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Links between the diffusion of Internet usage and social network characteristics in
contemporary Hungarian society. A longitudinal analysis.**

INTRODUCTION

The diffusion of Internet usage has reached its saturation point in several countries. In the U.S.A. and Scandinavian countries 70-80 % of the population is Internet user and this ratio has not really increased during the past years. Just on the contrary in Hungary the spread of PC and Internet use (the diffusion process) seems to have stopped, as for example the ratio of households equipped with a PC increased only by 1% from 2003 to 2004, which is exactly the same as the increase in the ratio of those having colour television sets, which is supposed to be an „old” technique¹. Similarly the yearly 2% increase in Internet-access at home can hardly be interpreted as a dynamic one: if the increase keeps this pace, then it would take Hungary exactly 25 years to reach the present ratio of home Internet access in the U.S.A.

Nonetheless sociologists can be happy with this otherwise undesirable phenomenon as this provides a good opportunity to study several questions of the social diffusion of the Internet while in process. In countries where the diffusion process is already at its end, similar research questions can not even be studied retrospectively. Definitely such an area is the impact of the Internet on sociability and social capital of the individuals, and the exploration of the cultural and communicational obstacles of the diffusion process. It is interesting that the research of sociability is especially popular in countries (e.g. the U.S.A.) where the spread of ICT tools have almost reached saturation, and where now the real social impact of these techniques became the indispensable question. At the same time it is exactly the high level of penetration which makes it impossible to detect the real mechanisms of ICT tools from the beginning of the process. Due to these lost opportunities some questions are very difficult to answer, whereas in countries with low levels of ICT penetration and an „underdeveloped” information society this knowledge would be very important for phrasing political, economic and social priorities.

In our study we examine the relations and impacts of Internet-use and network characteristics. A longitudinal analysis was done on a sample of more than 2000 Hungarians from 3 waves of a panel survey, the World Internet Project (2001, 2002, 2003). We test four hypothesis which were formed while analysing the cross-sectional data of 2002, which lists the theoretically possible relationships between sociability and Internet usage.² The longitudinal analysis facilitates the comparison of the changing relationships of groups who were Internet users in all three years surveyed, those who did not use the Internet at all in this period, and those who just started and those who gave up using the Internet. The panel research project was launched before the real boom

¹ In case of television this increase happened at a penetration rate of 94%, PC has a penetration rate of 32%.

² In more detail see: MOLNÁR, Szilárd: *Sociability and Internet*. Review of Sociology Vol. 10 (2004) 2, pp. 67-84.

Links between the diffusion of Internet usage and social network characteristics in contemporary Hungarian society in the diffusion process and hopes to provide an understanding of the mechanisms and impact of Internet use and social capital.

SOCIAL CAPITAL AND THE INTERNET

Putnam presents several data sets to support his claim about the general decline of social capital in the USA and other modern societies since World War II. The spread of information technologies further enlarged these fears thus the debate on the impact of computer networks on interpersonal relationships and social networks became more vivid.

Some researchers argue that the Internet is unable to create strong, emotional ties between people thus time spent on the Internet decreases time spent with primary groups³, that is users become socially more isolated. The fast spread of ICT tools let other issues to emerge⁴, which supported the further isolation of users: the Internet pries users out of their social networks as they contact family, friends and other community members less. According to professor Norman Nie e-mail facilitates the communication between people in vain if it cannot provide the atmosphere of having a talk over coffee or beer, of being hugged, thus the Internet can be the ultimate isolating technology which destroys communities already weakened by television and automobiles. They found that “the more time someone spends on the Internet, the less time one spends with real human beings.”⁵

Based on longitudinal analysis in the United States⁶ Internet usage may lead to a decrease in the frequency of visits to friends and family, what is more, this effect is stronger in case of those who used to have more personal relationships prior to starting to use the Internet. All this can result that society becomes more irresponsible and atomistic due to the use of computer-networks.⁷ The representatives of the pessimistic view say that even if new ties are created via the Internet, these are merely weak ties⁸, as e-mailing is an „inferior” communication compared to talking on the phone or a personal visit. Thus ICT tools provide opportunities for strengthening anonymity and individualism, and also weaken social norms, the level of trust, and erode social capital⁹.

³Nie (at al) emphasises this phenomenon especially in case of home users. See NIE, Norman – HILLYGUS, S. – ERBRING, L.: *Internet Use, Interpersonal Relations and Sociability*. In: *The Internet in Everyday Life*. Blackwell, 2002

⁴ See for example the first *Internet and Society* volume published in February 2000 at Stanford University, edited by Norman NIE and Lutz ERBRING (Norman H. NIE AND Lutz ERBRING (2000): *Internet and Society*. Stanford Institute for the Quantitative Study of Society), in which a number of studies argue for this trend.

⁵See the news release on the results of the Study of the Social Consequences of the Internet: http://www.stanford.edu/group/siqss/Press_Release/press_release.html

⁶ KRAUT, Robert – RAINIE, Lee – SHKLOVSKI, Irina: *The Internet and Social Participation: Contrasting Cross-Sectional and Longitudinal Analyses*. *Journal of Computer-Mediated Communication* 10 (1), 2004

⁷LEVINE, Peter: *The Internet and Civil Society*. In Verna V. Gehring, ed., *The Internet in Public Life* (Rowman & Littlefield, 2004, pp. 79-98.

⁸Of course in the optimistic view weak ties are also important resources.

⁹ KIESLER, S., J. SIEGEL, and T. W. MCGUIRE (1991). Social psychological aspects of computer-mediated communication. Pp. 330-349 in C. Dunlop and R. Kling, eds., *Computerization and controversy: Value conflicts and social choices*. San Diego, CA: Academic Press

Other surveys found that Internet users do not spend less time dealing with their social relationships than non-users¹⁰. On the contrary, using the Internet may even strengthen their existing relationships by a widening selection and easier accessibility to means of communication, and on the other hand such new relationships formed online can be just as useful as offline relationships. Barry Wellman articulates more precisely: “Taken together, our results suggest that the Internet is increasing social capital, civic engagement, and developing a sense of belonging to online community”, and this development is detectable in case of online communities¹¹.

Similar results were found on the basis of the cross-sectional Hungarian data of the World Internet Project (WIP) in 2002, when we tested whether sociability indices and attitudes of Internet users differ from those of non-users, and if so, in what way and to what extent. We found¹² that from the aspect of social capital, intensive and long-time Internet users are by no means in a disadvantageous situation, but on the contrary, using the Internet positively correlated with the volume of social activity not only when comparing the groups of users to non-users but also among the groups with the same age, sex and social status. That is, if we consider those in their fifties we find that Internet users are more active in the non-profit sector, show higher levels of community commitment, spend more time with friends and sports, and value community as an important source of information more than the group of non-users.

The sociability of users and non-users from the same socio-economic background was also compared. A completely unambiguous result indicated that among users and non-users hailing from the same social background the users time and time again have higher sociability indices, that, in addition, rise in direct ratio with their time spent on the Internet.

¹⁰ For example studies of Cole and Robinson indicate that Internet-users have more positive social attitudes and feel less lonely. See: COLE, Jeffrey és ROBINSON, John: *Internet Use And Sociability in the UCLA*. IT&Society, Volume 1, Issue 1, Summer 2002, pp. 202-218

¹¹ WELLMAN, Barry (and Anabel Quan Haase, James Witte, Keith Hampton) (2002): *Növeli, csökkenti vagy kiegészíti az Internet a társadalmi t?két?* Információs Társadalom, II. évf. 1. szám, 2002. and WELLMAN, Barry at al (2002): *Capitalizing on the Net Social Contact, Civic Engagement and Sense of Community*. In.: *The Internet and Everyday Life*, Blackwell, 2002.

¹² See in more detail: MOLNÁR Szilárd: *Az elektronikus hálózatok társadalmi értéke. Szoftver, Internet, társadalmi t?ke*. Innen: *Internet.hu. A magyar társadalom digitális gyorsfényképe* Vol. II. and MOLNÁR, Szilárd: *Sociability and Internet*. *Review of Sociology* Vol. 10 (2004) 2, pp. 67-84.

Fig. 1. Sociability of groups with various education levels, according to use and non-use of the Internet

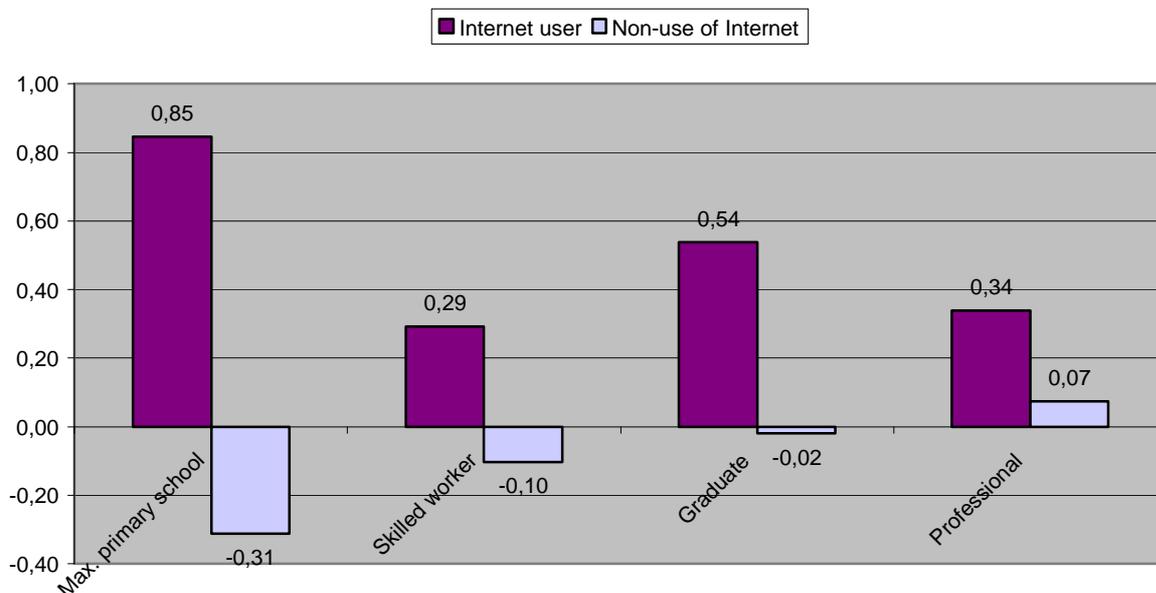
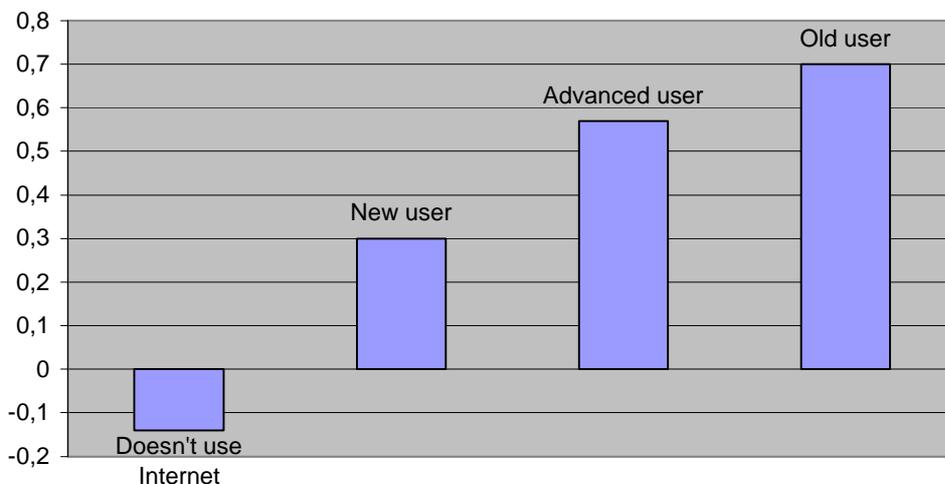


Fig. 2. Levels of sociability in the different groups based on Internet use



It seems that experienced, more extensive (not unvarying) and lengthier use of the Internet as a tool for both communication and contact-establishment can help to raise social capital. But regarding causality we could only propose hypotheses to be tested on longitudinal data as it is the only way to see whether today's experienced users began using the Internet specifically because they already had a more widespread social network at their disposal or whether their social capital has increased purely because of their using the Internet. Which model stands more efficiently? Did experienced users start using the Internet because they already had higher social skills whose higher needs could be perfectly satisfied by the Internet? Or is it the case that lengthy use of the Internet has a beneficial effect on communicative and contact-making competencies? In order to answer

these questions truly, we would have to compare the current users with their former selves before they started using the Internet, instead of contrasting them with people who are members of the same social strata but are currently unwilling or unable to deal with the Internet. We could test this hypothesis on adopters on a longitudinal dataset, provided by the 3-year longitudinal data of the WIP survey.

Based on the analysis of 2002 we proposed four hypotheses.

HYPOTHESES

Our first hypothesis is (1) that primarily people with originally more social capital start using the Internet, that is, we think that the trends of Internet diffusion is similar to that of the distribution of network capital/social relations.¹³

On the other hand using the Internet also affects sociability, social capital. This impact may have three directions.

„Positive impact” hypothesis:

(2) Using the Internet increases social capital. The older and the more intensive net-user someone is, the more likely one is able to increase his/her social capital by using the Internet.

„Neutral impact” hypothesis:

(3) Using the Internet neither increases nor decreases social capital.

„Negative impact” hypothesis:

(4) Using the Internet may result in the decrease of interpersonal contacts with friends and family members. It may be especially true among those having very high levels of social capital even before starting to use the Internet, and among those who spend a very significant amount of their time on the Internet.

SAMPLE AND METHODS

The longitudinal panel sample of the WIP in the years 2001-2003 provides – among other things – an excellent opportunity to study the dynamics of Internet usage. Analysing the data of almost 2700 respondents¹⁴ it turns out that during the given three-year period three-quarters of them did not use the Internet at all and the ratio of those using the Internet in all three years, that is, who

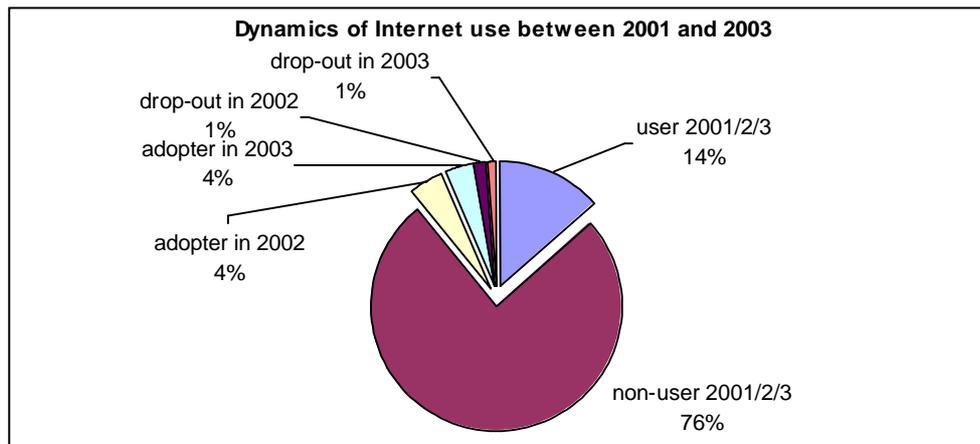
¹³ Albert Fruzsina- Dávid Beáta 1999: About friends. In: *Social Report 1998*, Eds: Kolosi et al. TÁRKI, Bp.pp:270-293. and ALBERT Fruzsina - DÁVID Beáta 2000: A kapcsolathálózatokról. In: *Növekedés alulnézetben. Társi Monitor jelentések*, December, pp. 247-253.

A general tendency is that men tend to have more friends than women, and more women have no friends at all than men. As age increases, the number of friends decreases; as the level of education, income and urbanization of the place of living increase the number of friends also increases.

¹⁴ We used a complex individual weight variable in the analysis which weighted cases based on age, education, sex and settlement type.

can be considered continuous users, is only 14%. The number of adopters is similar in 2002 and 2003, their ratio in the sample is 4% yearly. The ratio of drop-outs is one-fourth of the number of adopters, the same in both years. Based on our data it seems that 3% of the population aged 16 or older became Internet users yearly. (Figure 3.)

Fig. 3.



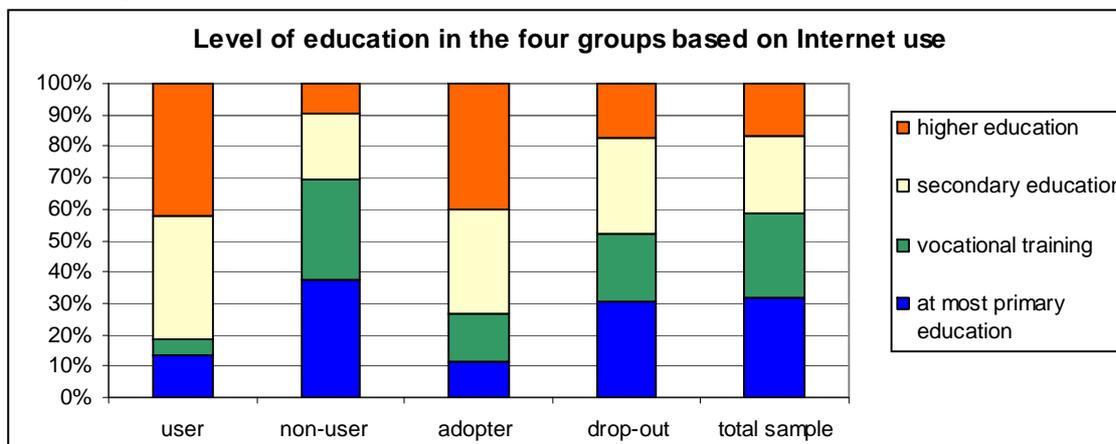
As to the dynamics of Internet usage four groups can be separated: the group of users (14%), non-users (76%), adopters (8%) and drop-outs (2%). By comparing the socio-demographic, network characteristics and sociability of these groups, we try to test our proposed hypotheses.

The socio-demographic variables clearly differentiate the four groups, in most aspects like age, level of education, region, ethnicity. Regarding sex the only difference is between the groups of users and non-users: 18% of men while 11% of women use the Internet.

It is not very surprising that the group where the average age is the highest is non-users (53 years). However it is interesting that the group of drop-outs seems to be the youngest (average age is 29 years), the group of users is little bit older (32 years old on average). The group of adopters is the second oldest with an average of 37 years.

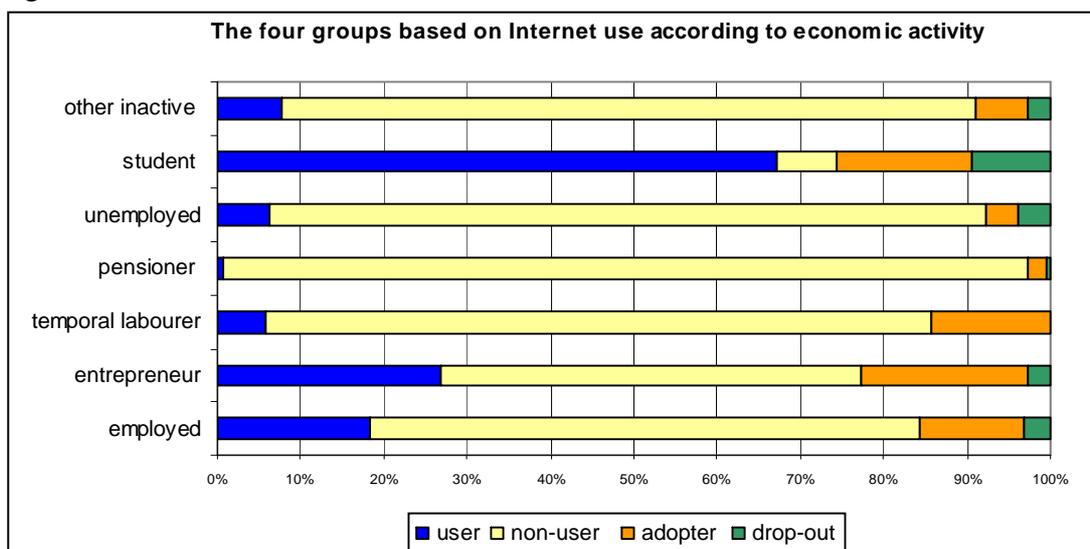
Figure 4 shows that primarily educational level is highest among the users and the adopters. The level of education of drop-outs is somewhat higher than that of non-users, but not so high as that of users and adopters.

Fig. 4.



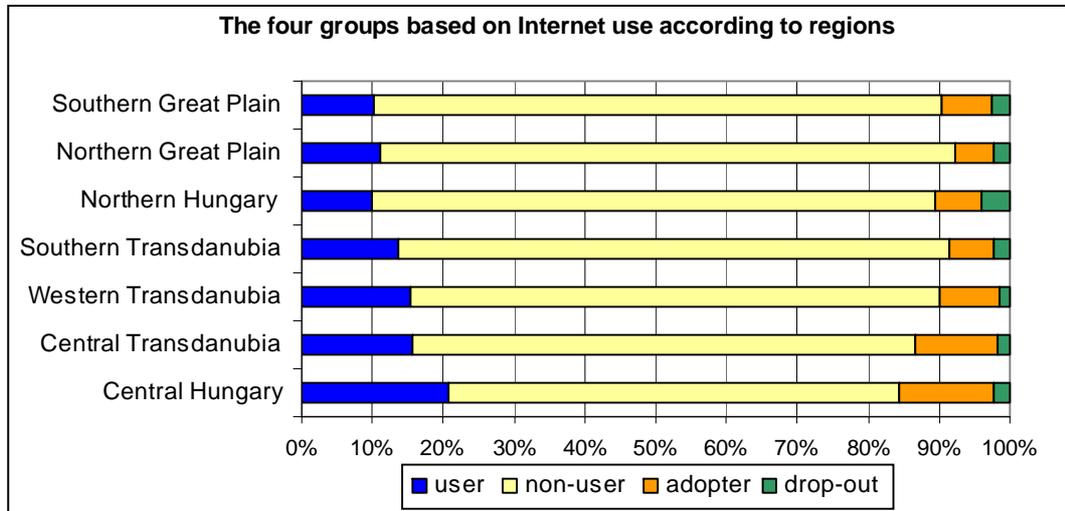
Economic activity indicates the already mentioned effects of age and education, so we cannot be surprised to see the „passivism” of pensioners (Figure 5.). Yet it is probably due to some compulsion that one of the most „active” Internet user group is that of the entrepreneurs, every fifth of them was an adopter. The group of students is very heterogeneous: we can find the highest ratio of users in this group, but the ratios of adopters and dropouts are also high.

Figure 5.



The regional distribution of the four groups is very different. Based on figure 6. Northern Hungary is the most disadvantageous region from the aspect of Internet usage. We can find the lowest ratio of users, and the highest ratio of dropouts in this region. Central Hungary is in the most favourable position: both the ratio of users and adopters are the highest here.

Fig. 6.



MULTIPLE LOGISTIC REGRESSION ANALYSIS

The most suitable tool to test our first hypothesis is multiple logistic regression. In the text and tables we only indicated relationships with a significance level of $p < 0,05$.

The groups (models in the logistic regression analysis) we compared:

- Internet users versus non users,
- those starting to use the Internet during the period of research versus the non-users
- those stopping to use the Internet in the research period versus those using the Internet in all three years.

The differences of the groups and the factors influencing the models were analysed by binary logistic regressions. The explanatory variables in our model were: sex, age, level of education, economic activity, level of education of the father, material conditions (income quintiles based on per capita household income), region of the place of living, settlement size, ethnicity of the respondent (Gypsy or not), and whether he/she lives alone. None of the models show significant relationships regarding ethnicity, and whether the respondent lives alone or not.

Table 1.: Logistic regression models in groups based on Internet usage – odds ratios (only significant ones)

| | Model 1 Odds for Internet usage versus non-users | Model 2 Odds for adoption versus non- users | Model 3 Odds for dropouts vs. Internet users |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| Sex <i>Reference category: women</i> | 1,670** | | |
| Age <i>Reference category: 14-29 year olds</i> | *** | *** | |
| 30-39 year-olds | ,481*** | | |
| 40-49 year-olds | ,325*** | ,387** | |
| 50-59 year-olds | ,168*** | ,146*** | |
| 60 or older | ,057*** | ,042*** | |
| Educational level <i>Reference category: max. primary</i> | *** | *** | *** |
| Vocational | | | |
| Secondary | 4,188*** | 2,835* | ,067* |
| Higher | 12,768*** | 9,910*** | ,017** |
| Region <i>Reference category: Central-Hungary</i> | ** | ** | |
| Central Transdanubia | | | |
| Western Transdanubia | ,258*** | ,246** | |
| Eastern Transdanubia | ,302** | ,215** | |
| Northern Hungary. | ,395** | ,359* | |
| Northern Great Plane | ,414* | ,226** | |
| Southern Great Plane | ,354** | ,246** | |
| Settlement type <i>Reference category: village</i> | | | |
| Town | | | ,277* |
| County town | | | |
| Budapest (capital) | | | |
| Father's level of education <i>Reference category: max. primary</i> | *** | * | |
| Vocational | | | |
| Secondary | | | |
| Higher | 5,977* | | |
| Economic activity <i>Reference category: employee</i> | *** | *** | |
| Independent entrepreneur | | | |
| temporary worker | | | |
| Pensioner | ,331** | | |
| Unemployed | | | |
| Student | 12,892*** | 11,237*** | ,031** |
| Other inactive | ,376** | | |
| per capita household income quintile <i>Reference category: the poorest quintile</i> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| top quintile | 2,143* | | |

Note: significant at a *0,05 level, **0,01 level, ***0,001 level

In the 3 models the independent impact of the explanatory variables are mostly manifested in Model 1: out of the 8 socio-economic variables in 7 there is a significant difference between Internet users and non-users (Table 1.). There are also quite strong differences between the groups of adopters and non-users, similarly to Model 1. Among others, due to the smaller number of cases the independent impact of the individual factors can be least detected in the Model 3 on the odds of drop-outs.

Examining the odds of men using the Internet is more than 1,5 times higher than that of women. With age advancing the odds of Internet usage dramatically decreases: as compared to those less than 30, the odds for those older than 60 to use the Internet is 94% less, but even in case of the group of 30-39 year-olds it is 50% less. Level of education has the strongest impact on Internet usage: as compared to those with maximum primary education, those with higher education have an odds ratio of 13, but even those with secondary education have more than 4 times higher chance to be in the group of Internet users. The chance of being an Internet user is 6 times higher in the group with higher educated fathers as compared to the children with fathers with primary education. As compared to the Central Hungarian region (the capital city, Budapest is included), in all other regions people have at least less than 50 % odds to be Internet users. Surprisingly even in the well-developed Western Transdanubian region the odds to be an Internet user is 75% less as compared to the central region. As compared to employees, students have 13 times higher, but pensioners 70% lower odds to be users. The positive impact of income can be detected only in the highest quintile: they are 2 times more likely to be Internet users than those in the lowest quintile.

In the analysed period between 2001-2003 the odds to be a new Internet user decreased heavily by ageing: as compared to those younger than thirty even those in their forties have 60% lower odds to start using the Internet. Again we find the dramatic impact of educational level: compared to those with primary education those with secondary education have almost 3 times, those with higher education almost 10 times higher odds to become new Internet users. As compared to central Hungary, those living in the other regions have app. 60-70% lower odds to become users. Compared to employees, students were 11 times more likely to become adopters.

Those who stopped using the Internet in the research period were 70% less likely to live in towns than in villages. They are 94-99% less likely to be found in the groups of the higher educated than in the group of those with primary education. The odds ratio for being a drop-out is 97 less in the group of students than in the group of employees.

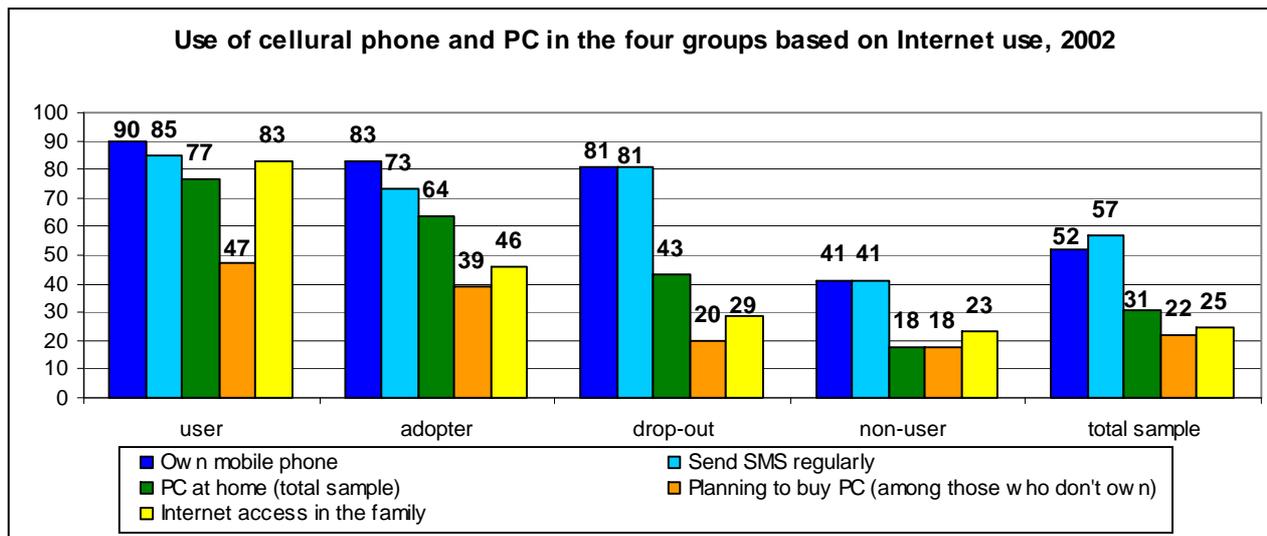
Drop-outs – those who stopped using the Internet

Regarding the drop-outs the multivariate analysis showed strong but quite few significant connections, maybe due to the low number of cases. At the same time cross-tabulations (Figures 4.,5. and 6.a) show quite a clear picture of the phenomenon. We think it is worth further considerations at least for policy decision making.

In spite of the fact that the drop-outs, being the youngest group, may seem to be in an advantageous situation from an innovative aspect, for them using the Internet is like a short flirt, lasting only for 1-2 years. They are not motivated enough individually or by their social

Links between the diffusion of Internet usage and social network characteristics in contemporary Hungarian society environment to become conscious, permanent users. The Internet does not become part of their daily routine, in fact nothing changes if they have no Internet access.

Fig. 7.



Note: We use the 2002 survey results because in this year we find data of both the adopters and the drop-outs

Figure 7. clearly demonstrates that the group of drop-outs is very similar to the group of non-users regarding owning PC at home, PC purchase and the presence of other family members using the Internet. As to their environment, drop-outs are a lot less motivated than adopters. Nonetheless cellular phone became an integral part in the lives of drop-outs (mainly young people): four-fifths of them actively send short messages (SMSs).

Fig. 8.

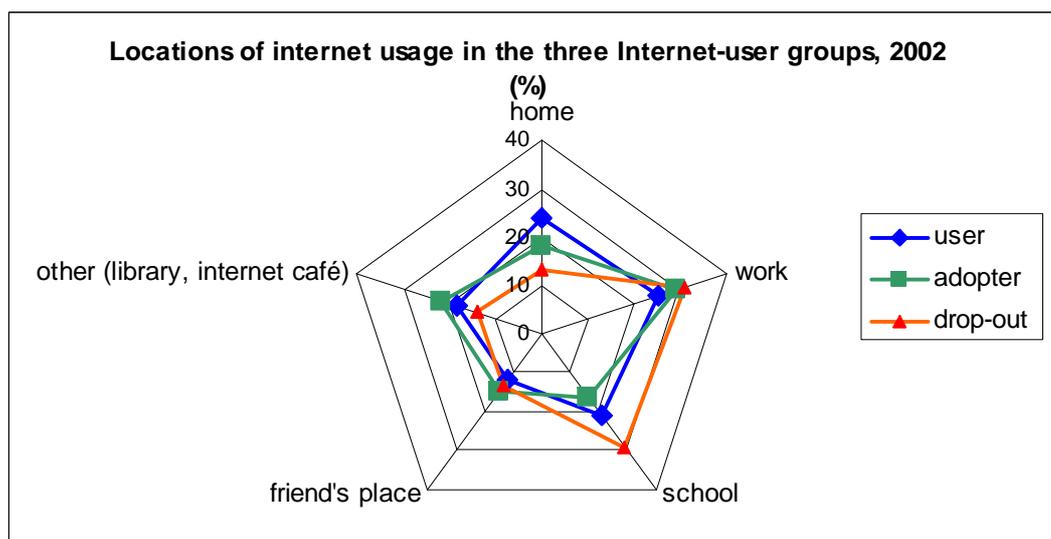


Figure 8. compares the location of Internet usage in the three Internet user groups. One can see, that in case of drop-outs the state subsidised „Sulinet” program (School-net) unfortunately only has a temporary effect: the ratio of those using it at their homes or from other public places are the

lowest among them. Once leaving school thus having no access any more, they will not look for other options and substitution.

SOCIAL CAPITAL AND INTERNET USE

Our 1st hypothesis based on studies that emphasize the positive relation between social relations, social capital and Internet usage is that the Internet users – per se – possess a higher level of social capital, which – as our 2nd hypothesis suggests - will be supplemented and increased due to Internet usage. Introducing further variables to the logistic regression model of the longitudinal panel database we can examine if the personal network characteristics – both kin and non-kin – affect independently the probability of belonging to one of the Internet-user groups. When testing the 1st hypothesis the interesting group is the adopters because in their case we can „clearly” vision the beginning; contrary to the users whose level of social capital has already been altered in some way simply because they’ve been using the Internet.

Table 2. Logistic regression models of the groups based on Internet usage – by the social network variables (only significant odds ratios are indicated)

| | Model 1 | Model 2 | Model 3 |
|------------------------------------------------------------------------------------|------------------------------------------|------------------------------------|-------------------------------------|
| | Odds for Internet usage versus non-users | Odds for adoption versus non-users | Odds for dropouts vs Internet users |
| Visited friends last month <i>Reference category: no</i> | 1,487* | | |
| Have friends <i>Reference category: no</i> | 1,682* | 2,024* | |
| Participated in programs organised by clubs, etc. <i>Reference category: no</i> | 1,670* | | |
| Have relatives/friends abroad <i>Reference category: no</i> | 1,419* | | |
| Have relatives/friends in the countryside <i>Referencia kategória: nincs</i> | 2,491** | | |

Note: significant at *.05 level, at **.01 level

In Table 2., supplement to Table 1. only the significant social network variables are indicated. The network variable referring to the intensity of kin relations (*visited relatives last month*) had no independent effect on any of the three models. This might suggest that non-kin ties are more influential in the process of Internet usage.

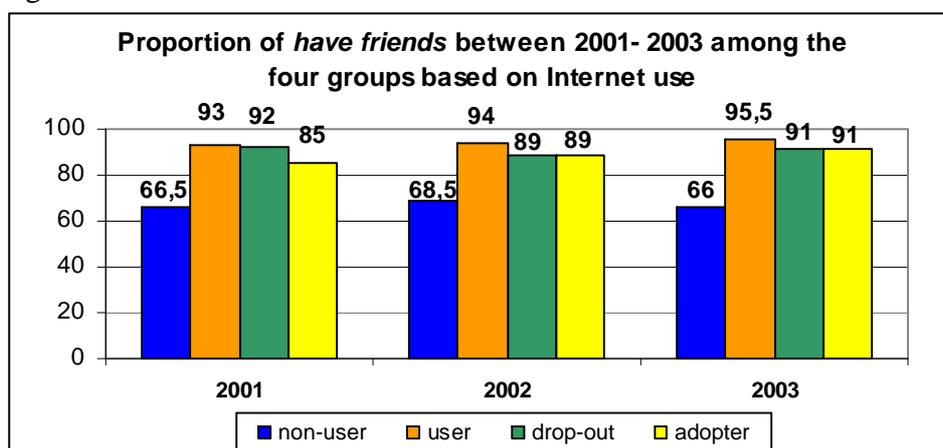
The results show that Internet users tend to have more social contacts, they are socially more active than the non-users: for those who visit friends, participate in social activities and/or have friends abroad or in the countryside the chances are between 1,5 and 2,5 times higher to be an Internet user than for those who are socially less involved. What is even more important to note is that - by filtering the effects of all the other factors - simply to have friends doubly raised the odds for one to become an adopter. This strongly affirms our first hypothesis, that Internet use penetrates faster among those whose level of social capital is higher.

PERSONAL RELATIONSHIPS

It is not among the aims of the WIP surveys to give a proper and detailed account of the individuals' personal network characteristics therefore the questions regarding both kin and non-kin ties/relations were quite randomly chosen, and were hard to be sorted on the basis of being applicable to Internet usage or not.

In the three examined years we calculated the rate of those who have no friends based on the question *How much time one spent with friends*. Since there was no data on the actual number of friends the only dimension in which any shift was measurable is the „friends gained versus lost” category. According to the WIP data one third of the total sample has no friends¹⁵: this number corresponds with the results of surveys exploring individuals' social network systems¹⁶. (Figure 9.)

Fig. 9.



From Fig. 9. a similar conclusion can be drawn as from Table 2. about the relationship between social capital and Internet usage. Among the non-users the rate of having friends is the lowest so in this respect we can say that in this group the level of social capital is also lower than in the other groups. The other three groups studied differ less from each other but the difference is still significant. Between 2001 and 2003, in the *adopter group* the rate of those who have friends increased by 6%: in this case we can say that the gain in friends/hip can be – among other factors - due to the Internet usage. This result confirms our 2nd hypothesis, the positive impact of the Internet on social relations.

On the contrary in the drop-out group one can see the shift moving in an other (opposite) direction. In 2001 the two groups with the highest rate of having friends were the drop-out and Internet-user group. By 2002 and 2003 the drop-out group is more similar to the adopter group contrary to the Internet-user group who have friends in a significantly higher rate. The shift towards

¹⁵ 28% in 2001, 26% in 2002 and 27% in 2003.

¹⁶ Albert Fruzsina- Dávid Beáta 1998: About friends. In: *Social Report 1998*, Eds: Kolosi et al. TÁRKI, Bp.pp:270-293. and ALBERT Fruzsina - DÁVID Beáta 2000: A kapcsolathálózatokról. In: *Növekedés alulnézetben. Táarki Monitor jelentések*, december, pp. 247-253.

losing friends in the drop-out group is irrelevant: represented mostly by young people their – naturally - rich social networks are not affected when they stop using the Internet, the impact is neutral. Gaining or losing friendships is independent of Internet usage.

In 2003 two completely new questions were added in order to map further the different spheres of one’s social network structure: one referred to the number of friends/relatives living in the countryside¹⁷, the other referred to the number of friends/relatives living abroad¹⁸.

Fig.10.

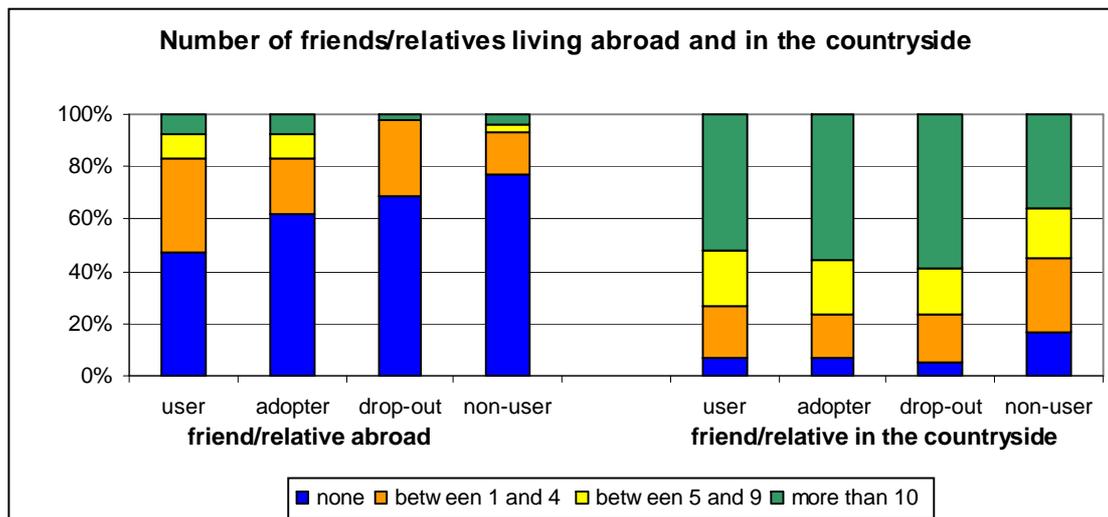


Figure 10. also strongly affirms that there are big differences in the level of social capital between the groups based on Internet usage according to. There is hardly anybody among the non-users who has friends/relatives abroad, and also this is the group with the lowest rate of having any social ties in the countryside. The drop-out group – compared to the other two groups using the Internet – is in the most disadvantageous position concerning friends/relative abroad: the average number of ties abroad in the user group is 2,4, 2,3 in the adopter and 0,7(!) in the drop-out group. Behind this rather negative fact lies the question of motivation or in fact the lack of it: since there are no contacts abroad to maintain one is not able to benefit from one of the biggest advantages of the Internet. We should refer back to the observations by Cumming et al. (2002) that people’s choice of the different communicational means depends „not only on the quality of the relationships sustained using it, but on opportunity costs as well”. (Cumming et al.: 2002:108) And we should add that there seems to be the opposite motion as well: people can completely leave one communicational tool behind and change if found unnecessary. For members in the drop-out group Internet is the medium abandoned while mobile phone is the one chosen/preferred.

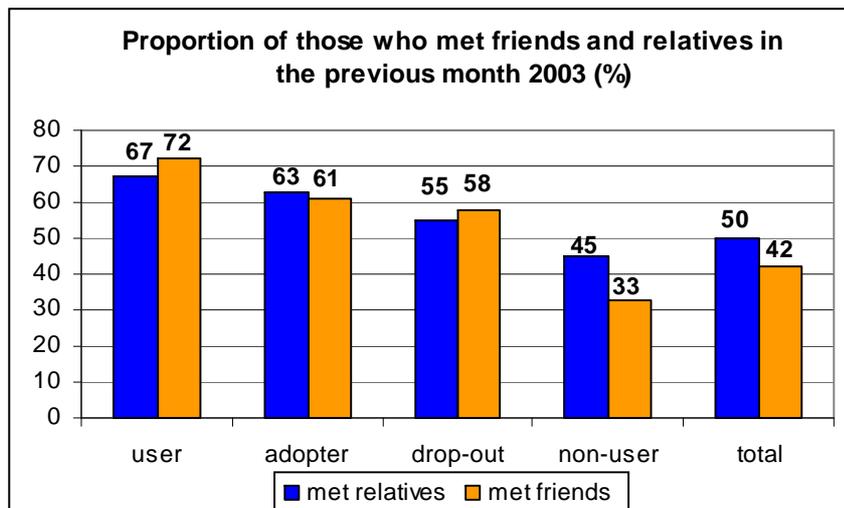
From the 2003 WIP survey we also know how often respondents meet their relatives and friends. Fig.11. shows that the intensity of maintaining both kin and non-kin ties is highest in the

¹⁷ Outside one’s own settlement

¹⁸ Unfortunately one slice of the cake is missing: the total number of friends/relatives one has contact with.

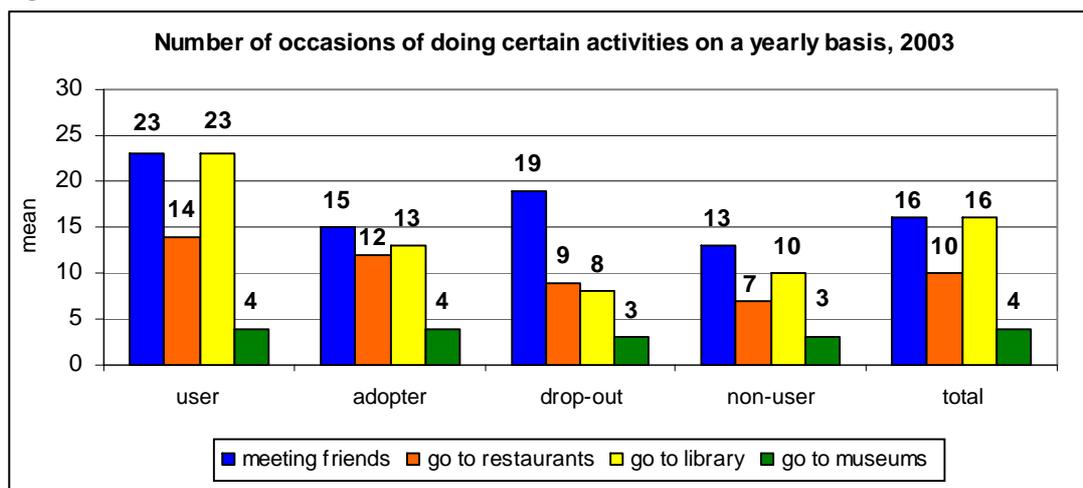
Internet user group. There is a notable difference between the Internet-user and non-user groups concerning the intensity of meeting friends and relatives.

Fig.11.



When comparing the four groups by the frequency of taking part in different social activities throughout 2003 we find that the least active people are overrepresented in the non-user group (Figure 12). The most distinctive difference between the adopters and the drop-outs is that while the drop-outs maintain their friendship ties on a more intensive level, the adopters go much more to restaurants and oddly to libraries.

Fig.12.



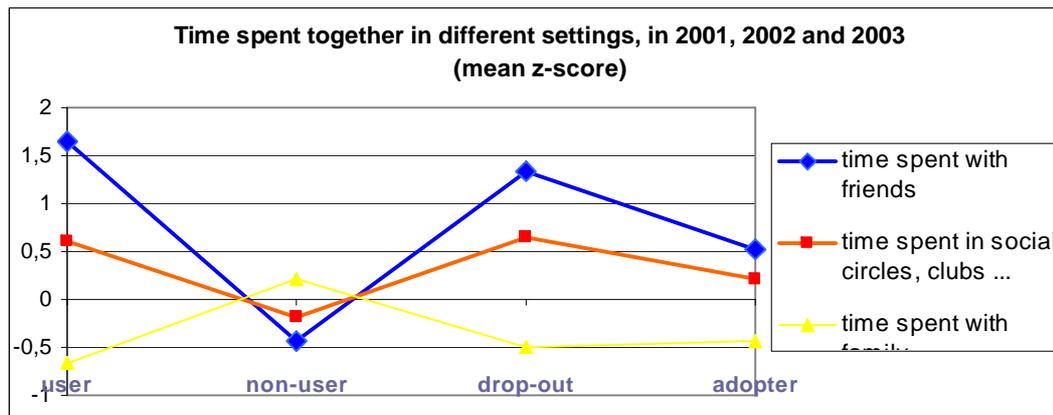
SOCIABILITY – SOCIAL SKILLS

In order to enhance and utilize one’s social capital a special skill (sociability) is needed for the individual to be able to activate his „network” capital. As our 2nd hypothesis suggests the positive relationship/correlation between Internet usage and sociability probably holds in a wider context, referring to weak ties like civil and associational acquaintances. Whereas in case of the

strong ties - kin and close non-kin ties – a neutral or negative impact may prevail as formulated in the 3rd and 4th hypothesis.

The amount of time spent in different social settings (family, friends, civil) can be a strong indicator for showing their relation to Internet usage. (Figure13)

Fig.13.



Respondents not using the Internet spend significantly more time with their family (Fig.13.). Analysing with logistic regression it turned out that the factor responsible for this difference is age: once controlled for age-groups this difference between the groups disappeared. It's only in the youngest age group (18-29 years old) where there is a significant difference between the users and the non-users: the latter spending more time with their families.

Regarding the average time spent with friends the opposite tendency seems to prevail: the Internet-users spend more time with their friends. But as mentioned previously it is again the effect of age, except in the youngest age group where the users spend more time with their friends. In this respect there is a variance within the different groups actually using the Internet: the adopters spend less time with friends (Fig13.)

The amount of time spent in social circles, clubs or volunteer organizations is quite low and it is equally distributed between the groups.

Although the amount of time spent with the family is the least for the users, this number in itself doesn't seem to affect either the quality of family life or the frequency of family visits (see Fig11. where it is just the users who visited relatives in the highest rate).

In his previous study based on the 2002 WIP data, Szilard MOLNAR¹⁹ measured the rate of sociability by the first factor of a principal component analysis in which 13 items were introduced.

¹⁹ See more: MOLNÁR, Szilárd: *Sociability and Internet*. Review of Sociology Vol. 10 (2004) 2, pp. 67-84

For our purposes a few changes were made in the selection of items: time spent for sleeping was omitted, and two other items referring to family functioning were combined. Our family function item is a combination of four variables.

Table 3. Distribution of the variables according to the factors they scored highest in 2001, 2002 and 2003 (principal component analysis)

| <i>List of variables</i> | 2001 | 2002 | 2003 |
|----------------------------------------------------|------|------|------|
| Club, community as information source | * | | |
| Importance of family/friends as information source | | | ± |
| Importance of participation at religious events | + | + | + |
| Importance of civic activity | * | * | * |
| Importance of being together with friends | * | * | * |
| Family functioning (4 item summa) | ± | ± | ± |
| Time spent pursuing some kind of sport (Zscore) | | | |
| Time spent with members of the family (Zscore) | | | |
| Time spent in clubs, communities (Zscore) | | | |
| Time spent with friends (Zscore) | | | * |
| Frequency of SMS-sending | + | + | + |

* factor 1

+ factor 2

± factor 3

Table 3. summarizes the results of the principal component analysis²⁰ by indicating the distribution of the variables according to the factors they score the highest²¹ in the 3 different years studied. From Table 3. we can see that certain variables score on the same factor in all three years: importance of participation at religious events, importance of civic activity, importance of being together with friends, family functioning and the frequency of SMS-sending. One factor brings together the variables “importance of being together with friends” with “importance of civic activity” plus “Club, community as information source” only in 2001 and “time spent with friends” only in 2003. The second factor is the combination of the variables “frequency of sending sms” and the “Importance of participation at religious events”. In the latter the common ground in fact is *not considering religious events important*. On the 3rd factor there is only one item that fits perfectly: that is family functioning. Except in 2003 when the item “Importance of family/friends as information source” scored also high enough. The problem we captured here is the wording of the question: it would have been better to separate the word family from the word friend because in this way certain differences just blur.

The items describing the amount of time spent for different (social) activities (family, friends, civic and sport activities) are not represented independently on any of the factors. See Fig.13. where for each item is shown separately. The results suggest that if the same phenomenon –

²⁰ Special thanks to Ildiko BARNA who was great help with factor analysis.

²¹ If the factor score of the item on the given factor is at least twice as much as on the other factors.

like family functioning – is measured both by qualitative and quantitative ways, quantity in itself has a less substantive effect, and neither can it be automatically concluded that Internet-use has negative effects on family relations just because the amount of time spent with the family is (or becomes) less.

The next step was to run principal component analysis separately for each three factors including the 13 listed variables in Table 3. The first principal factor includes items that emphasize the values of one's social relation that are in a wider context: these can be called weak ties from the civil sphere, from associations or clubs. We labelled this factor „*civil*” *sociability*. This factor preserved 51 percent of the variance of the original variables in 2001, 64% in 2002 and 49% in 2003 respectively. The second principal factor combines the secular ethos with the frequent use of high-tech tools (like SMS) therefore it is labelled „*modern*” *sociability* factor. This factor preserved the variance of the original variables: 59% in 2001, 62% in 2002 and 60% in 2003. The third factor is represented by actually one item which is a combination of four variables featuring four aspects of family functioning and familial ties. Following the labelling logic this factor²² is called “familial” *sociability* although strictly speaking the data refer to the quality of family functioning.

²² We call it a factor although it is consisted only from one variable, therefore in further calculations we use the original variable.

Table 4. Regression factor scores of the 3 principal factors²³ in the four groups based on Internet-use, (2001, 2002 and 2003)

| | | 1 „civil” sociability | 2 „modern” sociability | 3 „familial” sociability |
|-------------|----------|--------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| 2001 | user | ,3314569 | ,8902386 | 17,4684 |
| | non-user | -,0817151 | -,1998707 | 17,3669 |
| | drop-out | ,4092631 | ,8774062 | 17,2426 |
| | adopter | ,1732633 | ,5436447 | 17,6393 |
| | sig | .000 | .000** | n.s. |
| | N | 2495 | 2513 | 2362 |
| 2002 | user | ,3580985 | ,9312892 | 17,8769 |
| | non-user | -,0962444 | -,2299158 | 17,6159 |
| | drop-out | ,5590793 | ,8618323 | 17,9394 |
| | adopter | ,2665202 | ,6619193 | 17,6944 |
| | sig | .000 | .000** | n.s. |
| | N | 2522 | 2553 | 2349 |
| 2003 | user | ,4975652 | ,8548594 | 17,8849 |
| | non-user | -,1196961 | -,2311696 | 17,6454 |
| | drop-out | ,4542182 | ,7375632 | 17,6065 |
| | adopter | ,2864715 | ,7164032 | 17,7697 |
| | sig | .000* | .000 | n.s. |
| | N | 2471 | 2573 | 2338 |

Note: * the values in the boxes are significantly different also in the three kind of Internet user groups (* sig .05, **sig .001)

From Table 4. we can see that the rate of „civil” sociability is the lowest among the non-users. Examining only the groups using the Internet it is only in 2003 when there is a significant difference. The „dynamics” of the sociability rate within each group tends to vary and shift to different directions. Comparing the first and the last year studied (2001 and 2003) for two groups – users and adopters – the tendency is positive, there is an increase in the rate of „civil” sociability. In other words these groups with Internet use by increasing the sociability level could strengthen their social capital as well. The users’ advantageous position remains and even takes the first position in 2003, confirming our 2nd hypothesis that Internet use continually increases one’s social capital. Among the non-users there is a steady decrease in the rate: unfortunately further explanation has to be suspended because of insufficient data. As to the drop-out group the tendency is fluctuating: most probably in this case „civil” sociability and Internet use are independent phenomena. From our data we may presume that because of retardant mechanisms certain relationships don’t cease immediately after the drop-out, they only fade after a certain period. Among the drop-outs – due to their young age – any gain or loss in weak ties is temporary: „once finished with Internet there is a new challenge coming”.

Figures of the so called „modern” sociability factor imply similar trends to the that of „civil” sociability. The factor scores are very high both in the user and in the drop-out group. Fluctuation is revealing in the user group, and to a lesser extent in the non-user group (it is almost stagnation).

²³ In fact the „familial” sociability factor consists only one variable so the values are simply ANOVA means for the 3 years.

The sociability rate of the drop-out group is quite clearly decreasing, the drop is especially remarkable in 2003: it seems that when one stops using the Internet one also reduces the frequency of SMS sending. This seems to be the negative impact of the double-edge effect of the Internet: if one has an online relation there is a higher probability of maintaining it offline, but once this tie disappears to be online the intensity of the contact will be reduced offline as well. Just the opposite happens in the case of the adopters: with Internet usage year by year increases the frequency of SMS sending and the „modern” sociability rate.

The third, so called „familial” sociability factor completely differs from the previous two components. The data confirm our observation that family relations are unaffected by Internet usage. In this respect there is no difference between the groups.

4. táblázat

MAINTAINING SOCIAL RELATIONS ONLINE

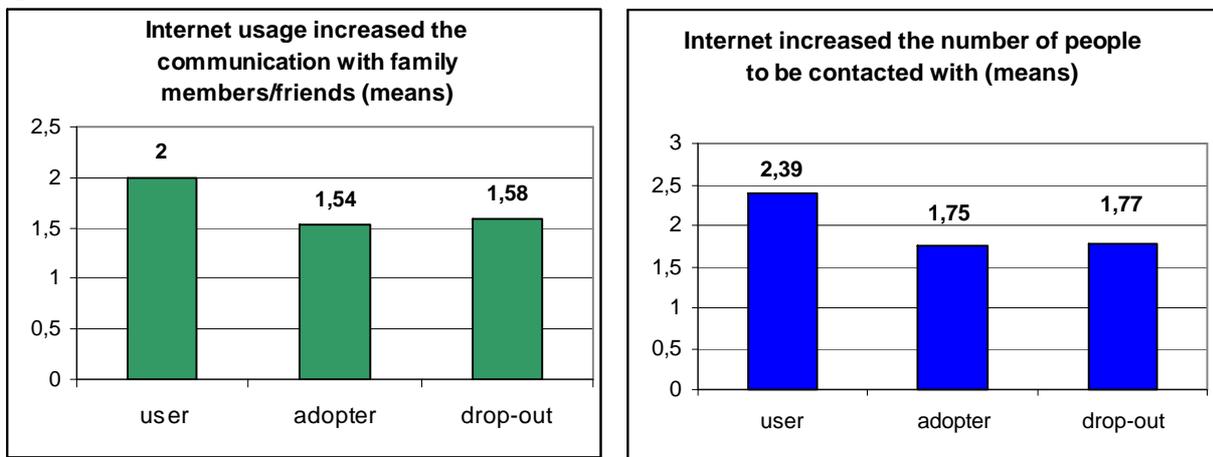
In the WIP surveys many questions applied to the different aspects of how Internet usage affect relations and how these ties are maintained. The following figures²⁴ refer to how respondents in the three Internet user groups agree to each statement. The data is based on the WIP 2002 survey. We used a five-point scale where 5 means total agreement while 1 refers to total disagreement.

From Fig.14. - Fig.16. we can see that those who have been Internet users all the 3 years (user group) studied feel that because of the Internet not only do they communicate more with their families, friends and people with similar professions, but they increased the number of their personal contacts. There are many respondents²⁵ who even assert that certain personal matters are rather shared with an online relation than with someone face-to-face (Fig.15.). The longer time one is a user the bigger the chance is for one to agree to that Internet helps to increase the number of contacts one has. It is also very important to note that in the *user group* versus *the adopter group* there is a higher rate of those who think that with Internet use they don't spend less time with their relatives/friends or people with similar profession. This is strongly confirmed with our data on the time spent with the family and friends (see fig.14. and principal component analysis).

²⁴ In the figures shown the significance level is at least ,05.

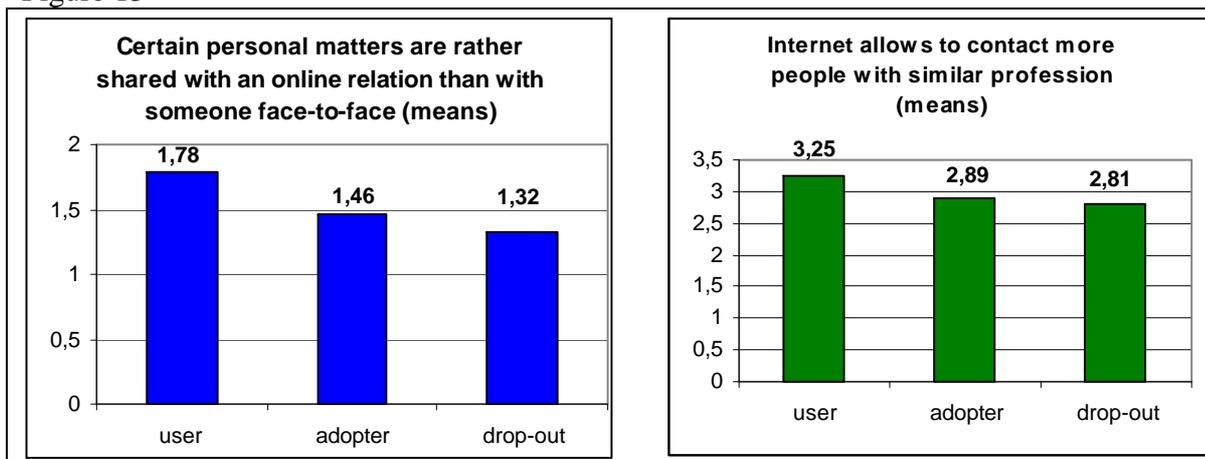
²⁵ Still compared to the other statements this is where people score and agree with the least.

Fig.14.



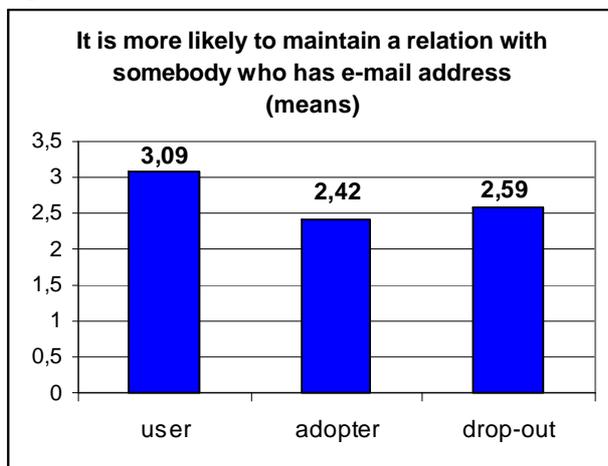
According to *the users* it is easier to make contacts online than offline (face-to-face). This points out a very important feature of the e-mail, namely that it facilitates the communication with people with whom one otherwise wouldn't be connected to: either because personally they never met before or because the low cost of Internet communication. The Internet (e-mail) also contributes to strengthening the principle of homophily by which people choose someone similar to them in different aspects like profession or hobby (Fig.15.)

Figure 15



Nevertheless among *the users* the criterion of having an e-mail address is articulated in order to maintain a relation. The difference between the *user and adopter group* is that in the previous one the respondents agreed in bigger numbers to the statement that „it is more likely to maintain a relation with somebody who has e-mail address” (Fig.16).

Fig.16.



Our data confirms that long-time and groovy Internet usage leads to a more extensive exploitation of the communicational techniques in order to maintain social ties. The respondents belonging to the *user group* send or receive more SMS and e-mails than people in the *adopter group* (Table 5.). The difference between the two groups in the rate of E-mail sending/receiving is twofold: 30% of the adopters versus 60% of the users!

Table 5.

| | More than once a week send/receive (%) | |
|----------|---------------------------------------------|--------|
| | SMS | e-mail |
| User | 85 | 61 |
| Adopter | 73 | 30 |
| Drop-out | 81 | 30 |
| sig. | .000 | .000 |

The questionnaire gives the opportunity to compare the three groups using the Internet on the basis of the number of friends:

1. whom they knew online first and met afterwards,
2. whom they knew online but haven't met yet,
3. whom they knew offline but later keep in touch by e-mail.

From Table 6. we can see that for all kinds of online relations it is the *user group* in which people have the most number of friends on average. For example while *the user respondents* have two friends on average whom they knew offline but at present the keep in touch by e-mail, among the *adopter respondents* this number is only 0,7.

Table 6. Aspects of online friendships (mean number of friends)

| | Number of friends whom | | |
|----------|--------------------------------------|---------------------------------|------------------------------------------------|
| | knew online first and met afterwards | knew online but haven't met yet | knew offline but later keep in touch by e-mail |
| User | 0,91 | 3,52 | 2,02 |
| Drop-out | 0,21 | 1,09 | 0,64 |
| Adopter | 0,18 | 0,87 | 0,70 |
| sig. | .003 | .190 | .002 |

With the longitudinal data we are also able to study the dynamics of the number of friends for each group in the three years.

Table 7. Dynamics of social relations: knew online first and met afterwards (%)

| | Number of such friends | | | Total |
|----------|------------------------|---------------|-----------|-------|
| | Decreased | Didn't change | Increased | |
| User | 10,5 | 71,3 | 18,2 | 100 |
| Drop-out | 20,7 | 72,4 | 6,9 | 100 |
| Adopter | 6,4 | 86,4 | 7,3 | 100 |

Sig. 004

The biggest difference seems to be between the user and the drop-out group. (Table 7) While almost one-fifth of the permanent Internet users reported that the number of those friends increased whom they knew online first then met personally, while one fifth of the drop-outs felt exactly the opposite: the number of such friends decreased in the 3 years. These numbers are quite straightforward in indicating how important online communication is in meeting new people and in maintaining old relationships. Once this opportunity ceases there is the chance for one's social network system to shrink substantially, which is in the case of the drop-out group means young people (below 18 years) living in small villages.

It should be noted that for a relationship originally online is rarer to remain virtual, then to meet face-to-face: 25 % of the users reported that the number of such friends decreased (Table 8.) while this rate was 10% in the previous case (Table 7).

Table 8. Dynamics of social relations: knew online first but haven't met yet (%)

| | Number of such friends | | |
|----------|------------------------|---------------|-----------|
| | Decreased | Didn't change | Increased |
| User | 24,7 | 65,2 | 19,1 |
| Drop-out | 17,9 | 64,3 | 17,9 |
| Adopter | 10,1 | 79,8 | 10,1 |

Sig .000

Interestingly we found the biggest increase in the number of friends when we asked about friends who were offline but with Internet usage e-mail became the most important mean for keeping in touch with them. Among the users the rate of those for whom this number increased is almost 30%.

Table 9. Dynamics of social relations: knew offline but later keep in touch by e-mail (%)

| | Number of such friends | | |
|----------|------------------------|---------------|-----------|
| | Decreased | Didn't change | Increased |
| User | 22,1 | 49,2 | 28,7 |
| Drop-out | 13,8 | 75,9 | 10,3 |
| Adopter | 14,5 | 70,0 | 15,5 |

Sig .000

From our data the tendency seems obvious: Internet usage (especially in the case of the *user group*) increases both online and offline relations.

SUMMARY

Our data analysis proved our first hypothesis. All the different data showed that *adopters* possess a higher level of social capital than the non-users: on the basis of the logistic regression analysis - which filters the impacts of all the socio-demographic parameters – the effect of network capital (*measured by having friends*) was traceable. People's chance to become an Internet user is more than twice as much if they have friends than if they don't.

When studying the impact of Internet usage on personal relations and on the three different types of sociability separated in our theoretical framework the result was unambiguously positive and that is Internet usage increases social capital. For the longer-time one is an Internet user the more likely that he could broaden his social sphere by means of the Internet. Our data also confirm that this doesn't happen at the expense of existing offline relations. Our results are quite convincing in the case of the adopters: no matter how high the level of their social capital is at the starting point their sociability rate is still lower than that of the *users* simply because the former respondents simply didn't have enough time to make the best of this communicational tool. In the 3 years studied with no doubt the network capital was always highest in the *user group*: they probably had a higher sociability rate right from the start which through Internet usage was even further expanded by making new contacts and by maintaining the old ties at the same time. Parallel to this phenomenon our observation is that Internet usage has a neutral effect on family relations.

We presume that Internet diffusion is very much affected by the Hungarian social network structure, namely the lack of social network capital very characteristic to our society. This also points to the necessity of analysing the cultural barriers in the Internet diffusion mechanism: we are claiming that the reason for every third respondent²⁶ who refuse to use the Internet to give an answer „I don't need it” is that people with low social capital don't require such techniques that will broaden or even maintain the few social contacts they have; for them the positive aspects of the Internet is not realized. This can partly explain why the exposure rate of Internet diffusion is still so low when 23% of the non-users live with relatives who are Internet users, and on top 18 % of them live in households where there is PC at home. Other than with the existence of the cultural barrier it is quite difficult to explain the fact that with such high rates of direct experience of Internet usage (family member is a user) and the high rates of the given conditions (PC available at home) there is only a 2 per cent growth in the number of people using Internet at home.

²⁶ In 2003 36% of the non-users - when giving reasons for why they refuse Internet - said they simply don't need it.

Our data confirms that the diffusion of innovation is very much influenced by cultural traditions and the fine fabric of the social network structure, as the difference is quite remarkable between the fragile and spare social ties of the non-users and the numerous social relations combined with a high sociability of the users and the adopters. One should note the importance of the different public places (Tele-house, library) and the role of the friends in case of the adopter group. The popularity of such places are precisely the outcome of the extensive social network system. This is also proven by our data that show that the chances to use the Internet is primarily affected by one's non-kin ties (friends, acquaintances) rather than the strong, family and other kin ties. We also showed some evidence that it is the quality rather than quantity of the ties that are influential factors.

If it is as it seems that the cultural context is the bottom line of the diffusional process then it is very difficult to predict the future rate of expansion. The great paradoxon in this situation is that while our data confirm the positive aspects of Internet usage on one's social capital building and the social network system it is the very non-user who although very much in need can not benefit and increase his social capital because of the spare social ties that hinders anything in the first place.