to be correlated with them. Spurious correlation is not removed by random

assignment but controlled for. Control variables are hence a major issue: if a critical variable creates the observed correlation between causes and effects but is not or cannot be taken into account, then the correlation brought to light is in fact spurious. Whether sources of spurious correlations are removed or controlled for, the concept of causation is the same: these two approaches just differ relatively to the degree of purity of the implementation of this concept.

In social and human sciences, besides experimental psychology, the use of experiments is less straightforward: if we were interested in establishing the effects of unemployment on marital disruption, we would have to assign couples randomly to unemployment and to compare marital disruption levels observed in the two groups. Apart from ethical considerations related to manipulating the lives of couples, what would we learn about life outside experimental situations? The problem of the use of experiments to answer social questions is that in real life, assignment to different groups is not random. Factory workers' chances to get out of employment are quite different from that of executives. Robust dependence analysis can answer this kind of question and no doubt that this dimension would be part of the controls. However, it is well known that colinearity between "independent" variables is not a problem but the mark of social structure (see Simiand, 1922 for instance, or Abbott, 1998): as random assignment, controls suppress "spurious correlations" but also the whole social structure which is the fabric of daily life.

The main social assumption behind this conception of causation is that human beings are all interchangeable, that their differences are superficial and are hiding a universal human essence. This assumption is in complete contradiction to evidence accumulated by ethnographic and socio historic studies. Elias demonstrated how behaviour which used to be marked by moodiness became more self-controlled with social change in Europe: self-control depends on societies' historical trajectories and within societies, on social position (Elias, 2000 [1939]). This conception of causation is very similar to that of magic found in undifferentiated societies: behind both of them is the contention that there is an active force (here an eternal human nature) which is having concrete effects (Durkheim 1965 [1912], p. 519). When pharmaceutical firms design experiments to see the effects of drugs, they have good reasons to think that from a purely physiological point of view, one person is every bit as good as another. But when it comes to analyze the rest of the human realm, this is not true anymore unless a universal social human nature is assumed, a quite nonscientific hypothesis similar to faith in the existence of magic. For it is not only relative chances of employment and unemployment which depend on the position and past trajectory in the social space but every aspect of life and even tastes and disgusts (Bourdieu, 1979): social positions are highly correlated with dispositions. Consequently, in all likelihood, utility and desire of having the Internet is correlated with social position, as reflected in the digital divide observed.

These two versions of causation can be found in the literature on the social consequences of ICTs. They both rely on an oversimple anthropological model in which passive and ahistorical agents evolving in a social vacuum are suddenly confronted to the Internet, reduced here as a consumption product with no prior existence. The second survey designed by Nie and Hillygus (2002) is not purely experimental but contains a strong experimental dimension: the panel they are using received a WebTV and a free Internet connection. It means that households that had not considered buying an Internet equipment and subscribing to the Internet got it for free, just because they were assigned to the Internet group. Note that the form the Internet entered their homes, through TV, is likely to be not neutral on the way it is used. Kraut et al. (1998, 2002) used a similar design but distributed computers. The second survey though, is quite different since only Internet free access was offered as a reward to new PC buyers who accepted to participate to the survey. In any case, unless they want to administer an "Internet treatment" to the whole US population by distributing free computer and Internet subscription, this experience does not tell anything about the Internet and social capital. It just tells us how families who had not intended to use the Internet reacted when confronted to a new technology in their home. The literature on the digital divide (see DiMaggio et al. 2002 for instance) emphasized the huge social inequalities in this matter: early Internet adopters are socially very different from those who are not connected. Paraphrasing Halbwachs (1972 [1923]), it is just as absurd as if we were trying to see how reindeers and camels react if they were respectively transferred in Sahara and in the North Pole. However, Kraut et al.'s follow up of their first survey teaches us that the negative effects of the Internet they found were an artifact due to the discovery of the Internet and that once this effect had disappeared, the Internet had not any more significant impact on social life.

Studies based on observations relied extensively on regression. Regression is widely implemented and routinely used, most of the time in a descriptive way rather than in a true modelling perspective: the problem is that, as a descriptive tool, regression is quite poor (Abbott, 1998). The purpose of regression analysis is indeed to throw light on an average relationship between a "dependent" variable and a set of "independent" variables: social structure is taken into account but kept hidden and action is reduced to a set of variables which are taken as independent though they are not even if their correlations have been neutralized.

Consequently, even if regression-based analyses of the social consequences of the Internet are based on observations, the experimental bias of the tool used is hiding most of the information and reduce the Internet to a homogeneous quantity.

2.2 Is Internet time really homogeneous?

Even if almost every author starts by acknowledging the variety of Internet use, in particular e-mail, when analysis begins, time spent on the Internet is rapidly reduced to a homogeneous quantity. Internet users are opposed to non-users, at best the number of hours spent on the Internet is taken into account. To palliate the lack of knowledge of the way the Internet is used within families, the implicit rule is to throw light on the positive or negative potential of the Internet. In the literature cited, the authors generally agree that e-mail, as a new way of communication, is socially good and the rest of the Internet, i.e. the Web, is bad. The Web would be even worse than TV: both are considered as passive leisure but TV can be at least a group activity (Nie, 2001). Consequently, Web-browsing is worse than TV-watching.

The Internet would be a one-dimensional, addictive, and anomic activity: a drug, in sum. This analogy is even used by Nie (2001): "many of us are familiar with that unique Internet characteristic of surfing that leads Internet junkies to sit down to do a single task and end up, hours later, with a loss of a sense of time, place, and original purpose" (p. 431). When combined with a narrow time-budget standpoint on daily life, this negative and homogeneous conception of the Internet is leading quite naturally to the proposition that the more time spent on the Internet, the less time for other daily activities. By definition, this statement is a tautology: it is only true because the Internet time is considered as a one-dimensional, addictive, and anomic activity completely separated from the rest of life. This assumption is not resting on scientific evidence (Kraut et al., forthcoming). In fact, the truth is that little is known on how the Internet is used.

One reason for this is technical: it is very difficult to obtain and analyse Internet use data. It requires a software recording Internet activity and a series of operation to transform raw data into a usable database (Beauvisage and Assadi, 2005). Indeed, since Internet logs contain only lists of URLs, it is then necessary to identify the main use of the Internet (Web, e-mail, chat, etc.) and identify sites. The next step is to enrich this list of sites with information on the type of site: categories must be defined and then sites must be classified according to this nomenclature. This is why the current practice is to restrict the analysis to Web server logs (server centric analyses). Consequently, to date, little is known about how the Internet is actually used: nothing is known about which web sites are visited, for how long, by whom in the households, if a part of Internet time is a collective activity, etc.

As a matter of fact, the few elements known about how the Internet is used in the household refute the homogeneity hypothesis (Frohlich and Kraut, 2003). The Internet entered the home through computers, remind the authors, and this has many consequences on the way it is or can be used. As families once had to make room for TV, they now have to find a suitable location for the computer. This is a particular crucial issue since the room where the computer is determining to a large extent who is going to be the most legitimate user. If the computer is located in the living room, all family members can access it easily but there is a lack of privacy which is sometime deliberately used by parents to monitor their children's use of the Internet³. On the contrary, when the computer is in a more private room, a bedroom for instance, it is at the same time privatized: its main user has more privacy and other users have to adapt the timing of their Internet activities. Another solution is to put the computer in a study so that it is less privatized and it is still possible to have some privacy.

Most of the Internet time occurs on the evening or during⁴ weekends and since there is often only one computer and consequently a single access to the Internet, Internet is a scarce resource which must be shared between family members. The way it is shared depends on where the computer is but also on family members' respective schedules: work schedules for adults and schools ones for children. When these schedules are synchronized, family members have to elaborate complex routines to take turns. When on the Internet, family members try to make the most of this time. One of the most common strategies is multi-tasking: "Because time on the PC was generally a scarce resource in the households we visited, individuals had evolved a variety of time-saving practices within and across sessions. Within sessions, they would sometimes multi-task to make use of one program in the time taken for another to operate. A typical example was listening to an audio CD while backing up data, or checking email while software downloaded. TV watching was also reportedly done in parallel with PC use. Teenagers seemed to have the greatest

³ For a more detailed analysis of the issue of children's privacy online see Livingstone 2005, and Livingstone and Bober, 2004.

⁴ This is due to a large extent to work schedules. Another reason is telecommunication pricing schemes which can favour off-peak dial-up Internet use. Week end Internet use is substantially different from week days : for more details see Frohlich and Kraut (2003).

propensity to do this, even in tasks that apparently don't need much attention like playing games or doing homework!" (Frohlich and Kraut, 2003, p. 16). We could also test this using the time-use data – what did people do whilst using the net?

Contrary to the *petitio principii* found in some articles about the social consequences of the Internet, Web browsing can be and is a group activity, because it is a scarce resource but also because computers and the Internet are more complex to use than TV: family members help each other to domesticate these technologies, exchange Websites, tips to find more efficiently information, etc. Sometimes, children even become more competent than their parents in terms of computer and Internet skills: this dependency reversal remodels family interactions, notably between fathers and their children (Livingstone and Bober, 2004).

Consequently, the time spent on the Internet is not completely disconnected from daily life but on the contrary highly integrated. Multi-tasking is a common practice: checking e-mail while browsing the Web is usual. Moreover, it is mainly e-mail which is addictive (Frohlich and Kraut, 2003). Therefore, Nie's Web nerds account certainly for a small part of Internet users and as Gershuny suggests (2003), Web nerds were computer or other nerds before browsing the Web: they were not turned into nerds by the Internet.

2.3 Local communities and social change

The last presupposition relates to the social consequences of the Internet. Various measures of sociability have been used (see Table 1) but overall, two kinds of sociability have been investigated: sociability with friends and community participation. Sociability with significant others have been analysed using the number of friends and the time spent with them, more rarely using the time spent with family members and in this case only through self-estimate questions. Community participation is often measured by church attendance or participation to organizations. The assumption is the more time with relatives, friends, and community members, the better.

Most articles preoccupied by the social consequences of the Internet refer to the decline in American civic involvement described by Robert Putnam (1996, 2000). Putnam reviewed different dimensions of civic involvement: political participation, civic participation, religious participation, connections in the workplace, informal social connections, volunteering, and reciprocity. Each time, he evidences a downward trend. However, as Wellman et al. (2001) remark "What if Putnam is only measuring old forms of community and participation while new forms of communication and organization underneath his radar are connecting people?". Putnam is of course aware of the nostalgia peril and this why he used a series of indicators of various aspect of civic involvement. Yet, the indicators he is using are far from being perfect: only extra-family sociability is taken into account.

Article	Measure of sociability
Kraut et al. 1998	Psychological measures of loneliness, stress, depression. Indicators of interaction with family, friends, etc.
Kraut et al. 2002	Ditto + other similar measures to take into account some criticisms
Franzen 2000	Number of friends, self-estimate of time spent with them the previous week. Self-estimates of time spent with family, reading books, doing sport.
Nie and Erbring 2002 [2000]	Self-estimates of time with friends, watching TV, attending events, etc. Questions asked directly, e.g.: "Has using the Internet changed the amount of time you spend..."
Nie and Hillygus 2002	Two definitions of sociability: - "active engagement" with family and with friends measured through the "with whom" variable - "socializing activities", basically primary activities with a sociability potential (visiting, parties, etc.)
Gershuny 2003	Daily time budgets estimates from diaries and in particular going out and visiting friends
Kestnbaum, Robinson, Neustadts and Alvarez (2002)	Daily time budgets estimates from diaries: - Non free time activities: work/education, family care, personal care and travel - Free time activities: religion, organizations, social events, social/visits,

conversation telephone, mass media, other and computer	
Wellman, Quan Haase, Witte and Hampton, 2001	Three dimensions of social capital: network capital, participatory capital, and community commitment measured by scales measuring organizational participation, political participation and community commitment.

Table 1 – Measures of sociability

Wellman (2001) believes that sociability has been privatized: “Community interactions have moved inside the private home—where most entertaining, phone-calling and emailing take place—and away from chatting with patrons in public spaces such as bars, street corners and coffee shops. Even when people do go out with others—to restaurants or movie theatres—they usually leave their neighbourhoods”. If this is true then Putnam’s diagnostic could be wrong: indeed, the series of indicators he has been using are almost all related to a type of sociability quite close to Durkheim’s ideal type of mechanical societal solidarity. No indicator of family time for instance is used: measuring time together within families is not easy and few studies, mainly focusing on parental time, have been addressing this issue. Using a quite restricted definition of parental time, Sayer et al. (2004) demonstrated that despite unfavourable structural changes parental time increased between 1965 and 1998. Consequently, Putnam’s account of the collapse of social capital in the US would miss its transformation and time use results tends to confirm Wellman’s proposition, quite close in this respect to Parsons’ theory of the consequences of social change for family.

In any event, Putnam notices that “the timing of the Internet explosion means that it cannot possibly be causally linked to the crumbling of social connectedness described” (2000, p. 170): societies are changing and attributing these changes to the sole ICTs revolution would be quite presumptuous. According to Putnam, the decline in community sociability can be partly explained by the rise of female labour force participation (p. 200): this effect is more pronounced when full-time employment is chosen by women. Consequently, the Internet has not arrived in a stable environment but amidst long term social changes which are to be taken into account in order to understand how ICTs are integrated into daily life.

The transformation of sociability also draws attention on a quite unnoticed characteristic of a part of the literature on the consequences of the Internet on social capital: local community sociability is considered as good for individual well-being. This strong normative assumption is indissociable from the hidden hypothesis of the existence of a universal and eternal human social nature. This normative assumption is challenged by accumulated evidence on the transformation of solidarity (Durkheim, 1998 [1893], Elias, 2000 [1939]).

Consequently, the social theory behind the questioning about the social consequences of the Internet is oversimple. It presumes that the Internet is a homogeneous and anomic activity, appeared in a social vacuum and that it is damaging, quite magically, local sociability, supposedly indispensable to individuals’ well being. Such a theoretical background cannot explain satisfactorily how ICTs are being integrated in everyday life. Despite this quite biased starting point this is exactly the conclusion reached by most participants to the vigorous academic debate on this question: Anderson and Tracey (2001) advocate dropping the “impact” perspective to focus on the nuances Internet use; Gershuny (2003) urges analysis to take into account the integration of the Internet into what he calls the “chains of provision” of human wants; and as DiMaggio et al. (2001) suggest, “the social impact of the Internet depends on the impact of society on what the Internet becomes”: the Internet is actively integrated into daily life and its use are invented, combined with existing activities. This is this daily integration of the Internet that we are witnessing... and missing.

3 A sociological account of the integration of the Internet into daily life

In order to understand how the Internet is used in daily life, a theoretical and historical perspective is required. The Internet has not appeared in a social void but in a highly structured social world whose current characteristics can be traced historically.

3.1 Social change, solidarity, and daily life

The way members of a society interact is not governed by natural or other eternal rules linked to a presupposed human social nature but are highly correlated with social organization. The birth of sociology precisely corresponds to the acknowledgement of this interdependence (Nisbet, 1966). The two different ideal types of solidarity proposed by Durkheim (1998 [1893]), mechanical solidarity and organic solidarity, are still topical. Mechanical solidarity can be seen as bonding social capital i.e. it is inward looking and reinforces exclusive identity: this type of solidarity is linked to group sociability and is characteristic of undifferentiated societies. Organic solidarity is linked to participation to socially organised activities as for instance working in a firm: solidarity does not emerge from a certain conformity and adherence to the group

but on the contrary to specialisation and division of labour. The main thesis of *De la division du travail social* is that with the constitution of states, societies are less and less dominated by mechanical solidarity: with the advent of national states and the consubstantial maturation of capitalism, societies are more and more integrated, leading to a different social organization and hence, to different interpersonal relations (Durkheim, 1998 [1893], Elias, 2000 [1939]).

However, the opposition of mechanical and organic types of solidarity is oversimple (Tilly, 1988) and applies above all to the dramatic economic changes occurring at the end of the 19th century. Therefore, this change of solidarity describes mainly the transformation of work, the transition from home-based work to industrial organization of labour: workers have to leave their local communities to become simple links in the chain. However, the process of monopolization of physical, fiscal and symbolic power has not only led to the emergence of an autonomous economic field but more generally to differentiated and partially autonomous social fields, among which the economic field (Bourdieu, 1994). Each social field is organised and has rules, which have been progressively constituted and which still evolve to a certain extent. In differentiated societies, solidarity has a multiplicity of sources, arising from the participation to these social fields. Instead of being linked to geographically localized groups, community is now made of multiple strands, also known as networks: networks are personal communities (Wellman et al., 1988). But, as each social field is governed by distinct principles elaborated over time, it also means that these types of solidarity can vary with these principles: family solidarity is likely to be very different from the solidarity within the economic field.

Family can be conceptualized as a social field which solidarity changed markedly (Bourdieu, 1993). Dominated by a high degree of division of labor in undifferentiated societies, family solidarity is progressively relying more and more on mechanical principles (Durkheim, 1921, Adams and Steinmetz, 1993). Mechanical solidarity means temporal symmetry in daily life (Durkheim, 1965 [1912], Zerubavel, 1985): everybody does the same thing at the same time. Consequently, mechanical solidarity is time together and requires synchronicity. Time together is the new source of family solidarity (Berger and Kellner, 1964): through discussion, partners share common principles of vision and division of the world. Yet, the division of labor has not totally vanished, as the gendered division of domestic chores evidence. However, the historic trend in every economically developed country is towards more equity (Gershuny, 2000, Gershuny and Robinson, 1988).

Durkheim was right: work is the main mode of social solidarity because the economic field is the main social field. Economic solidarity depends on the way the economic field is organized namely on the division of labor and specialization. This is why Durkheim chose to name it organic: economic solidarity is based on the position occupied in the expanding production process and does not stem any more from ascribed positions in local communities. The organic solidarity in the economic field is linked to temporal asymmetry (Moore, 1963): different specialized activities mean that workers do not do the same thing at the same time. Hence the main difficulty is to synchronize these different activities: "time [...] is a major factor in economic efficiency, and timing is a major factor in competitive success" (Moore, 1963, p. 137).

Consequently, not only does solidarity differ from one social field to the other but also correspond to different kind of rhythms. Time, in differentiated societies, is plural, and is potentially conflicting. As a matter of fact, two of the main social fields rest on potentially opposite rhythms. When only one spouse was participating to the labor market, this tension used to be buffered by the spouse specialized in unpaid work: within dual-earner couples, this tension should be, in theory, exacerbated. The rise of dual-earner couples observed in most economically advanced societies (in France dual-earner couples represented 70% of active couples in 2002) means that temporal tension is reaching unprecedented heights. The desynchronization of the work schedules of these couples can be used as an indicator of the new temporal tensions these couples are facing daily. In France, 9 to 5 work days have been losing ground to shifted schedules in the morning and the afternoon/evening, leading to increased desynchronization for dual-earner couples (Lesnard, 2004): in accordance with theory, temporal tension is increasing.

But non standard work schedules, and desynchronization, are not randomly distributed in the economic field: the lower the social position, the higher the chances of having non standard work schedules and thus of having desynchronized work schedules for dual-earner couples. Contrary to Presser's earlier contention (Presser 1986, see also Presser 2003 for a new perspective on this question), desynchronization is not chosen by parents in order to share parental work but is the consequence for dual-earner couples located low down the social space of atypical work schedules imposed by firms individually on workers. When both spouses have some freedom to determine they work schedules, often because they are located at the top of the social space, they overwhelmingly choose to be synchronized (Lesnard, 2004). However, if these couples are more synchronized, they also work longer: the money rich are time poor and the money poor are time rich (Gershuny, 2000). Desynchronization is endured and seldom chosen.

This non-standard work schedule growth has been evidenced in France and in the USA (Hamermesh, 2002) and there is little doubt that this trend is shared by many economically developed societies. This growth suggests that specialisation and division of labour in these economic fields are greater than ever: the main social field is consequently requiring more and more desynchronization. The rise of dual-earner couples also implies that the division of labour is decreasing and subsequently that the main source of conjugal solidarity is increasingly stemming from time together or in other words requires more synchronicity. Taken together, these two social changes suggest an increased temporal tension and a growing need for synchronicity within families. This general need for time together and synchronicity is differentiated according to social position. The money rich are quite synchronized but lack time whereas the money poor have more time but are more often desynchronized.

Literature on family time has been focusing almost exclusively on parental time in the USA (Lesnard, 2005). Sayer et al. (2004) have proven conclusively that parental time increased in the USA between 1965 and 1998. The trend is also upward in France since the 1980s and in general, all family time, including conjugal time, increased in France. Sociability within the family is replacing neighbourhood and local group as the main source of mechanical solidarity, or bonding social capital in more modern terms. It is not because bowling leagues are disappearing that Americans are suddenly bowling alone: they bowl, and more generally entertain, in family. In France, the three main familial activities (parents and children) are eating, watching TV and leisure: most of the daily routine is spent with family members, not alone.

Therefore, empirical evidence supports the hypothesis that economic and family rhythms have intensified, or, in other words, that these two opposite principles of solidarity have been diverging even more. As a result, it is not surprising to see a decline in other forms of mechanical solidarity as Putnam has showed for the USA.

3.2 Technology and daily life

The literature on the social consequences of the ICTs overwhelmingly considered only this question from a demand side viewpoint, as if the computer and the Internet were just consumption products. However, the advent of the computer in the workplace came many years before it entered the home (Burris, 1998, Venkatesh, 1996). Consequently, before becoming available on the household market in the form of new products, services, and entertainment, ICTs have entered the workplace, leading to the "second industrial divide" (Piore and Sabel, 1984). Consequently, before entering the home, computers and communication technologies have been playing a considerable part in the transformations of the economic field (see Figure 1).

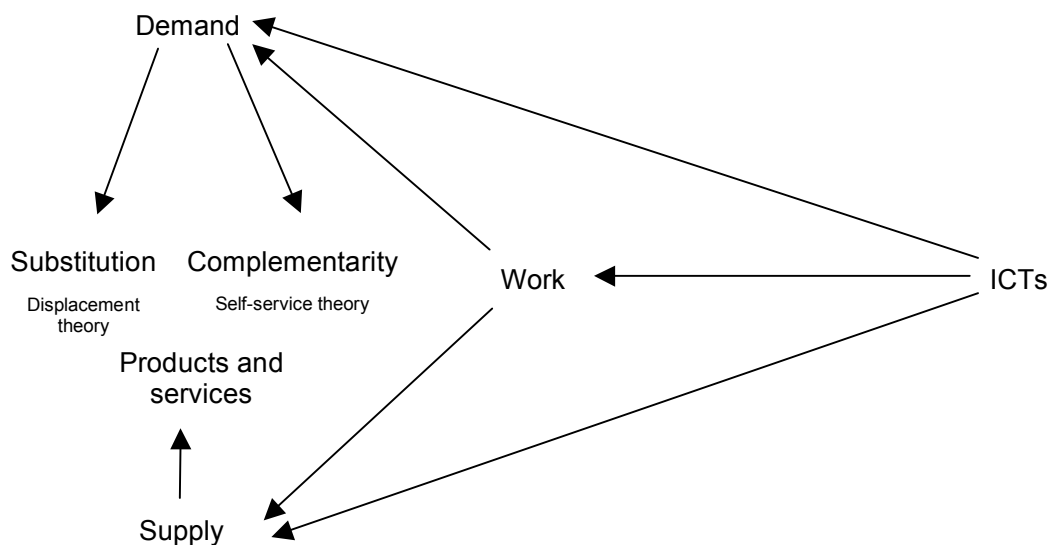


Figure 1 - ICTs and daily life: a synoptic view

3.2.1 ICTs and the economic field

We do not intend to review how ICTs have been used in and their development stimulated by the economic field but just to sketch out an overall picture. Computers have been playing an increasing part in the organization of the workplace (Burris, 1998). The effects of computerization on workers depend on their

position in the economic field, i.e. on their position within firms and of the position of firms in the different sub-economic field (branches), which is linked to their characteristics (Bourdieu, 1997, Salzman and Rosenthal, 1994). Overall, the design and implementation of computerized technology tend to reinforce the centralization of control and lead to an increasing “bifurcated workforce” between those who control and plan and those who are controlled and whose work is planned (Burris, 1998).

For unskilled labour force, computerization is often synonymous of a greater scientific management of their work: beside numerical control of machining and the quite general upward trend in skills, new organizational paradigms such as “just in time production” strive for a better synchronization of the flow of production. If the just in time production system can be seen in manufacturing industries as a radicalization of the scientific organization of work conceptualized by Taylor, it is not restricted to this sub-economic field but is also applied to the service industry as well as to commerce. For instance, superstores cashiers’ productivity can be monitored and analyzed statistically in order to improve productivity: in France, cashiers work schedules match perfectly the two main peak shopping periods, located at lunch time and at the end of the 9 to 5 standard workday (Prunier-Poulmaire, 2000). As a result, cashiers’ working hours, disproportionately part-time jobs, are often staggered and shifted in the evening. In the UK, Tesco, Sainsbury’s, Asda, Boots and Marks & Spencer have equipped workers with small computers and radio connections to monitor them on a real-time basis, especially because these firms rely on just-in-time shelf-filling rather than holding buffer stocks (see “Firms tag workers to improve efficiency”, *The Guardian* June 7, 2005). The analysis of the scheduling of work (Lesnard, 2004) supports the contention that the subordinate occupations have been increasingly subjected to the “tyranny of the flow”, with the help of the computerization of the workplace (Durand, 2004), resulting in more non standard work schedules and conjugal desynchronization.

But the advent of computerization in the workplace did not only change the working conditions of the subordinate working-class. As Gershuny evidenced (2000), the superordinate working class as well as professionals and managers work hours increased dramatically since the 1960s in every economically advanced country he studied. Indeed, these workers are endowed with high economic, cultural and social capital which give them the best chances of success in the economic field (Bourdieu, 2003, Gershuny, 2005). However, rather than being just the result of a rational optimisation, this strong investment in the economic field is the consequence of an “exploit”, a play dimension for these workers, whose dispositions are perfectly adjusted to the characteristics of the economic field (Bourdieu, 2003, Gershuny, 2005). Consequently, despite that they also enjoy a large degree of autonomy at work and to determine their work schedules, they tend to have longer, but also more standard, work days than the rest of workers (Lesnard, 2004).

ICTs help these workers to invest even more in the economic field in different ways. First, it is these workers who introduced computers in the home at the beginning the 1980s in order to be able to bring back home work (Venkatesh, 1996). Second, the just in time production process has also been implemented for this category of workers through project management and groupware software (Durand, 2004). Third, the Internet, and more precisely mobile devices with e-mail clients, such as blackberry mobile phones, virtually keeps them connected to their co-workers and their supervisors.

ICTs also contributed to this bifurcation of the workforce, indirectly this time, through the unification of the financial components of national economic fields. The end of the Bretton Woods system, in 1971, the first and, to date only, fully negotiated monetary order in world history, caused by the USA’s suspension of convertibility from dollars to gold, <http://en.wikipedia.org/wiki/History> marked the beginning of a new economic era. Since then, exchange rates are determined by markets and finance has been progressively deregulated in economically developed societies, leading to an exceptional growth of finance markets (Young, 2003). ICTs played a major part in this process. First, theoretical financial models and derivatives products would have been impossible to use by traders without computers. Second, this growth can be attributed to the replacement of traditional actors exchanging stocks by auction on stock exchange floors by a global network between financial institutions and markets, leading to cheaper and faster transactions (Godechot et al, 2000). Combined with the lowering of duty and other protective mechanisms of national markets of good and services, local workforce of economically developed societies are being increasingly subject to competition with those in low-wage developing countries. The two main consequences, the unemployment rise (Hatzius, 2000) and the decline in the quality of low-skilled jobs (Wright and Dwyer, 2003), are likely to reinforce temporal inequalities.

Computers and the Internet have played and are still playing a major part in the transformations of the economic fields of developed societies and thus, in the increase of the temporal tensions with family time. Computers and the Internet were not invented in order to become a new household device to access new product and services. As the telephone’s use was different from what their designers had planned, the use of

computers and the Internet depends on the social context of their appearance: it is also consubstantial in developed societies to a certain social organization. This is not to say that the current temporal tensions between the economic and the family fields are the consequences of the computerization of the workplace and of the advent of the Internet: they are inextricably related to one another. But as a consequence, it is not possible to understand how the Internet has been and is being progressively adopted by households without bearing in mind the temporal tensions between work and family with which it is linked.

3.2.2 ICTs and the family field

The fact that the Internet entered the home through computers is also crucial to understand how it is being integrated in households' daily life. Till the end of the 1980s, computers were overwhelmingly associated to work and the general public was overall largely computer illiterate (Venkatesh, 1996). VCRs became available to households at approximately the same time as home computers but since they were simple to use and connected to an existing household technology, namely the TV, VCRs rapidly invaded the home (Venkatesh, 1996). Moreover, the lack of telecommunication connectivity and of household related software precluded the integration of computers in daily routines. Plus the problem of finding a suitable location of the computer in the house.

Mobile phone is another example of a technology adopted rapidly. That mobile phone is a variant of the traditional and widely used phone should not blind us to the fact that it was also a technology used in the first place by the superordinate working class. Its transformation into a popular and almost indispensable communication object is certainly related to the need for synchronicity. Mobile phone ensure total availability, a reason why they were adopted swiftly by workers located high up the social space, and as a result also enhance the synchronicity between and within social fields. Mobile phones help solving the temporal equations family members are daily facing: within dual-career families, not only the participation of both parents to the economic field must be taken into account but also the temporal constraint associated to schools and imported by children into families. Mobile phones specially adapted to young children have been introduced quite rapidly into the household market for this purpose. In sum, ICTs are a part of the new daily problems faced by families and are at the same time also a part of the solution.

As DiMaggio et al. (2001) remind us, the Internet's ancestor was a scientific communication network set up at the end of the 1960s and only emerged in 1982. It is only at the beginning of the 1990s with the advent of graphical interfaces and the authorization of commercial activities that the Internet really took off. However, in the early 1990s, e-commerce and services remain limited. One of the main use of the Internet was, and is still, e-mail, which is also perfectly adapted to the temporal pressures of the superordinate working class: it allows desynchronized communication but, contrary to mail or fax, is instantaneous and easy to use, the perfect tool for the high-skilled workers in search of better synchronicity and in general of a better use of time. Given that the same workers had already a computer at home to bring back work, it is no wonder that the beginning of home Internet is marked by strong social inequalities. But far from being the result of sole wealth inequalities, the whole context of computing at home and of the content and temporal needs of these workers must be taken into account. Venkatesh (1996) remarks that in the 1980s workers with computers at home and telecommunication connectivity spend more time working than workers without connection.

The entering of the Internet in the home is consequently also marked by work, not work in general however, but the kind of work done by the superordinate working class or the emerging computer workers group, engineers and technicians, in charge of the computerization of the workplace. The question of getting a computer and/or an Internet connection could not even come to mind for those whose work did not involve the direct use of computers and e-mail: more than their prices, their interest and utility were, as tools directly imported from executives' offices, nil. Video games, the other early use of computers at home by executives' children, could, and still can, be played on video game consoles.

According to Venkatesh, the advent of new services on the Internet is responsible for the obliteration of the job-related image of computers (1996). Beside, information gathering and e-mail, the Internet is increasingly used to read news, plan travels and vacations, shop, manage home finance, and access to public service (Hoffman et al. 2004). Between 2000 and 2003, these different use towered: less than 60% to 80% for reading news, 52% to 78% for travel and holiday planning, 58% to 78% for online shopping, 30% to 60% for online banking, etc (Hoffman et al. 2004). The success of the Internet seems to be highly correlated to the recent availability of quality services related to daily life needs. In this regard, the kind of Internet connection seems also crucial: whereas only 32% of households with dial-up connections have been accessing online

banking in 2000, the figure reaches 63% in broadband households⁵ (Fox, 2005). The Internet is all the more integrated into daily life as it is always available, does not prevent telephone communications, and is fast.

However, it seems that the availability of new services is not the only reason for the increasing integration of ICTs in daily life. Work, games and the Internet are not the only use of computers: leisure also is going digital. Computers are used to dematerialize music, either through, legal or not, peer-to-peer networks or through the conversion of CDs into compressed audio files. It is also possible to record internet radio programs, thus mimicking radio tape recording. More important, digital technology is completely disrupting photography: Kodak, one of the emblematic firms of this branch, is on the verge of completely abandoning argentative activities to focus exclusively on digital products. Photography is exemplary because it is a leisure deeply connected to family solidarity and to its self-representation. Family pictures represent the bulk of photos: "photographic practice only exists and subsists for most of the time by virtue of its *family function* or rather the function conferred upon it by the family group, namely that of solemnizing and immortalizing the high points of family life, in short, of reinforcing the integration of the family group by resserting the sense that it has both of itself and of its unity" (Bourdieu et al., 1996 [1965], p. 19).

The history of households' use of photography can be retraced by the progressively appropriation of the different elements of the photographic chain which culminate with digital photography. The practice of photography can be seen as a "domestic manufacture of domestic emblems" (Bourdieu et al., 1996 [1965], p. 28), and the historical trend is toward an increasingly self-production of these "domestic emblems". With digital photography, failed pictures can be erased till pictures are perfect (i.e. family members do not close eyes or look elsewhere), perfect domestic emblems. Even if it is possible to use digital cameras as stand alone products, they are often used in conjunction with computers and increasingly with the Internet: image manipulation software allow complete control of the final look of the photos which can be sent by e-mail or uploaded on online photo albums which can be browsed by relatives and friends and prints ordered. Digital photography combined with computers and the Internet does not only enable total control over the production of domestic emblems but also make easier the circulation of these symbols across the family/friends network: "like letters, and better than letters, the photograph has its role to play the continual updating for the exchange of family information" (Bourdieu et al., 1996 [1965], p. 22). In order to resist to the increasing daily temporal pressure which threat its unity the family celebrates its cult more often and puts into circulation more efficiently its "domestic emblems". Within families, digital pictures are often viewed directly on the computer screen and sometimes printed using dedicated photo printers, bypassing the traditional retail printing.

Consequently, the success of the Internet depends on its successful integration into households' daily life, made of division of labour but also of time together and of the celebration of these moments. While computers and the Internet were only technologies related to the work of a minority of workers, they could not become mass products. ICTs are not drugs but objects and as such are integrated in the normal environment and sequence of actions of everyday life. After experimentation, routines are implemented, hot keys used, Web site bookmarks organised, etc: through manipulation (i.e. through physical contact) the computer and the Internet are progressively colonized as domestic appliances are. The example of domestic appliances is in this regard particularly interesting: gender inequalities are highly correlated with manual skills acquired during childhood solely by women. The domestic division of labour is not only a question of goodwill but also, and perhaps above all, a matter of habits and skills (Kaufmann, 1997), of dispositions socially acquired in sum.

The experimental situations set up by Kraut are catching this process: once the novelty effect has vanished, the Internet is progressively integrated into daily routines till it is not possible to see drastic differences with non users. As the computer and the Internet are experience goods, the number of different Internet activities also increase with experience (Wellman et al., 2001). With time, ICTs become so incorporated that deprivation can be even perceived as a disruptive event in daily life (Hoffman et al., 2004): if the vocabulary of addiction can be used to describe this phenomenon, it is nonetheless misleading of the nature of the place of ICTs in users' life, as objects.

⁵ The discrepancy between Hofman et al. figures and those of the Pew project are not worrying: it is the trend between 2000 and 2003 and difference between dial-up and broadband connections that matter. Another Pew memo (Fox, 2002) reports a 164% increase in online banking since early 2000. In this regard, Young (2003) believes that the future of finance is online and is threatening the generation of financial intermediaries which emerged with the deregulation of the 1980s.

4 Conclusion

The relevance of the model proposed by Gershuny appears now clearly: the model of the chains of provisions has anthropological underpinnings that help to understand how micro behaviour relates to macro regularities. The question of the integration of the Internet and other ICTs in everyday life can be reformulated as the integration of ICTs in the existing chains of provisions of wants: how ICTs are used to satisfy differently wants. The displacement theory would be valid if the Internet was used to do completely new activities, without relation to the rest of daily life. It is of course not the case and even if some aspects of the Internet are new, most of activities are in fact new way of doing old things. Computers and the Internet are likely to be used to alter self-service consumption. Reading newspapers online is not exactly self-production but a more efficient and interactive way of accessing news. Accessing bank account online, making transfers, gambling on the stock exchange market, downloading bank statement is self-servicing. Looking for information about possible travel destination, booking a flight, a hotel, a restaurant, etc, are new ways of producing leisure. And online shopping is becoming a major Internet use. These are the growing Internet activities (Hoffman, 2004, Fox, 2002 and 2005) and these are also the kind of things experienced Internet users do (Wellman et al., 2001). The example of digital photography also evidences Gershuny's self-service hypothesis and how they are interacting with ICTs: traditional retail photo printing is threatened as families want to control completely the production of "domestic emblems" and their circulation.

Families are subject to increased temporal tensions in their daily lives: not only dual-earning is the new dominant way of dividing paid work, but also because at the same time asynchronicity increased in the economic field. Busyness is the new badge of honour of the superordinate working class while workers located low down the social space are working less than ever *but* increasingly at the margins of the 9 to 5 work day. ICTs have been playing a considerable role in this but are also a way to cope with the daily temporal equations family are daily confronted with: with the Internet, government services, health information, shopping, banking, etc become accessible 24/7. Even if online shops do not deliver during the night and rely often on traditional delivery services, they help families to improve the planning of daily life. Some grocery online shops however have their own and propose different delivery hours, on the evening in particular: we see here that this option which makes life easier for some is also a source of atypical work schedules for others.

Consequently, as Anderson and Tracey (2001) suggest, analysts should abandon the "impact" perspective they used to have to analyse the Internet and focus instead on how ICTs are being integrated in daily routines. As Gershuny (2003) put it: "We will discover what the actual chains of provision are only by asking, and seeing, what people are actually using the net for, how it relates to other aspects of peoples' lives – by observing how the technology is embodied in the chains of provision for the various final services we consume". Changing the research question is crucial, not only from an academic point of view, but also from a data perspective: we currently lack good quality quantitative data which can be used to answer this question because previous surveys were not designed to answer it.

In this respect, future studies should focus on two main aspects: on the reasons why computers and the Internet are entering or not new homes and how and in what context they are used. Is the use of computer at work or at school still an important factor in owning a computer at home with an access to the Internet? Or if it does not make anymore a difference, maybe the way computer and the Internet are used still depend on these factors? What is the role of digital leisure (music, photo but also video), of new services available (online banking offers from traditional retail banks)? Future research should also address the issue of relatives and friends: the spread of the Internet might be fuelled now by a kind of snowball effect, i.e. households who adopted ICTs advertise them into their personal networks, maybe in the hope of increasing the number of persons with whom they can exchange e-mail, pictures, etc. This information should be completed by questions about the schedules and temporal constraints of the whole family, in particular for dual-earner couples with children.

The domestic context of ICTs must also be investigated. Previous research underlined the paramount importance of the location of the home computer, especially with regard to multitasking. When computer and Internet time is a scarce resource, family members have to develop routines to make the most of this time. Multitasking⁶ is one of these daily strategies: when several persons share ICTs, it is crucial to know who is connected in order to analyse this kind of use. Previous researches suggest that the use of individual accounts for the different family members is not usual (Kraut et al., 1996). Therefore, surveys should not implement this system since it would distort the actual use of the Internet. For when there is only one

⁶ The next version of Microsoft's Internet browser will implement tab browsing, a feature available in Netscape, Mozilla or Firefox browsers, which improves considerably multitasking.

computer with an Internet access, there is a strong collective dimension in the use of ICTs which has to be taken into account.

But we should also not forget that in order to circumvent this scarcity, families can decide to have more than one computer and share the Internet connection, as happened with TV. The latest Internet offers of providers foster this trend: with broadband access and Wireless Fidelity (WiFi) technology, sharing an Internet access has never been so easy. Internet use in these leading households is likely to be very different from in the newbie ones. It is only with the help of Internet log analyses that the actual use of the Internet can be uncovered. This is maybe the most challenging part of the future surveys and calls for a true interdisciplinary work involving computer and social scientists. For instance, Beauvisage and Assadi (2005) remark that "the difficulty is to set the relevant period of inactivity between two recorded events to determine whether a session is finished." To solve this problem, they decided to declare as finished every session inactive for more than 30 minutes: this rule can be problematic with multitasking as a web site can be loaded, for instance a news web site, and only checked from time to time, like listening to the radio in background.

Computers are also going mobile. In May 2005, the sales of notebooks surpassed desktops in the US for the first time (*Current Analysis* 03-06-2005 press release). With the development of WiFi hotspots and capabilities in notebooks, this means that the Internet also is going mobile. Internet access is also becoming available on mobile phones. Rather than being in competition, these two modes of mobile access to the Internet seem to be complementary (Chae and Kim, 2003): Internet on mobiles phones in Korea, a leading country in this domain, is used mainly to buy quite standardized and relatively cheap goods such as movie and concert tickets, CDs, videos but also to get information on the weather or news. SMS seems more popular than e-mail. Even if the size of the screen of mobile phones limits how the Internet can be used, it seems that the availability of clever interfaces and web sites can turn mobile phones into an access to the Internet adapted to the needs of users away from a stationary Internet access. Beside asynchronous communications either through e-mail or SMS, mobile phones Internet use in Korea is clearly linked to leisure and self-service: instead of planning in advance to see a movie with friends, the Korean youth decide at the last minute through SMS who is interested and buy tickets online wherever they are. Maybe the "widgets" Apple introduced in the 10.4 version of their OS provide a good example of what could be simple and efficient interfaces to Internet services mobile phones need.

Another use of mobile Internet is digital leisure: it is now possible to listen to electronic music, take pictures and videos and send them to relatives or friends. The rise of photo-phones is another step to the appropriation of the production of "domestic emblems" by group of friends or families: pictures can be taken anytime (it is no longer necessary to plan to take pictures, as the photos and videos taken in the evacuation of the London underground on the 7th of July 2005 demonstrate) and sent immediately to friends and relatives. In other words, "domestic emblems" can be produced and shown to significant others instantaneously, and thus the group can celebrate itself despite distance and temporal desynchronization it is facing.

Finally, it seems that certain uses of the Internet have not been investigated despite their sociological and financial importance. In particular, gambling and pornography seem to be more than an emerging use and on the contrary have certainly played an important part in the emergence of the commercial Internet. The poker website PartyGaming is listed on the London stock market since the 27th of June 2005 and is now a bigger company than Rolls-Royce or Sainsbury's. The success of the *Minitel*, an earlier and simpler version of the Internet, in France is largely due to its erotic chat room-like sites (Castells, 1996). Although it is difficult to assess its financial importance, online pornography also takes advantage of the new modes of interactions provided by the Internet: amateur pornography web sites such as amateuruniversity.com or karasamateurs.com are in fact web portals similar to yahoo.com offering specialized blogs, pictures, movies and webcam viewing (Patterson, 2004). Webcams in particular, with their grainy and poorly defined images gives a sense of authenticity which is reinforced by the address of the "amateurs" which transforms the lack of the spectator into a need they are asking her/him to satisfy. Future investigations should not neglect these less 'legitimate' uses of the Internet and as with any other 'deviant' practices, a careful and adequate mode of investigation should be used to throw light on significant and presumably major social uses of the Internet which are for the moment almost completely ignored⁷.

Consequently, further research should cast light on the actual use of the web, ideally, through the analysis of Internet logs. This also could be addressed with a series of careful questions about web use including

⁷ Pornography has been a concerned only in a few studies dedicated to children's use of the Internet (for instance Livingstone and Bober, 2004, and Wigley and Clarke, 2000)

pornography and gambling⁸. Computer and Internet multitasking seems technically difficult to measure through direct recording but could be addressed through more standard question to assess how interwoven the different use of the web and of digital leisure are⁹. Multitasking of Internet activities and other daily activities such as watching TV is also of interest and could be assessed with more standard time-use surveys. Another dimension to take into account is the presence of family members while browsing the web. This is all the more likely during week days, when Internet time is occurring in the evening which is also the familial moment of the day *par excellence*. Standard time use surveys with information on with whom activities are done could also be used to investigate this issue¹⁰. The sequencing of the Internet time should also be of concern: with diaries from all family members, it should be possible to see how they take turns and how the Internet is integrated in the dynamic of daily life. Family dinner is still the major familial event during week days (Lesnard, 2005): is the standard scheduling of family time disrupted by the Internet? Or is it just combined in new ways, the computer becoming an emergent family time in its own right? Given that the Internet time occurs mostly in the evening, such sequence analysis could be restricted to this moment with no significant loss of information.

The work and social origin of the domestic Internet should not be forgotten. As Cummings and Kraut (2003) remark, there is a strong "path dependency" in web use. The web use of experienced web users is still marked by work whereas newcomers came with more personal motives whilst diffusion of the Internet, which is far from being over, is following a more complex model than mobile phone, partly because of the great variety of uses which can fit different needs. As Gershuny remarks, these wants are socially defined and can be related to the position in social space: the time poor and money rich are likely to use the Internet more as a time-saving device than as a pure entertaining media as the time rich money poor newcomers. This kind of hypothesis can be partially tested with datasets such as Home OnLine (Anderson & Tracey, 2001) where it is possible to cross-tabulate web use and time spent online and offline. This effect on the chains of provision could also be measured by considering, conditionally to social position, daily life of web users and non users: an effect should be measured mainly for the highest social positions and maybe some substitution effects with TV or other leisure effects¹¹ for those located low down the social space.

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⁸ First "pornography web site" should be called in surveys "adult web sites", a name less subject to social obloquy. Questionnaire should typically include a series of questions to know if respondents know the different type of gambling and adult web sites in order both to see the respondents knowledge but also to make sure that the respondents have in mind what covers 'visiting gambling and adult web sites'. Before asking the respondents if they themselves have visited recently (last month for instance) these web sites, a small introduction emphasizing that visiting those web sites is very common seems necessary. Respondents replying no should be given a second chance and the interviewer should go through the different kind of web sites encompassed by the definition. This is only by using this kind of methodology that the extent of less legitimate web use can be uncovered. The BT funded Home OnLine (HoL) survey included some question about the kind of Internet and Web use. The most detailed questions are unfortunately only present in the first wave and few web use are distinguished with a 'leisure' category encompassing presumably gambling and pornography along with more legitimate use.

⁹ An extensive 'digital multitasking' would mean that the leisure, and presumably anomic, dimension of the web could be completely counterbalanced by other contemporaneous Internet use such as e-mail, instant messaging, shopping, online banking, etc.

¹⁰ The very existence of concerns about privacy is also indirect evidence of this collective dimension of the Internet time.

¹¹ This can be achieved through regression analysis but not through the simple control of social position: a model, like the one used by Gershuny (2003) using the HoL dataset, controlling for social position is trying to measure such effects *independently* of social position, or in other words seek an average effect *valid and identical for all social positions*. Our contention is that these effects varies with social position.

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