

# Social networks and residential ICT adoption and use

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## Abstract

*In this paper we analyse a sub-set of data from a representative EURESCOM survey on mobile telephone and Internet private uses completed in December 2000 in 9 European countries. In the following we analyse the data on social networks with family, friends, and acquaintances and the communication technologies used to create and maintain the networks. The results show a close relation between the forms of social life, the types of communications technologies used as well as a certain specialisation of voice and written communications. Residential mobility impact on network size and spatial extension. This in turn influences the type of communication technologies used. All in all, regarding the overall pattern of social relations maintained online we see a strong link between electronic communications of all sorts and face to face interactions which seem to remain the ideal type of personal contacts.*

## 1 Why is the understanding of social networks important for explaining ICT adoption and use in a residential context?

Watzlawick's [1] classic statements on communication are "To communicate demands being at least two" and "One cannot not communicate". If the second slogan gives us a glance at the potential importance of the communication technologies in the human life, the first one reminds us the value of the personal relationships for the effective use of telecommunications.

We can not communicate if we have not someone to exchange with: it is a recurrent story of each communication device which provides mediation between people. When someone adopts a telephone, a fax machine, or an email the adopter must know others who also have an access to the same communication system. Or he or she has to convince prospective receivers of his or her messages to implement it! This is a reason why the diffusion of technological innovation has been studied as a process combining dissemination of knowledge about new technology and persuasion coming from earlier adopters. The adopter's social network is seen as one of several channels of the diffusion process through which social influence exerted by adopters on non-adopters to equip themselves [2].

An idea very comparable was used as the starting point of EURESCOM project P903 "ICT uses in everyday life." If telecommunications operators intend to conceive better and more profitable services they should understand the structure of everyday life of their customers. The research intends to extend the traditional understanding of market studies by explaining adoption and use of the Internet and the mobile telephone through a combination of the socio-demographic data used in standard market studies with data on attitudes towards the Internet and the mobile phone, on values, on geographical mobility and activity structures. A special emphasis is on social networks. It is on this latter aspect that the following paper will focus.

The analysis is based upon the P903 multi-country survey data. The countries surveyed were Norway, Denmark, and the Netherlands as countries with advanced ICT penetration levels, Germany and the UK as countries with intermediate penetration levels, France, Italy, Spain as representatives for Latin countries, and the Czech Republic as a representative for a Central European country. In each of the countries surveyed, about 1,000 individuals were sampled through regionalised random walk selection. The fieldwork was executed in December 2000. All data are weighted for analysis so that they are representative of gender and age distribution for the population aged 15 years and older within each of the

intra-national regions. EURESCOM shareholders may obtain the final report [3], the raw data and a codebook from the EURESCOM website.

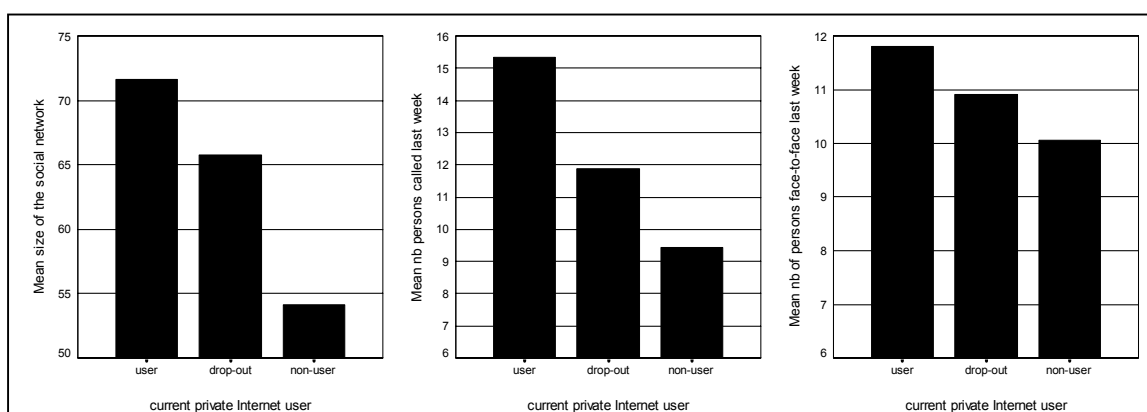
In the following, we shall, first, analyse major single contributions to the links between social network structure and ICT use and then, second, analyse how both correspond in an integrated way.<sup>1</sup>

## 2 The characteristics of social networks and ICTs

### 2.1 Internet use and social networks size

Do ICT users have different personal networks as compared with nonusers? Looking at Internet users – as in most countries the mobile telephone is already largely diffused – and the size of their social networks, we see that in general, Internet users to be more sociable than Internet non-users. The European data of P903 match recent North American surveys data, which also revealed that Internet users have larger social networks than nonusers [4]. In particular, long-term users report more frequent sociability with friends [5]. The largely publicised result of the U.S. HomeNet Project finding Internet users to be unsocial and psychologically destabilised, in reality is unfounded [6].

**Figure 1 Comparison of the network size of Internet user, of past user (drop-out) and nonuser personal networks and number of active network contacts<sup>2</sup>**



One can establish here the relationship between Internet and email use, which for some authors is a critical point for the stabilisation of residential Internet practices as Lelong and Thomas [7] proposed in their longitudinal research on new Internet users in France. According to a survey conducted by the Pew Internet and American Life Project in the United States at the same time as our fieldwork, almost 80% of those U.S. inhabitants who went online on a typical day in 2000 sent an email [8]. This level of use is more than double than the for any other Internet activity. P903 survey confirmed this pattern. The survey indicates that 85% of private Internet users uses their email account during the last three months. Thus, sending email messages is the service that is the most widely of all Internet services used. In fact, it is also among the most often used: 64% of Internet users opened their email accounts at least every other day. And 48% of private Internet users in our sample have effectively contacted their personal network *via* email last week: among them, 50% sent at least one message to a local, 34% to a national destination and 8% to a network member living abroad.

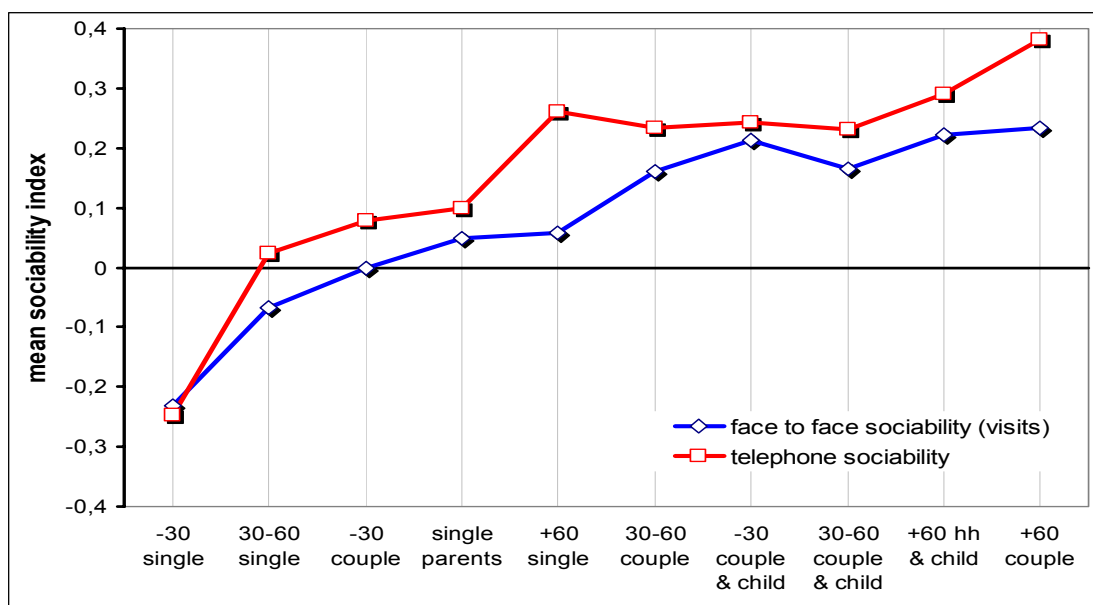
P903 data further showed that not only the Internet user networks were larger but also that the active contacts with these networks (last week) were more intense than in the case of nonusers (cf. figure above). Of course, we cannot establish here a cause-effect relationship between networking and Internet adoption, but this result seems to point to one of the important function of the private Internet connection, which is communication.

<sup>1</sup> Before starting with the analysis, a caveat has to be voiced: it is quite courageous to analyse the diffusion process using variables that are more complex than the ordinary socio-demographic variables, like gender, age, income, or educational level. Longitudinal market research with individual data on ICT adoption and with a second interview of the same person about his or her behaviour some years later are expensive and therefore, do not exist. P903 data only allow us to judge the actual situation of users and non-users, and not to evaluate a situation which for some happened years ago.

<sup>2</sup> All differences between users and nonusers are statically significant at  $p < 0.0001$  level (t-test).

## 2.2 ICT use and face-to-face contacts

When we look at communication technologies in everyday life from the perspective of social uses of the technology, we immediately notice that their utilisation is embedded in an individual's social relations. A basic illustration comes from residential telephone usage studies. For example, a 1996 French study that compared the proportions of calls sent to family with those emitted to friends revealed a clear correlation between the life cycle stage and the preferred telephone communication partners of a household [9]. The making of a couple and the birth of its first child reorganises considerably the communications patterns towards a larger implication of the close family [10]. P903 survey data confirmed this pattern on a multi-country level. A sociability index was created to reflect the family orientation of the network. It was calculated as the difference between the number of family members called or seen and the number of friends called or seen, weighted by the size of the network of family and friends called or seen. As we can see from Figure 2 the sociability index of telephone contacts closely follows the index for face-to-face meetings. A change of the network to more kin-oriented contacts can be observed in face-to-face as well as in telephone contacts when the situation in the life cycle fundamentally changes the overall form of private relations with the social world outside the household.<sup>3</sup> This happens when child arrives in the family and again, when the person enters the age of retirement.



**Figure 2 Face-to-face and telephone sociability orientation (family versus friends) through life cycle**

This result clearly shows that communication patterns go hand in hand with one's overall sociability orientation and change at different life stages. But this effect also indicates that the electronic communications are correlated with face-to-face contacts. Accordingly, research on fixed as well as mobile telephone contacts shows that in relations with family and friends, the rule is "The more I see you, the more I call you". Our data also corroborated this pattern. There was a clear-cut correlation between the number of network members (i.e. kin living outside the household, friends and acquaintances) personally met last week face to face, and the number of network members contacted *via* telephone during the same time period ( $r = 0.35$ ,  $p < .0001$ , partial correlation controlled for global network size).

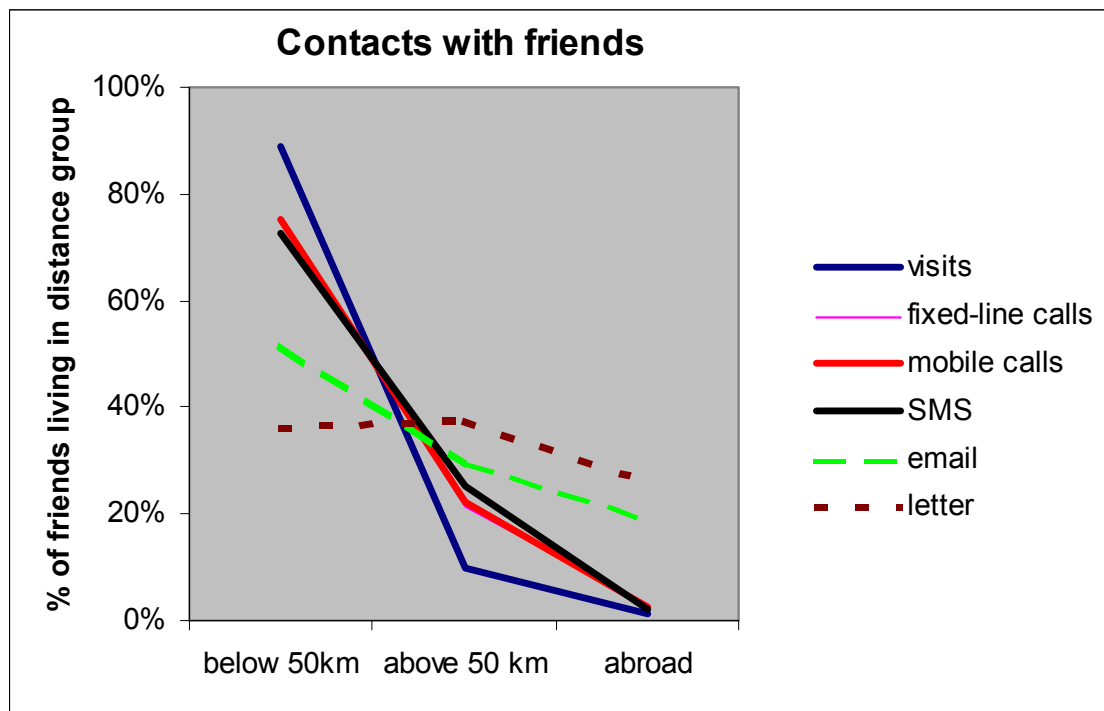
Even though our aggregate data do not allow us to confirm that the person seen is also the person contacted through the telephone, the aforementioned result underlines the strong link between a person's implication in a network (measured by the number of persons met) and the same person's telephone use (as measured by the number of persons called). A more detailed French study based upon a crossing of telephone traffic and interview data, where each telephone correspondent was identified and described by the respondent, has shown that this relation can be confirmed on the individual level [11].

<sup>3</sup> We might add here that at almost each stage in the life cycle the telephone is more used for family contacts than are face-to-face contacts. This observation points to the important distinction between voluntary and normative relationship. Kinship contacts are much more socially regulated than friendship contacts which are voluntary, and a regular contact within the close family is expected even if geographical distance or a lack of time goes against it. Thus the telephone has become an instrument of these socially required exchanges with parents. In our study, a young Frenchman expressed this in the following way: "If I don't call them at least one a week, they get uneasy, and they will call me to show that I forgot them."

### 2.3 The spatial structure of communications

The close link between visits (i.e. face-to-face meetings) and telephone calls hints to another characteristic of voice communications: the impact of spatial constraints on social networking. About three out of four telephone calls are sent to receivers situated in the same region. This long-established fact clearly counters the myth of geographical ubiquity linked to the telephone since its inception, as de Sola Pool and Claisse & Rowe [12] mentioned. Due to the so-called “Law of Least Effort” translating into a friction of distance, telephone calls as well as visits show a strong tendency to spatial clustering (see numerous studies cited in [13]). This creates the necessity of many short, “practical” calls as well as longer, relational exchanges between individuals localised closely in the space and connected by common activities.

This effect can easily be seen in the P903 survey when the use of different communication technologies between friends is examined according to distance: all phone-related contacts are closely associated to face-to-face interactions and due to the friction of distance, both are largely restricted to the same region (cf. Figure 3).



**Figure 3 Percent of friendship network contacted last week by communication technology and distance**

However, the spatial structure of an individual’s social network is also related to the inverse situation: to communications with geographically distant but emotionally close people (like very close relatives and “old friends” living far away). In this instance, we can detect a substitution of visits by telephone calls when telephone calls are frequent and face-to-face interactions become rare. In general, long distance calls, which are also less frequent, are also much longer than local calls [11]. A social relationship is normally based upon face-to-face multi-sensorial interactions. In the case of long-distance contacts it has to be confirmed through more or less ritualised personal news taking and giving. Therefore, the conversation takes longer. Our results confirm the special importance of the spatial pattern of social networks but also inform us on potentially different roles of the same communication technologies in everyday life communications.

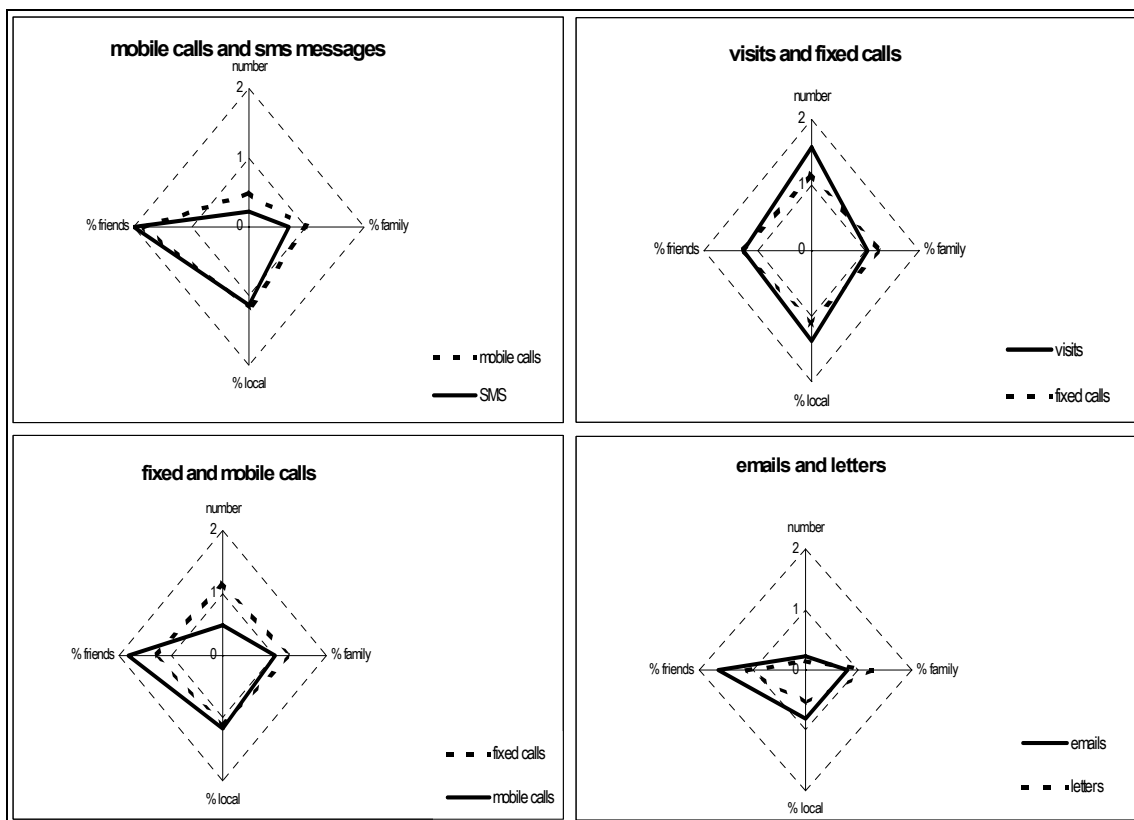
Licoppe [14] recently proposed to analyse the uses of fixed and mobile calls and SMS messages as different forms of communication acts that intend to maintain a social relationship. There are two forms of conversations, according to him, one called “connected”, the other “ritualised” mode. Persons communicate in connected mode when frequent and short calls, normally on the mobile phone or SMS messages, are sent to a private person and intend more to signal that one thinks about her/him than to

enter a real conversational exchange. Longer calls, often emitted at the evening, serve more to exchange information and emotions with personal correspondents. This is what was called “ritualised mode.” The mixing of both communication modes could be a reason why mobile phones (and SMS even more) are particularly employed to contact friends or loved ones, and in particular frequently seen persons, i.e. persons living in geographic proximity. The use of fixed phone seems to be more polyvalent. Thus, in our survey, correlations between number of face-to-face contacted and local people called on the fixed telephone line were both strong, i.e.,  $r = 0.36$  for family members and  $r = 0.43$  for friends. However, for mobile telephone contacts, they dropped to only  $0.22$  with local kin but still were strong for friends,  $r = 0.39$ . For persons contacted by SMS these correlations were  $0.11$  for kin and  $0.32$  for friends’ network. In consequence, a certain social specialisation can be associated with a fixed telephone communications and another one with mobile communications.

## 2.4 Communication technology profiles in social networks

To compare communication technology use and networks contacted, technology profiles were created that try to mirror the measures that showed up as important in the network analysis: the size of the network, the communication means used, and the geographical span of the network. In fact, the analysis revealed that network patterns and ICT use correspond for specific combinations of technologies to a considerable degree.

The four graphs below compare the degree to which the different communication means are above or below the grand mean for each of the four central dimensions of our scrutiny: the size of the network, the percentage of friends, the percentage of family members in the network, and the percentage of local members, i.e. of members contacted living in the same region. The more the rhombus is vertically elongated, the more the part of the network contacted with the specific communication means is large and localised. The more the rhombus peaks to the right or the left, the more the network is composed of friends versus of family members.



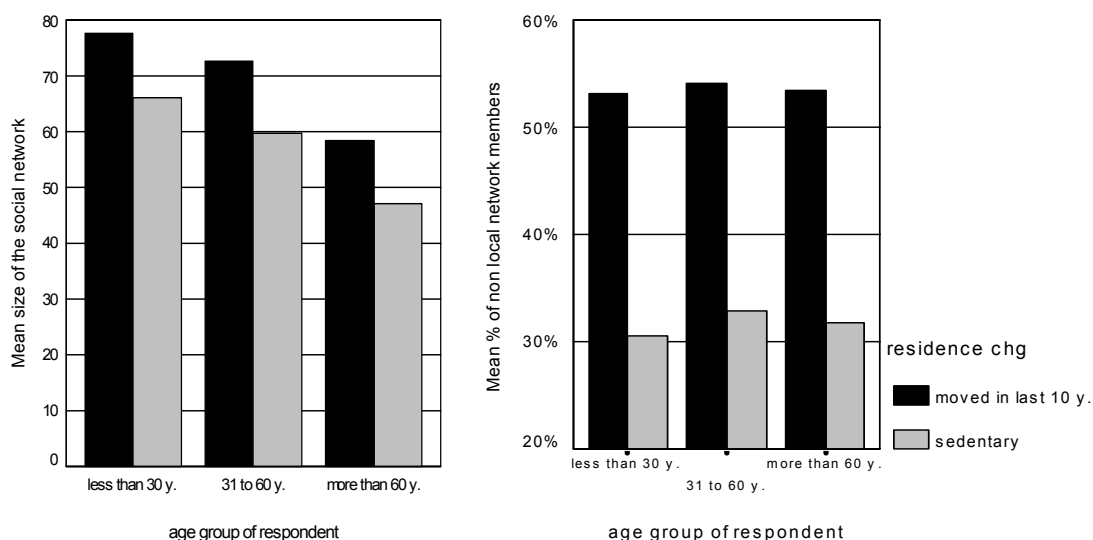
**Figure 4 Information technology profiles of networks**

Visits demand to overcome physical distance, to engage an effort that takes time. Therefore, face-to-face meetings, which constitute, at the same time, the largest sub-network, are the most localised. Also, they are more oriented towards the friends, i.e. they are more self-selected than the contacts with the family,

which are norm-ruled and therefore, in part, socially imposed. The part of the network contacted through fixed line telephone calls is smaller than the one for face-to-face contacts. As no physical effort to overcome distance is demanded for establishing a call the network is less localised. The networks contacted *via* the fixed line telephone are rather balanced between friends and family. The network contacted by mobile telephone has structurally the same characteristics as the fixed line network but it is even smaller, and more oriented towards the friends. This is a general tendency already found in the qualitative analysis of P903 study. The SMS-based network exaggerates the aforementioned tendencies. It is the less oriented towards family members and the most towards friends and it is far more restricted. Email and letter-based sub-networks are, on the average, the smallest and the least localised. However, the average covers two distinct sub-networks: one that is local, and the other, international. In spite of these common traits, emails and letters are not sent to the same kind of person. Letters are posted in similar proportions to friends and to the family, whereas emails are more often sent to friends. This panorama gives us an insight in a potential specialisation of the technologies as a consequence of the type of communication partner.

### 3 Networks, communications, and residential mobility

The spatial characteristics of social networks and communication patterns can also be related to the patterns of residential mobility. In our sample one in three respondents said that he or she ever moved their residence for more than 50 km away from their actual residence in the past 10 years. Residential relocation has clear consequences for social networks and sociability patterns: mobile persons had larger social networks than the sedentary ones. Even if a mobile person was in general younger<sup>4</sup> (with a mean of 34.6 years vs. 46.2 years for sedentary one) and had a higher level of education (41% of mobile persons have finished tertiary education), this tendency is the same in each country studied and across all age groups. The geographical frame of reference for residential mobility as it was used here was the change of region (50 km) which is more extended than usually used definition. The region was chosen as the residential relocation within the same region allows movers to maintain their networks, besides looking for new neighbour. Because of its considerable impact on networks and socialising, and thus, on ICT use, residential mobility merits further attention.



**Figure 5 Network size and % of non-local members by age of respondent**

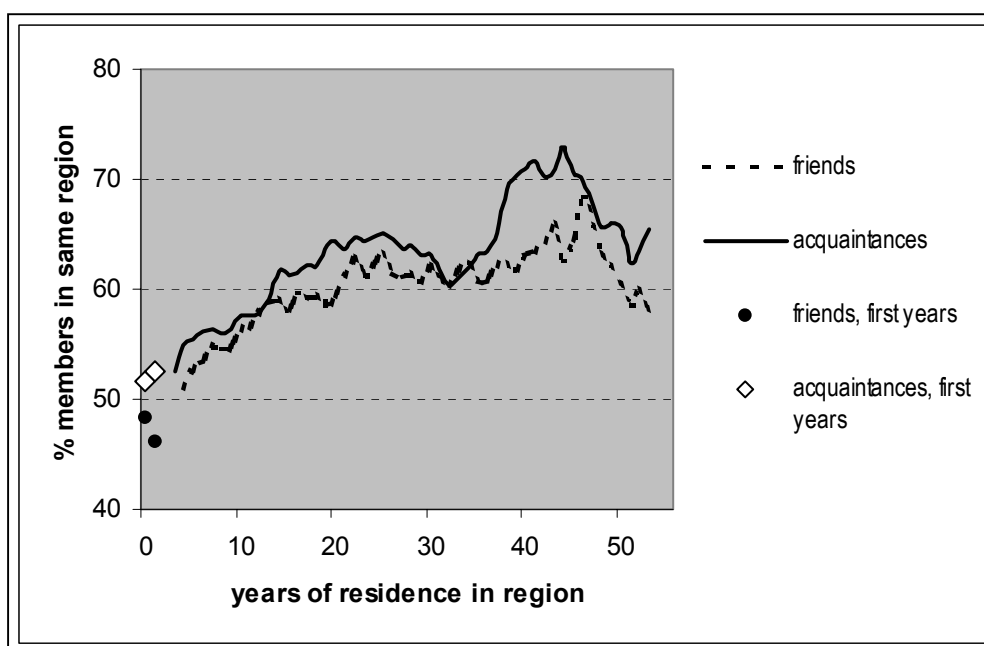
The effect of residential mobility on the network composition observed in the figure above has an immediate influence on networks, sociability patterns and related telecom uses. As compared to sedentary population, the migrants had only half of their family members living in the same region but twice as

<sup>4</sup> The size of social network varied with age: younger people (especially singles and childless), declared more friends than older groups: 19.5 friends for respondents aged 30 years and below, 15.3 friends for persons aged 31 to 60 years, and 11.6 friends for respondents aged 60 years and above.

many if they lived outside the region. If the number of local friends did not differ between sedentary and mobile persons, the distant friends were almost three times more frequent with migrants. As a result, migrants had significantly more geographically dispersed voice and mail communication than geographically immobile person. The importance of immigrants in long-distance communications is also confirmed by a recent Australian study [15].

The geographical stability over time, “sedentarity”, provides the opportunity to nourish local contacts and to make one’s local network grow. Creating social contacts needs time as each personal relation has its own story. Therefore, we observe differences in network characteristics between geographically mobile and immobile persons over the time, a fact well long known in urban research (see, for instance, [16]).

As the following Figure 6 shows, within few years after migration people strongly focus their selection of friends and acquaintances on persons living geographically close, in the same region. After about 15 years of residence, people anchor their network even more within the region, and after about 30 years of residence, there is a further increase. Therefore, the length of residence within a region can be considered as strongly influencing spatial network patterns. The communication patterns follow this network transformation.



**Figure 6 Length of residence and its effect on the local focus of networks**

Restricting the geographical span of one’s network is, of course, not only a matter of residential immobility. There are persons who never left their hometown, and others immigrate from abroad. So even with the same length of residence within a region, there should be differences in the local orientation of one’s network depending upon whether the individual is born in the region or not. Age will play a role, as does the structure of the life cycle. Maybe, in small communities people have more spatially focused networks than inhabitants of large conurbations. And the country where people live, with their different social norms and cultures, might play a role too. This all together should strongly influence the communication means used to maintain the networks.

Separate regression calculations for both the level of local orientation of the network of friends and for the network of acquaintances show that the main forces in both networks are the same. All things equal, the local centeredness of a social network is strengthened by, in decreasing order of importance, the smallness of the network, the length of residence in the region, the age of the respondent, and the fact of being born in the region or having moved into it. National differences, the size of the agglomeration of residence, or gender are either unimportant or impact only feebly. This means for the analysis of networks and ICT use that we can concentrate on central social network measures, leave the influence of socio-demographic variables such as age for another, more in-depth study and focus on common, trans-national tendencies which can be found in all of the countries studied.

## 4 Social network dimensions and ICT use: an integrated view

Having analysed the individual components of social networks one by one, we now turn to an integrated study of the influence of network structures on ICT use. Social networks as understood here, are centred upon an individual. An individual's network can be described by its size, its composition (family members, friends, acquaintances and colleagues, neighbours), its intensity (the frequency of interaction or the social distance among its members), its geographical range (members living in the vicinity, the same region, the same country or elsewhere abroad). As we are interested in ICT adoption and use, we also asked for the communication means used to contact the network's members during the last week. To understand ICT use within the context of everyday life, we also asked for the importance of face-to-face visits and letter writing.

Previous research convincingly showed that the characteristics of a network heavily influence the communication structure including the choice of ICTs used for this purpose. Therefore, we hypothesised that the network's characteristics will influence, first, the adoption of a mobile phone, and, second, the intensity of use of mobile phones and of Internet email services. In the following section, we shall first, create a typology of social networks based upon our survey data, then look at its impact on mobile phone adoption and use and an email use, set these use in a framework of competitive and ... communication means and, finally, look into its effect upon users and non-users of mobiles and Internet, so so-called double users.

### 4.1 The overall structure of social networks

Analysing the factors that underlie the different aspects of a network, the following variables were thought to be the most representative and were used in a factor analysis: (1) size of the network (number of first and second degree family members, friends, and acquaintances seen at least several times during the last year, excluding colleagues, school mates, and neighbours); (2) % family members; (3) % friends; (4) % of network members living in same region (around 50 km of the respondent's community); (5) social distance with friends (five-points rank scale).

A factor analysis (principal component analysis) conducted explains 47% of the variation between the variables, which is a respectable level. The two factors obtained mirror the spatial centeredness of a network and its social composition. They can be labelled "local focalisation" and "family orientation". The network of a respondent can be called locally focussed if it is rather small and, at the same time, the majority of contacts are limited to the respondent's region due in part to long-term residence. Respondents are family-oriented if their network is largely composed of family members, if they only have few friends and if they are emotionally not very close to the friends.

**Table 1 Social network dimensions**

Factor loadings	Network dimensions*	
	Local focalisation	Family orientation
% local contacts with social network	0.73	
years of residence in region	0.68	
global size of the social network	-0.65	
% family members within social network		0.79
% friends within social network		-0.76
emotional distance with friends		0.29
% of variance explained	26%	21%

\* rotated component matrix only showing loading above 0.25.

In a second step, factor analysis was again employed to find common dimensions that took all of the different means of communicating into account. Three common dimensions of the technology profile emerge: there is, first, a tendency to use the three electronic communications means, the mobile phone, SMS and email messages side by side. A second tendency shows up with people who prefer to see their kin, friends, and acquaintances in person and use a fixed-line phone for calls. The third profile dimension concerns people who large use fixed-line telephone calls but also letters. The dimensions might be labelled electronics, meeting and calling, and writing and calling. Together, the dimensions explain 66% of the variance in the data.

**Table 2 Communication technology use profile dimensions**

Factor loadings % network members contacted by	Profile dimensions*		
	Electronic means	Meeting & calling	Writing & calling
SMS messages	0.74		
mobile telephone calls	0.62		
email messages	0.40		
face-to-face		0.54	
fixed phone calls		0.44	0.39
letters			0.27
% of explained variance	29%	20%	17%

\* rotated factor matrix, showing only loadings above 0.25

Which type of user best represented the different communication profiles? This structure can be found in all of the studied countries. The first dimension of electronic means is basically a generation phenomenon, with the youngest under 25 years of age the most heavily using the mobile, SMS and emails in combination for their private communication. Italy is the country, which exhibits the strongest a clear electronic communication profile. This profile can be far more often found in large cities, with the young, the mobile, the male, and well-educated. However, today, the combined use of mobiles, SMS and emails is not only linked to young age but especially to persons who have no family obligations or who are recent immigrants. Thus, mid-aged couples whose children have left home are among the more active in using these communication means. It could be interesting to mention that in all of the countries, a strong electronic means profile goes together with a high telecommunications budget. The socio-demographic characteristics of individuals with a strong profile in meeting and calling is far less clear-cut. Older people, people from foreign minorities and those with a long length of residence are far more oriented towards seeing their important others and preparing the meetings by calls on the fixed telephone. Persons with a strong profile in writing and calling have a very specific soci-demographic pattern: they are older and more mobile than the average, they live in larger cities, have a higher level of education, and there are more women in this category.

#### 4.2 Social networking and ICT use

We can now better answer our basic question: Do social network characteristics and communication technology profiles go together? Can the use of specific combination of communication technologies be explained by the patterns of the social relations they are intended to support? In fact, two dimensions described well the network patterns, its local focus and its social composition. The network's geographical focus is well linked to technology use. Networks whose members are rarely contacted with electronic communications are small, spatially constrained and depend on contacts nurtured since years, and vice versa (the correlation between the degree of local focalisation of a network, see: table 1, and the level of use of electronic means, see: table 2, was  $r = -0.28$ ). To no surprise, these constrained networks typically correlate with the use of the second communications dimension: face-to-face meetings and fixed line calls ( $r = 0.25$ ). The evident reason is that the effort necessary to visit someone spatially constrains the network. The second dimension, the social composition of the network, influenced the type of communications means only in the case of electronic communications: the more members of your network are contacted by electronic means, the more likely the network is largely composed of friends ( $r = 0.16$ ). In short, network composition, size, spatial range, and length of residence in fact influence communication technology profiles. This is especially in the case with mobile persons with large and spatially extended networks. They show a strong tendency to simultaneously use mobile telephones, SMS and Internet email services and are of prime commercial interest to telecommunications operators.

### 5 Conclusion

Concluding, the question one can ask is: is the Internet, and *in fine* also mobile Internet, something different in comparison to face-to-face or voice interaction? Can Internet abolish the geographical distance between people and set up a new kind of interpersonal communication universe? This question is not a new one, the same question was posed also at the beginning of telephone diffusion when social visionaries forecast a kind of direct democracy spread thanks to the electric communication between all Americans [17]. This prophecy apparently failed, many things have changed but strangers still speak very seldom to another. Nowadays, sibyls of the new age of information speak about the "global village"

where everyone can communicate with everyone anywhere on the globe. For example, Wellman, an eminent social network specialist who also works on electronic networking, gives us a rather optimistic appraisal saying that “research shows that people interact happily and fruitfully online and in ways similar to face-to-face contact” (Wellman and Frank, [18]). This may be true for some “weak ties” but most interpersonal relationships do not exist only online but use online contacts to fulfil the gaps between face-to-face encounters. It is plausible that in the specific case of Internet interest groups, of discussion lists members or of chatters, we can observe the communication pattern of “never-see-you-but-still-exchange-with-you.” In our private lives, however, this pattern certainly cannot apply to voice interactions like telephone calls. On the contrary, only a fraction of the individuals a person personally knows is also *socially* accessible to the person’s telephone conversations (as it is in the case of informal meetings or home receptions). In this sense, the communication devices can very well help to connect people but also act as filters. In the case of telephone users, a certain stabilisation can be observed based upon a limited number of persons called on the telephone [9]. There are always the same family members and friends who called upon regularly with the telephone, whereas with the others, especially not so close family members or acquaintances the degree of regularity clearly diminished. This is a general phenomenon to be observed even with socially or geographically distant networks members, or with job contacts: There is a tendency to establish a restricted circle of persons who are regularly called on the telephone. The social world of telephone contacts is visibly structured around a process of a “coagulation” of ties around a stable core of repeated links, i.e. a social network of communicating persons that is more or less stable over time. Thus, *having a potential connection doesn’t mean that one really uses it*. The “global village” hypothesis can very well turn down just like the telephone myth quoted above. For example, Castells [19] - albeit he is confident that information technologies have changed profoundly our social world frame of reference producing what he calls “network society” - points also to the “identity question.” He sees traditional values (as religions or ethnic identities) or new definitions of local communities as a base for meaningful identification, and that seem to resist the globalisation process introduced in part by information technology’s universalistic credo. There is a paradox of what he and others term “glocalisation”, the field lost by the State is occupied at the same time by global, international exchange systems and by reinforced local, or regional forms of coordination. From the observation of social networks and social interactions we can learn that even if today the (developed) world is interconnected in a nearly perfect way *through* telecommunication networks, interpersonal electronic contacts are still very closely linked to classic, face-to-face meetings. Most sociologists indicate that the multi-sensorial, face-to-face contact is the model of human interaction, and this founding principle shapes the strong localisation observed in the actual communication behaviour. In this sense, we can ask if the human body is not the ultimate barrier for virtual contacts in the private sphere and also the development vector of telecommunication uses? Just as the human body demands a local environment to fulfil its basic needs (to eat, to sleep, to reproduce...), conversely, the human being as social animal involved in the multiple contacts with other people needs face-to-face interactions to maintain his or her socio-psychological environment.

To paraphrase a well-known marketing slogan the question we can ask at this third generation communication technologies summit – is: Can our role as telecommunications operators be described as “*connecting people*” or is our job more directed towards *maintaining links* between already connected persons? In this way, telcos will provide their residential customers a maximum of interaction possibilities to better organise or to free the time to pass with the people they are important to. Telcos will thus multiply forms of real time or asynchronous interactions adding image to voice or text transmissions, and maybe someday, smell or touch. Providing these social interactions potentials may be defined as the ultimate goal in the provision of communication technologies for the individual customer.

## 6 References

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- [1] Watzlawick, P., Beavin, J.H., and Jackson D.D. *Pragmatics of Human Communication*, Norton, New York, 1967.
  - [2] Rogers, E.M. *The Diffusion of Innovations*, The Free Press, New York, (fifth ed.) 1995.
  - [3] Mante-Meijer, E. et al. “ICT Uses in Everyday Life: P903 Final report”, EURESCOM, Heidelberg, 2001.
  - [4] Cole, J. I. (ed) “Surveying the Digital Future”, UCLA Center for Communication Policy, Los Angeles, 2000; Hampton, K., and Wellman, B. “Examining community in the digital neighborhood: early results from Canada's wired suburb”, in: I. Ishida and K. Isbister (eds) *Digital Cities: Experiences, Technologies and Future Perspectives*, Springer, Heidelberg, 2000; DiMaggio, P.,

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- Hargittai, E., Neuman, W. R., and Robinson, J. P. "Social Implications of the Internet", *Annual Review of Sociology*, vol. 27, 2001, pp. 307-336.
- [5] Katz, J.E., Rice, R.E., and Aspden, P. "The Internet, 1995-2000: Access, civic involvement, and social interaction", *American Behavioral Scientist*, (forthcoming).
- [6] Kraut, R., Lundmark, V., Patterson, M., Kiesler, S., Mukopadhyay, T., and Scherlis, W. "Internet Paradox: A Social Technology That Reduces Social Involvement and Psychological Well-Being?" *American Psychologist*, vol. 53, 1998, pp. 1017-1031.
- [7] Lelong, B. and Thomas, F. "Familles en voie de connexion", *La Recherche*, n°328, 2000, pp. 79-82.
- [8] Pew Internet and American Life Project. "Survey November-December 2000", ([http://www.pewinternet.org/reports/chart.asp?img=6\\_daily\\_activities.jpg](http://www.pewinternet.org/reports/chart.asp?img=6_daily_activities.jpg))
- [9] Smoreda, Z. and Licoppe, C. "La téléphonie résidentielle des foyers: réseaux de sociabilité et cycle de vie", in: *Actes du 2nd Colloque ICUST, Arcachon, 1999*.
- [10] Burt, R. "Kinds of Relations in American Discussion Networks", in: C. Calhoun, M. Meyer and W. Scott (eds) *Structures of Power and Constraint*, Cambridge University Press, Cambridge, 1990.
- [11] Licoppe, C. and Smoreda, Z. "Liens sociaux et régulations domestiques dans l'usage du téléphone", *Réseaux*, vol. 18, , no. 103, 2000, pp. 255-276.
- [12] Pool, I. de Sola, *Forecasting the Telephone*, Ablex, Norwood NJ., 1983
- Claisse, G. and Rowe, F. "Téléphone, communications et sociabilité: des pratiques résidentielles différenciées", *Sociétés Contemporaines* n°14/15, 1993, pp. 165-189.
- [13] Thomas, F. "Telefonieren in Deutschland". *Schriftenreihe Max-Planck-Institut für Gesellschaftsforschung*, vol. 21, Campus, Frankfurt/Boulder, 1995.
- [14] Licoppe, C. "Deux modalités d'entretien téléphonique des liens interpersonnels: du téléphone de maison aux terminaux mobiles", *FTR&D/UCE, Issy, 2001* (unpublished manuscript).
- [15] Hellwig, O. and Lloyd, R., *Sociodemographic barriers to utilisation and participation in telecommunication services and their regional distribution: a quantitative analysis*. University of Canberra, National Centre for Social and Economic Modelling, Canberra, 2000.
- [16] Pfeil, E. *Großstadtforschung*, Jänecke, Hannover (second ed.) 1972.
- [17] Fischer, C. S., *America Calling: A Social History of the Telephone to 1940*, University of California Press, Berkeley, 1992.
- [18] Wellman, B. and Frank, K. "Network capital in a multi-level world: Getting support from personal communities", in: N. Lin, R. Burt and K. Cook (eds) *Social Capital: Theory and Research*, Aldine de Gruyter, Chicago, 2001.
- [19] Castells, M. *The Power of Identity*, Blackwell, Oxford, 1997