

This paper looks at the findings of a survey conducted in February 2003 on a representative sample of a Hungarian city.

Investigations in the field of mobile communication can be traditionally classified into either of two research paradigms: the “*technical diffusion*” and the “*new user patterns*” paradigms. The first is focusing on similarities and dissimilarities between the diffusion of emerging (e.g. mobile) and pre-existent telecommunication technologies by comparing patterns and groups of first users in both technological realms. For the second, emerging technologies are defined as a new social realm and the emphasis is put on the appearance and the disappearance of communication patterns, lingual inventions, styles of speech as a result of technical development at a given historical stage. This approach is basically dealing with the supposedly *new communication algorithm*, whilst its diffusion and interpenetration in the social framework is of secondary importance.

In this paper we give a short summary of the survey, through which we attempt to develop, on empirical grounds, a third methodological approach. In our view, interactions in human communication networks follow culturally defined specific patterns which form and develop according to traditions, inventions, socially conditioned and transmitted norms, personal goals, financial conditions and lifestyle. In our theory, the use of any new communication tool and technology is subordinate to communication networks existing prior to its appearance. Accordingly, new mobile phone users do no more than place the brand-new tools in the context of these historically pre-existent networks. We of course do not exclude that new technologies may generate new consumer needs and demands, but maintain that inventions are getting organically incorporated into the already existing networks. Mobile communication would therefore first be placed in the realm of personal communication which would undergo specific transformations only as a result.

With the focus on private communication networks, business communication is categorically excluded. We are aware of the fact that production and service also engender communication acts, moreover per-

sonal communication networks may also originate at the workplace and that the personal and business communication elements might be interwoven and sometimes hard to separate. It is also obvious that personal communication networks are often maintained through means of business communication during the day. However, the scope of our survey is reduced to the personal, non-business interactions. We conceive the analysis of the communication network order of Hungarian society as a process on multiple levels. On the one hand, the achievements of such a survey will necessarily contribute to the improvement of our analytical skills and methodology. On the other hand, these individual (private) fragments of the entire social communication network can also be analyzed as compact social spaces having their own realm.

Given the complexity of its communication networks, any city would stand as a perfect example of these social spaces. Accordingly, our methodology was tested by conducting a field study in a Hungarian city of medium size as a first step.

As a location of our research, the town of Szeged has been chosen. It is a settlement which – with its 150,000 inhabitants, cultural heritage and importance both with respect to regional and cross-border dimensions – is at the centre point of the surrounding region. Our survey was conducted on a personal sample of 500, representative of the entire population of Szeged over the age of 15. This was complemented by an additional sample of 100 representing the more than ten thousand college and university students.¹ (Although the student population at Szeged is constantly changing, they still organically belong to the connection and communication networks of the residents.)

We built two different tools for collecting information: the first, a personally administered questionnaire was complemented by a second, a so-called communication diary (self-administered). The self-administered diary enables us to register every single private “communication act” of individuals during an entire week broken down into daily items as accurately as possible.

¹ Given this sample definition, by “population” we consequently mean “inhabitants of Szeged aged 15+”.

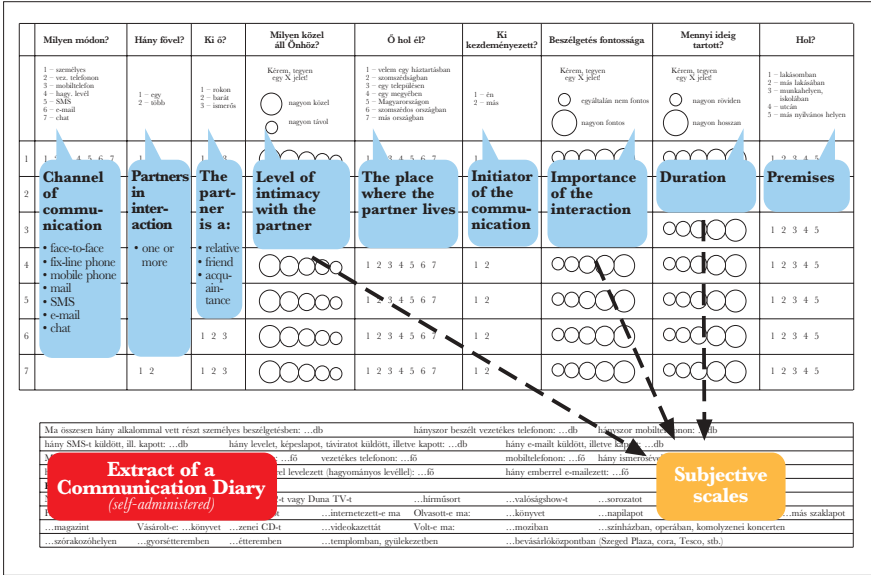


Diagram 1

Records to be registered with regard to every single communication act include the type of communication channel (personal, telephone – mobile or fixed –, written mail, SMS, e-mail), the number of participants and a categorized summary of their identity, the initiator, the importance, the duration and the place of the communication act. The diary was set up in a way to allow the individual to apply a basically subjective classification of its interactions; therefore no values were highlighted on the scales used for measuring specific aspects of these interactions, and circles of different size were applied instead. Our second source of information, the questionnaire was administered prior to the diary. It focused on communication habits, their social and cultural background and info-communication equipment in the household. The diary completion rate was 577 out of 600 for a full-week period.

It is interesting to learn that 71% of Szeged’s inhabitants are mobile phone users to some extent. Within the mobile user population, one-third (33%) are users for more than 2 but less than 4 years, 12% for 5–6 and 5% for more than 6 years. New mobile users (those with less than 2 years of experience) account for 50%. (Later we will come back to these segments when analyzing effects of mobile phones on communication networks.)

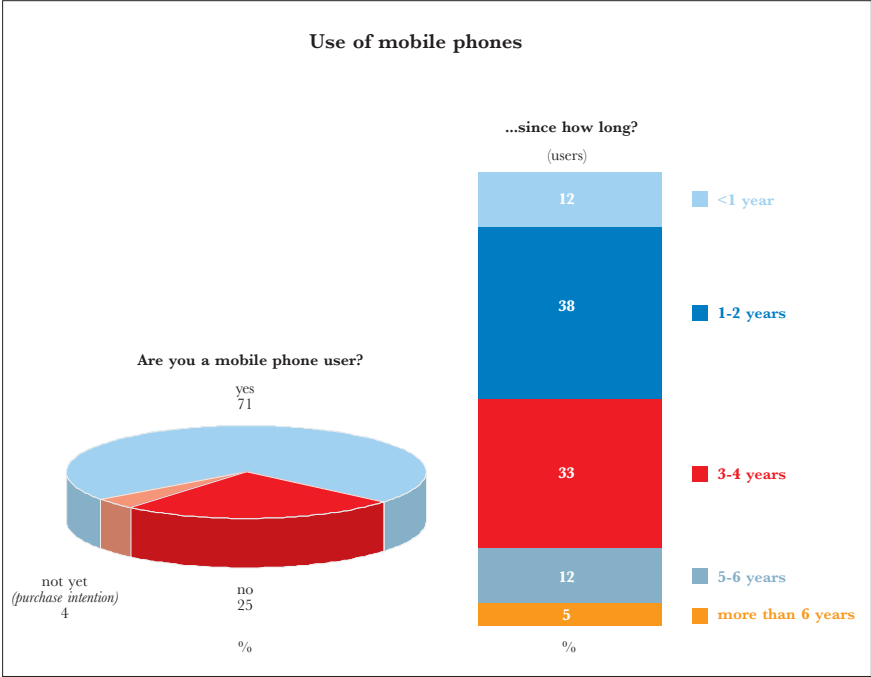


Diagram 2

As a first step, we divided the inhabitants of Szeged according to the intensity of their interactions. Intensity is defined as the number of communication acts in which individuals in the sample took part during the examined week. One of the focuses in this survey being mobile communication, we isolate 2 main types of communication:

- *mobile:*
 - all communications acts performed with the use of cellular phones, including conversations and
 - sending and/or receiving SMS messages;
- *non-mobile:*
 - personal conversations,
 - conversation on the wired telephone network,
 - “traditional” (paper) mail,
 - e-mailing,
 - internet chat.

Once the intensity scales for both mobile and non-mobile communications are set up, we will isolate 4 different groups along these 2 axes. Each group is named according to what seems to be their major characteristics in terms of their socio-demographics, preferred communication channels and lifestyle. Most important of all is the segment of those with low communication intensity on both axes: 53% are classified here as “Quiet”. The second segment is comprised of those with low intensity on the non-mobile and high intensity on the mobile axes (“Mobile”, 13%). The third segment is composed of the opposite: people classified here participate in very few mobile communication acts but have high scores on the non-mobile intensity axis (“Non-mobile”, 17%). Finally, the last segment has high scores on both intensity axes (“Dynamic”, 17%).

Means of communication acts within 4 groups defined on the basis of communication intensity

	Size in population	Total of comm. acts/week (mean)	Mobile comm. acts (phone+SMS) /week	Non-mobile comm. acts /week
“Quiet” (mobile low – non mobile low)	53%	25	5,3	19,7
“Mobile” (mobile high – non mobile low)	13%	61,5	36	25,6
“Non-mobile” (mobile low – non mobile high)	17%	73,2	9,4	63,8
“Dynamic” (mobile high – non mobile high)	17%	121,1	45,6	75,5
Sample total		54,6	16,9	37,7

Diagram 3

The average weekly amount of private communication acts is 55 for 1 individual in the total population. The difference with regard to the number of contacts is five times between the “Dynamic” and the “Quiet”. At the same time, the “Mobile” and “Non-mobile” do not much differ in terms of their number of contacts, both having higher communication intensity scores than the sample average. Nevertheless, the “Non-mobile” still have a slightly higher average number of contacts. One would point out that it is the “Mobile” segment which tends to achieve a balance between the two major communication patterns (their number of contacts is 36 for mobile and 26 for non-mobile), rather than the “Non-mobile” (with 9 and 64 contacts respectively). It is also worth noticing that the pre-eminence of non-mobile channels is maintained in the “Dynamic” group as well, while the number of their mobile interactions is still three times the sample average.

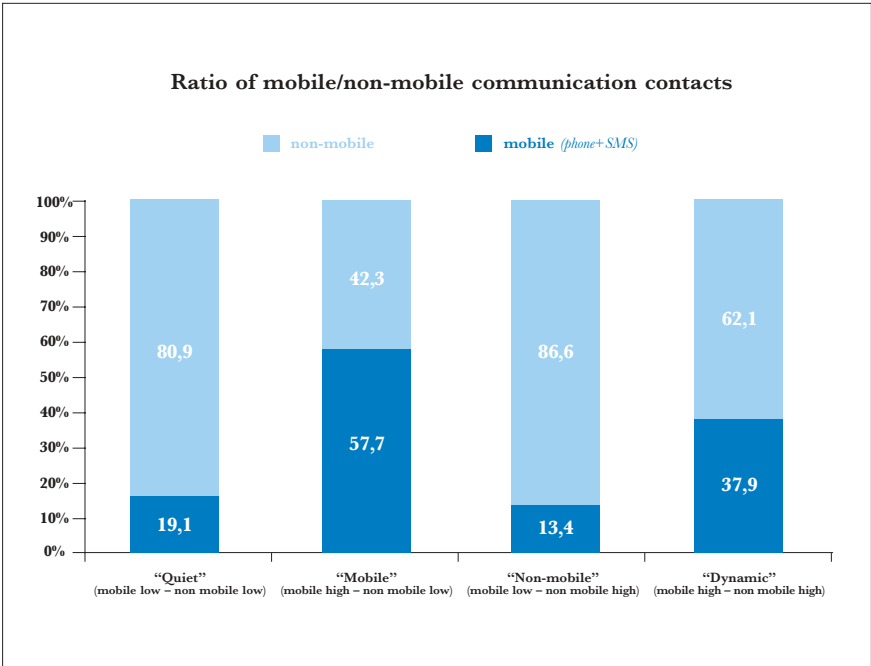


Diagram 4

An additional comparison of these 4 segments defined along the mobile/non-mobile axes will show the share of different communication

channels within the sum of interactions. Based on data gathered by the means of the “communication diary”, non-mobile interactions account for almost three-fourth (73%) of all communication acts, while the share of mobile channels is only 27%. The use of non-mobile channels is especially predominant within the “Quiet” segment where the intensity of communication acts is low. On the other end of the intensity scale, mobile interactions account for 38% in the “Non-mobile” segment and are especially dominant in the “Mobile” segment (58%).

**Share of different communication channels within
the total of communication contacts**
based on number (and not duration) of interactions

	Channel					
	face-to-face	fix phone line	mobile	SMS	mail	e-mail
“Quiet” (mobile low – non mobile low)	56%	22%	14%	5%	2%	1%
“Mobile” (mobile high – non mobile low)	31%	7%	31%	27%	1%	2%
“Non-mobile” (mobile low – non mobile high)	63%	19%	10%	4%	2%	3%
“Dynamic” (mobile high – non mobile high)	43%	10%	21%	17%	1%	7%
Sample total	52%	18%	17%	10%	2%	3%

Diagram 5

The analysis of the two basic axes (mobile/non-mobile) takes us closer to the exact share of specific communication channels. The “Quiet” have a higher share of personal and fixed-line interactions within their communication mix, yet their share of mobile interactions is not much lower than the city average. In contrast, the “Dynamic” have a significantly lower share of personal (43%) and fixed-line channels (10%). It is their affinity for SMS which differentiates them the most from the other groups while their “mobile” share is only slightly above the sample mean.

Apart from highlighting basic (technical) parameters of these communicating segments, it is also interesting to learn more about their socio-demographic background by focusing on what differentiates them the most from the average city dweller. As a rule, the segment of the “Mobile” consists of more men (55%) than women and the presence of the 16–25 age group is especially significant here. The “Dynamic” segment is discriminated by the age variable as 74% of them belong to the 16–35 age group. Accordingly, the weight of students is also important among them (50%). The “Non-mobile” has the highest portion of college or university graduates (28%) (education being their most differentiating feature), but they are also more likely to be female (62%) than male. Not surprisingly, the “Quiet” segment has a higher portion (27%) of the elder (aged 66+), while those with lower education level (max. elementary school) and pensioners account for 34% and 49% among them. Interestingly enough, the portion of college or university graduates is not a differentiating factor between the “Quiet” and the “Dynamic” segments.

**Main features of the 4 groups defined
on the basis of their communication intensity**

	“Quiet“ (mobile low – non mobile low)	“Mobile” (mobile high – non mobile low)	“Non-mobile“ (mobile low – non mobile high)	“Dynamic“ (mobile high – non mobile high)
Gender		male (25%)	female (62%)	male (55%)
Age	66+ (27%)	16-25 (44%)		16-25 (49%)
Education	max. elementary (34%) apprentice school (20%)		college, university (28%)	high school (56%)
Activity	pensioner (49%)			student (50%)

Diagram 6

The role of social and cultural conditioning in the development of communication networks becomes evident when examining the education of the father: in the “Quiet” and the “Dynamic” segments, the correlation with this variable is more significant than with respondents’ education level. Among the “Quiet”, 46% have fathers with lowest educational level while only 9% have fathers with graduate level. These figures are 12% and 31% respectively among the “Dynamic”. Another indicator of the cultural capital is the number of books: households with more than 500 books are overrepresented in the “Dynamic” segment where the portion of households with maximum 100 books is lower than the average. The opposite goes for the “Quiet”.

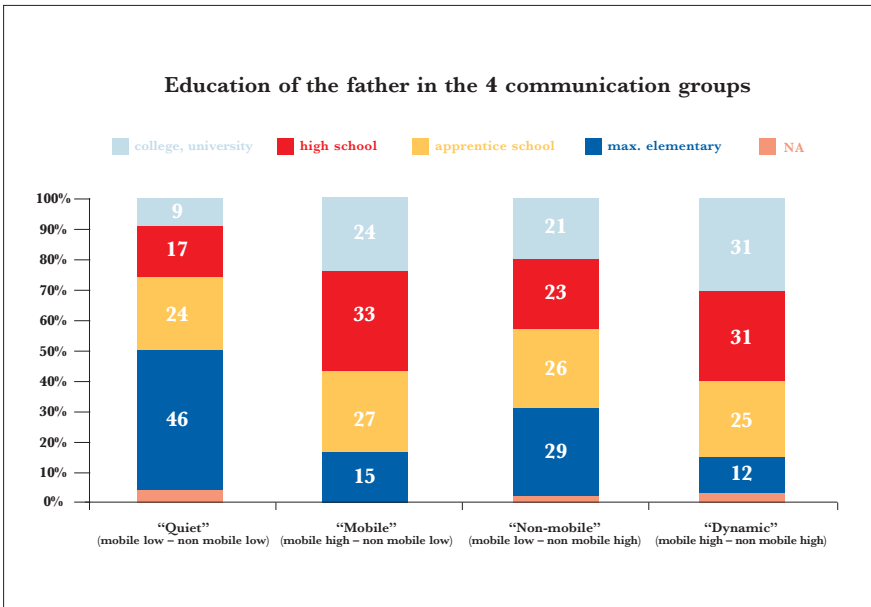


Diagram 7

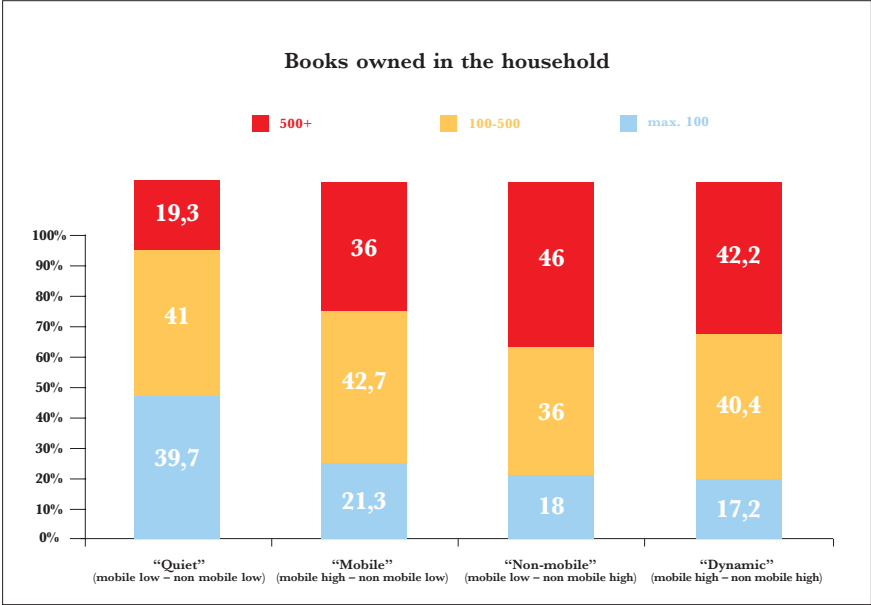


Diagram 8

We made an attempt to map city-dwellers' interpersonal networks. The objective here is only to give a "sketch" of, rather than fully represent, what makes up any individual's social environment in its vast complexity. Accordingly, respondents were asked to list a maximum of five persons out of their households whom they regularly contact and who had to be of some importance to them. (Nonetheless, only 20% registered a total of 5 persons.) Frequency and channels of communication were also registered for each person on the list. Treating these interpersonal connections as equally important (i.e. without weighting each of them as a function of its intensity of contact), we proceed to establish the social network of the population.

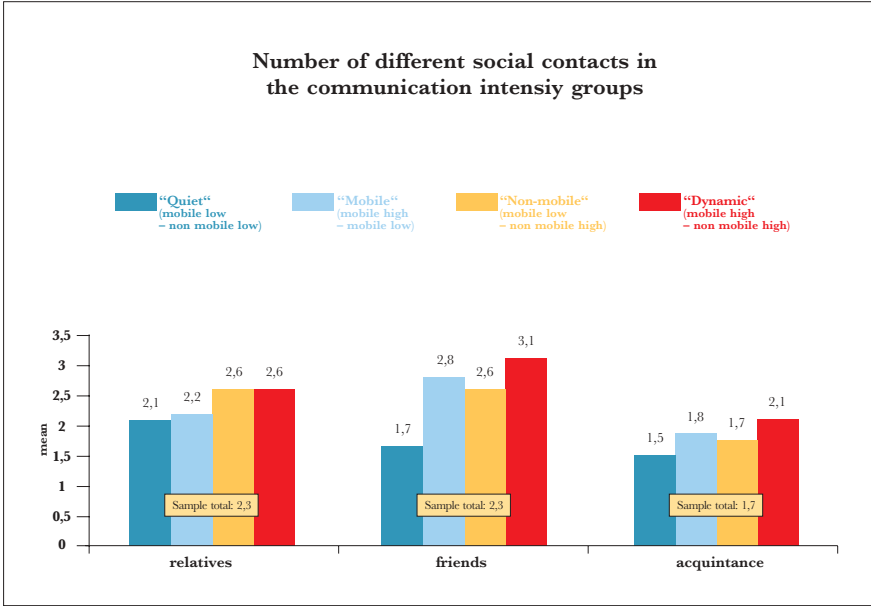


Diagram 9

It is in the number of friends that our four segments differ the most while differences are less important in the number of their familiar contacts and acquaintances.

In addition to a set of information with regard to this interpersonal network, data are also available concerning the number of actors at the “other end” of the communication channels in daily segments. Actors involved in communications by means of the four most important channels (face-to-face conversation, fixed-line and mobile telephoning, SMS) were considered as decisive elements of the communication network, hence their number requires specific attention. We found that the four groups tend to differ in the number of their correspondents in accordance with the number of communication acts they participate in. This is particularly true as regards face-to-face interactions but the conclusion is similar as regards conversations by means of mobile phones, too.

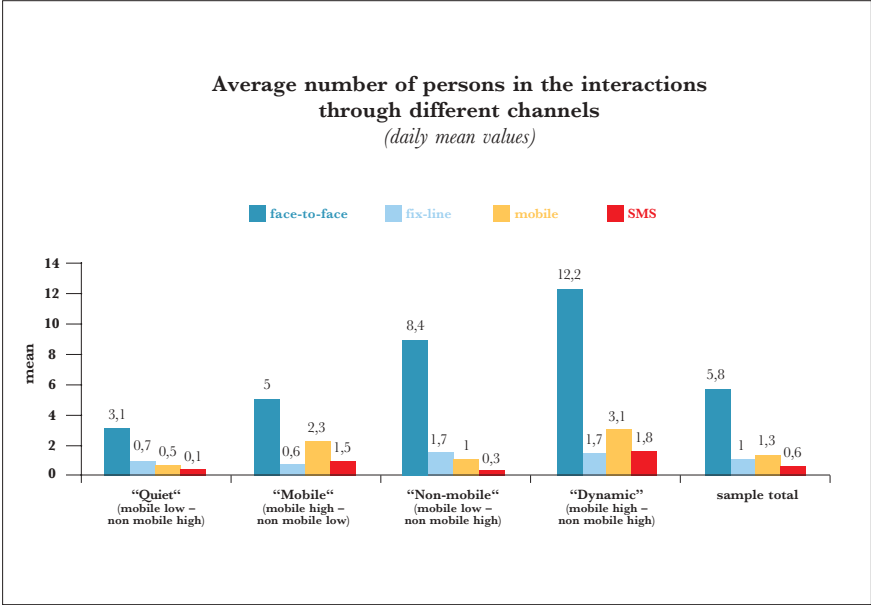


Diagram 10

The examination of a set of qualitative indicators comes at a following stage. Classification is made using cluster analysis of the following variables:

- duration of interactions (1 to 5 on a subjective scale),
- importance of the subject discussed (1 to 5),
- number of actors involved (0 = 2, 1 = 3+),
- the identity of the initiator (0 = respondent, 1 = other person),
- level of intimacy with the partner (5 to 1 on a subjective scale).

The identity of the initiator and the number of actors proving to be rather secondary aspects, differentiating is therefore fundamentally based on the level of intimacy, the subject discussed and the duration of the interaction.

Cluster analysis of communication patterns
using variables of non-instrumental aspects of interactions

Aspects	Final cluster centers				Sample mean
	1.	2.	3.	4.	
Level of intimacy (1-very intimate, 5-not intimate at all)	1,70	3,08	1,83	2,48	2,20
Importance of the interaction (5-very important, 1-not important at all)	4,03	2,74	3,09	3,50	3,46
Duration (1-5)	3,47	2,46	2,53	3,04	2,97
Initiator of the interaction (him/herself)	51%	55%	51%	49%	51%
Ratio of interactions with more than 1 participants	27%	32%	19%	30%	27%
Size of clusters in the total sample	28,1%	13,9%	21,6%	36,3%	
Labels	“Intimate“	“Shallow“	“Moderate“	“Average“	

Diagram 11

The cluster analysis led to four clusters in the five-dimensional space defined by the above variables.

Cluster 1: “Intimate”. Longer interactions with more intimate partners, important subjects (28⁰% of the population).

Cluster 2: “Shallow”. The opposite of cluster 1: shorter interactions, less intimate partners, superficial subjects (14⁰%).

Cluster 3: “Moderate”. Shorter interactions than the average, rather superficial subjects with intimate partners (22⁰%). Predominance of the “tête-à-tête” conversations.

Cluster 4: “Average”. Average on most aspects with slightly less intimate partners (36⁰%).

Communication patterns vs. groups defined by intensity

	Clusters			
Intensity groups	1.	2.	3.	4.
	“Intimate”	“Shallow”	“Moderate”	“Average”
“Quiet” (mobile low – non mobile low)	35%	15%	17%	33%
“Mobile” (mobile high – non mobile low)	17%	11%	35%	37%
“Non-mobile” (mobile low – non mobile high)	27%	16%	22%	35%
“Dynamic” (mobile high – non mobile high)	17%	10%	25%	48%
Total sample	28,1%	13,9%	21,6%	36,3%

Diagram 12

Following a comparison of these four clusters with the four segments defined along the two communication axes (mobile/non-mobile) the structures of the communication networks in the city become visible. Different patterns are detected according to the intensity of mobile and non-mobile communications. For example, the “Quiet” are more likely to be “Intimate” (35%) than the “Mobile” (17%). The “Moderate” are overrepresented in the “Mobile” segment. The “Non-mobile” are the least differentiated while the “Dynamic” are the most differentiated from that of the average city-dweller. The “Dynamic” are less likely to be “Intimate” (17%) and almost half of them (48%) belong to the “Moderate” cluster. This may be due to the high number of interactions they participate in.

The experience in using mobile phones (measured in years of use) is also a common differentiating feature. Those with more than four years of use have the lowest portion of “Quiet” (29%) among them while almost half (46%) of those with 1 to 2 years of use belong to this segment. In contrast, the “Mobile” are more likely to appear among those with more than four years of use (30%) than among “newcomers” (up

to 2 years of use, 13%). Interestingly, the “Non-mobile” are not characteristic of any of the groups defined on the basis of experience.

Proportion of intensity groups within segments according to experience of mobile phone use

	How long have you been user of mobile phones?			
	up to 2 years	3-4 years	more than 4 years	total sample
“Quiet“ (mobile low – non mobile low)	46%	38%	29%	41%
“Mobile” (mobile high– non mobile low)	13%	22%	30%	19%
“Non-mobile“ (mobile low – non mobile high)	18%	17%	13%	17%
“Dynamic” (mobile high – non mobile high)	23%	23%	28%	24%
Total	100%	100%	100%	100%

Diagram 13

Without having attempted here a full array of empirical verification, the results we highlighted in this paper can be interpreted as indicators showing that mobile communication, as it is becoming an integral part of our everyday life, is also contributing to the transformation of human communication networks. It is not only a technological invention but also a new social realm. It seems as if mobile communication would contribute to the intensification of everyday interactions without at the same time weakening parallel (already existing) communication channels. At this stage of the research we have only drawn a sketch of where we stand now: a more profound and longer analysis of the enormous amount of information collected by the diary and the questionnaire still lies before us. What’s more, we hope that this research will be a step forward towards a more extensive survey to be conducted on a nationally representative sample in order to fully explore communication networks in Hungarian society.

