

UNIVERZA V LJUBLJANI  
FAKULTETA ZA DRUŽBENE VEDE

Andraž Petrovčič

**Nove komunikacijske tehnologije in preoblikovanje  
družbenosti v pozni moderni**

**New communication technologies and the  
transformation of sociality in late modernity**

Doktorska disertacija

Ljubljana, 2011



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## Acknowledgements

In the past months I was often asked “When you will finish your dissertation?” I must admit that this was the last question I wanted to be asked, although I knew that actually these were words of encouragement from people who believed in my work. Now, when I feel that my research is completed, I would like to express my gratitude to the people who kept asking me that question, and to those who helped me to finish my dissertation.

In particular, I would like to thank my supervisor Professor Vasja Vehovar for his invaluable guidance during my fellowship as a young researcher. At each stage of my writing he provided me with encouragement and stimulus to move forward. I would also like to thank my cosupervisor Professor Leopoldina Fortunati, who has inspired me with necessary enthusiasms for researching. I am also grateful to her for introducing me to the international community of world’s leading scholars who opened my mind for new ideas. Without her supervision and dedication, it would have been much harder for me to complete this challenging project.

My gratitude also goes to the colleagues at the Centre for Methodology and Informatics at the Faculty of Social Sciences of the University of Ljubljana, where I worked as a young research fellow. They offered me generous support over the past years. I am particularly indebted to Gregor Petrič for long conversations and for challenging me with tough questions throughout the project that helped me to understand why social theory and social informatics are important for understanding the technological facet of the contemporary social reality. I am thankful to Vesna Dolničar and Katja Prevodnik for providing me with feedback on the survey questionnaire and helping me with the data collection. I am also grateful to Tina Kogovšek for advising me about researching egocentered social networks and kindly sharing the datasets from past social support surveys in Slovenia. This project has also benefited greatly from debates with Katja Lozar Manfreda and Nejc Berzelak who provided me with an insight into the golden rules of survey methodology, showing me why it is not only important what you ask people in surveys but also how and when you ask them.

This doctoral project has taken an invaluable amount of cooperation and support from friends. Matic Kavčič, Tjaš Prinčič, Monika Kristančič, Miha Štokelj, Tanja Passoni, and Sebastjan Leban not only provided me words of encouragement during writing but also kept me grounded with their insightful observations about everyday practices and experiences



associated with the use of new communication technology. When I felt overloaded with theoretical models and conceptual thinking their sincere comments and intuitive reflections turned out to be a rich cache of alternative views, pointing me toward arguments I would otherwise never have thought of.

Most of all, I would like to express my deepest gratitude to my family for their unreserved support and for believing in my work.







## IZJAVA O AVTORSTVU

### doktorske disertacije

Podpisani/-a Andraž Petrovčič, z vpisno številko 21051154, sem avtor/-ica doktorske disertacije z naslovom: New communication technologies and the transformation of sociality in late modernity (Nove komunikacijske tehnologije in preoblikovanje družbenosti v pozni moderni).

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## **ABSTRACT**

This doctoral dissertation deals with a very present and relevant topic related to the role of new communication technologies in the transformation of interpersonal relations in late modernity. In a narrower sense, the dissertation is thematically placed within the field of social informatics, while in a broader sense, it addresses the area of study of the society-technology relationship that has already been the subject of many theoretical and empirical studies which have investigated the electronically mediated forms of sociality from different perspectives and with different approaches. The first part of this dissertation, thus, focuses on the conceptual and theoretical approaches that have been applied in sociology to understand the importance of new communication technologies for interpersonal communication within personal networks. With the aim of critical reflection and synthesis of existing research it introduces the concept of digital sociality which is informed by the socio-technical interaction networks approach. It suggests that digital sociality is constituted along a plurality of social forms and practices which can be described as socio-technical phenomena and fully understood only through an analysis of processes and relationships which are established in the context of late modernity in interactions between the three facets of social reality: the technological environment, social interactions and social networks. With an informative overview of theoretical discussions related to the above mentioned elements and with a particular focus on the interactions between them it seeks to highlight the key structural aspects of the development and potential changes in personal relationship and communication that were marked by the proliferation of new communication technologies into late modern flux of everyday life.

Along this argument, this dissertation is initially aiming to show that the expressive power of (self)reflexivity, on which rests the individualizing moment of the transformation of late modern sociality, is based primarily on the intensification of interactions between individuals, which is today essential for preserving the mutual trust in personal relationships. It is precisely in this regard that the dissertation indicates the central structural link between the electronic mediated communication and the nature of interpersonal relations in late modernity: new communication technologies give individuals the opportunity of a virtually perpetual access to their personal networks, while allowing them to contact each network member in an individualized way. Such actions, in principle, reproduce the general characteristics of individualization: in addition to a greater control and autonomy over his/her



(inter)actions the individual is also taking certain systemic risks that are associated with the need for perpetual connectivity and maintenance of contact with social ties as well as with the ability for preserving trust and reciprocity in personal relationships.

In addition, this dissertation suggests that in order to understand the structural changes in characteristics of social interactions in digital sociality we should take account of the convergence between the following three elements: (1) the emergence of new social environments and spatial-temporal zones of everyday life (2) the creation of new communication practices based on new forms of coordination and ubiquitous connectivity, (3) reorganization of the normative structures that define the relationship between different ways (technologically mediated) interpersonal communication. The dissertation identified some implications of the convergence of these elements with an integration of the key sociological notions (e.g., absent presence, “connected” presence, micro-coordination, network sociality, mobile sociality), which recently appeared in the literature describing the social implications of the emerging technology-mediated interaction contexts. As part of this overview, the dissertation highlights the implications of these new interactional forms on the structural characteristics of personal networks.

In the last part of the theoretical discussion this dissertation presents an interdisciplinary analysis of the key aspects of the transformation of personal networks in late modernity. It outlines various transformations of personal networks related to their inner structural characteristics as well as to their position within broader social structures and institutions (e.g., family, community, neighborhood), which both demonstrate their centrality in the modern (technologically mediated) forms of sociality. In particular, it seeks to put forward the connection between the growing complexity of interactional practices and the structural diversity of personal networks in terms of the relation between strong and weak ties as well as the spatial and temporal distancing, made possible by new communication technologies.

Accordingly, the notion of personal networks serves us as a baseline concept for the empirical verification of the heretofore laid out theoretical advances regarding the technologically-driven transformation of sociality. Consequently, an empirical study was carried out to identify and explain how the size and composition of personal (egocentered) networks and patterns of interpersonal communication within personal networks are related to the use of new technologies for interpersonal communication. With the help of a telephone survey we collected data on the structure and size of personal networks on a representative



sample of more than 1200 Slovenian residents aged 10-74 years in order to test the hypotheses associated with the following research questions: (1) What are the structural characteristics of personal networks in Slovenia and how are they linked with socio-demographic characteristics of individuals and their use of communication technologies? (2) How are the structural characteristics of personal networks and internet use related to social integration in terms of social isolation? (3) How do individuals combine different communication technologies to maintain contact with the members of their personal networks and is there any difference in the usage patterns according to the type of social support and the strength of social ties? (4) Is there any change in the structural characteristics of personal networks between 2002 and 2009 and can the potential modifications in the network structure be associated with growth in the proportion of internet users and frequency of internet use, which marked the development of new communication technologies in Slovenia in the last ten years?

The results showed that the frequency of internet use is related neither to the size of social support networks nor to the number of weak and strong social ties. Further, internet use is not associated with social isolation or, in other words, with the fact that respondents do not have anyone who provides them with emotional support or social companionship. Nevertheless, as expected internet use turned out to be more strongly associated with the structural features of socializing networks than with the features of emotional support networks, as the former enclose more occasional, far-flung, and remote social ties which can be established on and contacted via the Internet. In general, the results also speak in favor of the hypothesis that the smaller and less geographically dispersed networks are characterized by frequent in-person, mobile voice and texting communication, whereas in larger and more geographically remote personal networks, individuals are more often in contact via landline phone, email and other internet communication services.

The dissertation confirms the findings of prior research suggesting that individuals in establishing and maintaining contacts with their network members combine various “new” and “old” communication technologies in complex ways without “displacing” or “replacing” other technologies. In fact, the results show that in a complex media environment each technology usually finds a special place in the dynamics of establishing and maintaining the web of social ties. These usage patterns are associated with socio-demographic characteristics of individuals as well as with the composition of their personal networks. The dissertation





confirms the hypothesis of differences in size and geographic distance of personal networks with which individuals are in contact via various communication technologies (i.e., communication sub-networks). Specifically, the results suggest that social support networks with which individuals keep in touch via the mobile phone (emotional support) and texting (both types of social support networks) are smaller and limited to the local area, while internet sub-networks are larger and include more geographically distant ties. At the same time the dissertation ascertains that significant differences exist in the composition of communication sub-networks. Namely, their composition differs according to role-relation (e.g., partner, parents, children, friends) and geographical distance. Most marked differences are present between internet and other sub-networks, as the former includes more friends and distant ties, whereas the latter generally embrace more locally based kin relationships.

Moreover, the findings speak in favor of the media multiplexity theory, which argues that the strong personal ties are generally embedded in complex patterns of communication technologies. Individuals use more communication modes to contact their alters in emotional support networks than in socializing networks. In addition, these patterns are associated with different structural features of both types of personal networks. In socializing networks the media multiplexity increases with the growing proportion of family and geographically remote ties, whereas in emotional support networks it is positively associated with network size and alter's age.

Based on the analysis of secondary data this dissertation also identified a change in the size and composition of emotional support and socializing networks between 2002 and 2009. Consistently with the proposed hypothesis the changes were larger in socializing networks, although a shift toward more intimate, family-oriented, local and long-standing personal ties was also ascertained for emotional support networks. In general, the frequency of internet use is not associated with these changes, since the identified trends are very much alike for both internet users and non-users. Nevertheless, the results show that, on one hand, internet users when compared with non-users have suffered from a smaller increase in the size of the emotional networks during the analyzed period. On the other hand, in comparison with internet non-users their social ties were less exposed to the localization trends and the reducing of the geographic distance of social ties. The decomposition analysis of network change showed that the change in the size of personal networks is mainly due to intra-cohort changes. In addition, it suggested that there are some significant differences in the patterns of



change between internet users and non-users. In this respect it should be mentioned that the increasing size of emotional support networks among internet users stems from the replacement of older cohorts with younger generations of internet users (i.e., inter-cohort change). Conversely, the increase in size among internet non-users is associated solely with intra-cohort changes.

We believe that with the implemented research approach we were able to encapsulate some of the key structural features of the new forms of sociality and to offer a conceptual framework informed by social informatics, which could represent a sound basis for further theoretical and applied research. We further believe that the acquired knowledge from the empirical analysis could be of applied value for the professional and the general public who is interested in the relationship between the use of new technologies in interpersonal communication and social support networks.

**Key words:** sociality, social informatics, information-communication technology, personal relationship, interpersonal communication, personal network, late modernity, social support.



## POVZETEK

Doktorska disertacija obravnava zelo aktualno in relevantno problematiko vloge novih komunikacijskih tehnologij v preoblikovanju medosebnih odnosov v pozni moderni. V ožjem smislu se disertacija tematsko umešča na področje družboslovne informatike, v širšem smislu pa na zelo kompleksno področje proučevanja razmerij med družbo in tehnologijo, ki so bile v preteklosti že predmet teoretskih in empiričnih študij, ki so z različnih zornih kotov pristopile k raziskovanju elektronsko posredovanih oblik družbenosti. V prvem delu se zato disertacija osredotoča na konceptualne in teoretske pristope, ki so si v družboslovnem raziskovanju prizadevali razumeti pomen novih komunikacijskih tehnologij za medosebno komuniciranje znotraj osebnih omrežij. Z namenom sinteze in kritične refleksije obstoječih raziskav v disertaciji vpeljemo pojem digitalne družbenosti, ki ga na osnovi pristopa družbeno-tehničnih interakcijskih omrežij pojmuje kot družbeno-tehnični fenomen, ki ga je moč celovito razumevati le skozi analizo procesov in razmerij, ki se v okoliščinah pozne moderne vzpostavljajo v interakcijah med tremi vidiki družbene realnosti, in sicer tehnološkim okoljem, družbeno interakcijo in socialnimi omrežji. Skozi pregled teoretskih tematizacij naštetih vidikov, predvsem pa z osvetljevanjem aspektov interakcije med njimi, skuša disertacija izpostaviti ključne strukturne razsežnosti, ki so z vstopom novih komunikacijskih tehnologij v sfero vsakdanjega življenja zaznamovale razvoj in potencialne spremembe medosebnih odnosov in komuniciranja v kontekstu pozne moderne.

V doktorski disertaciji zato v prvi vrsti poskušamo pokazati, da izrazna moč (samo)refleksivnosti, na kateri naj bi se vzpostavil individualizacijski moment preoblikovanja poznomoderne družbenosti, temelji predvsem na izraziti intenzifikaciji interakcij med posamezniki, ki je nujna za ohranjanje vzajemnega zaupanja v medosebnih odnosih. Prav s tega vidika se nakazuje osrednja strukturna povezava med elektronsko posredovanim komuniciranjem in naravo medosebnih odnosov v pozni moderni: nove komunikacijske tehnologije posameznikom načeloma omogočajo nenehen dostop do njihovih osebnih omrežij, hkrati pa jim dovoljujejo, da z njihovo pomočjo individualno naslavljajo izbrane člane omrežja. V takšnem delovanju se pravzaprav nakazujejo splošne značilnosti individualizacije; poleg večjega nadzora in avtonomije nad interakcijami namreč posameznik prevzema tudi določena sistemska tveganja, ki so vezana na skrb za stalno povezljivost,



ohranjaje stika z osebnimi vezmi ter vzdrževanja zaupanja in vzajemnosti v medosebnih odnosih.

Pri tem disertacija vpeljuje tezo, da je za razumevanje strukturnih sprememb v lastnostih samih družbenih interakcij v digitalni družbenosti konstitutivna konvergenca treh elementov: (1) nastanek novih družbenih okolij oziroma prostorsko-časovnih con vsakdanjega življenja; (2) oblikovanje novih komunikacijskih praks, ki temeljijo na novih oblikah koordinacije in vseprisotne povezanosti; (3) reorganizacija normativnih struktur, ki določajo razmerje med različnimi načini (tehnološko posredovanega) medosebnega komuniciranja. S sintezo ključnih socioloških pojmov (npr. odsotna prisotnost, povezana prisotnost, mikrokoordinacija, omrežna družbenost, mobilna družbenost), ki so se pojavili v literaturi kot odgovor na potrebo po refleksiji nastajajočih tehnološko posredovanih interakcijskih kontekstov, v disertaciji opredelimo nekatere posledice konvergence naštetih elementov. Ob tem izpostavimo tezo, da je posledice interakcijskih oblik, v katere so vpete nove komunikacijske tehnologije, mogoče prepoznati na ravni strukturnih lastnosti osebnih omrežij.

V zadnjem delu teoretske razprave se zato disertacija z interdisciplinarnim pristopom loteva analize ključnih vidikov preoblikovanja osebnih omrežij v pozni moderni. Na osnovi sistematičnega pregleda teoretskih razprav so v disertaciji predstavljeni različni vidiki in ravni preoblikovanja osebnih omrežij ter njihovega položaja znotraj družbenih struktur in institucij (npr. družine, skupnosti, soseske), ki pričajo o njihovi centralnosti v sodobnih (tehnološko posredovanih) oblikah družbenosti. Še posebej si disertacija prizadeva izpostaviti povezave med naraščajočo kompleksnostjo interakcijskih praks in strukturno raznolikostjo osebnih omrežij v smislu razmerij med močnimi in šibkimi osebnimi vezmi ter prostorske in časovne razpršenosti, ki jo omogočajo nove komunikacijske tehnologije.

Osebna omrežja nam zato na empirični ravni služijo kot operacionalni pojem za preverjanje predstavljenih teoretskih izhodišč o preoblikovanju družbenosti v povezavi z novimi komunikacijskimi tehnologijami. Namen disertacije je bil namreč tudi odkriti in pojasniti, na kakšen način so velikost in sestava osebnih (egocentričnih) omrežij ter vzorci medosebnega komuniciranja znotraj osebnih omrežij povezani z uporabo različnih novih tehnologij za medosebno komuniciranje. S pomočjo na reprezentativnem vzorcu s telefonsko anketo





zbranih podatkov o strukturi in velikosti osebnih omrežij več kot 1200 prebivalcev Republike Slovenije v starosti od 10 do 74 let smo zato poskusili preveriti hipoteze, povezane z naslednjimi raziskovalnimi vprašanji: (1) Kakšne so strukturne značilnosti osebnih omrežij v Sloveniji in kako so slednje povezane s sociodemografskimi značilnostmi posameznikov in z njihovo uporabo komunikacijskih tehnologij? (2) Kako so strukturne značilnosti osebnih omrežij in uporaba interneta povezane z družbeno integracijo z vidika socialne izolacije? (3) Kako posamezniki uporabljajo različne komunikacijske tehnologije, da ohranjajo stik s člani osebnih omrežij? Ali v tem pogledu obstajajo razlike v načinu uporabe komunikacijskih tehnologij glede na tip socialne opore in jakost osebnih vezi? (4) Ali je v zadnjem desetletju prišlo do sprememb v strukturi osebnih omrežij ter ali so morebitne spremembe povezane z rastjo deleža uporabnikov interneta in pogostosti uporabe interneta, ki je zaznamovala razvoj novih komunikacijskih tehnologij v Sloveniji v zadnjih desetih letih?

Rezultati multivariatnih analiz so pokazali, da pogostost uporabe interneta ni povezana niti z velikostjo omrežij socialne opore niti s številom šibkih in močnih osebnih vezi. Uporaba interneta prav tako ni povezana s socialno izolacijo oziroma z dejstvom, da anketiranci nimajo nikogar, ki bi jim nudil emocionalno oporo ali druženje. Je pa uporaba internetnih komunikacijskih tehnologij izraziteje povezana s strukturnimi lastnostmi omrežij druženja kot pa omrežij emocionalne opore; prve namreč vključujejo več šibkih, spremenljivih in oddaljenih vezi, s katerimi lahko posameznik hitreje navezuje stik prek internetnih komunikacijskih servisov. V splošnem rezultati tudi govorijo v prid hipotezi, da je za manjša in geografsko manj razpršena omrežja značilno pogostejše osebno komuniciranje ter komuniciranje prek mobilnega telefona in SMS/MMS sporočil, medtem ko so v večjih in bolj oddaljenih omrežjih posamezniki pogostejše v stiku prek stacionarnega telefona, elektronske pošte in drugih internetnih komunikacijskih servisov.

Disertacija potrjuje ugotovitve predhodnih raziskav, da posamezniki pri navezovanju in ohranjanju stikov s člani svojih osebnih omrežij na kompleksen način združujejo različne »nove« in »stare« komunikacijske tehnologije, pri čemer ni opaziti vzorcev »izpodrivanja« ali »nadomeščanja« drugih tehnologij, temveč empirični izsledki govorijo v prid domnevi, da v kompleksnem medijskem okolju tehnologije običajno najdejo posebno mesto v dinamiki navezovanja in ohranjanja medosebnih odnosov, ki je povezana tako s sociodemografskimi



lastnostmi posameznikov kot tudi s sestavo njihovih osebnih omrežij. Disertacija potrjuje hipotezo o razlikah v velikosti omrežij in geografski oddaljenosti vezi znotraj osebnih omrežij, s katerimi so posamezniki v stiku prek različnih komunikacijskih tehnologij (t. i. komunikacijskih podomrežij). Natančneje, rezultati kažejo, da so osebna omrežja socialne opore, v katerih posamezniki ohranjajo stik s svojimi vezmi s pomočjo mobilnega telefona (emocionalna opora) in kratkih besedilnih sporočil (oba tipa socialne opore), manjša in lokalno omejena, medtem ko so internetna podomrežja večja in vključujejo geografsko bolj oddaljene vezi. Hkrati disertacija potrjuje domnevo, da obstajajo pomembne razlike v sestavi komunikacijskih podomrežij, in sicer so slednje največje glede na tip odnosa (npr. partner, starši, otroci, prijatelji) in geografsko oddaljenost vezi. Najizrazitejše razlike so prisotne med internetnimi in ostalimi podomrežji, saj prva vključujejo več prijateljskih in oddaljenih vezi, medtem ko ostala v splošnem sestavljajo v bližini živeče sorodstvene vezi.

Rezultati analiz govorijo tudi v prid tezi o medijski multipleksnosti, ki pravi, da so močne osebne vezi praviloma vpete v kompleksnejše vzorce uporabe komunikacijskih tehnologij. V omrežjih emocionalne opore – ki vključujejo več močnih osebnih vezi – namreč posamezniki uporabljajo več načinov komuniciranja kot v omrežjih druženja, pri čemer je vzorec uporabe tehnologij povezan z različnimi strukturnimi lastnostmi obeh omrežij. V omrežjih druženja se multipleksnost povečuje z naraščanjem deleža sorodstvenih in oddaljenih vezi, medtem ko se multipleksnost v omrežjih emocionalne opore povečuje z naraščanjem števila članov omrežja in njihove starosti.

S pomočjo analize sekundarnih podatkov iz raziskave Omrežja socialne opore prebivalstva Slovenije v disertaciji tudi potrdimo prisotnost sprememb v velikosti in sestavi omrežij emocionalne opore in druženja med letoma 2002 in 2009. Spremembe so bile izrazitejše v omrežjih druženja, čeprav je tudi v omrežjih emocionalne opore prisoten strukturni premik k bolj intimnim, družinskim, lokalnim in dolgotrajnim osebnim vezem. V splošnem pogostost uporabe interneta nima posebne vloge pri navedenih spremembah, saj so zaznani trendi zelo podobni tako med neuporabniki kot uporabniki interneta. Kljub temu rezultati kažejo, da so bili dnevni uporabniki interneta v primerjavi z neuporabniki tekom omenjenega obdobja deležni manjšega povečanja velikosti emocionalnih omrežij, njihova omrežja druženja pa so bila manj izpostavljena lokalizaciji oziroma zmanjševanju geografske oddaljenosti osebnih vezi. Dekompozicijska analiza omrežnih sprememb je pokazala, da spremembe znotraj



kohort predstavljajo osrednji mehanizem pri spreminjanju velikosti osebnih omrežij, pri čemer obstaja nekaj značilnih razlik v vzorcih sprememb med uporabniki in neuporabniki interneta. V tem pogledu velja omeniti predvsem ugotovitev, da je povečevanje velikosti omrežij emocionalne opore med uporabniki interneta povezano zlasti z zamenjavo starejših kohort z mlajšimi generacijami uporabnikov interneta, medtem ko je pri neuporabnikih interneta naraščanje velikosti vezano izključno na spremembe znotraj kohort.

Menimo, da smo z izbranim raziskovalnim pristopom na teoretski ravni uspeli zaobjeti nekatere ključne strukturne lastnosti novih oblik družbenosti ter da smo postavili družboslovnoinformatični konceptualni okvir, ki je lahko ustrezna podlaga za nadaljnje teoretsko in aplikativno raziskovanje. Hkrati smo tudi mnenja, da ima pridobljeno vedenje iz empiričnih analiz tudi uporabno vrednost za strokovno in širšo javnost, ki jo zanima odnos med uporabo novih tehnologij v medosebnem komuniciranju in omrežji socialne opore z vidika družbenih in tehnoloških razsežnosti.

**Ključne besede:** družbenost, družboslovna informatika, informacijsko-komunikacijska tehnologija, medosebni odnosi, medosebno komuniciranje, osebna omrežja, pozna moderna, socialna opora.



## TABLE OF CONTENTS

1	INTRODUCTION.....	39
1.1	Dissertation Organization.....	53
2	UNDERSTANDING THE ROLE OF TECHNOLOGY IN SOCIETY.....	60
2.1	Theorizing the technology – society relationship.....	64
2.1.1	Theories of technological determinism.....	64
2.1.2	Symptomatic approach.....	68
2.1.3	Theories of social constructivism.....	72
2.1.3.1	The social construction of technology.....	75
2.1.3.2	The actor-network theory.....	77
2.1.3.3	The systems theory.....	80
2.1.3.4	Social constructivism and the “ensemble view of technology”.....	84
2.2	Discrete-entity and web models of technology deployment.....	86
2.3	Social-technical interaction networks.....	92
2.4	Digital sociality from the STIN perspective.....	99
3	LATE MODERNITY AS THE SOCIAL CONTEXT OF DIGITAL SOCIALITIES..	107
3.1	Modernity and late modernity.....	108
3.2	Globalization and individualization in late modernity.....	112
3.3	The reconfiguration of intimacy and personal relationships.....	117
3.3.1	Pure relationship and late modernity.....	119
3.3.2	The “suffusion” of friends and family.....	123
3.4	Between fragmentation and reconfiguration of social ties: Social integration in late modernity.....	127
4	SOCIAL INTERACTIONS IN DIGITAL SOCIALITIES.....	137
4.1	The spatial and temporal dimensions of technologically mediated social connectivity	139
4.2	New modes of technologically mediated social interactions.....	147
4.3	Personal connectivity in the complex media environment.....	161
4.3.1	The problem of media choice.....	163
4.3.2	The normative aspects of media choice.....	167
5	SOCIAL NETWORKS AND THE TRANSFORMATION OF SOCIALITY.....	174

5.1	Locating networks in the digital sociality .....	175
5.2	Personal networks and the networked individualism: from concentric circles to personal communities .....	181
5.3	Digital sociality or digital socialities? .....	191
5.4	Digital socialities and personal networks: An overview of empirical evidence .....	195
5.4.1	The socio-historical context of social connectivity research .....	195
5.4.2	The corroding effects of the online communication under question .....	197
5.4.3	ICTs and the structural characteristics of personal networks .....	203
5.5	The research framework and working hypotheses .....	218
6	RESEARCH METHODS AND MEASURES .....	226
6.1	Survey implementation: Contact procedure, sample design and weighting .....	226
6.2	Sample: Basic demographics and representativity .....	228
6.3	Questionnaire development and testing .....	231
6.4	Measurement instruments .....	232
6.4.1	Personal network measures .....	232
6.4.2	Media use measures .....	237
6.5	The CMI Survey 2002 .....	240
7	A GENERAL DESCRIPTION OF PERSONAL NETWORKS .....	242
7.1	Personal network size .....	245
7.1.1	Internet use and personal network size .....	251
7.1.2	Internet use and social isolation .....	252
7.2	The composition of emotional support and socializing networks .....	257
7.2.1	Internet use and the composition of personal networks .....	259
8	SOCIAL CONNECTIVITY WITHIN PERSONAL NETWORKS .....	262
8.1	Media and communication within personal networks: a descriptive overview .....	262
8.2	Media communication patterns in personal networks .....	268
8.2.1	Communication patterns in emotional support network – frequency of communication .....	269
8.2.2	Communication patterns in socializing network – frequency of communication .....	274
8.2.3	Summary of the results regarding frequency of communication within personal networks .....	280



8.2.4	The proportional size of media sub-networks in emotional support sub-networks .....	281
8.2.5	The proportional size of media sub-networks in socializing network .....	288
8.2.6	Summary of the results regarding frequency of communication within personal networks .....	291
8.2.7	Communication multiplexity within personal networks .....	293
8.3	Media sub-networks .....	296
8.4	Clusters of egos with distinctive patterns in communication with alters .....	301
8.4.1	Communication clusters in emotional support networks .....	302
8.4.1.1	The structural characteristics of emotional support networks of communication clusters.....	308
8.4.2	Communication clusters in socializing networks.....	309
8.4.2.1	The structural characteristics of socializing networks of communication clusters	315
8.4.3	Summary of the results regarding communication clusters .....	316
9	INTERNET USE AND PERSONAL NETWORKS IN SLOVENIA: 2002 – 2009.....	319
9.1	Internet growth trends in Slovenia .....	321
9.2	Size and compositional changes in personal networks.....	326
9.3	Internet use and the structural changes in personal networks .....	331
9.4	Decomposition analysis of personal network size change .....	341
10	CONCLUSION .....	345
11	REFERENCES.....	355
12	APPENDIX .....	379
	Appendix A: Dendrograms .....	379
	Appendix B: Socio-demographic differences in personal network composition.....	380
	Appendix C: Socio-Demographic profiles of communication clusters .....	384
13	INDEX OF NAMES .....	386
14	GENERAL INDEX.....	390
15	NOVE KOMUNIKACIJSKE TEHNOLOGIJE IN PREOBLIKOVANJE DRUŽBENOSTI V POZNI MODERNI (RAZŠIRJENI POVZETEK).....	398

## LIST OF FIGURES

Figure 2.1: Brynin and Kraut's conceptualization of the social impacts of ICTs .....	62
Figure 2.2: Key Social Informatics issues.....	99
Figure 2.3: Digital sociality as a socio-technical interaction network .....	102
Figure 3.1: Friends and Family – Expectations and practice .....	126
Figure 4.1: Functional image of media.....	170
Figure 4.2: Media and timing of announcements of birth of a child, by proximity of the correspondent.....	171
Figure 5.1: Concentric circles.....	184
Figure 5.2: Intersecting circles. ....	184
Figure 5.3: Spoke structure.....	185
Figure 8.1: Alter age and frequency of contact via six communication channels in emotional support and socializing networks .....	266
Figure 8.2: Tie duration and frequency of contact via six communication channels in emotional support and socializing networks .....	267
Figure 8.3: Geographical distance and frequency of contact via six communication channels in emotional support and socializing networks .....	268
Figure 8.4: The average network size of media sub-networks for emotional support and socializing.....	299
Figure 8.5: The proportion of kin in media sub-networks for emotional support and socializing.....	300
Figure 8.6: The proportion of friends in media sub-networks for emotional support and socializing.....	301
Figure 8.7: The proportion of alters living at a distance of over half an hour by car from the ego in media sub-networks for emotional support and socializing .....	301
Figure 9.1: The growth of regular internet users in the population aged 10-74 in Slovenia between 1996 and 2010 .....	321
Figure 9.2: Frequency of internet use in the population aged 10-74 in Slovenia between 2004 and 2009 .....	322
Figure 9.3: Gender composition of internet non-users between 2001 and 2009 .....	324
Figure 9.4: Age composition of internet non-users between 2001 and 2009 .....	325

Figure 9.5: Internet non-use and education between 2001 and 2009.....	325
Figure 9.6: Changes in the size of emotional support networks in Slovenia between 2002 and 2009.....	328
Figure 9.7: Changes in the size of socializing networks in Slovenia between 2002 and 2009 .....	328
Figure 9.8: Changes in the size of emotional support networks in Slovenia between 2002 and 2009 by frequency of internet use .....	336
Figure 9.9: Changes in the size of socializing networks in Slovenia between 2002 and 2009 by the frequency of internet use .....	337
Figure 9.10: Changes in the tie duration of emotional support networks in Slovenia between 2002 and 2009 by frequency of internet use .....	338
Figure 9.11: Changes in the geographical distance of socializing networks in Slovenia between 2002 and 2009 by frequency of internet use.....	339
Figure 13.1: Dendrogram for communication clusters in emotional support networks .....	379
Figure 13.2: Dendrogram for communication clusters in socializing networks .....	379

## LIST OF TABLES

Table 2.1: Fischer's typology of theorizing the technology – society relationship .....	67
Table 2.2: Kling and Scacchi's conceptualization of the discrete-entity and web model.....	90
Table 2.3: Conceptions of ICT in organizations/society .....	97
Table 4.1: Co-presence versus co-location.....	142
Table 4.2: Zones and realms of everyday life .....	145
Table 4.3: Connected presence vs. conversational mode .....	159
Table 5.1: Differences associated with the strength of ties .....	179
Table 6.1: Interview status.....	227
Table 6.2: The RIS 2009 sample .....	230
Table 6.3: RIS 2009 questionnaire design and the subsamples.....	231
Table 6.4: The CMI 2002 Survey sample.....	241
Table 7.1: Univariate distribution of network size of emotional support and socializing networks.....	246
Table 7.2: Univariate distribution of network size of social circles.....	248
Table 7.3: Summary of MCA for subgroup differences in network size of emotional support and socializing networks .....	249
Table 7.4: Summary of MCA for subgroup differences in network size of social circles ....	250
Table 7.5: Analysis of variance for personal network size by frequency of internet use.....	251
Table 7.6: Summary of logistic regression for socio-demographic variables and internet use predicting social isolation – emotional support networks .....	253
Table 7.7: Summary of logistic regression for socio-demographic variables and internet use predicting social isolation – socializing networks.....	254
Table 7.8: Summary of MCA for socio-demographic variables predicting the size of social circles.....	256
Table 7.9: Differences in network composition between emotional support and socializing networks.....	258
Table 7.10: Summary of MCA for internet use variable predicting the composition of emotional support and socializing network.....	260
Table 8.1: Frequency of contact via six communication channels in emotional support and socializing networks .....	263

Table 8.2: Frequency of media sub-network size – emotional support and socializing .....	264
Table 8.3: Model statistics of regression models - frequency of communication in emotional support networks .....	270
Table 8.4: Summary of hierarchical regression analysis for variables predicting frequency of communication in emotional support network.....	273
Table 8.5: Model statistics of regression models - frequency of communication in socializing networks .....	276
Table 8.6: Summary of hierarchical regression analysis for variables predicting frequency of communication in socializing network .....	277
Table 8.7: Summary for the verification of Hypothesis 3a.....	280
Table 8.8: Summary for the verification of Hypothesis 3c.....	281
Table 8.9: Model statistics of regression models – proportion of alters in emotional support network.....	284
Table 8.10: Summary of hierarchical regression analysis for variables predicting the proportional size of media sub-networks (emotional support) .....	286
Table 8.11: Summary of hierarchical regression analysis for variables predicting the proportional size of media sub-networks (socializing) .....	287
Table 8.12: Model statistics of regression models – proportion of alters in socializing network .....	290
Table 8.13: Summary for the verification of Hypothesis 3b.....	292
Table 8.14: Summary for the verification of Hypothesis 3d.....	292
Table 8.15: Model statistics for regression models predicting communication multiplexity in personal networks.....	294
Table 8.16: Summary of hierarchical regression analysis for variables predicting communication multiplexity in personal networks .....	295
Table 8.17: The size and composition of media sub-networks – emotional support.....	297
Table 8.18: The size and composition of media sub-networks – socializing.....	298
Table 8.19: A cluster typology of respondents by communication with alters in emotional support network via six media .....	304
Table 8.20: Summary of multinomial logistic regression for socio-demographic variables predicting cluster membership – emotional support .....	307

Table 8.21: A cluster typology of respondents by communication with alters in socializing network via six media.....	310
Table 8.22: Summary of multinomial logistic regression for socio-demographic variables predicting cluster membership – socializing .....	312
Table 8.23: Summary of MCA for socio-demographic variables and cluster membership predicting network size and composition – emotional support .....	313
Table 8.24: Summary of MCA for socio-demographic variables and cluster membership predicting network size and composition – socializing.....	317
Table 9.1: Internet use in the CMI 2002 and RIS 2009 survey .....	323
Table 9.2: Summary of MCA for network composition – comparison 2002 and 2009 .....	329
Table 9.3: Summary of MCA for network composition – comparison 2002 and 2009 .....	330
Table 9.4: Personal network size and internet use – comparison 2002 and 2009 .....	332
Table 9.5: Summary of the changing-effect model for variables predicting the size of emotional support networks in 2002 and 2009.....	334
Table 9.6: Summary of the changing-effect model for variables predicting the size of socializing networks in 2002 and 2009 .....	335
Table 9.7: Summary of hierarchical regression analysis for variables predicting the size of socializing network in 2002 and 2009 .....	340
Table 9.8: Results of LDM for emotional support and socializing network size across the internet (non)user groups from 2002 and 2009 .....	343
Table 13.1: Subgroup differences in role-relation composition of emotional support networks (%) .....	380
Table 13.2: Subgroup differences in network composition of emotional support networks.....	381
Table 13.3: Subgroup differences in role-relation composition of socializing networks (%) .....	382
Table 13.4: Subgroup differences in network composition of socializing network.....	383
Table 13.5: The socio-demographic profile of communication clusters (emotional support) .....	384
Table 13.6: The socio-demographic profile of communication clusters (socializing) .....	385

# 1 INTRODUCTION

The last twenty years have been marked by the extremely rapid development of information and communication technology (ICT) that gives to the people the opportunity to keep in touch in various domains of everyday life. Although technological innovations are a firm companion of societal history, the emergence and proliferation of personal digital technologies that enable electronically-mediated interpersonal communication show some peculiar characteristics which make this moment worth of special attention and detailed sociological observation. From the technological point of view, we have been, on one hand, witnessing an impressive concentration of hardware and infrastructural innovations that in terms of temporal intensity and global scope can be hardly compared to any other period of modernization of contemporary societies. The three most important milestones in that process are certainly the invention of the Internet in the late 1950s, the advancement of Global System for Mobile communications (GSM) standard in the middle 1980s, and the evolution of the World Wide Web in the early 1990s. All these technologies have given to people not only the opportunity to stay in touch from remote geographical location, but also to be connected while moving through geographical spaces.

On the other hand, the fast pace of technological advancement has been denoted by the digital platform on which both the Internet as well as mobile phones services are built and run. In the pre-web days, the electronic mail (email) and email-based communication services such as Usenet, newsgroups, newsletters, Bulletin Boards Systems (BBS), and Multi-User Dungeons (MUDs) attracted lots of early Internet adopters who were pulled on by the remoteness of virtual reality (Rheingold 1991). Yet, at the same time, they recognized the expressive, coordinative, and networking potentials of computer-mediated communication (CMC). At present, two decades after Tim Berners-Lee invented the World Wide Web at CERN, the internet researchers have been talking about the “permanent beta” era (O'Reilly 2005), when new web-based interactive communication services are mushrooming so quickly that one indeed comes up against a difficulty of keeping up with the constant stream of new media and updated applications.

However, what is probably even more interesting than the tempo of technological change on the Internet itself is the *social* orientation of web applications that have been taken up in the

last ten years (Baym 2010). In this context, we often hear talking about web 2.0 applications, the social web, and social media (O'Reilly 2005); all terms that lack of a clear and substantive definition, yet they are perceived by the academic as well as general public as words that indicate a turn-around point in the history of what Manuel Castells (1996; 1997; 1998) refers as the Informational age. Until the late 1970s the Internet used to be above all a computer network employed by governmental institutions, research organizations and scientists for professional aims and activities. The first email-based communication services were built by engineers at the MIT in order to discuss and overcome technical problems that turned up in the development process of internet protocols. The social dimension of the internet has become evident and important only at later stages when the Usenet newsgroups and other social settings – today known as online communities (Preece 2000) – have reached the critical mass of users, who went online in order to connect with each other.

For computer scientists, as Berners-Lee and Fischetti (2000) explain in their book about the foundations of the World Wide Web, the evolution of the social web and other internet-based socializing applications was the logical evolution/consequence of the network architecture, on which the Internet as technological artifact is built on. Likewise, the claim that the web is a social space, where people with common interests meet in order to socialize or interact with each other, might count as a general truth for digital natives – persons for whom digital technologies already existed when they were born, and thus have grown up with computers, the Internet, mobile phones. According to different survey-based studies on the use of ICT such as Pew Internet in the United States, Oxford Internet Survey in the United Kingdom or Eurostat Statistics in the European Union, the majority of teenagers or young adults in the developed Western countries has at least one email account, a personal profile on a social network site (e.g., Facebook, Twitter, Bebo, MySpace) or a mobile phone with internet access.

Nevertheless, for those social scientists, who have been studying the social transformation of internet and web applications long enough, the impressive change of the Internet from a *computer* network to a *social* network (Wellman et al. 1996) is less straight forward than it might appear at the first glance. Let us present two short personal anecdotes that illustrate why current embeddedness of personal relationships and social interactions in



communication processes mediated by web-based technologies, mobile phones and other ICTs is an outcome of a rather more multifaceted constellation of social forces and relations.

Recently, the author attended an invited speech given by a leading social media strategist and expert in Slovenia at an undergraduate course of “Internet in everyday life” at the Faculty of Social Sciences. The topic of the talk was the use of social media in personal branding or, in other words, how people in search of a new job can exploit the technological affordances of the social web in order to get in touch with potential employers and/or make a good impression on them. At the end of the talk, the speaker asked the students in the audience how many of them has ever used the microblogging service Twitter or has had an active Twitter account. Surprisingly, no one raised their arm up. Afterwards, the discussion revealed that students knew about Tweeter massive popularity in the United States, however, they did not perceived the exchange of 140-character status updates (messages) as a viable medium for keeping in touch with their personal network. This point was most clearly expressed by a student who wonderingly asked himself: “Why would I use texting online, if I can manage to exchange short messages to my mates through my mobile phone?”

This occurrence would not be worth to mention if not for the fact that an analog situation happened to the author approximately ten years ago – just before the beginning of the exponential growth of mobile telephony in Slovenia – at an ICT symposium, where the representatives of mobile carriers as well as hardware and software developers met to discuss about the future of mobile telephony in Slovenia. In one of the sessions dealing with the mobile phone internet services, almost all attendees shared the belief that short text messages (SMS) have become a “killer application”. However, at the same time, they also agreed on that in a couple of years SMS will be a “death technology” and consequently replaced by other multimedia services (i.e., Multi Media Messages – MMS) that will allow users to send and receive longer and graphically enhanced messages. In fact, ten years later, the empirical data from a nation-wide survey on representative sample of residents in Slovenia has shown that the percentage of MMS users has increased considerably in comparison with the year 2000. However, the SMS have not suffered any replacement effect yet: they are still widely used among all age cohorts and social classes in the population (Goggin 2006; Ling 2008). Even more, if we observe the number of persons that the average user communicates with via SMS in Slovenia in a typical week, the size of the corresponding social networks (i.e., 8.0

persons) has already drawn near the number of persons communicating via landline telephone (8.5), in person (11.0), mobile phone voice calls (13.7), or the Internet (e.g., chatting, instant messaging, emailing, online forums, blogs, social network sites; 14.1) (Vehovar et al. 2009).

Even though these two episodes have an anecdotal value, as they are not the result of a methodological scrutiny, they are useful as an intuitive instruction of the complexity of social phenomena related to use of ICTs in personal relationship maintenance and formation. First, both Twitter and SMS have similar *technological* affordances – they are a text-based communication application with a strict character limit (i.e., 140 characters in the case of tweeter updates and 160 characters for SMS). Nevertheless, the former has until now received only limited attention from young internet users, while the latter has reached a massive popularity across the globe. Secondly, the two stories bring to the front the transformative facet of the digital technology and the transformative potential of its users. Twitter was originally designed as a socializing application that would enable people to follow or be followed by their family, friends, and acquaintances, etc. during their everyday life activities (Crawford 2009). However, a recent Pew Internet and American Life Project study about communication patterns on Twitter shows that tweeting and status-updating is more frequently *used and perceived* as a one-to-many communication than an interpersonal (one-to-one) communication channel (Lenhart and Fox 2009). On the other hand, SMS was at the very beginning of the development of the mobile telephony conceived as a data based service. The basic idea for SMS was to use one part of the GSM frequency spectrum to transport messages on the signaling paths, which would help the mobile carriers to control the telephony traffic during low traffic time periods and consequently use those timeframes to transport messages at minimal costs (Taylor and Vincent 2005). With the massive uptake of mobile telephony by young users the current role and usage this 160-character channel was actually *reinvented* as a social medium by the users themselves (Ling 2004; Ling and Donner 2009).

Finally, returning to the anecdote about the lecture on social media and personal branding, consider the student's self-referring question that was asking about why he should use tweeting if SMS is from the technological point of view a pretty much similar communication – with an important advantage of being mobile. This question points to two interrelated issues. On one hand, it brings on the surface the normativity of the social context that frames

the use patterns of communication technologies. By now, SMS have become a firm part of our lives. Texting practices have become normatively regulated and have acquired stable symbolic interactional meanings that help individuals to get in touch with each other within different social contexts (Bryant et al. 2006). In contrast, Twitter, as a recent product of the social web philosophy, is “a new player on the market” and people still have not had enough time to build around it a set of normative and interactional conventions that would give to tweets a take-for-grantedness typical of the “old” technologies for interpersonal communication such as the landline phone, the mobile phone, texting, instant messaging, etc.

On the other hand, that question brings our attention to the problem of how social structures on different social levels (macro, mezzo, and micro) and within different social spheres (work, family, leisure, etc.) adapt to a seemingly endless proliferation of ICTs. In this regard, two epistemological issues deserve consideration. First, it is safe to argue that interpersonal communication is today dispersed across a set of new communication technologies with similar *social* functionalities and affordances (e.g., Baym 2010; Fortunati 2005; Licoppe and Smoreda 2005; Petrič et al. 2010; Sooryamoorthy et al. 2008; Vehovar et al. 2009).<sup>1</sup> People can use different devices and media to get in touch with different people within different social settings, as they can use only one device to connect with different people, or an array of devices to be in touch with one single person. Apparently, new communication technologies have created a myriad of possible options – hardly imaginable only a few years ago, – contributing to the condition of “multimodal connectedness” (Schroeder 2010), under which it would be inappropriate to study how people maintain their connections with each other by narrowly focusing on only one medium. If one wants to understand how personal relationships are mediated by new technology, one should not concentrate on one single technology but on the set or ensemble of devices people nowadays have at their disposal to manage their social ties<sup>2</sup> (Bausinger 1984; Höflich and Gebhardt 2005).

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<sup>1</sup> Articles Petrič et al. (2010), Petrič et al. (2011), Petrovčič et al. (2011), Vehovar et al. (2009), and Vehovar et al. (2010) present results of previously published studies that were conducted as part of this doctoral research project.

<sup>2</sup> In this study we understand and use the notion of social ties in Putnamian terms, as “... connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (Putnam 2000, 19).

Secondly, it seems that new communication technology with its ubiquitous presence within everyday life is moving – if not even dissolving – the boundaries between social realms. For example, Rakow and Navarro (1993) in their study of the use of mobile phone by employed mothers in the United States assert the changing social conventions mobile communication has introduced in terms of mothering. They argue that the progressive dissolution of the division between the domestic and working sphere has been accompanied by specific uses of mobile phones. Mobile communication has brought about a single realm of ubiquitous personal connectivity where the boundaries between family and work have collapsed. The mobile phone permits mothers to exist in their domestic and work worlds simultaneously, creating a practice of “remote mothering” which is organized around “parallel shifts” and not “double shifts” as it used to be in the past (Rakow and Navarro 1993). The general implication of their findings is that new communication technologies make it easier for personal relationships to criss-cross different realms of everyday life. Hence, paying attention on a single realm could not provide a clear answer about the implications new communication technology holds for social connectivity. This is also the epistemological stance of this dissertation that aims to investigate the role of new technologies for interpersonal communication in the maintenance of social ties under the conditions of late modernity.

In the introduction to *Personal connection in the digital age* Nancy K. Baym notes, “... digital media raise a variety of issues as we try to understand them, their place in our lives, and their consequences for our personhood and relationship with other” (Baym 2010, 2). This is an apt observation as it gives to understand the complexity of research questions, designs and frameworks one faces when studying the contemporary social reality, which is instituted on the processes that connect technology with society in a seamless way. For example, for Jenkins (2006) the intensive link-up of technological means and human agency is creating a new cultural form. Jenkins (2006) coined the notion of “convergence culture” to analyze and explain how the global media culture of the information age is shaped by the interrelation between the technological convergence of new media and global convergence of users’ media consumption: the digital format enables media producers to disseminate the content across multiple media platforms, yet, at the same time, the popular culture is creating a uniform pattern of media consumption, which stems from the growing integration of content. What Jenkins is telling us, is that, if one wants to understand the convergence of the contemporary

media consumption, one should not analyze technology and human agency as two detached domains, but rather study the reality that is emerging out of the interconnections between the two domains.

One may think of the social reality that is distinguished by the complex and rapid transformations in the kinds of technological mediation of personal relationships in similar terms. As Hogan (2009) observes people can use mobile phones to coordinate with their family and friends that live nearby. They can also use it for communication with work ties. They may reserve the landline telephone for short chatting and long distance conversations with emotional support ties. They can use social network sites (such as Facebook, Twitter) for keeping up with friends and relatives on a daily basis or for reconnecting with former schoolmates or acquaintances they have not seen for ages. They can also use social network sites (e.g., LinkedIn) for networking with professional ties or maybe use instant messaging or texting to exchange short messages over large distances. Moreover, they can decide to organize an in-person encounter because informal, formal or legal obligations imply that.

When one grasps the question of how new communication technologies characterize social interactions in terms of temporal and spatial organization and in what ways people connect with the members of their personal networks, such inexhaustible myriad of technologically mediated forms of social connectivity makes the challenge of understanding the relations between the technological social interaction and contemporary personal relationships even more multifaceted and multilayered. Even more, such diversity and variety creates the doubt of whether these new forms of social connectivity bring about social regularities that are framed and can identified by a distinguishable normative order palpably visible in the organization of social interactions, personal relationships and historical contexts (Hogan 2009). If such regularities, however, do exist, what analytical, theoretical and methodological approach should be applied to capture the diverse dimensions and levels of social processes and structures that both enable and constrain individuals to behave in certain ways.

In the first part, this dissertation tries to establish and present the theoretical framework which can account for the characteristics of social structures and processes that are inscribed in the relations between technology, social interactions, and personal networks. Such conceptual framework should help us to understand why certain forms of technologically-

mediated social connectivity in late modernity are not only individual practices present in specific contexts or situations but are diffused throughout the social reality as structural conditions that denote the restructured normativity of how people form and sustain (as well as break up) personal relationships within different social contexts. In this sense, it should help us to explain why and how people access different social ties through different communication channels. It should also be able to inform new communication technologies not only as neutral artifacts that have added to the complexity of contemporary media ecology, but also as active participants that co-constitute the characteristic features of social interactions. And last, but not least, it should encompass the analytic tools that can help us to understand what implications these interactional characteristics have for social integration.

To derive such a theoretical framework, we draw upon different theoretical traditions that analyze and explain the contemporary organization of personal relationship and social connectivity from the technological, interactional and network point of view. From the technological point of view, we follow Baym's suggestion in a search for conceptual tools that, "... look concretely at the qualities of a medium, consider how those qualities have played out in previous innovations, and understand how they are modified or expanded in combination of new media" (Baym 2010, 152). We identify the Social-Technical Interaction Network (STIN) approach, introduced by Kling et al. (2003), as an analytical model that explains the origins, patterns and consequences of social uses of communication technologies within different social settings and contexts. In contrast with deterministic and symptomatic approaches (Fischer 1992), which look on the relation between technology and society as if they would represent two separated spheres, the STIN model assumes social constructivism and conceptualizes technology both as a tool in individual's hands and as a structure that constraints and enables the individual in his/her actions. By emphasizing the user, the social ends and the social context, the STIN approach should help us to understand not only how new technologies have reorganized media ecology itself, but foremost how they formed a set of social conditions for the development of ontological and epistemological foundations, through which individuals experience the sharing and the construction of a common space of experience and meaning in interpersonal relations.

However, the experience of social presence and togetherness in personal relationships is not only technologically, but also historically mediated. As Harper notes in the case of mobile

communication (cited in Ito 2005, 11): “The mobile age is not rendering our society into some new form; it is, rather, enabling the same social patterns that have been in existence for quite some time to evolve in small but socially significant ways.” In other words, the way people perceive and live their personal relationships, mediated by digital technology, is contextualized by the changing nature of traditional institutional forms that characterized modernity. Contemporary sociologists such as Giddens, Beck, Beck-Gernsheim, and Lash acknowledge that the modernizing impetus of reflexivity, individualization and globalization show universalizing tendencies that create new patterns of social, political, economic as well as personal life organization, which are characteristic of what they recognize as late modernity (Giddens 1990) or second modernity (Beck 1992; Beck and Beck-Gernsheim 2002; Lash 2002a). These circumstances imply living, “... with the consequences of radical disembedding processes that lift the forms of connectedness out of their old social settings, and undermine given resources of social and personal identity” (Heaphy 2007, 10). These changes, it is argued by Giddens, include a hitherto not seen democratic emphasis that has profound and far-reaching implications for the personal life of the individual. The relational life in late modernity presents a shift towards equality and an opening up of demands for active negotiation of trust within relationships. However, what makes late modernity different from other social realities is the fact that the empowering agency does not represent a deliberative choice for the individual, but rather a structural requirement: if the individual wants to make the burdens of living in the “risk society” (Beck 1992) bearable, s/he has to constantly rework and reorder his/her social ties (and identities) by him/herself without the support of traditional institutions.

In our opinion, it is precisely in the relational management of latemodern social ties or what Giddens (1992) terms “pure relationships”, where the interweaving of social affordances of digital technologies for personal communication finds its pragmatic expression. It seems that the individual addressability (Ling and Donner 2009), the personal connectivity (Baym 2010), and higher control over the “volume” of social interaction (Baron 2008) allowed by new communication technologies, produce a remarkable match with the structural demand for more intimate and selective relationality, which is imposed on the individual by late modern institutions. However, what we are witnessing is far more than a quantitative modification in terms of volume communication and rearrangement of social interactions in the enhanced media ecology. But rather, as Fortunati (2005) and Zhao (2006a) note, a

*qualitative adaptation* of social interactions to the complexity of choices, rules, conducts, and strategies involved in the social connectivity.

Various scholars recognize such alternations in social interactions with different notions such as micro-coordination (Ling and Yttri 2002), perpetual contact (Katz and Aakhus 2002), “connected” presence (Licoppe 2004), absent presence (Fortunati 2002; Gergen 2002), always-on connectivity (Baron 2008) – to mention only a few of them. These terms capture different aspects of the shifting nature of technologically-mediated social interactions: (1) the conversational dynamics and characteristics of interpersonal communication; (2) the relation between public and private communication; (3) the temporal and spatial organization of interpersonal communication; (4) the accessibility of interlocutors on a particular medium; (5) the experience of social presence in the course of interpersonal communication. As Licoppe (2004) argues the personal relationships emerging out of these conditions at the same time establish the normative framework in which interactions take place. Under such circumstances, face-to-face communication is not anymore the only prototypical form of social interaction from where all other mediated forms of communication derive (Fortunati 2005; Zhao 2006a). The social co-presence that was once upon a time seized to the realm of “here and now” (i.e., co-locational co-presence), has now become – thorough mediated modes of social interaction – expanded to the realms of “there” and “now” and “there” and “then” (Zhao 2006a). As Zhao (2006a, 471) puts it,

The emergence of a multimodal structure of human interaction has redefined the meaning of sociality. In a society of physical co-presence, the distinction between “alone” and “with others” is usually unproblematic: alone means by oneself and with others means being in the presence of others. Today, this distinction becomes less obvious: one can be physically alone, yet in real-time contact with multiple people.

Technological mediation is creating a stable construction of shared expectations and routines through which the contemporary individuals are experiencing the taken-for-grantedness of their personal relationships in a different manner from their ancestors.

The analysis of changes which the new communication technologies have introduced into the interactional dynamics of the everyday experience of social presence and togetherness enables us to expand our investigation to a more macroscopic level, that of egocentric



networks of interpersonal relations that constitute the substance of digital sociality (Castells 2001; Mascheroni 2007; Miyata et al. 2005; Wellman and Hampton 1999; Wittel 2001). Here the main idea is that new media for personal connection by changing the way people access their social ties, have altered the structure of personal networks. In the past, the personal networks were enveloped in the spatial and temporal *co-location* of traditional social structures, which are exemplified by the notion of the place- and locally-based community. At present, these kinds of structures are increasingly replaced by new social structures that support the spatial and temporal disembeddedness of personal networks, which are, for example, based on the principle of individual addressability (Ling and Donner 2009) and “always-on” connectivity (Baron 2008). Wellman and Leighton (1979) have used the notion “personal communities” to encapsulate such structural variation. He and his collaborators portray them as geographically dispersed, sparsely knit, and homogenous personal networks made up of specialized and selective social ties, whose composition varies according to the individuals’ social and cultural location (Chua et al. 2011). Wellman argues that personal communities are not the creation of late modernity; in different forms and with diverse characteristics they have been part of social reality for centuries. However, the advent of modernization with its spatial and temporal reorganization of social institutions has fostered a shift in normative framework of personal network formation. Unlike in the past, today social connectivity is not strictly bounded by spatially-defined communities but rather embraced into relationally-defined communities that emphasize the central role of the individual in network formation and maintenance. Wellman (2001) calls this emerging form of sociality “networked individualism”, while other academics term it “the spoke model of network formation” (Pescosolido and Rubin 2000), “network sociality” (Wittel 2001), “selective sociality” (Matsuda 2005), or “mobile sociality” (Mascheroni 2007).

Such notions informed by (social) network theory might nowadays appear appealing and instructive. However, as Willson (2010, 760) cautions, “... while network theories provide some useful descriptive and structural frameworks from which to analyze certain social forms, and to predict others, considerable work is still needed to enable more nuanced and less theoretically problematic explorations of mediated sociality and social forms and practices to take place.”

Therefore, in developing our argument we adhere to Fortunati (2005) who suggests that the diversity of these socialities is not a theoretical artifact, but indeed a result of different social experiences and practices of the relational complexity lived by the individual in late modernity. This suggestion is shared by Ito (2005, 11), when noting, "... while we do see the strengthening of discourses and bonds of intimacy and selective relationality, the forms that these take in everyday practice are so varied that they cannot be reduced to a single model of sociability." Nevertheless, Pescosolido and Rubin (2000, 62-66) argue that late modern socialities have at least three characteristic features in common. First, the individual position in relation to their social circles and institutions is externalized: they often form and keep up their relationships and links to institutions in a personalized and temporary way, without the obligation of lifelong commitment to one, but multiple social ties and settings. Second, the individual takes up a central, yet critical position in the "geometry" of contemporary relations in terms of social interaction and integration. Finally, these kinds of arrangements require constant negotiation between social actors because they are only partially supported by traditional social institutions – a feature that neatly dovetails Giddens (1991) notion of pure relationships. To these three points we could add the forth one, which argues that networked socialities are actually digital socialities (Licoppe and Smoreda 2005; 2006; Thompson and Cupples 2008), as they are supported by the new communication technologies that mediate the web of personal relationships and institutional affiliations (Wellman 2001; Wittel 2001).

Moreover, personal community does not merely account to a network of social ties, but also represents a resource of people's self-identity and belonging. In this context, Spencer and Pahl (2006) put forward an interesting observation. They notice how the notion of personal community brings together the words "personal" and "community", which are usually read as antonyms in sociology, creating perplexity among those who understand the notion of community as a social collectivity based on the shared fate that is geographically circumscribed or socially determined. However, they also note that, for example, neighborhood and class bases for a sense of belonging and personal identity in modern society are today juxtaposed by more complex and individualized resources, which function as reference points when people think about themselves in relation to collective. In other words, the role of new communication technologies in personal community maintenance is not only related to the processes of social interaction, but also to those of social integration. Personal communication technologies have inherently inscribed a tension between autonomy

(i.e., personal) and interdependence (i.e., community): while they allow people to be “always-on” (Baron 2008) or in “perpetual contact” (Katz and Aakhus 2002) with their social circles, they, at the same time, give them more discretion to select to whom, when, how they will talk to.

While the dimension of ubiquitous connectivity and accessibility has been usually perceived as positive by default and, thus, left undisputed (Ling 2008), the dimension of autonomy has been opened to (moral) persuasion and habitually associated with the disruptive effects of new technology on personal relationships and involvement in local environment. The clear-cut division between physical reality and virtual reality (Rheingold 1991), which dominated and framed the internet research in the 1990s, often identified in the openness of the cyberspace and the anonymity of computer-mediated communication (CMC) the levers of alienation and social disintegration, which are always ready to tear the individual out of face-to-face interactions, “real” relationships and local environment (e.g., Kraut et al. 1998; McPherson et al. 2006; Putnam 2000). Nevertheless, later discussions around the (dis)integrative effects of the Internet and mobile phones as well as the research carried out in this field, tell us that people appropriate new technologies as means for fostering meaningful personal connections, which span across online and offline spaces and cannot be considered in advance as fragmentary, opportunistic, or disembedded from the local community. As Baym (2010) argues, the interrogation of whether technologically-mediated communication compared to in-person communication is good or bad for social networks, cohesion and participation is ill-posed from the start because of the assumption that the social reality is divided on the basis of technological mediation and not relational complexity. Therefore, in her opinion, it would be better to address questions such as: who is communicating with whom, for what purposes, in what contexts, and how this is related to the social forms that support social integration in modern Western societies.

To sum up, on the theoretical level this dissertation contributes to the critical conversation about the role new communication technologies play in the contemporary sociality by answering the following four questions:

- 1. How can we characterize the relation between technology and society in such a way so that the technological mediation of social interactions can encompass the institutional direction late modernity is giving to personal relationships?*

2. *How the emergence of new technologies for interpersonal communication has modified the characteristic features of social interactions?*
3. *What implications have the technologically-mediated forms of socialites on the structural characteristics of people's personal networks?*
4. *What is the potential of technologically-mediated forms of social interactions for social integration/isolation on the personal network level?*

To summarize, the central thesis we defend in this dissertation is that for understanding the institutional foundations and implications of contemporary sociality one needs to consider the socio-technical nature of today's social reality. In fact, the shared experiences and practices of social connectivity that are characteristic of digital socialities emanate from the unique socio-technical dependency between social interactions, technology and social networks, which has been facilitated by appropriation of new communication technologies and framed by the late modern tendency toward an accentuated form of individualization and reflexive personal relating. The networked convergence of these elements has gradually given credit to the forefront position of the individual in the social life. It has also resulted in the emergence of social domains that are mediated by digital communication technologies, in interaction practices that support the ubiquitous modes of social connectivity, and ultimately in the reorganization of the normative structures that determine the relation between different modes of personal communication. We suggest that all these processes have found their social expression in spatial, temporal, and compositional structure of personal networks, within which people are using new communication technologies in an increasingly complex and individualized way for interacting with the social ties that provide them with diverse kinds of social support.

In this dissertation the problem of new communication technologies and new forms of socialities in late modernity is not only discussed on the theoretical level, but also empirically analyzed on the basis of survey data. We do this using data collected with a CATI survey on a nation-wide representative sample of 1209 residents of Slovenia aged 15 – 75 years. The aim of the survey was to provide a representative insight into various aspects of the use of ICTs in everyday life and social connectivity as well as to ascertain the importance of ICTs for social participation and digital in-/exclusion among different social groups. The respondents were randomly allocated to two subsamples of almost equal size, receiving two

different versions of the questionnaire divided into six modules. The second subsample completed a module with a set of specific questions that offer a detailed descriptions of the structural characteristics of these respondents' (i.e., egos')<sup>3</sup> personal social networks, including the use of old and new technologies for interpersonal communication with their network members (i.e., alters). In order to capture the complex array of social relations five different *name generators* were used in this module as questions to elicit the names of alters in the ego's personal network that represent his/her strong and weak ties. During the analysis, the alter data were aggregated on the ego level and are used as the empirical source of analysis which seeks to answer the following research questions: (1) What are the structural characteristics of people's personal networks and how they are associated with people's socio-demographic profile and their use of communication technologies? (2) How are the structural characteristics of personal networks and internet use associated with social integration in terms of social isolation? (3) How people combine old and new communication technologies to get in contact with those in their personal networks and is there any difference in the usage patterns according to the type of social support and strength of social ties? (4) Is there any change in the structural characteristics of personal networks between 2002 and 2009 and can the potential modifications in the network structure be associated with the substantial growth of access to and use of the Internet that characterized the evolution of the technological landscape in Slovenia in the last decade?

## 1.1 DISSERTATION ORGANIZATION

This dissertation consists of ten chapters. The Introduction (Chapter 1) is followed by four theoretical chapters, four empirical chapters, and the concluding chapter (Chapter 10). The theoretical part of this dissertation is organized around the four sets of relations central to roles new communication technologies have had in the transformation of sociality in late modernity: technology-society relationship, late modernity and personal relationships, social interactions, personal networks.

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<sup>3</sup> Throughout this study we use the term ego to identify the participant providing the data about their personal networks and the term alter when referring to the people in ego's network. The terms ego and focal individual are used interchangeably in this text.

Chapter 2 aims to build a critical framework for understanding how new communication technologies have been involved in the transformation of social interactions and personal relationship that are characterized by the late modern social conditions. As already mentioned in the Introduction, the relation between technology and society has always been subjected to different interpretations, which span from deterministic to relativistic (or symptomatic in Fischer (1992) terms) conceptualizations. Both paradigms have understood the technological and social sphere as if they would be independent. By focusing solely on the *impacts* technology has on social structure or *vice versa* on the *shaping effects* of the social structure on technology, however, it seems that they have not been able to explain how technology and society mutually co-construct each other within different social contexts and on different social levels. After a brief overview of these “discrete-entity” conceptualizations (Orlikowski and Iacono 2001) we introduce the STIN approach (Kling et al. 2003), which sees the relation between technology and society as a structuration process. From STIN perspective, ICT is more than just a tool in the user’s hands. It is a social ensemble or network of equipment, techniques, applications, and people which, “... defines a social context, including the history of commitments in making up that network, the infrastructure that supports development and use, and the social relations and processes that make up the terrain in which people use it” (Orlikowski and Iacono 2001, 21). An application of the STIN model will help us to map out the structural origins of digital sociality – the notion we use to analytically tackle the socio-technical structure emerging from the intersections between the use of new communication technologies, the changing traits of electronically-mediated social interactions and the structural characteristics of people’s personal networks, which are occurring as the multitude of digital media for personal connectivity facilitates differential access to social ties. The STIN model also promotes the idea that, “system participants (i.e., users of technology) are embedded in multiple, overlapping, and non-technologically mediated social relationships” (Kling et al. 2003, 57), suggesting that the specific characteristics of arrangements between technology and society are – to a large extent – determined by the social and historical development of institutional order and normative context.

Chapter 3 follows up on the theme of social context that shapes the constitution and organization of personal relationships in late modernity. By drawing on the theories of Antony Giddens and Ulrich Beck it discusses how reflexivity and individualization have been altering the institutions and modes of personal life. For Giddens, modern institutions are

characterized by a distinctive dynamism which has profound implications for reconfiguring of social relations, practice and modes of behavior (Heaphy 2007). This dynamism is related to three interconnected processes: (1) the uncoupling of time and space that gives to social relations the ability to be stretched across time and space; (2) the disembedding of social institutions from the social interactions that are shaped by the structural characteristics of local settings; (3) and the reconfiguration of traditional social institutions that gave meaning to social actions and have been now reconfigured by the institutionalization of reflexivity, which structures people's approach and response to the modern organization of social structures on the global scale as well as in the personal life (see Giddens 1991, 20). Our purpose is not to question these notions or to thoroughly analyze the rationale of these arguments, but rather to identify the implications the institutionalized reflexivity underpinning late modernity has had on the organization of personal relationships. Both, Giddens (1992) and Beck and Beck-Gernsheim (2002a) argue that if late modernity can be understood as reflexive modernity, then also personal relationships should be understood as an outcome of reflexive self-identities or do-it-yourself biographies. Therefore, Chapter 3 considers how Beck and Beck-Gernsheim's *individualization* (Beck and Beck-Gernsheim 2002) and Giddens's *pure relationships* (Giddens 1991) fare in digitally mediated environments, which allow more individual addressability, more control over individual's interactions, yet also more continuous connectivity and accountability in personal relationships (Baym 2010). For Giddens, as Heaphy (2007: 75-77) writes, late modernity is among other things also about developments in electronic media and communication technologies making the interlinked development of media and electronic communication central for understanding late modernity. In fact, the recent digital media are vessels for the temporal and spatial reorganization of social relationships, which through disembedding and globalization play a crucial role in the setting up of modern institutions on the macro and micro level (Giddens 1991, 26).

The fourth chapter picks up the theme of reflexivity and individualization of personal relationships, by analyzing how technological mediation of interpersonal communications is related to the changes in social interactions. The landline phone, the mobile phone, texting, the Internet, email, social media, and social network sites do not only represent communication technologies that have given to people more choice in how they can connect with their social ties. But, as Fortunati (2005) argues, they are also the source of important

structural reverberations in the *quality* of social interactions. In other words, the technological mediation of interpersonal communication has, on one hand, restructured the relations between new and old communication technologies, while, on other hand, it has denoted the appearance of wholly new modes and organization of personal connectivity such as micro-coordination (Ling and Yttri 2002), “connected” presence (Licoppe 2004), perpetual contact (Katz and Aakhus 2002).

To support this thesis, the first part of Chapter 4 provides an account of how the changes in the temporal and spatial conditions of social interactions have altered the human experience of social presence in everyday life. We argue that a multitude of new technologies has multiplied the realms of everyday life, making corporeal co-presence just one in a line of modes that sustain the subjective reality of interpersonal interactions. The second part of Chapter 4 provides an overview and comparison of notions that describe the qualitative changes in mediated interpersonal communication and link them, on the conceptual level, to the network organization of social connectivity under late modern conditions. Chapter 4 ends with a section that outlines the relation between new forms of mediated communication and the in-person communication (or body-to-body communication in Fortunati terms) which used to have the prototypical role in interpersonal communication. It extends Fortunati’s analysis of how and why technologically-mediated communication has a potential to undermine body-to-body communication in late modernity (Fortunati 2005). In addition, by drawing on a selected review of empirical research in the uses and gratification tradition (Blumler and Katz 1974), our aim is to take into consideration the changing normative role of in-personal communication.

Chapter 5 accounts for how the digitalization of interpersonal communication is reflected in the personal network structure. The chapter begins by locating the role of social networks in digital sociality. It proceeds with introducing the notion of personal networks as personal communities (Wellman 2001) and drawing on notions of networked individualism (Castells 2001; Wellman 2001), networked sociality (Wittel 2001), and selected sociality (Matsuda 2005) examines the intersections between media ecology and the characteristic of people’s personal networks. Although these concepts have emerged in different cultural contexts, are related to different research traditions, and refer to different communication technologies, they all underline a common trend, “... towards individualized over more traditionally



communal and spatially defined social ties” (Ito 2005, 10). The concepts certainly denote a state where individuals *can* use new communication technologies to access the range of their social ties in a selective and personalized way. However, they also refer to *institutional pressures* to maintain a highly individualized, selective and deliberative production of personal relationships. Networked individualism, networked sociality and selective sociality, in this sense, are not about autonomy and freedom of choice, but instead about the structural pressures the individual has to deal with in order have access to their personal network and social resources. Thus, the rest of the chapter is devoted to two concerns. First, we give a brief outline of past research evidence on the meaning new communication technologies for social integration. In this context, our objective is not to provide a detailed analytical comparison of this notion or to present how different sociological paradigms define it, but rather to highlight how new media and internet research have addressed the notion of social integration since the 1990s. These studies present two points of view: the pessimistic one, which is concerned about the alienating or disruptive potential of new technologies for personal relationships and the optimistic one, which suggests that electronically mediated communication leads to a reconfiguration of social connectivity and personal networks. Second, we provide an informative overview of studies that have drawn on the reconfiguration thesis, investigating the role of diverse old and new communication technologies in the way people interact with members of their personal network. Specifically, we shall look at how different types of social ties are supported by these technologies, and how the composition of personal network in terms of gender, age, role relation, geographical distance, and tie duration is related to the frequency and patters of contact via different communication channels. Chapter 5 ends with the formalization of the research framework and hypotheses drawn from the theoretical discussion in an effort to permit them to be tested in the empirical part of this study.

Chapter 6 introduces the empirical research of this study. It includes a brief description of the research design, a presentation of the survey deployment process and sample characteristics, which are collated with the recent Statistical Office of Republic of Slovenia data in terms of key demographic variables. The second part of Chapter 6 is devoted to the presentation of the operationalization of concepts developed in the theoretical chapters. In addition, it explains the methodology for eliciting and analyzing personal networks in detail.

Chapter 7 is a descriptive analysis of the structural characteristics of the personal networks. It looks at the size and composition of social circles, emotional support and socializing personal networks as well as compares their size and composition according to the ego's socio-demographic characteristics and internet use. It also investigates whether internet use facilitates social isolation.

If Chapter 7 looks broadly at the general characteristics of personal network and their relation to internet use, Chapter 8 focuses more specifically at the composition of the personal network in terms of ICT use. Here we examine how the structural characteristics of emotional support and socializing networks vary according to the differences in ego's access to and use of different communication technologies for interpersonal communication as well as how the characteristics of personal networks vary depending on the use of multiple ways for contacting network members. In addition, Chapter 8 demonstrates the existence of communication multiplexity and media sub-networks within personal networks. This chapter ends with the identification and multivariate analysis of different communication clusters and findings referring to their socio-demographic profiles.

Chapter 9 deals with the relation between internet use and the potential changes in the structural characteristics of personal network in Slovenia in the last decade. For this purpose, the 2009 survey data is merged and compared with survey data about the composition of emotional support and socializing personal networks, which were collected on a representative sample (N = 5013) of Slovenian population at the beginning of this decade (Ferligoj et al. 2002). Our aim is to explore whether the proliferation of access to and use of the Internet in Slovenia has had an effect on the structural characteristics of personal networks in the last decade. By employing various multivariate statistical methods and a regression-based linear decomposition model (Firebaugh 1997) we, *inter alia*, evaluate to what extent the potential structural changes in Slovenians' emotional support and socializing personal network are determined by the *intra-cohort* (i.e., changes in frequency and patterns of internet use *within* the same cohort) and *inter-cohort* (i.e., changes in frequency and patterns of internet use *between* different cohorts) changes in the population.

Finally, the concluding chapter addresses the implications of our empirical analysis and findings with respect to conceptions of digital socialities in late modernity. Unlike other

chapters in this dissertation, the tone of Chapter 10 is intentionally less characterized by rigorous analytic conceptualizations in order to give more space to the summative considerations regarding the implications of our theoretical and empirical work for broader theoretical discussions within the field of social informatics. The chapter is divided in three related parts. The first part presents a condensed and informative summary of the theoretical advances of this dissertation. The second part discusses the empirical results of our work with regard to the research questions and hypotheses addressed in this dissertation. The third part of the concluding chapter is an evaluation of the limitations of this study. It is also an attempt to put the results of our discussion on the role of new communication technologies in digital sociality into a broader thematization. We offer our views on how we believe our work can be applied within the field of social informatics and how can contribute to the analytical frameworks and methodological approaches with which social informatics as well as other disciplines are endeavoring to get insight into the complexity of interactions between technology and society.

## 2 UNDERSTANDING THE ROLE OF TECHNOLOGY IN SOCIETY

In the Introduction to *America calling: the social history of the telephone to 1940* Claude S. Fischer argues that, "... technological change in the personal sphere is a central dynamic of all theories of modernity" (Fischer 1992, 6). When restricting the idea of technology to the tangible, physical or material aspects of technological artifacts, one can observe how the role of technological devices and their systems of use differs from previous historical and social realities. At present, the technological artifacts appear as the taken-for-granted facet of people's daily life. If we think of public digital communication technology such as netbooks, notebooks, tablet computers, mobile phone, we can notice that individuals are surrounded by a set of devices that frame their way of experiencing the social reality they live in (Gebhardt 2008; Zhao 2006a). Even more, digital technologies are not present only as externalities in the social environment, but are also progressively coming closer to the human body, and thus becoming part of the way individuals perceive their body (Fortunati et al. 2003) and construct their self-images (Turkle 2008).

In this sense, Fischer observes, it seems that a general agreement exists between modernization and technology theorists about an *association* between the technological changes and modernization processes that have happened after the industrial revolution in the 18<sup>th</sup> century (Fischer 1992). In these interpretations the notion of technological development was generally equated with the idea of innovation and related to the process of social progress (Cavanagh 2007). However, less evidence of agreement is to be found concerning the *structural features* and *qualities* of the association between technological development and social change. Different views might be best represented by the dilemma related to the question of whether the technological development is an outcome of the general social progress that has taken place during modernization, or, *vice versa*, the technological innovation is the motive power of changes in the structural organization of contemporary societies. Such dilemma implies that the association between technology and society has a clear causal *direction* that helps researchers to identify the cause and effect of the potential social change associated with the technological innovation.

However, as Brynin and Kraut (2006), note such quandary might result in an oversimplified view and interpretation of the social world that is characterized by the perpetual

breakthroughs in the social application of ICTs. For instance, many of the reasons people use new communication technology such as the Internet and mobile phones are longstanding and deeply rooted in social relationships and structures that existed long before the Internet and the mobile phone were invented and became ubiquitous. Maintaining contact with family and friends at distance was already possible by the turn of the 20<sup>th</sup> century with the introduction of landline telephones into households (Pool 1977). Likewise, one could turn to newspapers, magazines or television for news and information that is nowadays available online. In this sense, new technology provides a new vessel and domain to people for accessing their network of personal relationships or information sources, yet it does not change the essential nature of those activities. However, other uses of new technology can also add a qualitatively new dimension to the way people achieve fundamental social goals. For example, micro-coordination<sup>4</sup> (Ling and Yttri 2002) with mobile phone is an illustrative example of how new technology has given people new opportunities in organizing activities and managing relationships that were more difficult in the landline phone era. Although the landline telephone communication has overcome the problem of space barrier between interlocutors, it has not eliminated the mobility limitation, which still demanded from the interlocutors to plan their potential in-person encounters and meetings in advance. With the introduction of mobile phones such requirement has virtually become obsolete as interlocutors have the opportunity to arrange their future actions on the move without being tethered to the spatial location of the receiver (Fortunati 2002). Further, Ling and Yttri (2002) argue that such developments do not represent a behavioral change in the organization of social activities, but also indicate a different cognitive and psychological attitude toward people's experience of social presence.

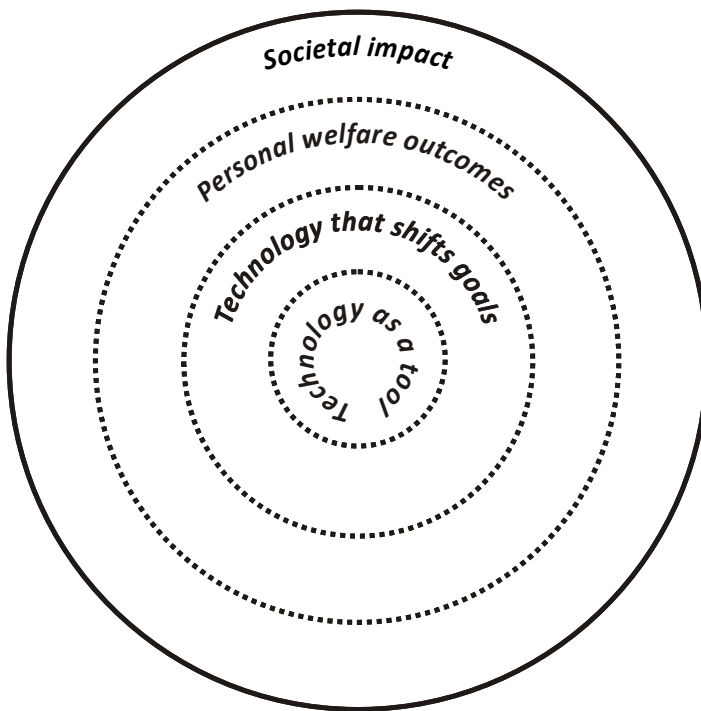
Such and similar examples seem to suggest some reservations to a straightforward and one dimensional readings of the relation between technology and society. Brynin and Kraut (2006) suggest that scholars interested in the role of ICTs in modernity have developed diverse articulations of the nature of technology and its interdependence with social contexts. According to them these conceptualizations are reflected in four diverse interpretations of the meaning of the notion of "social impact": *technology as a tool*, *technology as agent that shifts goals*, *personal welfare outcomes*, and *societal impact*. These approaches to analyzing the

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<sup>4</sup> The notion of micro-coordination is discussed in Section 4.2.

social impacts of ICTs are related to different levels of social reality and, according to Brynin and Kraut (2006), can be represented as concentric circles, with the innermost circle comprising a technological artifact and the outmost circle linked to impacts on the societal or macro level (see Figure 2.1).

**Figure 2.1: Brynin and Kraut’s conceptualization of the social impacts of ICTs**



Source: adopted from Brynin and Kraut (2006)

In the first and the narrowest of these approaches ICTs are understood “... as mere tools that allow people to achieve relatively static goals and to perform old activities in slightly new ways” (Brynin and Kraut 2006, 6). According to this interpretation, the social impact of new technology can be seen in the improved performance of activities when an existing activity is replaced by its technologically mediated, yet functionally equivalent, alternative. The second approach to research of social impacts of ICTs emphasizes the ways ICTs allow the qualitative shifts in the activities performed by people. In other words, this body of research argues that people do not use the new technology to achieve old goals or to replace the existing modes of action with their technological alternatives. Rather, it contends that people use new technologies to achieve a new set of objectives, which are generally related to emerging technologically-mediated social forms that have not existed before (Brynin and Kraut 2006). The third approach extends the notion of social impacts beyond the

technological and activity level, focusing on changes to people's behavior and attitudes as a result of using new ICTs. Researchers adopting this perspective are typically interested in considering the consequences of the use of ICTs on personal welfare in various social spheres, including work, leisure, family and so on. Finally, the fourth and most general perspective stretches the discussion and analysis of social impacts beyond technological, activity, and individual level and examines the implications new communication technologies have for the organization of larger social, economic, and political systems. These approaches can be identified in the macro sociological discussions that underscore the notion of computing characteristics of ICTs leading to new forms of social organization. For instance, Webster (2002) suggests that these approaches can be identified in those theories of the information society which appear to have over-magnified the transformative power of network technologies. In other words, what differentiates this perspective from the previous approaches is its focus on what Sproull and Kiesler (1991) describe as secondary or second-level effects. Such viewpoint implies that the implications of the appropriation of new technologies on the individual or micro level somehow converge into larger organizational and structural changes, which at certain point become consolidated in what seems to be a new social order that in a recursive way structures people's life and activities.

Choosing the "social impact" approach to describe the nature of the relation between technology and society can be useful because it allows underlining the common trends and transformations associated with new communication technologies across different levels of social reality: technological, individual, and societal. However as various scholars caution (e.g., Fischer 1992; Wyatt 2008), such perspective has also its own challenges. For instance, it tells us little about the mechanisms which connect the structural changes that are induced by the appropriation of technology on the micro level with the macro social transformations. Moreover, the choice of the phrase "social impact of technology" might itself be controversial as it implies an unambiguous causal link between use of new technology and social change. In this sense, rather than querying the technology – society relationship, the "social impact" discussion assumes a universal unidirectional subordination of the social world to technological change and innovation. Brynin and Kraut (2006) themselves suggest that, by being focused on social impacts, it is impossible to overcome the dichotomist perspective of technology versus society and to adopt an alternative perspective grounded on the idea that technology and society coexist as mutually enabled entities. In the rest of this

chapter, alternative theoretical frameworks and models are presented and discussed that help us better understand the dynamics of the relationship between technology and society.

## 2.1 THEORIZING THE TECHNOLOGY – SOCIETY RELATIONSHIP

Social scientists have long been interested in the relation between technology and society. Such prolonged interest has resulted in many different perspectives and theories aiming to explain the structures and processes that characterize the technology – society relationship on micro, mezzo, and macro levels. Fischer (1992) identifies the three main perspectives in this regard: impact analysis, symptomatic approach, and social constructivism. He argues that these perspectives provide alternative interpretations of the socio-technical relation. We suggest the three perspectives could be described according to seven dimensions, to which we refer as the model metaphor, the social reality, conceptual model, direction of relations, assumptions, and the role of social context (see Table 2.1).

### 2.1.1 *Theories of technological determinism*

For Fischer (1992) the impact approach refers to studies and conceptualizations that apply the “technological determinism”, which is according to Wyatt (2008) an influential approach to study the relationship between technology and society. Technological determinism is a technology-led theory of social change that understands the social reality as system made up by technology and society as two divided spheres. The spheres are connected by unidirectional links where technology is an independent factor that *impacts* on the structures, processes and relation in the social world from outside of society (MacKenzie and Wajcman 1999a). Fischer (1992) notes that technological determinists generally perceive technology as material artifacts, assuming that these tools operate in parallel with homogeneous, uniform and cumulative effects on society independently from the micro and macro social contexts in which they are appropriated. Likewise, Oostveen (2007) observes that technological determinism largely neglects the social context, when she argues that “... technological determinists believe that technology develops by its own laws and that it realizes its own potential whereby it is only limited by the material resources available” (Oostveen 2007, 3). Further, Oostveen (2007) argues that deterministic arguments are organized around three implicit propositions. First, technology is neutral – it has an autonomous logic of development and deployment that is not influenced by social, political or economic factors.



Second, the development and appropriation of technology in society is unstoppable, meaning that social structures and processes are perpetually subjected to the development of new technology without having the possibility to slow down or stop off this process. Third, technological development has a transformative potential – whether good or bad the appropriation of technological innovations always brings to some kind of social change that will more or less radically transform society.

Although these assumptions are shared by technology determinists, different positions can be found within the deterministic theory in terms of how firmly the deterministic assumptions have to be taken into account. On one hand, Fischer (1992) talks about conceptual differences between the “billiard-ball” and the “impact-imprint” models which have been elsewhere identified under the label of “strong” and “weak” determinism (Smith and Marx 1994; Wyatt 2008).<sup>5</sup> According to the “billiard-ball” model technological development acts as an autonomous driving force that “hits” structures of society, which in turn “impact” one another, resulting in a cascade effect that eventually leads to reorganization of social structures. This kind of determinism draws on the implicit assumption of economic rationality, where technology is understood as the materialization of social progress that rests on the economic development (Fischer 1992). However, as Mackenzie and Wajcman (2002) show the assumption of economic rationality driving the technological development has often proven itself to be inadequate in many ways; after all, economic relations represent only a specific part of social reality. Therefore, more contemporary versions of technological determinism have challenged the economic and instrumental logic of technological development, arguing that new technologies alter the organization of society, “... not by their economic logic, but by the cultural and psychological transfer of their essential qualities to the user” (Fischer 1992, 10). In other words, technologies have affordances – the perceived or actual properties of objects that determine how and in what circumstances they can be possibly used (Gibson 1977) – that structure the way people perceive and experience social

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<sup>5</sup> It should be noted that other analytical conceptualizations of technological determinism exists in the literature. For example, Wyatt (2008) proposes a four-fold typology of technological determinism, distinguishing between justificatory, descriptive, methodological, and normative determinism, whereas Bimber (1994) identifies three interpretations of technological determinism he terms “normative”, “nomological”, and “unintended consequences.”

reality. According to Fischer (1992) Meyrowitz's (1985) analysis of how new electronic media have shaped and influenced the social relations is a seminal example of what he calls "the impact-imprint" model. In *No sense of place: the impact of electronic media on social behavior* Meyrowitz (1985) argues that social affordances of electronic media, related to their global ubiquity, lead to an irreversible dissociation of the physical and social place. Since time and place historically have been conterminous, such detachment displaces people's notions of what it means to be socially present, thus leading to potential dislocations in organization of social interactions and experience of social relations. In short, Meyrowitz (1985) claims that electronic media do not change the organization of social life by their economic logic of development, but rather they reorganize social relations through the appropriation process, in which their affordances are inscribed in the cultural practices of electronic media users. Such position represents a substantial shift in the conceptualization of economic determinism of the "billiard-ball" model. Nevertheless, it still presumes that technology is an outer force in the social world and that its users have only a limited role in the process of appropriation.

On the other hand, Cavanagh (2007) provides a three-fold typology of deterministic approaches (Marxist, substantivist, and medium theory), arguing that, "... although each of these approaches *to some extent* posits a determining or causal role to technologies, the mechanism through which technologies are said to affect social processes, the means by which they become powerful enough to reconfigure social reality, is very different in each case" (Cavanagh 2007, 139). The differences between Marxist and substantivist approach generally resembles those between the "billiard-ball" and "impact-imprint" model: while Marxist interpretations underscore the economic rationality of technological change that reorganizes the social relations and understand the power of technology as power over social systems and structures, the proponents of substantivist approach focus on the power of technology at the level of everyday life – the environment where social interactions take place and where personal relationships are formed. According to Cavanagh (2007) the substantivists advocate the idea that technology enforces a specific way of being in the social world which in modern society is linked to technological rationality – "a way of thinking that privileges technical solutions to almost every problem" (Cavanagh 2007, 142).

**Table 2.1: Fischer's typology of theorizing the technology – society relationship**

	<b>Impact analysis</b>	<b>Symptomatic approach</b>	<b>Social constructivism</b>
<b>Model metaphor</b>	- technology as a tool	- technology as an artifact or cultural expression	- technology as a structuration process
<b>Social reality</b>	- understood as a system constituted by two divided spheres: technology and social world	- understood as a cultural realm where technology is a material expression of cultural forms	- understood as a structure that enables and constraints the individual
<b>Conceptual model</b>	- causal - billiard-ball model - impact-imprint model	- causal - technological politics	- relational - structuration
<b>Direction of relations</b>	- unidirectional - technology → society	- unidirectional - society → technology	- bidirectional – recursive - society ↔ technology
<b>Assumptions</b>	- technologies operate in parallel with homogeneous effects - technological effects operate in parallel in a uniform way - technologies have cumulative effects	- technologies form a coherent, consistent cultural entity - technological politics have homogeneous effects - the effects are uniform and socially/culturally determined	- technological change is undetermined - the role of technology is a result of the interaction between users' actions and characteristics of technology - neither material properties of technology nor cultural, social, political, and contexts do predestine the its development and employment in society
<b>Role of social context</b>	- social context is largely neglected	- social context determines the deployment of technology	- considered as a constitutive dimension of technological deployment

Source: adopted from Fischer (1992)

In the view of substantivism the technological rationality gets institutionalized in various social forms (e.g., personal relationships, communication modes) that determine how individuals structure their actions and understand their role in society. In contrast, for medium theorists the impact of technology is not primarily related to the institutionalization of specific forms of rationality, yet to the rudimentary organization of human perception (Cavanagh 2007). It is argued that the most representative notions of the medium theory are advanced in the works of Harold Innis (1986) and Marshall McLuhan (1964), members of what has come to be known as the Toronto school of Canadian sociology (Cavanagh 2007).

For Innis (1986) technology can be understood as a medium, a means of reproduction of social relations that enable the social integration. Furthermore, Innis (1986) argues that technology represents the relation between time and space providing people with a means for perceiving the social reality. He differentiates between time extending and space extending media, arguing that in the evolution of social relations and modern society space extending media have been taking the place of time extending media, because only the former can support the forms of social interaction and integration, which are not tied to the local settings, but are spread across the different environments in the global society. Likewise, also McLuhan (1964) argues that technological innovations related to print and electronic media have had a historical impact on the organization human perceptions and social relations. More precisely, for McLuhan all technologies are extensions of human physical and nervous systems to increase the power and speed, which is itself a disruption that causes changes of organization. Independently from the print age or electronic age, technology has always characterized the ways in which information is accessed by the individuals and how it is distributed in the social system. For example, in preprint (unmediated) age, people senses and perceptions where associated with face-to-face encounters in the physical space, whereas in the print age a disruption was introduced into the instantaneous nature of information transmission which, as McLuhan argues (1964) brought about changes in human perception of the social reality, creating the rational and reflective individual which is the basis of the modern society. As noted by Cavanagh (2007), the McLuhanian model, in which media act on human cognition, clearly implies a direction of the cause, typical for technological determinism or what Fischer (1992) terms as the “impact-imprint” model.

### *2.1.2 Symptomatic approach*

The second perspective which categorically rejects most of the views and positions of technological determinism is recognized by Fischer (1992) as the symptomatic approach. In contrast with the technological determinism the symptomatic approach introduces into the conceptualization of the technology-society relationship the cultural dimension of technology as a material artifact. Technology does not become part of social systems; it already is an inherent part of social structures and can be observed in different domains of social reality as a material expression of cultural, political, economic relations. By rejecting the primacy of technology over social structure it extends the view of technologies from simply mechanical

and instrumental objects that have an impact on the social world to the means of symbolic and cultural (re)production that are inscribed into the social and cultural practices of contemporary individuals. In this sense, the symptomatic approach assumes that social uses of technologies are a result of social, cultural, political forms which imply a high level of coherency and consistency. Thus, for Fischer (1992) symptomatic implies a causal relation between the moral order of social and cultural structures and the appropriation of technology, which usually privileges economic and social relations over the material characteristics of technological artifacts.

An example of symptomatic approach could be identified in the domestication theory (Berker et al. 2005; Silverstone and Hirsch 1992), which describes the social and cultural facets of the consumption of technology by its users. Hynes and Rommes (2005) underline the “symptomatic nature” of the domestication theory by noting that the domestication concept has developed from perspectives, which have emphasized the “social shaping of technology”, “... where the user is perceived to take the dominant role in defining the nature, scope and functions of technology” (Hynes and Rommes 2005, 149). Domestication theory argues that the process of consumption of technology is framed by the economic and social relations within households that are part of a more general objective economy and society of the public sphere. For the proponents of the domestication theory the set of social and economic relations within the household forms the *moral economy*<sup>6</sup> of the household, which plays an active role in the way how technologies as material and symbolic objects are engaged by households and their members. This engagement involves the appropriation of the commodities into domestic culture through a recursive multi-stage process, which not only presumes the incorporation but also the redefinition and adaptation of technology in accordance with users’ needs and expectations<sup>7</sup> that are framed by the household’s moral economy (see Fortunati 2009).

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<sup>6</sup> For a detailed discussion on the origins and implications of Silverstone's definition of the household as a moral economy see Silverstone and Hirsch (1992).

<sup>7</sup> As Fortunati (2009) notes in domestication theory the needs and expectations are not only linked to the material dimension of domestic life but also to its emotional facet.

Roger Silverstone (1994), as one of the most influential proponents of the domestication theory, describes the concept of domestication as a four-stage process, including the phases of *appropriation*, *objectification*, *incorporation* and *conversion*. For Silverstone appropriation denotes the stage, when households through their consumption of technology leave the formal economy of the public sphere and become part of the domestic realm, where they are given meaning according to the economic and social relations (i.e., the moral economy) in the household. However, appropriation is not only limited to the *adoption* of technology. Appropriation also embraces the *adaptation* of technological affordances to the values and routines that adhere to the social and cultural roles of members in the household. As Hynes and Rommes (2005, 148) argue: “Through their introduction into the household, commodities become enmeshed with the within an economy of meanings, where they are moulded in accordance with the habitus of the home in order to produce a ‘meaningful economy’, which articulates of the values of the home.” From this perspective appropriation stands for the moment at which technology leaves the public space of formal economy and enters into the household’s moral economy (Silverstone and Hirsch 1992). The second stage of domestication is objectification. In contrast with appropriation, objectification refers more to the material dimension of domestication. Silverstone (1994), in fact, suggests that although objectification is not confined to material objects (e.g., devices, services, applications), it could be observed on various material levels (although it is not confined to material objects). Most generally, it is expressed as a form of physical disposition of objects in the spatial environment of the home. In addition, one can see objectification in the construction as the household environment as such (Fortunati 2009; Morley 2006). Finally, objectification can also be expressed and observed through people’s uses of the technology. Whereas a concern with objectification principally identifies the spatial aspect of people’s consumption practices, incorporation – the third stage in the domestication model – focuses attention on moral and symbolic aspects of the modes in which a particular object or technology is used. For Silverstone (1994) every technological artifact is doubly articulated: technologies are not only material objects located in particular spatiotemporal settings, but they also represent texts or symbolic messages located within realm of moral and cultural discourses, which determine their social functions. These functions are neither fixed nor defined by the intentions of designers or marketers. Their original functions may change or disappear as Oblak Črnič (2009) showed in the case study of the incorporation of the personal computer in

Slovenian households, may become functional in ways which do not correspond to the intentions of designers and marketers. Thus, domestication theory rejects the functional predestination of uses advanced by the technological determinism. In fact, Silverstone argues: “To become functional a technology has to find a place within the moral economy of the household specifically in terms of its incorporation into the routines of everyday life” (Silverstone 1994, 129). Through the phases of appropriation and objectification technology can acquire new material and symbolic functions, which are later inscribed into the social uses of technology. Finally, Silverstone (1994) suggests that the phases of appropriation, objectification, and incorporation have to be matched by the phase of conversion where the potentially changed meanings of technology – influenced by the moral economy of the household – are confronted with the symbolic meanings outside the home, in the public realm. Conversion can take two different pathways. On one hand, the moral economy can provide the basis for negotiation and transformation of the meaning without the display and without the acceptance of those meanings outside the household. Or, on the other hand, it can make the transformative work of conversion public, making the altered meaning of technology visible in the public realm.

If the latter is the case, a conflict regarding the “appropriate” symbolic meaning and social use of technology in question may arise, which brings us back to the central thesis of symptomatic approach: technology is not simply a material object, an artifact in our hands, but, in the first place, it is a symbolic expression of social, cultural, and political forms which are embodied in the formal and moral economies of the social world. By favoring the impact of social structures over the objective properties of technology symptomatic approach represents the most clearly expression of “social shaping” standpoint, which contends that cultural and social forces are inherently inscribed both into the design and use of artifacts and systems, and that they control the direction or trajectory of technological deployment in the contemporary societies.

### 2.1.3 *Theories of social constructivism*

According to Fischer (1992) between the two poles of technological and social determinism, however, lies a third theoretical perspective, the social constructivism, which refuses both positions. Social constructivists have introduced several fundamental modifications into the interpretation of the relationship between technology and society. Among the most important ones is the conceptualization of social reality as structure of rules and norms which, at the same time, enables and constraints the individual in his/her actions and interactions. For example, Fischer suggests that the landline telephone and the television are tools that help people to stay in touch with the social circles and to keep informed about ongoing things. However, with the increasing diffusion of these devices they become a structure that not only enables but also constrains people in their actions: “Individuals may not to choose to watch television, but they must still content with the television in the popular culture, children’s fantasy lives, politics, public schedules, and so on” (Fischer 1992, 19).

For social constructivists technology and social world are not two separated domains of social reality, but rather represent a closely linked structure, where the technological and the social are continually co-constructed in the structuration process. As stated by social constructivists it is impossible to think of technological deployment as a process dislocated from the social. Technology is always produced and appropriated in a social context. Accordingly, it is intrinsically immersed in a series of relations that govern social relations. Concurrently, as a particular technology is appropriated by people, the social context may change that may in turn alternate the social conditions of its uptake. As Castells (1996) suggests while addressing the social history of the Internet: “Of course technology does not determine society. Nor does society script the course of technological change, since many factors including individual inventiveness and entrepreneurialism, intervene in the process of scientific discovery, technological innovation, and social applications, so that the final outcomes depends on the a complex pattern of interaction” (Castells 1996, 5). The complexity of such interaction is becoming more palpable with the proliferation of interactive ICT in everyday life which demands from its users a more active attitude. For example, in a recent study of social uses of ICTs for interpersonal communication Petrič et al. (2010, 47) note:



New technologies are thus increasingly becoming indispensable and inseparable elements of everyday life in a network and broadband society. However, since they do not enter everyday life as intruders, as external objects, but are appropriated by individuals in line with their socially, culturally and individually structured purposes and expected goals of communicating with others, they also imply the more active engagement of users when integrating them into the domain of social practices and cultural representations.

The suggestion here is that we can no longer think of our users as passive *adopters* of ICTs, but as increasingly active actors in the appropriation of ICTs. Fortunati (2010) illustrates this point by analyzing how the position of users in relation to telecoms and ICT industry has changed over the last decades. She suggests that with the development of new interactive communication technologies users have become more empowered towards and through ICTs, since they have been increasingly involved into the design and development of ICTs. This change can be described as a four-stage process where once passive users have gradually become seen by the industry first as customers, later as co-designers, afterwards as stakeholders, and lastly as *e-actors*. The result is that a user is not only an individual who adopts an artifact it is also a person who actively contributes to the social and cultural construction of technology, which comes into view in the form of material practices and symbolic meanings. In fact, the notion of e-actor denotes ICTs users who “... possess a common cognitive reference framework with regard to technology, have a specific competence, share common attitudes and social practices, and share common language and communication resources” (Fortunati et al. 2010, 33). These resources give them the opportunity to act upon their position in the social structure. However, the crucial issue here is not the changing qualities of the user – producer interactions, but the implication of this interaction for the wider society – technology relationship. The empowered position of e-actors pertains to their role as intermediates between the technology and society. Their central and active position in the socio-technical structure, in fact, translates and balances “the negotiation” between society and technology (Fortunati et al. 2010).

However, social constructivism does not imply a constant assessment of counterbalance between the technological and the social; social context and technology can have different implications on the process of appropriation and design of technology at different stages. Hence, for Fischer (1992) the conceptual model of constructivists does not imply only a relational, but also a recursive connection between technology and society. Further, Fischer

(1992) suggests that such relationality has a series of corollaries that can be understood as assumptions of the constructivist theoretical framework. First, since the technological development is embedded into the social world, technological change cannot be (solely) determined by the material characteristics of technological artifacts. Second, the appropriation of technology is an outcome of the interaction between users' actions and characteristics of technology. Third, neither material properties of technology nor cultural, social, political, and contexts do predestine the development and employment of technology in society. It is essential to recognize that the role of technology in society depends on how people actually appropriate the technology. Further, Oostveen (2007) adds that through these assumptions the model of social constructivism is extended to emphasize two supplementary aspects of technological development.

On one hand, social constructivism undermines the inveterate presumption of technological determinism which suggests that design and use of technology should be defined as two separated stages of technological development. In the view of determinism, design of technology is a process of *expertise integration*, in which developers assume that the potential users will fully adapt to the innovative technology and its features. In practice, this means that users are excluded from the design process. In sharp contrast with the deterministic position, the constructivism understands design of technology as a *democratic process*, in which developers and users collaborate in different forms in order to optimize the usability and functionality of technologies. In this respect, social constructionists are especially interested in the forms, mechanisms, and roles of users collaborating with designers.

On the other hand, when evaluating the roles of users in the design process, social constructionists do not forget to point out that democracy does not mean social equality. Society is a differentiated system with individuals residing in hierarchically arranged social strata according to divisions of social resources such as power, wealth, and social status. Social and cultural backgrounds of users certainly intermingle with their role in the design process. Such position can be clearly seen in Wajcman's observation, when she discusses the gendering of technology: "Technologies result from a series of specific decisions made by particular groups of people in particular places at particular times for their own purposes. As such, technologies bear the imprint of the people and social context in which they are

developed. ... Technological change is a process subject to the struggles for control by different groups. As such, the outcomes depend primarily on the distribution of power and resources within society” (Wajcman cited in Oostveen 2007, 7). As a result, the choices made in the design process tend to better represent certain social groups, providing a fertile ground for potential conflicts between the dominant and alternative uses (both, material and symbolic) of technologies.

In a similar manner as technological determinism also the social constructivism is not a unified body of theoretical approaches (Cavanagh 2007). In what follows, we introduce two typologies that understand the social constructivism as group of different theories that despite focusing on different aspects and levels of the “constructivism” in the technology-society relation share a wide range of the ontological, epistemological and methodological commonalities. The first typology of theories within the social constructivism perspective in our domain was elaborated by scholars working in the field of *Science and Technology Studies* (STS). The STS research is concerned with the way political, organizational, economic and cultural facets of the social world get involved with the process of technological innovation and change. To understand technology development and use, STS researchers consider both social and technical aspects as mutually constructive (Oostveen 2007). Bijker et al. (1987) argue that within STS three theoretical traditions have evolved: the social construction of technology, the actor-network theory, and the systems theory. In the following sections an informative overview of these theories is provided.

#### 2.1.3.1 The social construction of technology

Maybe the most well-known theory within the social constructivist perspective is the social construction of the technology (SCOT) approach, developed and firstly presented by Pinch and Bijker (1984) in their explanation of the development of the safety bicycle. They built up the SCOT approach in order to provide an analytic method for social scientists who have been interested in the social history of technologies. Congruently with the general premises of social constructivism, for Pinch and Bijker the technology and all its features are the outcome of complex interrelated social processes that involve different subjects situated within social, economic, political, and cultural environment. In contrast with the unidirectionality and linearity of technological determinism, the central premise of SCOT approach is multi-

directionality of technological development. According to Pinch and Bijker (1987) every innovation can be understood as a series of negotiations between relevant social groups involved in the development and appropriation of new technological devices until one of the interpretations of practical and symbolic functions of the innovation becomes dominant. In order to understand the mechanisms underpinning the recursive mechanism of technological deployment Pinch and Bijker (1987) introduced four related notions that correspond to the formal framework of the SCOT approach: *relevant social groups*, *interpretative flexibility*, *closure mechanism/stabilization*, and *technological frame*.

Relevant social groups are defined as, "... all members of a certain social group that [who] share the same set of meanings, attached to a specific artifact" (Pinch and Bijker 1987, 30). The advocates of the SCOT approach assume that relevant social groups have distinctive interests and objectives, which are reflected in different understandings and interpretations of what a particular technology is and how it should be applied. Relevant social groups can differ along several dimensions and levels of organization. A relevant social group can be an organization, institution, or simply a "grass-root" alliance of individuals with common interests.

Interpretative flexibility is the second important notion developed by Pinch and Bijker within the SCOT approach and is often identified as the concept, "... that distinguishes SCOT from other social constructivist approaches in the history of technology" (Kline and Pinch 2002, 114). Interpretative flexibility refers to the idea that technological artifacts can have (and usually have) diverse uses, meanings, and interpretations for different social groups involved with the artifact. It suggests that technological design and appropriation are open processes, where alternative interpretations of artifacts generate a series of problems, which bring along different more or less unexpected outcomes.

Another important concept in SCOT approach is stabilization or in Pinch and Bijker's terms "closure". Generally, after a while for every technology its social functions and meanings stabilize. The closure mechanism can be a result of a domination of one specific social group over another or an outcome of a general consensus that has been achieved through the recursive negotiation between different social groups. There are two kinds of closure mechanism: (a) *rhetorical closure* referring the situations in which social groups see the

problem as being solved and when they agree that there is no need for alternative designs to be introduced; (b) *redefinition of the problem* referring to the strategy when social groups struggle to overcome the contrasting interpretations by redefining the problem so that they no longer pose problems to them. In addition, Pinch and Bijker point out three important implications of closure mechanisms. First, closure is never permanent; existing or new social groups can always reintroduce interpretative flexibility into design process leading to potential conflicts about a material and symbolic roles of a particular technology. Second, although, the closure depends on many factors (i.e., economic, political, social, cultural), it is achieved only when the relevant social groups come to an agreement about the meanings associated with a selected technology. Lastly, as (Oostveen 2007) observes, for Pinch and Bijker interpretative flexibility collapses at different points for different social groups.

The last dimension of the SCOT approach is represented by the technological frame that refers to the social, economic, and cultural context of a social group, which determines its norms and values that form the background of uses and meanings given to a particular technology. Pinch and Bijker argue that members of each social group are unified by a common technological framework, which is expressed in their shared practical uses and symbolic representations of technological artifacts. As (Oostveen 2007) explains, a technological framework includes elements such as goals, key problems, problem-solving strategies, tacit knowledge, user's and designer's practice. These elements exist in the social world as latent structures that come into play whenever relevant social groups get involved into negotiations about the material uses and symbolic meanings of an artifact.

#### 2.1.3.2 The actor-network theory

An alternative approach within the social constructivist theory is the actor-network theory (ANT). The ANT was originally developed by Latour (1992; 2005) and Callon (1986) as a critical response to the SCOT theory. The authors of ANT criticize SCOT for giving too much power to social structures in determining the technology deployment, and consequently ignoring or relativizing the importance of the material characteristics of technology in the design process. As the name of the theory suggest its central concepts are the actor, defined as an "entity that does things" (Latour 1992, 241), and the network, described as a "group of unspecified relationships among entities of which the nature itself is undetermined" (Callon

1993, 263). As MacKenzie and Wajcman (1999b, 23) note for the proponents of ANT the relation between technology and society is “mutually constitutive”, or to put it into Callon (1989, 93) words: “The actor network is reducible neither to an actor alone nor to a network. Like networks it is composed of a series of heterogeneous elements, animate and inanimate, that have been linked to one or another for a certain period.” The ANT states that the social uses of technology as well as the material and symbolic characteristics of technology are a result of constant network transformations, in which human and non-human agents are considered as equally contributing to the development of the technology network. In addition, ANT declares that any actor in the network, whether person, object, or organization is without fix attributes that would *a priori* determine its role in the network. Identity, power, position, and role of each subject in the network are constantly evolving with the emergence of the network itself, and thus can be challenged or reconfigured at every stage of the development of the network. In this sense, ANT is strongly concerned with the dynamic nature and evolution patterns within networks (Cavanagh 2007; Oostveen 2007).

In order to analyze the emergence of technology networks and examine the role of various actors in their development the ANT has introduced an analytical framework that identifies three overlapping stages of networks: *inscription*, *translation*, and *framing*. Inscription refers to the processes and structures that enable technical objects to acquire the uses, beliefs, attitudes and meanings of social actors and transform them into technological artifacts. According to Akrich (1992, 208) inscription can be described as the stage in the development of technology when designers predetermine the uses of the technological devices by projecting their own visions of specific tastes, competences, motives, and the rest on users’ actions and attitudes related to the technical content of the new object. However, as ANT explains stability and social order are continually negotiated between various actors in the process of the development and appropriation of technology. Designers’ ideas, uses and values inscribed into the objective properties of technological objects can thus be challenged when users, institutions, or organizations, involved in the appropriation of technological artifact express their interest for re-interpreting or re-defining the original social meanings and cultural practices associated with the designed technology. Translation is “... embodied in texts, machines, bodily skills [which] become their support, their more or less faithful executive” (Callon 1991, 143) and, according to Callon (1991) encompasses four moments. The first is “problematization”. This entails the attempt of the actor to get involved into the

design processes and to be recognized by other actors in the network as a member of their network. The second stage of translation is “interessement”. During this stage, actors engage into negotiations about the terms of their involvement, while the primary actor (initiator) simultaneously works to convince other members in the network that the roles it has defined for them are legitimate and acceptable. When the actors accept their roles and functions that have been defined for them during interessement is called “enrolment”. The final dimension of translation Callon (1991) terms “mobilization of allies”. Bakardjieva and Williams describe this moment as actions of the initiator aiming at “... the enlistment of a dedicated group of spokespersons who speak on behalf of the many and behave according to the roles that were circum-scribed for them, thus supporting the initiator’s interests” (Bakardjieva and Williams 2010, 158). If initiator’s actions result in successful retrieval of active support, the network gains stability and reliance. The third and the final stage of the constitution of ANT framework is known as *framing*, described by Callon (1991) as the point in time when actors in the network achieve an agreement about open issues related to their own role and the position of other actors in the network. Framing is the necessary condition of stabilization of material uses and symbolic meanings of technological artifacts. The outcome of successful framing is punctualisation, a term denoting the stage when the actors in the network relate to each other in such a “friction-free” way that become hidden from the view of the user; thus the network appears as a unity to its users, as an actor in its own right. Latour (1999) refers to the process of punctualisation as “blackboxing”, describing it as “... the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed the more opaque and obscure they become” (Latour 1999, 304). As with other notions developed in the ANT framework also punctualisation and blackboxing do not imply stability and firmness but rather are subject to conflicts that may cause the break-up of the network – a process known as *depunctualisation*.

For Cavanagh (2007) the ANT analytical framework has at least three important implications for the understanding of the relationship between technology and society. First, social action is not an exclusive characteristic of human subjects, but can be also attributed to nonhuman agents in the network. Secondly, Cavanagh (2007) argues that the assumed equality between actors in the network leaves space for unexpected evolutions and outcomes. Actors in the

network are not only connected, they are involved in interactions, which can redefine the structural characteristic of their relationships, leading to unforeseen consequences. The network represents an emergent structure, whose characteristics are not equal to the sum of traits of their elements. In other words, the shape of the network is not dependent on the characteristics of its elements, but rather on its own structure. Lastly, according to ANT a network is not only made out of stable elements but also involves interactions between its elements. Interactions are the source of “radical indeterminacy” (Latour 1988), constantly keeping the network configuration open for transformations.<sup>8</sup> In contrast with the SCOT model where “closure” refers to the end or stabilization of the interpretative flexibility, punctualization inherently assumes a potential conflict in relations between the actors in the network, which might lead to the reconfiguration of the existing relationships between agents in the network.

#### 2.1.3.3 The systems theory

The systems theory is the last in the Bijker et al.’s (1987) three-fold typology of STS theoretical traditions. It was developed by Thomas P. Hughes in the early 1980s as a critical response to social constructivist studies and approaches that concentrated on the social construction of artifacts (e.g., the bicycle, the car, and the telephone) at the expense of studying the properties of large “systems”, in which they were embedded. He has contended that by focusing on the properties of a singular artifact we can learn little about its role in society at large. Further, in his opinion, such narrow approach can result in ill-informed conclusions about the role of a particular technology in society.

Hughes, influenced by Parsons and the American functionalist sociological school, has introduced the notion of system into the history of technology in the book *Networks of Power: Electrification in Western Society* (Hughes 1983). He defines systems “as socially constructed and society shaping” (Hughes 1987, 51). They are multidimensional social entities that contain messy, complex, problem-solving components, which range from artifacts, groups, processes, laws, to natural resources. System components are interdependent and interactive, which allows systems to grow over time, and become even

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<sup>8</sup> See Fortunati (2010) for a critical stance on this point.



more complex and interconnected. The features of components are shaped by the “system builders”. Due to their heterogeneity and complexity, systems operate along different lines. Nevertheless, they share two ultimate operational and organizational features: (a) the systems generally foster unity from diversity, and (b) show a preference for neutralization of alternative systems. In this sense, while evolving technological systems tend to integrate the environmental factors into them, in that way reducing possible sources of uncertainty and destabilization that may jeopardize their structures and processes. Systems are goal oriented aiming to reorder the material world in a way to make it more productive. They have inputs and outputs, which tend to be (internally and externally) interlinked. Lastly, Hughes (1987) describes systems as socio-technical entities that tend, over time, to acquire a hierarchical structure. He argues that the hierarchical structure is the outcome of a multi-stage process of technological development which contains seven phases: *invention, development, innovation, transfer, growth, competition, and consolidation*. The dynamic of system evolution, can be at all stages influenced by various factors, which do not involve only technological and economic aspects, but also social, political, cultural, and organizational circumstances. In addition, system theory assumes that these factors can take over different roles at every stage of deployment of technology in the system. Systems theory explains that when technology is relatively new, the social environment has a larger control over its material uses and social representations. However, with technology becoming the take-for-granted part of system components and social reality in general such power of the political, economic and cultural factors over technology gradually diminishes. Put in differently, “Hughes says that the relationship between technology and society always starts with a social determinism model, but evolves into a technological determinism form over time when its use becomes more prevalent and important” (Oostveen 2007, 14).

In addition, it should be noted that the systems theory has also attracted attention among scholars in the field of the organizational research. On this level, the notion of *sociotechnical system* has been introduced to analyze the dependency of modern organizations (as well as larger social entities) on interrelations between technical and social systems (Fortunati and Sarrica 2010). The sociotechnical system approach shares with the systems theory the view of social reality as a system of related entities which come into interaction with the social environment in order to achieve their goals. In this sense, two further similarities between systems theory and sociotechnical system approach could be observed. On one hand, at the

core of the sociotechnical system approach lays the belief that any social system is open to the continuous exchange of resources between the system and the environment. The exchange of resources (in the form of inputs and outputs) does not only affect the position of the sociotechnical system in the social environment but also represents the lever for the reconsideration of the relations between the elements that are part of sociotechnical system itself. On the other hand, the sociotechnical system perspective advances the notion of *dynamic stability*. Comparably to Hughes's systems theory it argues that "... a sociotechnical system is able to pass to superior degrees of heterogeneity and complexity, continuing to operate with efficacy and maintaining a relatively satisfactory internal ambience (Fortunati and Sarrica 2010, 249).

For Geels and Schot (2008) the dynamic stability of sociotechnical systems can be observed through the interaction between processes on three levels: (1) sociotechnical regimes (cognitive routines and cultural practices that explain the characteristics and directions of technological development and appropriation in society), (2) technological niches (social spaces where technological innovations emerge), and (3) sociotechnical landscape (the external environment that represents the societal context in which the sociotechnical systems are embedded). These three levels are connected by four pathways: *transformation*, *reconfiguration*, *technological substitution*, and *dealignment and realignment*. Although Geels and Schot (2008) provide a detailed analysis of these pathways, a complete discussion of their structural characteristics goes beyond the aims of this chapter. It must be emphasized, however, that all pathways presume that sociotechnical regimes are open to breakthroughs introduced by the technological niches. These niches are understood as social and technical innovations that could potentially contribute to the adjustment of existing sociotechnical regimes under the conditions influenced by the economic, political and cultural relations, which compose the social context. The multi-level organization, which is crucial in the sociotechnical system, leaves space for different kinds of system developments and evolutions. For Geels and Schot (2008) it does not represent a threat to the existence of the system, but rather an affordance that allows sociotechnical systems to promptly adjust to the transformations growing out of the social environment.

Furthermore, for Fortunati and Sarrica (2010) the sociotechnical system approach lies on two additional assumptions. First, it suggests that the development of systems is characterized by

the constant optimization of their technical and social functions. In the interactions between entities within the sociotechnical system and in the exchanges between sociotechnical system and the environment the adaptation of systemic functions is oriented toward better outcomes. Second, the existence and performance of a sociotechnical system is highly dependent on its ability to control the boundaries of the system. As Hughes (1987) noted a sociotechnical system develops two strategies to control its boundaries with the external environment. On one hand, it takes up a hierarchical organization that helps it to clearly delineate the relations between its constitutive elements. On the other hand, it acquires the strategy of neutralization of alternative/competitive systems which reside in its environment. Such strategy allows a sociotechnical system to control and protect its internal elements and resources, while still enabling its elements to be continuously supplied with the necessary resources. As Niederer and van Dijck (2010) suggest in their study of Wikipedia as a sociotechnical system, the ultimate goal of such organization is that the sociotechnical system acquires a somewhat stable organizational and social structure and, at the same time, leaving the necessary space open for development and innovation.<sup>9</sup>

When comparing Hughes's systems theory and the sociotechnical system approach to SCOT and ANT models one notable difference observed is the focus of system theories on complex social structures. On one hand, SCOT and ANT model are typically focused on exploring micro relations between designers, users, and technological devices. On other hand, the (sociotechnical) system model is concerned with macro and mezzo dimension of technological deployment. Technology is understood as a domain embedded into a complex social environment with its relations to the political, economic, cultural, and organizational structures and outcomes of the social system. The second notable difference between

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<sup>9</sup> It should be remembered that one of the postulates of sociotechnical system perspective is the notion of "dynamic stability" (Fortunati and Sarrica 2010). In other words – and somewhat paradoxically – a sociotechnical system attains a required level of structural constancy only when its organization enables the entities within the system – a consequently to the system as a whole – to adapt to new environmental conditions. For example, Niederer and van Dijck (2010) show that Wikipedia as a sociotechnical system would not have been so successful, without its social organization and technical infrastructure being opened for several rearrangements in terms of contribution protocols and software updates that enabled Wikipedia to accommodate the scaling problem (i.e., the service's ability to "function" as the number of users and contributions on Wikipedia increases).

systems, SCOT and ANT model, is that the former pays more attention to the stage of appropriation, use, and evaluation of outcomes of technology deployment, while SCOT and ANT are normally concerned with the development and design process (e.g., Meyer 2006; Oostveen 2007). Third, unlike SCOT and ANT, (sociotechnical) systems theory – with few exceptions (e.g., Fortunati and Sarrica 2010; Niederer and van Dijck 2010) – pays little attention to the appropriation processes and usage practices related to new media and ICTs. Finally, the systems theory assumes a stage of “consolidation” (where the role of technology becomes stabilized in relation to other system components) that is reminiscent of the “closure” stage in the SCOT model.

#### 2.1.3.4 Social constructivism and the “ensemble view of technology”

An alternative way to classify the theoretical approaches developed in the social constructivism perspective was proposed by Orlikowski and Iacono (2001). In their overview of the scientific papers published in the journal *Information system research* they label this approaches as the *ensemble view of technology*, which is characterized by the proposition that technology is only one element among many required in order to apply that technology to some social activity. Other important factors might include additional social resources on the individual (e.g., knowledge, skills, training) or organizational level (e.g., policies, incentives, arrangements) that operate in the dynamic interaction between people and technology. Orlikowski and Iacono (2001) identified four variants of the ensemble view that can be divided into two larger groups according to whether they are primarily focused on the ways in which technologies come to be developed (with secondary emphasis on the use phase) or they are primarily focused on how the technologies become to be used (with a secondary focus on the developmental phase). On one hand, the two variants focused on the development of technology are represented by the (1) technology as a development project and (2) technology as a production network approach. The former concentrates on the social dynamics that determine the development of a technological artifact, including social processes of designing, developing, and implementing technological devices and solutions in organizational or society-wide contexts. The general assumption of this approach is that the development of every single technology encompasses a potential conflict, which is reflected in the roles, actions, and power relations between various stakeholders that take part in the technology development projects. In contrast, the technology as production network approach

is not concentrated as much on how a particular technological artifact has evolved into its current form, but rather its focus is on the “building system of alliances” (Orlikowski and Iacono 2001, 126), which bring together corporations, research and development organizations, corporations, marketing agencies and policy makers (i.e., governments, public agencies), who work together to develop and implement new technologies. Studies adopting this perspective have been trying to identify the factors and contexts that make certain production networks more efficient and successful than others.

On the other hand, the two variants focused on the use of technology are represented by the (3) technology as structure and (4) technology as an embedded system approach. The technology as structure approach is concentrated on the ways technology is enmeshed in the conditions of its use. Its conceptualization is grounded in the notions developed under the Giddens’s (1984) structuration theory and represented in the structurational model of technology (Orlikowski 1992) and adaptive structuration theory (DeSanctis and Poole 1994). These theoretical models understand technology as social structure – a set of rules and resources that have been built into the artifacts by designers and producers and which are later appropriated by the users as they interact with the technology (Orlikowski and Iacono 2001). Although every technology encompasses a set of forms and shapes that were inscribed into it during its development, this rules and resources do not function as given or external forms, but rather exist only in and through the activities of users. In other words, technology at the same time poses limitations and provides opportunities for its users. Such condition is reflected in the changing nature of the normative frameworks, social practices and symbolic representations related to the appropriation of technology in different social settings. The technology as an embedded system approach shares several of the assumptions characteristic of the structuration perspective. According to Orlikowski and Iacono (see 2001, 130-131) it presumes that (a) technology, by definition, is not neutral, natural, universal or given, but rather charged with emerging cultural and social meanings that are inscribe into it in the design process; (b) technology is always embedded in some spatial, temporal, cultural and social conditions that frame the historical and cultural aspects of its ongoing development and use. If someone wants to understand the social role of technology these factors cannot be abstracted or ignored in any way; (c) technological artifacts cannot be understood as a uniform and unified monolithic entities, but rather as products of a multiplicity of different (social and material) components/processes, whose dynamic interconnections define the

social role(s) of technology; (d) technology is subjected to social agency. Technology is not a stand-alone entity existing outside the social world. Rather, it is conceived as an object of human manipulation, subjected the activity of social actors who use it in order to achieve their, both material and symbolic, goals; (e) although technological artifacts can “stabilize” in certain ways and at certain times and places, its nature essentially is not static neither unchanging, but dynamic and open to material modifications and/or social adaptations. Studies applying the embedded system approach were mainly informed by the Kling and Scacchi (1982) *web models of computing* that is considered as central reference for researchers who seek to understand,

... the complex and fragmented emergence of IT artifacts, how their computational capabilities and cultural meanings become woven in dense and fragile ways via variety of different and dynamic practices, how they are shaped by (and shape) social relations, political interests, and local and global contexts, and how ongoing developments in, uses of, and improvisation with them generate significant material, symbolic, institutional, and historical consequences. (Orlikowski and Iacono 2001, 133)

Unlike other approaches in the ensemble view of technology perspective the web of models computing perspective underlines the role of social context in comprehending the ongoing developments in organization of social life coupled with the appropriation of ICTs. Seen in this way, the web of computing approach is more oriented toward understanding the social milieu that infuses meaning and purpose into the *uses* of new technologies, rather than being concentrated (only) on the social and organizational factors that shape the *development* of new technologies. Technology, social context as well as people and the history of their actions are seen as a web of social relations and processes that set up the conditions, in which users appropriate the technology. The following section presents a detailed overview of the web model of computing approach in order to introduce some analytical terms useful for the social analysis of digital socialities.

## 2.2 DISCRETE-ENTITY AND WEB MODELS OF TECHNOLOGY DEPLOYMENT

The web of computing approach (in short the web model) is a theoretical framework built up by Kling and Scacchi (1982) in early 1980s as part of their conceptual efforts to provide a viable theoretical interpretation of socio-technical systems. The development of the web

model approach was partly also motivated by Kling and Scacchi's interest into the so called *productivity paradox* (Brynjolfsson 1993) – a phenomenon recognized by economists in the late 1970s and early 1980s related to, at first sight, counterintuitive discrepancy between huge investments of organizations in information technology and surprisingly small returns of those investments. Kling and Scacchi (1982, 8) understand web model as ideal type abstracted from the literature about computing developments in the 1970s that relies on a complex set of assumptions and provides a theoretical insight into the interaction between technical systems and social (infra)structure. More recently, Lamb and Sawyer (2005) defined web models as an analytical orientation of social informatics research, which refers to studies that develop theories about ICTs in institutional and cultural contexts that contribute to an enhanced understanding of how the evolution of ICTs' uses in a particular setting can be generalized to other systems and other settings.

Before further consideration is given to the notion of web model, it should be noted that this analytical framework was originally designed to give researchers a tool for understanding the socio-technical systems *in (formal) organizational settings*. When Kling and Scacchi (1982) for the first time introduced web model metaphor into the literature at the beginning of the 1980s, information technology was generally available only in organizational sector and public administration – owing to high costs of personal computers and lack of telecommunication infrastructure individuals and households had limited access to information technology at that time. Consequently, the authors have used a terminology that might appear today unsuitable to capture the complex social reality of larger social systems. Nevertheless, as Meyer (2006) notes the web model represents the initial step in Rob Kling's endeavor to arrive at a universal theory of socio-technical systems, which could be applied in social settings independently of their size or level of analysis.

Kling and Scacchi (1982) illustrated the web model approach by comparing it against the discrete-entity models with regard to nine dimensions (related to: the unit of analysis, logic of technological development, social context, socio-technical system, computing system, role of infrastructure, control over infrastructure, methods of analysis, formal characteristics of technology) that in their opinion represent the constitutive characteristics of two opposite conceptions of the relationship between technology and society in the computing literature (see Table 2.2). From several points of view, for Kling and Scacchi the discrete-entity model

represents what Fischer (1992) labels as the impact and symptomatic approach to theorizing the technology – society relationship.

According to Kling and Scacchi (1982) the discrete entity model is focused on the technological resources and the social implications of the appropriation of technological resources, while largely neglecting the social context<sup>10</sup> in which they are used. It assumes that technological and social world coexist as two separated entities that from time to time come into contact and influence their internal structure, organization and processes. Such assumption has two important implications. On one hand, discrete-entity model presumes that technologies are tools with largely identifiable and socially neutral characteristics. On the other hand, it employs a questionable logic of technical development, as it assumes that old technology can be easily replaced with new innovations without causing serious problems for the organization of social systems, since new technologies represent an outcome of the accumulation of computational capabilities (Kling and Scacchi 1982). Further, despite the understanding of socio-technical systems as loosely aggregated collection of equipment, people, organizational procedures and beliefs, the discrete-entity model argues that attributes of technological innovations can be directly translated into social attributes, implying a direct causal subordination of the social world to the technological domain. As regards the role and control over the infrastructure this conception assumes that the infrastructure is a neutral social resource with a permanent supportive role, that infrastructural and human resources are ample – both in terms of quality and quantity – and separated from the computing resources, and that organizations have a good control over social processes. Finally, from the methodological point of view the discrete-entity model presumes that both technologies as well as infrastructural elements can be analyzed independently of interactions with computer resources and social or organizational arrangements within which the technologies are deployed. In addition, it also sees formal characteristics of technology as valid indicators of goals and uses of computing resources in organizations.

Kling and Scacchi (1982) acknowledge that discrete-entity models are sometimes useful, because of their simplicity, which makes them tractable and easy to apply when a researcher

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<sup>10</sup> For Kling (2000, 225): “the social context does not refer to some abstract cloud that hovers above people and information technology; it refers to a specific matrix of social relationships.”



is focused on only a selected technical and economic characteristic of a new computing technology. Nevertheless, they also find such approach problematic in several respects; with their central objections to the neglecting of the social context and the assumption that socio-technical system can be thought of as consisting of two separated domains. In fact, it is in these two respects that the web model represents a significant departure from the assumptions of the discrete-entity model.

With the web model Kling and Scacchi (1982) introduced the “network” metaphor to explain the complex and perpetual interaction between the social and technical that would privilege neither the social nor the technical. Web model assumes that socio-technical systems are a highly interrelated network of equipment, people, organizational procedures and beliefs, embedded into the social context, which structurates the way people use the technology for conducting their activities. Hence, the social context is believed to be an important facet of technological deployment and cannot be boiled down to notion of social infrastructure. Owing to the embeddedness of technology into the social context, the web model suggests that technology is a social object charged with meaning and that its features can be only partly identifiable. Further, this conception suggests that the infrastructure consists of technical and social elements, which both have an important supportive role. In contrast with the discrete-entity model, it argues that the infrastructural resources are biased, limited and dispersed across different subjects with organizations having only limited control over them. Consequently, web model assumes that technological and infrastructural elements cannot be analyzed without taking account of interactions with computer resources and social or organizational arrangements. As computing resources are co-constructed by a network of producers and consumers, which Kling and Scacchi (1982) term *production lattice*, the formal characteristics of technology are not a valid and effective indicator for what organizational goals are and of how the computing resources are used within a social environment. When analyzing the role technology plays in the socio-technical system, Kling and Scacchi (1982) argue, one needs to analyze the network of interactions that connect the social context to the computational resources.

**Table 2.2: Kling and Scacchi's conceptualization of the discrete-entity and web model**

	<b>Discrete-entity model</b>	<b>Web model</b>
<b>Unit of analysis</b>	- technology / computer resource	- the network of socio-technical interactions
<b>Logic of technical development</b>	- direct substitution	- fitting
<b>Social context</b>	- incremental aggregation	- packing
	- usually neglected	- considered as an important facet of technological deployment
<b>Socio-technical system</b>	- is assumed to be loosely aggregated collection of equipment, people, organizational procedures and beliefs	- is assumed to be highly interrelated network of equipment, people, organizational procedures and beliefs
<b>Computing system</b>	- computing systems characteristics are largely identifiable	- computing systems features are partly identifiable
	- technologies are tools and are socially neutral	- technologies are social objects charged with (cultural) meaning
<b>Role of infrastructure</b>	- the supportive role of the infrastructure	- the supportive role of the infrastructure
	- infrastructure is a neutral resource	- infrastructure is not a neutral resource
	- infrastructural and human resources are separated from the computing resources	- infrastructural and human resources are related to the computing resources
<b>Control over infrastructure</b>	- organizations have a good control over social processes	- organizations have limited control over social processes
	- infrastructural resources are ample (in terms of quality and quantity) and mainly available within the organization	- infrastructural resources are limited (in terms of quality and quantity) and dispersed across different subjects
<b>Methods of analysis</b>	- technologies and infrastructural elements can be analyzed independently of interactions with (a) computer resources and (b) social or organizational arrangements within which the technologies are deployed	- technologies and infrastructural elements cannot be analyzed without taking account of interactions with (a) computer resources and (b) social or organizational arrangements
<b>Formal characteristics (of technologies)</b>	- are good indicators of organizational goals and uses of computing resources within the system	- are fair-to-poor guide for what organizational goals are and of how the computing resources are used within the organization

Source: adopted from Kling and Scacchi (1982)

As Mayer (2006) suggested, the web model shares a number of assumptions and propositions with the SCOT and ANT models. In general, all three approaches reject the deterministic role of technology in society. In addition, all perspectives underscore the interactional mechanisms between technological and social elements that shape the material and symbolic

appropriation of technology within social contexts. In this sense, the SCOT emphasizes the social construction process wherein the involved social groups frame the interpretative flexibility of technological devices, helping them to move toward a state of closure and stabilization. The ANT model is consistent with SCOT in the sense that by introducing the notions of inscription, translation, and framing provides an alternative view on the factors which govern the stabilization of interpretative flexibility. However, for ANT the interpretative flexibility is not only shaped by iterative interactions between designers and users but also by other (non-human) actants (e.g., political organizations, cultural industry) that are part of the network. Web model shares with the ANT theory the “network” metaphor (in the sense of the multiplicity of relationships that is key to understand the material and social aspects of technology), although it more conservative in attributing the agency to subjects other than humans. Concurrently, it is also less committed than ANT to the proposal of “radical relationality” (Cavanagh 2007) and “radical indeterminacy” (Meyer 2006), arguing that the relationship between actants in the network sooner or later becomes stabilized, producing an objectified social-technical infrastructure. Finally, unlike ANT and SCOT models, which are primarily focused on the design and development stage, the web model also considers and examines the relationship between technology and society in the phase of the consumption of technology. For Kling and Scacchi (1982) one should not assume that after technology is designed by developers and engineers its material uses and symbolic meanings become immutable. In other words, “closure” and “black-boxing” do not necessarily take place at the end of the design process, but can occur while technology gets appropriated by users. Kling and Scacchi (1982) argue that the consideration of appropriation is even more fundamental when analyzing the implementation of information technology and computer resources in the organizational environment, since the technological (e.g., interactivity, convergence) and social affordances (e.g., personalization) of digital technology give to users more control over how they will domesticate and reshape it in medium- and long-term use. To sum up, the web model underlines the limited role of technology designers and developers in determining the actual deployment of computing systems in organizations. However, it tells us little about the nature of these processes in social settings that are not limited to the organizational environment. In order to overcome the problem of generalizability of the web model Kling and his colleagues (2003) developed the *Socio-Technical Interaction Networks* (STIN) approach, which is not restricted to the conception of computing within the

organizational boundaries, but aims to explain the implications of the appropriation of ICTs on a larger, social scale.

### 2.3 SOCIAL-TECHNICAL INTERACTION NETWORKS

As already mentioned in the previous section, the STIN model is an elaboration of Kling and Scacchi's earlier web models (Meyer 2006; Rosenbaum and Joung 2004). On one hand, it can be recognized as Kling's response on external critics that exposed the inherent connection of the web model to the context of organizations and, consequently, its limited scope for application to other social domains. On the other hand, the STIN can be seen as Kling's reaction to his internal desire for creating a conceptual tool that would allow researchers to analyze interactions between the technological and the social under the conditions where ICTs have literally inhabited every single aspect and sphere of social life. For Kling (2000; 2002) ICTs and more so the Internet with their interactional affordances represent a different social experience; with new modes of technological design, development, appropriation and use practices, which correspond to innovative forms of individual uses, social forms, organizational structures and cultural representations in everyday life, which are significantly different from experiences related to the age when information technology and computers were almost exclusively tied to the organizational and economic domain.

The STIN model was originally laid out by Kling, McKim, and King (2003) in a paper that examined the electronic scholarly communication forums.<sup>11</sup> In that paper the authors have given an explicit definition of the STIN model as "... a network that includes people (including organizations), equipment, data, diverse resources (money, skill, status), documents and messages, legal arrangements and enforcement mechanisms and resource flows. The elements of a STIN are heterogeneous, the network relationships between these elements include: social, economic and political interactions" (Kling et al. 2003, 48). Lately, the STIN model was also described as, "... an emerging conceptual framework for identifying, organizing, and comparatively analyzing patterns of social interaction, system development, and the configuration of components that constitute an information system"

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<sup>11</sup> The STIN approach has been used to study several other topics related to the social application of ICTs in the past decade (for a detailed overview see Meyer 2006).

(Scacchi 2005, 2), which emphasizes that “... ICTs do not exist in social and technological isolation” (Lamb et al. 2000, 1).

Besides the formal definition of STIN approach, Kling et al. (2003) in the study of electronic scholarly communication forums laid down the central assumptions, which underlie the theoretical framework of the STIN model. The four constitutive assumptions of STIN approach are (Kling et al. 2003, 56-57):

(1) the social and technological are not meaningfully separable ...; (2) theories of social behavior not only can, but should influence technical design choices ...; (3) system participants are embedded in multiple, overlapping, and nontechnologically mediated social relationships, and therefore may have multiple, often conflicting, commitments. Further, the system plays roles of varying importance in the social and professional lives of system interactors. The sustainability of the system will depend on other systems ... that the interactors already participate in ...; (4) sustainability and routine operations are critical.

Each of the above mentioned assumptions has important implications for the understanding of the role of ICTs in contemporary society (Meyer 2006). The first assumption clearly reflects the general socio-constructivist position that views social reality as structure, constituted by technology and society as two highly interrelated realms that support and constrict individuals in their actions and interactions. However, this highly intertwined nature of STIN is not universal. Hence, a study of social and the technical elements in the STIN requires from the researcher the development of a case-specific understanding of how social, political and economic relationship are reflected in the material uses and symbolic representations of technology and why certain cultural practices related to technology get reshaped through a series of innovations and adaptations introduced by users during appropriation. The second supposition of STIN model is in line with the second key idea of social constructivism: the social implications of technological deployment cannot be fully explained if one does not consider the user as an active participant in the socio-technical systems. Individuals through the use of technology draw on the technological and social resources, while, at the same time, creating with their actions new resources that form the socio-technical context of their actions. Further, Meyer (2006) notes that the second assumption also reflects the normative element of the STIN approach, which stems from the normative orientation of social informatics, in which research aims to work out the social and

cultural mechanisms, involved in the appropriation process, in order to recommend alternatives for professionals who are engaged in the design and development of ICTs (Lamb and Sawyer 2005). STIN's third assumption points to the social, political, and cultural embeddedness of the networks which emerge from the interactions between the actants in the socio-technical systems. The appropriation of technology is always a "... problematic and complex, contingent process, ..., that is mediated by history, context, structure and agency, culture and meaning systems, symbolic and material interests and resources, and political and social processes" (Robbin 2007, 238). Or as Kling et al.'s (2003) note the relationship between the user and technology is not only determined by the interactions between them, but also by the other dimensions of the social world (e.g., institutional linkages, socio-economic factors, cultural capital, social class, knowledge), which, on one hand, constitute a source of users' social experience, and, on the other hand, structurate the material and symbolic characteristics of the technology. For example, in the study about the utilization of computerization information systems Kling (2000, 219-220) describes a socio-technical interaction network as a computer package which "... brings together equipment, equipment vendors, technical specialists, upper-level managers, ICT policies, internal funding, and external grant funding with the people who will use information systems in the course of other work (such as policing, accounting, taxing, or planning)," noting "... that these elements are not simply a static list but are interrelated within a matrix of social and technical dependencies." Finally, the fourth assumption of the STIN model emphasizes the importance of sustainability and custom practices for designing technological devices and services as well as for understanding the implications of technology on social life. As regards the former aspect, Kling et al. (2003) underline that technology should be (re)designed in accordance with the needs and behaviors of the potential (existing) users. That does not necessary mean that designers should always conform to the needs of users and their rules of conduct; in fact, since users can hardly feel the benefits of potential innovations without actually using them, it would be ineffective to ask them about tangible advantages. Nevertheless, designers should have, at least, a basic conception of how a sustainable use of a potential innovation would look like, before its actual development (implementation) begins.

On the theoretical level, for Kling et al. (2003) *sustainability* implies a reflection on the long term adaptation of technology to social agency. As technology is open to being reshaped by human actors in political, economic, and cultural context, its position, role and function in the

socio-technical interaction network may change through time. Analyzing the structural relations between social environment and technology at only one (specific) stage of its social appropriation may provide a biased insight into the quality of the technology-society relationship. Looking at the long-term configuration of socio-technical interaction networks does not only allow researchers to understand the underlying mechanisms of mutual adaptation of the technology to the social world, but also to describe the ways sustainable practices and routines have been developed in the socio-technical network. As Fortunati and Saricca (2010) have noted in their study of the evolution of the press in the new media age, with such approach the sociotechnical perspective can, for example, give us a valuable insight into the technical and social aspects of journalism under the digitalization of media sources and channels, explaining how the technological advancements are intertwined with the relationships between publishers, journalists, editors, and audiences.

In an attempt to illustrate the conceptualization of ICT as socio-technical interaction network, Kling (2000) compares the STIN model with the viewing of ICTs, which were developed in the 1970s and early 1980s (e.g., the Media richness theory [Daft and Lengel 1984] – see Section 4.3 for a detailed presentation of the theory) and understood ICTs as tools that have a direct impact on the social structures, processes, and relations. For him technology as a tool is “... a computing resource (that) is best conceptualized as a particular piece of equipment, application or technique which provides specifiable information processing capabilities” (Kling 1987, 311). Kling (2000) labels such deterministic approaches as *standard (tool) models*. He argues that they almost completely overlook the complexity of the implementation of ICT, while overestimating the uniformity of its application between different social settings (see Table 2.3). On the contrary, the conception of ICT as socio-technical interaction network implies a highly intertwined model which takes account not only of users and technology, but also of the *social environment*. In this perspective, therefore, the consequences of ICTs are indirect and involve different time scales, while their implementations are an ongoing social process. Interactions between users, ICTs, and social contexts are complex and can be observed in multivalent relationships between services, people, technology history, politics, culture, as well as knowledge and expertise. The latter are not an implicit quality of technology, but are rather (at least temporally) consolidated in the social practices related to the ICTs. In short, according to Barab et al. (as cited in Rosenbaum and Joung 2004, 2) the notion of socio-technical interaction network is used in

social informatics, “... to capture the complex sociotechnical arrangements involved in a technology-intensive project, emphasizing the reciprocal character of the interaction among people, among people and equipment, and even among sets of technical structures and political climates.”

According to Meyer (2006), however, STIN can be seen more as an analytic strategy than a real and proper theory. As he notes: “The STIN strategy leads to choosing particular methods, to favoring certain kinds of understandings about the world, but maintains the overall social informatics open-mindedness towards a variety of methods, and a preference for multiple method approaches to research questions” (Meyer 2006, 44). Despite this methodological openness of STIN, Kling et al. (2003) identify a list of analytic steps that build up a research method for what they call “STIN modeling”. This method has eight components (Kling et al. 2003, 57):

1. Identify a relevant population of system interactors;
2. Identify core interactor groups;
3. Identify incentives;
4. Identify excluded actors and undesired interactions;
5. Identify existing communication forums;
6. Identify resource flows;
7. Identify system architectural choice points;
8. Map architectural choice points to socio-technical characteristics.

Since STIN in analytical sense comprises a network of nodes and interactions the Steps 1, 2, and 4 of the STIN procedure are related to the identification of potential (and group of) subjects that are included or excluded from the socio-technical network. In a study of electronic scholarly journals, where this analytical procedure has been applied for the first time, Kling et al. (2003), for example, identified the following systems of interactors: scholarly society, industry, government and public sector; and the group of interactors: authors, readers, scientific societies, publishers, libraries, editors. The Step 3 is related to the identification of incentives which motivate actors to participate in the network. Step 5 is oriented toward examining the communication systems that either allow interaction between network members or connect the network with the social context. For instance, Kling et al. (2003) in the study of e-journals mention the following communication systems: print



journals, proceedings, conferences, symposiums, workshops. Step 6 refers to the recognition and naming of resource flows that “... can have both direct and indirect influence on the interactions within the network” Kling et al. (2003, 58). The idea here is to draw up a list of exchanges between network nodes in order to identify the long-run sustainability of the socio-technical system. The last two steps are related to the proactive involvement of researchers in an attempt to optimize the design and organization of the analyzed STIN. System architectural choice points are the locations in the socio-technical network where designers have an option to introduce alternative solutions (e.g., changing the format of the documents stored on e-journal servers, choosing between open-access and subscription-based publishing, introducing new submission and review forms). Finally, the last step consists of an *a posteriori* evaluation of the decisions taken with reference to architectural choice points in socio-technical characteristics, or, in other words, analyzing whether the introduced modifications in the networks have matched the expected outcomes.

**Table 2.3: Conceptions of ICT in organizations/society**

<b>Standard (tool) model</b>	<b>Socio-technical network model</b>
ICT is a tool.	ICT is a socio-technical network.
A business model is sufficient.	An ecological view is also needed.
One-shot ICT implementations are made.	ICT implementations are an ongoing social process.
Technological effects are direct and immediate.	Technological effects are indirect and involve different time scales.
Politics are bad or irrelevant.	Politics are central and even enabling.
Incentives to change are unproblematic.	Incentives may require restructuring (and may be in conflict).
Relationships are easily reformed.	Relationships are complex, negotiated, and multivalent (including trust).
Social effects of ICT are big but isolated and benign.	
Contexts are simple (a few key terms or demographics).	Contexts are complex (matrixes of business, services, people, technology history, location, etc.)
Knowledge and expertise are easily made explicit.	Knowledge and expertise are inherently tacit/implicit.
ICT infrastructures are fully supportive.	Additional skill and work are needed to make ICT work.

Source: Kling (2000, 220).

From this description it clearly appears that the STIN analytical strategy is founded on a set of very flexible methodological assumptions that vary according to the contextual characteristic of the phenomenon under investigation. Even though this flexibility has resulted in various applications of the STIN methodology in the context of social informatics

– see Mayer (2006) for a detailed review – a pattern of repeated findings and common knowledge stems from them that, according to Lamb and Sawyer (2005, 16): “... helps to anchor understandings of new and emergent ICTs by serving as a relatively stable framework for examining their uses and effects.” The most frequent and generic findings are shown in Figure 2.2. It can be observed how these findings underscore the intertwined and embedded nature of relationships which exists between users, ICTs, and the social context. In addition, from this listing the following general implications can be drawn.

First, ICTs are highly interactive technologies, with their actual uses and implementations substantially diverging from the intentions and meanings inscribed into them during the design stage. Further, ICTs imply a considerable amount of active engagement from users, giving them a sizable level of flexibility in tailoring social affordances of ICTs to their needs and practices. Second, ICTs support and mediate social interactions, which means that the social uses of ICTs do not only have implications for users as individuals, but also for interactional and integrative quality of communication processes and personal relationships that are mediated through them. Because social interaction involves negotiations between the participants, ICTs are even more exposed to the social (re)shaping that they would have been if they were only personal technologies. Third, the way social reality is structured and experienced depends on the interplay between the ICTs and the social structures and processes developed on the top of it. It should be, however, noted that because of the changing social affordances and cultural meanings of ICTs, both the social structures and users’ experiences are inherently temporary and susceptible to variation and transformation. Lastly, the role of ICTs in the reconfiguration of social forms is not only dynamically changing with the development and introduction of new communication devices and applications but also can vary according to the level of analysis.

In terms of implications that the proliferation of ICTs in everyday life has on sociality in contemporary society, the objective of this study is to introduce the methodology, which will draw on the STIN model in an attempt to recognize the structural connections between social interactions, personal networks, and ICTs in the context of late modernity. In order to enhance the understanding of digital sociality, it is first necessary to articulate a holistic framework that will help us to clarify the main structures, processes, and social contexts that link the components of digital sociality (in Kling et al.’s words identify the system interactors

and interactor groups as well as find those subjects that excluded from these components). In our opinion, the STIN model can help us to evaluate these aspects of digital sociality. Section 2.4 presents an attempt to create a STIN model tailored to the social and technological dimensions of digital sociality, which may serve as a basis for an articulation of systematic linkages that connect the technological mediation of social interactions and social networks under the conditions of late modernity.

**Figure 2.2: Key Social Informatics issues.**

1. The context of ICT use directly affects their meanings and roles.
2. ICTs are not value neutral: their use creates positive and negative implications.
3. ICT use leads to multiple, and often paradoxical, effects.
4. ICT use has moral and ethical aspects and these have social consequences.
5. ICTs are configurable – they are actually collections of distinct components.
6. ICTs follow trajectories and these trajectories often favor the status quo.
7. ICTs co-evolve during design/development/use (before and after implementation).
8. ICTs effects will vary by the level of analysis.
9. The design, implementation, use and context of ICTs have reciprocal relationships.

Source: Kling et al. (2000, 117), Lamb and Sawyer (2005, 16)

## 2.4 DIGITAL SOCIALITY FROM THE STIN PERSPECTIVE

The multiple facets of STIN model that have been illustrated demonstrate that relationship between technology and society is not only about technology influencing social processes or social forms shaping technological development, but is a much more complex phenomenon. While the STIN model has been used for at least two decades for investigating the technological aspects and social implications of new communication technologies in organizational settings, its application to wider social contexts and everyday uses of ICTs still remains a young research area (Meyer 2006). Nevertheless, in our opinion the STIN methodology could be very relevant for understanding the role of ICTs in digital socialities, which have been emerging from the multi-faced interactions between social interactions, social networks and ICT-based technological landscapes. Before discussing its methodological role in analyzing various aspects of digital sociality, it is important to provide an idea of the general and challenging notion of digital sociality.

Although new media research has produced a recurring empirical interest in the relation between ICTs and social connectivity over the last 20 years, surprisingly little attempt has been made to develop a theoretical framework that could help us to conceptualize the

technological embeddedness of sociality into practices and interactions enabled by personal communication technologies. This partly stems from the small interest sociology in general has shown recently for developing a comprehensive definition of sociality.

Thompson and Cupples (2008) and Licoppe and Smoreda (2005; 2006) are among the few who have drawn up a comprehensive conceptualization of sociality in the sociology of new media which could be used to derive a holistic research model. Thompson and Cupples (2008) derive their conceptualization of digital society from the actor-network theory and qualitative research conducted with New Zealand teenagers. They explore how teenagers, mobile phones, socio-spatial relations and discourses related to mobile communication exist within an interdependent network of social and technological structures. Thompson and Cupples (2008, 102) define digital sociality as the *social order* that has emerged in the socio-technical network consisting of teenagers, their everyday mobile phone use, the mobile phones as technological artifacts, ideas about technology, children and capitalism, as well as other actors such as telecoms.

According to the authors, this order is an outcome of translation<sup>12</sup> carried out by teenagers and can take multiple forms, including the tendency to rarely make voice calls and only to text, use mobile communication as means of emancipation from their parents or as means which help them to manage and redefine social space in relation to their peers (see also Weisskirch 2011). In addition, what is of note here is the suggestion that this social order appears to need a constant reaffirmation through performance from the participants in the network.

To recap, Thompson and Cupples (2008) conceptualization puts forward two dimensions of digital socialities. On one hand, it advances an idea of digital sociality as social structure which is a result of individuals acting upon the intersections between the social and technological structures of social reality. On the other hand, it suggests that the emerging social order is not based on a hierarchical organization of social relations but rather presents an articulation of horizontal interactions between actors in the network. Notwithstanding this advances, the major weakness of this conceptualization remains that it is a case study focused

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<sup>12</sup> See Section 2.1.3.2 for a detailed presentation of the notion of translation in the actor-network theory.

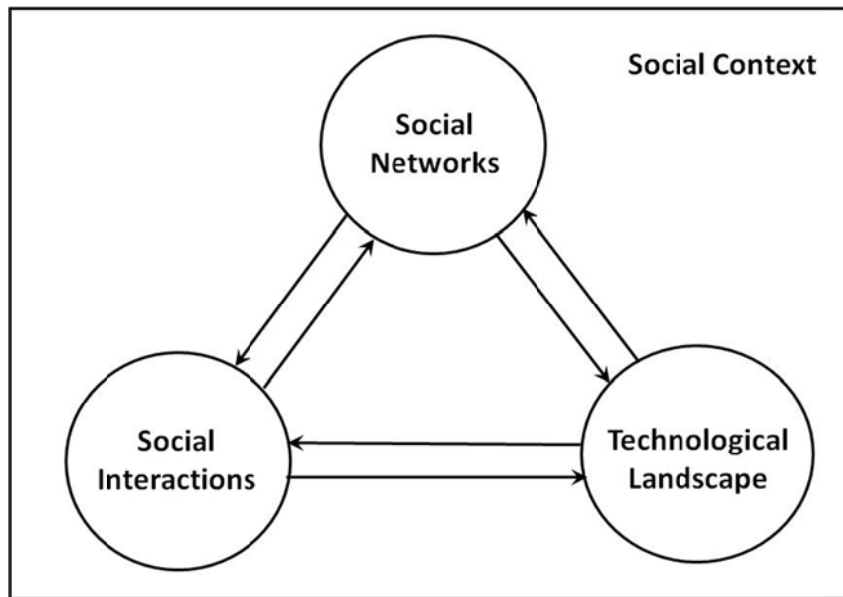
on one particular technology and one specific user group. Consequently, it almost completely lacks the potential for analyzing the forms of sociality which have been co-constituted by ICTs on a more general societal level. Therefore, we now turn to another conceptualization of the digital sociality that has recently been developed by Licoppe and Smoreda.

In contrast with Thompson and Cupples, Licoppe and Smoreda (2005; 2006) do not speak directly about digital sociality but develop the notion of technologically-mediated sociability<sup>13</sup> that is conceived as “... the flow of exchanges people maintain with those to whom they are tied” (Licoppe and Smoreda 2005, 319). According to them the cotemporary sociability cannot be seen any more as a part of social reality which is based on in-person encounters but as a social phenomenon grounded on three main building poles (see Figure 2.3): (1) *social networks* – defined as enduring forms of social organization, composed of sets of social ties that connect the nodes; (2) *exchanges* or social interactions that encompass practices, acts, or actions of at least two interlocutors who are mutually oriented towards each other's selves, trying to affect or take account of each other's subjective experiences. Interactions are generally performed through a succession of communication acts which may take a different forms and modalities; (3) the *technological landscape* made up from various technical means which people have at their disposal to mediate the social interactions between them.

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<sup>13</sup> Our decision to use the notion of sociality instead of society or sociability stems from two conceptual reasons. On one hand, we feel that the use of the notion of society (as in the case of network society or information society) would be too broad and misleading, since in our research we are aiming to untangle the trends in social connectivity on the level of what Berger and Luckmann (1966) refer to as the lifeworld dimension of the social reality, thereby not referring to the political, economic and cultural dimensions of social systems that are generally implied in sociological accounts of society. On the other hand, in our opinion the notion of sociability is too narrow and constrained for what is intended in this study. In sociological theory the notion of sociability generally underlines the more *informal* aspects of social life related to the private sphere of family and leisure. Conversely, according to Maffesoli (1995) the notion of sociality accounts also for the more *formal* aspects of personal relating in everyday life, embracing various forms of relationships in the public domains such as work, school, community, etc. As part of our argument addresses precisely the role new communication technology has in the relation between the public and private dimension of social connectivity we suggest that the concept of sociality represents a more suitable framework for tackling down the interactions between these structures.

**Figure 2.3: Digital sociality as a socio-technical interaction network**



What is important for the understanding of the social condition that determines the organization of contemporary sociality are two further suggestions set out by Licoppe and Smoreda (2005; 2006). On one hand, the relations between the three poles do not assume a hierarchical structure but presume a network organization, in which the position of each of these poles is exposed to a possible redefinition of its role in the structure. According to Licoppe and Smoreda (2005) neither social networks, nor social interactions or technologies determine the human experience of social connectivity by themselves. The contemporary sociality which includes various modes of technological mediation, forms of social interactions and social network structures has emerged out of the exchanges that connect these domains through social action. The suggestion here is that one can no longer think of the three poles as self-referential domains but as increasingly constituted by the exchanges that connect them. For example, while portraying the ways in which new and old interpersonal communication technologies are involved into the rhythms of social interactions within personal networks Licoppe and Smoreda (2006) note that the introduction of new technologies into the mediation of social interactions has rearranged the experience of communication, which has in turn altered the way people experience those technologies in terms of social accessibility, relational reciprocity and tie strength. As Sooryamoorthy et al. (2008, 747) suggest, “New communications technologies redistribute opportunities for interactions and construct a common space for experiences which can contribute towards a

transformation of interpersonal relations and sociability.” A good illustration of how the redistribution of the relational opportunities is correlated with structural characteristic of social networks is the use of mobile communication. Mobile phones are typically used for keeping in touch with close, locally-based and smaller personal networks (Sooryamoorthy et al. 2008). In addition mobile communication consists of short but frequent exchanges that create new conditions of social interactions which have been described as a state of “connected” presence (Licoppe 2004) or an “ambient virtual co-presence” (Okabe and Ito 2005). However, Baym et al. (2004) contend that usage patterns of interpersonal media (i.e., in-person, telephone, the Internet) are importantly shaped by geographical location and, to a lesser extent, by the closeness of the relationship. In addition, Sooryamoorthy et al. (2008) also suggest that mobile phones are associated with a cluster of other technologies that together make up what Schroeder (2010) calls the state of “multimodal connectedness”, suggesting that “... the mobile’s uses cannot easily be separated from uses of other ICTs, as when ICTs compete for time spent or when key functions such as maintaining relationships are distributed across devices” (Schroeder 2010, 75). In other words, the relational structure associated with the personal networks is embedded into a cluster of personal communication technologies, which cannot be treated as a separate entities but as intertwined parts of a landscape that shapes the contemporary condition of social interactions; thereby, transforming the maintenance of intersubjective reality, which through the construction of shared expectations and routines, encourages a modified experience of the social world (Zhao 2006a).

This brings us to the second point advanced by Licoppe and Smoreda (2005). They argue that networks, interactions and technologies represent a potential constraint as well as a resource for the interactions between the three poles. Consequently, the forms, modes, and organization of relational practices, which emerge from these interactions, are complex, negotiated, multivalent, and involve an ongoing social process. Focusing on the role of the technology we could say that under such conditions technology cannot not be seen only as a tool that mediates the exchanges between interactions and networks; technology clearly captures the essence of some relational modes since it is inscribed practices and meanings associated with them. Using the terminology coined by Burrows we could say that digital sociality is increasingly “comprised” or “constituted” by the technological landscape that sheathes the contemporary society. In Burrows (cited in Beer 2009, 987) words:

... the “stuff” that makes up the social and urban fabric has changed – it is no longer just about emergent properties that derive from a complex of social associations and interactions. These associations and interactions are now not only *mediated* by software and code they are becoming *constituted* by it.

The work, by writers including Licoppe, Ling, Matsuda, Habuchi, Wellman, and Turkle, describes the ways in which mobile and internet communication technologies constitute in manifest and concealed ways the structure of social interactions in personal relationships. Turkle (2008), for instance, is concerned with how mobile communication and ubiquitous connectivity is involved in an ascent of a “tethered self” – a condition under which individuals, and in particular adolescents, are increasingly unable to perceive their personal and social identity without been ubiquitously and constantly “connected” with the help of ICTs to their social network. In fact, as Turkle (2008) continues, technology gives people an opportunity for a constant reflexing of their thoughts, feelings, relations, and deeds. For example, mobile phones because of their portability and proliferation across various realms of everyday life have enabled the need of what Turkle (2008) refers to as “validation” to become commonplace. Most of these acts of validation that have the form of short “check-in” calls or texts, Turkle (2008) notes, go unnoticed because they are progressively seen as “normal”, although they might have lasting implications for the experience of sociality in the long-run. She, in fact, observes, how these short but intensive exchanges of “check-in” calls have evolved “ ... into a new kind of contact between parents and children,” (Turkle 2008) because both parties know that in the mobile phone they have a kind of “back-up”, which could help them to overcome the critical situations and moments in the everyday. The crucial issue here is that these new modes of social interactions would not exist if they were not enabled by mobile phones. Put it differently, what Turkle (2008) calls short “check-in” calls or Licoppe (2004) names “connected” presence are not merely in-person conversations mediated by mobile technology; these interactional practices set up a new relational mode, which has consequences for the way people keep up with their social networks.

The way contemporary sociality is structured and experienced therefore depends on the interplay between the technological infrastructure and the social interactions and networks that are constituted by it. This theme has the focus of socio-technical interaction networks as a conceptual resonance could be found here in the attention given by Kling et al. (2003) to the



co-constitution of the social world and technology and the intertwined nature of three poles of social world, which as equivalent domains make up the modern experience of social connectivity. The writers we have focused on here all point toward the idea that electronic media for interpersonal communication such as the telephone, the mobile phone, short text messages, email, instant messaging, social network sites as well as other internet-based services represent the underlying technological infrastructure for the development of new types of social interactions. These modes of electronically-mediated social connectivity are not a direct consequence of the appropriation of ICTs, but are rather an outcome of the ICTs becoming involved in the reconfiguration of the structural characteristics of personal relationships and social networks. This reconfiguration gives rise to new modes of social connectivity that cannot be experienced outside the technologically-mediated social world. In addition, the reflexivity and individualization, which characterize late modern relationality, coincide with personal connectivity supported by new (portable) media and can be observed in the structural characteristics of personal networks, in which social ties and interpersonal communication are organized according to the principles, for example, of *networked individualism* (Castells 2001; Wellman 2001), *selective sociality* (Matsuda 2005), *mobile sociality* (Mascheroni 2007) or *mobile sociality* (Wittel 2001).<sup>14</sup>

Due to the observed parallels between the notion of digital sociality advanced in the mobile and internet communication research literature and the STIN approach, we suggest that the STIN framework could be used for the analysis of the social and technological structures that constitute the digital sociality. As already mentioned in Section 2.3, the difficulty with STIN approach is that it has been developed for the analysis of socio-technical structures within the organizational environment. Consequently, its eight methodological steps (see Section 2.3) which have been introduced by Kling et al. (2003) can hardly be followed on the macro social level in their totality. An identification of all the factors (e.g., groups, systems, incentives, interactions, resources, and interactions) in the STIN, which have enabled the development of new forms of technologically-mediated sociality, would make the analysis prohibitive in the sense that it would lower the propensity of the STIN procedure as a lens through which the general regularities that according to writers such as Castells, Licoppe,

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<sup>14</sup> These notions are discussed in more detail in Chapter 5.

Mascheroni, Matsuda, Smoreda, Wellman, Wittel characterize the organization and experience of social connectivity. Drawing on the research carried out by the just mentioned authors, a major suggestion of this study is that the STIN model of digital sociality can be reduced to three main elements, namely, the social networks, the social interactions, and the technological landscape. In this three-fold model, the key for the explanation of concept of digital sociality is to examine the structural links between the three elements. A key challenge of the study is to demonstrate that the structural organization of these links creates a series of unique practices and experience of social connectivity that would not exist otherwise.

However, before doing that it should be noted that according to the STIN methodology social context is central for grasping the nature of mechanism and forms that connects the technological infrastructure with social structure. As Kling et al. (2003) note, social context is crucial for developing a holistic approach to understand the technology – society relationship. It was already argued that late modernity corresponds to the social context within which diverse forms of digital socialities have emerged. Therefore, in Chapter 3 the conceptual analysis of personal relationship in late modernity is presented with an emphasis on how individualization (Beck and Beck-Gernsheim 2002) and institutional reflexivity (Giddens 1990) have reorganized the basic origins of personal relationships.

### **3 LATE MODERNITY AS THE SOCIAL CONTEXT OF DIGITAL SOCIALITIES**

One of the most interesting, but also complex, perspectives in the analysis of the role of ICTs in the development of personal relationship and interpersonal communication concerns the analysis of the social context, in which – as it was illustrated in the previous chapter – ICTs have become part of the complex social structures, on which people today rely when they interact with their social environment. The analysis of the relationship between technology and society and the review of different conceptual and paradigmatic approaches that deal with this relationship has showed that the meaning of the social context is closely related to the analytic framework within which the analysis of relationship between technology and society is carried out.

As already mentioned, social informatics has generally tied the social context to the inter- and intra-organizational settings, in which new technological tools, applications and services have been introduced. In this regard, the role and implications of technology for the organization of social relations have been often described by studying and comparing the characteristics of social processes before and after the introduction of new technological solutions (Brynin and Kraut 2006). On the other hand, the development tied to the macro social context of human relations has been rarely considered by social informatics. However, in the few exceptions that use a similar approach of analysis to the one developed by Kling et al. (2003) and that have taken a macro social perspective (e.g., Habuchi 2005; Matsuda 2005), social context is regarded as influenced by the characteristics of modernization of contemporary societies. In addition, it has been argued that this recent emergence of ICTs converges with the universalizing tendencies, which are said to mark out the changed nature of political, social, economic and cultural aspects of modernity (Giddens, Castells, Webster, Bell). For instance, Giddens suggests that “... the mechanization of transport has been the main factor leading to the dramatic forms of time-space convergence noted previously as characteristic of the modern age,” (Giddens 1984, 123) and he adds that “... but the most radical disjuncture of relevance in modern history (whose implications today are very far from been exhausted) is the separation of media communication by the development of electronic signaling, from the media of transportation” (Giddens 1984, 123). As Giddens refers to this modern era of

electronic communication as *late modernity*, this chapter discusses late modernity as a sociological concept which gives us the necessary framework to understand the social foundations of the technologically mediated socialities. It does it so by considering the arguments about how modernity is different from late modernity, by describing the globalizing and individualizing process affecting the organization of late modern social life, and by focusing on the universalizing tendencies that shape the sphere of personal relationships in the late modern age as put forward by Giddens and Beck.

### 3.1 MODERNITY AND LATE MODERNITY

Before moving forward to identify the social forms associated with late modernity, it should be noted that at present social scientists and sociologists in particular describe the organization of contemporary societies with other similar notions such as reflexive modernity (Beck, Giddens, Lash), postmodernity and postmodernism (Lyotard, Lash, Harvey), liquid modernity (Bauman), high modernity (Giddens), second modernity (Beck), risk society (Beck), network society (Castells, van Dijk), just to mention a few of them. With these notions scholars describe and identify the changes, which in their opinion have happened in contemporary societies. The difference between these concepts is not only nominative but also substantial, as various authors provide diverse interpretations of the structural and processional dimensions of the modern organization of social reality.<sup>15</sup> Nevertheless, this does not mean that some of the above mentioned concepts and approach do not share a similar perspective on the direction and evolution of modernity in contemporary society (Heaphy 2007).

The meaning and conceptualization of late modernity is highly dependent upon the time frame of the analysis as well as with which historical period is compared (Filipović 2007). Generally late modernity is analytically compared to the so called modernity (or first modernity in Giddens terms). Nevertheless, as Filipović (2007) observes the meaning of the notion of modernity is highly influenced by the reference period (preindustrial society,

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<sup>15</sup> For an overview of the conceptual differences between these sociological accounts of contemporary society – especially, the distinctions between the notions of late modernity and postmodernity – and their applications in relation to the issue of personal relations and social integration, see Heaphy (2007).

premodern society, traditional society, society of mechanical solidarity, etc.). Similar to the divergences and contrasts in defining the notion of late modernity, a considerable variation exists in the understating of social structures, processes and relations that are thought to characterize modernity. For example, Heaphy (2007) presents an overview of sociological approaches to modernity which underscore four different (yet interrelated) aspects of modernity (*cf.* Filipović 2007): (1) the development of capitalistic economy and commodification as well as their penetration in all aspects of social life (Marx); (2) the advanced division of labor and the development of industrial society which has been founded on the mechanical form of social solidarity (Durkheim); (3) the increasing importance of progress, innovations, technology, bureaucracy and science that was enabled by and, at the same time, was enabling the growth of the instrumental rationalization of all aspects of social life (Weber); (4) the upraise of urbanization that together with the instrumental rationalization formed a specific culture of modernity which was fostering individualism and represented a threat to the existence of social cohesion in societies, based on mechanical solidarity (Simmel).

In contrast with the classical sociologists Anthony Giddens offers a more concise definition of modernity. He argues that modernity refers to "... the institutions and modes of behavior established first of all in post-feudal Europe, but which in the twentieth century increasingly have become world-historical in their impact" (Giddens 1991, 14-15). Further, Giddens distinguishes three institutional axis of modernity, which include: industrialism – defined "... as social relations implied in the widespread use of material power and machinery in production processes" (Giddens 1991, 14) –, capitalism – understood "... as a system of commodity production involving both competitive production markets and the commodification of labor power" (Giddens 1991, 15) –, and institutions of surveillance – distinguished by "... the supervisory control of subject populations where these control takes the form of 'visible' supervision or the use of information to coordinate the social activities" (Giddens 1991, 15). For Giddens, these three dimensions of modernity produce certain distinct social forms and institutions (e.g., the nation-state), which are in different aspects discontinuous with the pre-modern structural organization and experience of social reality. In addition, the author suggests that the most important facet of this discontinuity is the modernity's extreme *dynamism* which can be observed in social relations, both on the organizational and personal level.

In his earlier analysis of modern organization of social life, Giddens (1990) suggests that there are three main causes that have underpinned the institutionalized dynamism in the modern forms of human association. First, Giddens (1984; 1990) argues that modernity is highly demarked by the *separation of time and space* as a condition for the articulation of social relations across wide spans of time-space. He observes that during the evolution of social structures, organizations, processes and institutions, social action has been always defined by the temporal and spatial position of the subjects involved in interactions. However, in pre-modern times social agency and consequently social relations were determined by the geographical location of social agents. In addition, the time and space were inherently connected through the situatedness of place, because social interactions could only take place in the physical co-presence of social actors, who at the same point in time shared the same geographical place. With the advancement of new forms of transportation as well as new modes of (electronic) communication, Giddens (1984) argues, the “unity” of time and space has dissolved. In fact, the separation of time and space created a new dimension of social life and experience of social reality, where – in contrast with the traditional societies – interaction and relations could evolve between social agents who do not share the same place. Such evolution has had a lasting effect on the structural and integrative dimension of social organization, since:

Together with the transformation of time, the commodification of space establishes a “created environment” of a very distinctive character, expressing new forms of institutional articulation. Such new forms of institutional order alter the conditions of social and system integration and thereby change the nature of connectedness between the proximate and remote in time and space. (Giddens 1984, 144)

Second, Giddens (1990; 1991) argues that time-space distancing is central for the *disembedding* of social institutions, a second most important influence on dynamic nature of social structures in the modern age. Disembedding mechanisms consist of *symbolic tokens* and *expert systems* (which together form the abstract systems), which disconnect the social interaction from the particularities of place. Disembedding mechanisms do not imply only the differentiation of social structures but also their independence for the local contexts that are determined by their position in time and space. Giddens (1990) differentiates between two types of disembedding mechanisms: symbolic tokens and expert systems. In brief, symbolic

tokens “... are media of exchange which have standard value, and thus are interchangeable across a plurality of context (e.g., money),” whereas expert systems include those social structures which overcome time and space through “... deploying modes of technical and expertise *knowledge* which have validity independent of practitioners and clients who make use of them” (Giddens 1991, 18). Both symbolic tokens and expert systems virtually penetrate every aspect of social life in modern age and they both appeal to complex societal structures as well as to the professional and intimate personal relationship that emerge between individuals in their everyday life. Disembedding mechanisms are based on *trust*, which in the modern organization of social life not only presumes a level of confidence between social actors – present in the traditional societies, but also a commitment to the abstract social structures and expert systems that are not based on actor’s personal experience. For Giddens (1991, 19), “... trust, of various sorts and levels, underlies a host of day-to-day decisions that all of us take in the course of orienting our activities. But trusting is not by any means always the result of consciously taken decisions: more often it is a generalized attitude of mind that underlines those decisions.”

These forms of “disembedded” trust are related to the third and last dimension of modern dynamism, the *institutional reflexivity*, which is described as the “... regularized use of knowledge about circumstances of social life as a constitutive element in its organization and transformation” (Giddens 1991, 20). According to Heaphy (2007) the notion of institutional reflexivity includes three aspects that distinct late modern forms of social organization form their pre-modern precursors. First, in line with the structuration theory (Giddens 1984) the notion implies a high level of monitoring of social action by individuals during which they have to draw on resources in form of knowledge. In this sense reflexivity is associated with the actors’ self-awareness and self-consciousness in the day-to-day life in which resides the potential for the reproduction as well as transformation of social action. Second, late modern forms of reflexivity cannot be equated with the Enlightenment conception of reflection as a basis of certainty of knowledge. Quite the contrary, the reflexivity of modern age actually undermines the certainty, legitimacy and authority of scientific and expert knowledge, promoting the *radical doubt* in social structures and institutions that once had the power to legitimate the organization of social relations in the pre-modern conditions. In this sense, lastly, the notion of institutional reflexivity is associated with the idea detraditionalization. Traditional structures that once upon a time were tied to the community environment and

gave meaning to the social forms have in late modernity become “lifted out” of place. Thus, they have lost the take-for-grantedness and are no longer simply given. Rather, they have become subjected to the subjective choices of social actors or, at least, open to the democratic negotiation between social actors. This implies that the social and personal life in late modernity takes the form of “experiments”, which are presided by uncertainty and contingency that the imperative of the constant choice inscribes in the perception of late modernity (Salecl 2010). To sum up, reflexivity is not a characteristic of social actors, but rather the structural condition of social agency in late modernity. Therefore, its implications can be observed on the individual as well as global level of social organization.

### 3.2 GLOBALIZATION AND INDIVIDUALIZATION IN LATE MODERNITY

When Giddens talks about the separation of time and space as a structural condition of modernization, he suggests that social forms have become lifted out of the local place and thereby have lost their legitimacy which stemmed from the traditional institutional order. Yet, he also suggests that the disembedding mechanisms have been counterbalanced by other, reembedding processes, which connect these global tendencies back with the local environments. Giddens calls this feature of the late modern world *globalization* and identifies in it a major source of modern dynamism which facilitates the intensification of institutional reflexivity and which enables the weakening of the traditional contexts of social action (Giddens 2000). It is the complex dialectical relationship between the interdependency of the local and the distant that, according to Giddens, makes globalization so complex. In fact, globalization refers to a set of highly interconnected social, economic, political and cultural processes that extended across different levels of social reality (see Beck 2000b; Tomlinson 1999). For example, on a political level, globalization has been associated with the trends towards convergence of practices and diverse national institutions as well as to the diminishing role of national states and the increasing importance of inter- or transnational organizations (Beck 2000b; Giddens 2000) in the form of economic or financial entities. Therefore, on an economic level, the consequences of globalization have been frequently associated with the development of the global labor market and the transformation of industrial capitalism into the flexible capitalism, which is founded on a continuous reorganization of economic institutions, on a flexible specialization of production and on a decentralized concentration of economic and social power (see Sennett 1998).



Of course, such structural reorganization of labor markets and economic relations has been enabled by the advent of new technological solutions and products that support connection between global and local environments. Hence, Castells (1996) argues that globalization should be understood and analyzed in the context of the informational revolution based on the uptake of new ICTs. He suggests that ICTs facilitate the action at distance and are deeply bound up with the network organization of social reality in the global world. Although, information has been an essential component of all societies, Castells (1996) says that in the *network society* information becomes a *key* factor in economic productivity. Production, processing and transmission of information represent the main resources of productivity, competitiveness and added value for firms, regions and countries across the world. In addition, being part of global networks and having access to information is vital not only for the economic prosperity, but also for the normal functioning of social system in general. Nowadays, for instance, the unequal access to the information resource has created a set of new divisions between the “haves” and “have-nots” (Castells 1996). In other words, the network organization of social structures and social agency does not imply the end of capitalist society, but rather its profound reorganization: the global capital and labor are stretched across the globe, the former residing in the *space of flows* and the latter in the *space of places*<sup>16</sup> (Castells 1996).

The globalized economic transformations in the network society have also had a notable impact on the cultural dimension of social reality. The development of a comprehensive review of cultural aspects and implications of globalization would go beyond the scope of this dissertation. Nevertheless, it is worth pointing out that the cultural consequences of global communication flows have been deeply influenced above all by the global proliferation of the Internet in the last two decades. For Slevin (2000), the internet represents an emblematic global technology because of its involvement with the three main processes that, according to Thompson (1995, 150), underpin the rise of globalization. These processes include (1) activities that happen in a communicative environment which is free of geographical and temporal barriers or nearly so; (2) actions that are drawn up, arranged and managed on the global scale; (3) activities which inherently and systematically consist of forms of

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<sup>16</sup> See Section 4.2 for a detailed definition of these two concepts.

connectivity and reciprocity between localized activities that take place in geographically and temporary dislocated places around the world. The cultural outcomes of such activities, mediated by global media platforms, are far from being homogeneous and uniform (Tomlinson 1999).

In fact, Slevin (2000) suggests that cultural globalization and communication in the new media age consists at least of two global trends. On one hand, the convergence and ubiquity of the internet-based communication services fosters the commodification and consumption of cultural products and practices which have been introduced by mass media (see also Jenkins 2006). On the other hand, however, he puts forward that the trend of cultural convergence is balanced by a “liberating” potential of digital technology which gives users from different cultural and social background the possibility of what he terms “localized appropriation” – a kind of adoption in which the processes involved in the domestication of digital technologies are incorporating the cultural uniqueness and social idiosyncrasy of local contexts. Tomlinson (1999) refers to this as “deterritorializing” character of the globalization process. Deterritorialization implies a diminishing of the significance of social geographical location to the everyday experience of social reality. However, this does not mean that globalization damages local cultures at the expense of uniform cultural forms. In fact, the notion of deterritorialization, describes a process through which local contexts have become increasingly “bifurcated” by the connectivity of globalization in socially and culturally specific ways. As Tomlinson pointed out: “The more obvious examples of this sort of penetration of localities are in such areas of mundane cultural experience as our interaction with globalizing media and communications technologies – television, mobile phones, email, and the Internet” (Tomlinson 2003, 273).

It is precisely in this local context and through the localized appropriation of the global cultural trends and ICTs where the globalization enters into the everyday life of people in late modernity. For Giddens (1991) such trends are associated with the new opportunities for social interactions as well as with new risks related to problem of referential systems that are being continually questioned. Giddens (1991, 189-201) denotes them as the “four dilemmas of the self”. The first of these dilemmas refers to the *dialectic relation between unification and fragmentation* which stems from the (technologically) mediated experience of social reality. Mediated experiences heighten the degree to which the individual can become

involved into global frameworks of experience. Yet, at the same time, these new frameworks may jeopardize the integrity of social identity of the individual as they become integrated into a variety of disconnected and fragmented personal identities. As Ule notes: “In late modernity the identity is never unified; rather it is extremely fragmented and cut into pieces by different, often antagonistic discourses, practices, and social positions” (Ule 2000, 191). However, on the other hand, with the support of new communication technologies globalization allows people to overcome the local contexts as referrals of their identity experience. It gives them the opportunity to connect with others who share similar ideas, goals, and motives over distance (Willson 2006). Thus, globalization creates a series of new social zones linked to the global level of social organization, which may provide people with alternative experiences on which they could base their personal and social identities (see Castells 1997; Giddens 1991).

While the above discussion has pointed out the globalizing trends in late modernity, Giddens (1991) and especially Beck (2000a); in collaboration with Beck-Gernsheim (2002) have also called attention to the fact that the globalizing tendencies in the modern age go hand in hand with the transformation of social and institutional forms associated with the personal life of individuals. As Giddens (1994, 59) suggests: “The global experiment of modernity intersects with, and influences as it is influenced by, the penetration of modern institutions into the tissue of day-to-day life. Not just the local community, but intimate features of personal life and the self become intertwined with the relations of indefinite time-space extension.”

To discuss the characteristics and consequences of such lifeworld transformations Beck and Beck-Gernsheim (2002) introduce the notion of *individualization*. Individualization, as the authors theorize it, is concerned with a set of social transformations and experiences that carry two meanings (Beck and Beck-Gernsheim 2002, 2). On the one hand, individualization refers to the disintegrative processes associated with social forms that were characteristic of modern societies and could be observed in the stable role of such institutions as social class and status, gender roles, family, neighborhood, community. For Beck and Beck-Gernsheim (2002) these social forms are not only dissolving as a consequence of the break-down of religion, tradition or the (national) state, but have been replaced by new social structures that promote the centrality of individuals and their actions. This later point is closely related to the second meaning of individualization: the emergence of new opportunities, demands, controls and constraints that have been imposed on the individual. In the everyday experience of

social reality these new elements span across different social levels and environments. For example, in their analysis of social transformations of modern Germany, Beck and Beck-Gernsheim (2002) illustrate how individualization influences our life through the job market, education, family life, welfare state and other social institutions. However, this transfer of power to the individual to decide what they will do with their life does not necessarily mean more autonomy. On the contrary, the structural logic of institutionalized individualism presumes that individuals must appropriate the late modern regulations and guidelines in their life in order to be able to cope with the break-up of traditions and institutions, which represented a firm and unquestionable element of modern and pre-modern societies.

Therefore, individualization is not associated with the dissolution of social order but rather replaces the traditional and modern forms of social organization with new institutional demands and actions that put the individual in the center of the social structure. As Salecl (2010) highlights, the individual choice is not a consequence of free will or human autonomy, but a direct consequence of institutional pressures that include a group of – often contradictory – demands and responsibilities that are related to different spheres of everyday life. Individualization implies an active role of the individual in their life. In other words, the individual has to construct their own *do-it-yourself biography* (Beck and Beck-Gernsheim 2002) in order to muddle through the structural risks, stemming from the absence or limited availability of institutional support. In addition, Beck and Beck-Gernsheim also note that the consequences of personal choices introduced by the do-it-yourself mode of action not only apply to the individual him/herself, yet they extend to the social environment in which the individual resides. While introducing the notion of individualization they in fact note (Beck and Beck-Gernsheim 2002, 4):

Individualization is a compulsion, albeit a paradoxical one, to create, to stage manage, not only one's own biography but the bonds and networks surrounding it and to do this amid the changing preferences and at the successive stages of life, while constantly adapting to the conditions of the labor market, the education system, the welfare state and so on.

This, relational, aspect of individualization has been often highlighted in the discussions about the individualization thesis. In our opinion it is central for the understanding of how individualization through reflexivity has been increasingly characterizing the personal relations among individuals, which represent the backdrop of late modern socialities. The

meaning and consequences of reflexivity and individualization have been elaborated in the discussion about the social and cultural developments associated with the notion of intimacy and personal relationships (see Chambers 2006; Heaphy 2007). The following section outlines how sociologists approach the issue of reflexive relating and intimacy under late modern conditions.

### 3.3 THE RECONFIGURATION OF INTIMACY AND PERSONAL RELATIONSHIPS

The relationship between public and private is tightly related to the development of modern societies. In his seminal book *The fall of the public man* Richard Sennett (Sennett 1974|1984) analyzed the historical origins and social implications of this relationship, arguing that modernization has substantially affected the role of public and private realm in the life of the contemporary individuals. In the historical analysis of the relationship between public in private he puts forward a set of suggestions to support his general thesis that the public realm of social relations under the conditions of capitalism and secularism has become increasingly paralyzed by the tyranny of intimacy, which is defined in terms of: “Social relationships of all kinds are real believable, and authentic the closer they approach the inner psychological concerns of each person” (Sennett 1974|1984, 259).

In other words, Sennett suggests that public realm of social life has been oppressed by a set of social and cultural developments that have made the private sphere the center of human agency. With the advancement of modernity people have become possessed by the search for a unique/authentic selfhood, which – in Sennett’s opinion – is just a psychological materialization of the cultural transformation that sees the formal nature of public realm as oppression imposed upon individuals in their search of the true self. Such advancement of private realm does not imply a physical extinction of public space. Yet it points toward a cultural domination of private ideology over the formal practices and cohesive experiences that had been once upon a time the necessary condition of public life. If in the past the expression of emotions implied taking into account a set of social conventions that made them comprehensible to the surroundings, today people do not express their emotions to others but rather direct them toward their subjective feelings and impressions (Sennett 1974|1986). Therefore, public culture has become seen as a domain of formal and impersonal ritualized activities that are empty, futile, insignificant and meaningless because they cannot

fulfill the expressive and emotive needs of personal emotions. Under such circumstances, social conventions are not perceived as vessels for personal fulfillment and relational success; instead, Sennett (1974|1984) contends, they are seen as limitations, as the necessary evil, which puts a ceiling on modern individual's opportunity for self-realization. Paradoxically, in this search of emotional uniqueness and genuineness, people are losing their ability of relational expressiveness. According to Sennett (1974|1984) the loss of expressivity can be connected with important changes in human identity and psychology. In fact, he talks about the evolution of a clinical profile of narcissist – a state of being where the individual is focused only on their own feelings, perceptions and goals, without any consideration of the surroundings, in which he is socially involved. Sennett (1974|1984, 326) sees the narcissist as a threat to the sociality because for them the only logical view of social reality is to interpret it as meaningful when it mirrors the imaginary of their self-image. To sum up, Sennett offers a noticeably pessimistic assessment of social transformations that underpin the prominence of intimacy in late modernity. The late modern turn into private and intimate sphere, in his opinion, has facilitated the loosening of social conventions and cultural practices that represent the necessary condition of cohesive sociality (Filipović 2007).

Sennett's view has been a subject of much discussion due to the rather pessimistic interpretation of social implications that have been associated with concurrent formation of the intimate sphere.<sup>17</sup> In the theory of late modernity, the meaning and implications of intimacy with respect to sociality has been viewed from a different perspective, which rather than focusing on the (dis)integrative aspect, draws attention to structural transformation of intimacy that emerges from the reflexive nature of self-identity in late modernity. Contrary to the pessimistic conception of intimacy as a negative force on sociality, late modern conceptualizations stress the transformative quality of personal relationship in the private sphere. To put it differently, individualization and institutional reflexivity do not presume an intimacy which leads to the development of a selfish and narcissistic self, but rather postulate

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<sup>17</sup> For example, in the mobile communication research some authors (e.g., Fortunati 2009) argue that caution is needed when drawing conclusions about the domination of the private over the public in the contemporary sociality, since also opposing trends can be seen to have developed with an intrusion of the public domain into the private sphere.

that people have to invest more of their time, efforts, and competences in order to build up trustworthy and supportive personal relationships (Heaphy 2007).

### 3.3.1 *Pure relationship and late modernity*

The changing nature of reflexive intimacy is perhaps most insightfully captured with the notion of *pure relationship*, with which Giddens (1991) aims to depict the increasingly democratic and deliberative quality of personal relationship in private life. With the accentuated reflexivity of social structure and the institutionalization of individualization as a form of social organization, Giddens (1991) argues, a new democratic arrangement of relating emerged in late modernity as an alternative to the personal relationships supported by the traditional institutions of family and community. Further, he suggests that pure relationship is a part of more wide-ranging restructuring of social roles which include both kin and non-kin relations. He outlines pure relationship as “... a situation where social relation is entered into for its own sake, for what can be derived by each person from a sustained association with another; and which is continued only in so far as it is thought by both parties to deliver enough satisfaction for each individual to stay within it” (Giddens 1992, 58).

A more detailed analysis of the notion reveals that pure relationship consists of seven interrelated elements that should be seen as designating trends, which are linked to reflect its key characteristics (see Giddens 1991, 88-98). First, Giddens associates pure relationship with the disembedding mechanism, while suggesting that it is not anchored in the social and economic dimension of social life. In support of this suggestion, Giddens presents a series of evidence that shows how various forms of personal associations (e.g., marriage, partnership and friendship) become more and more kept on until they deliver the expected level of emotional satisfaction and personal fulfillment. Second, pure relationship corresponds to the experience of individualized relating, which is carried out by social actors only for what the relationship itself can bring to the parties involved. In this sense, the levers of formation and break-up of relationships are not linked to expectations, demands or constraints of wider social structures, but rather reside in the parties themselves. Third, as already noted, pure relationship is an expression of institutional reflexivity. Hence, it is subjected to the constant self-monitoring and negotiation between the parties involved. Reflexivity also implies a high level of openness that needs a considerable amount of determination, tolerance, flexibility,

adaptability and compliance. Fourth, pure relationship is based on mutual commitment and can hardly exist without a sizable amount of reciprocity. Contrary to the traditional forms of relating, which were anchored in institutions of community and kinship, pure relationships are not founded on external anchors but fuel their legitimacy from the emotional agreement achieved by the parties. Fifth, the shift to mutual commitment and reciprocity corresponds to the central role of trust in pure relationship. While in pre-modern conditions trust was ascribed to the relationship because they resided in the stable forms of human association, in the late modern forms of relating social actors have to achieve the required level of reciprocal commitment and respect. According to Giddens (1991) the needed reciprocity can only be achieved through a mutual disclosure of both parties, which presumes a high level of reflexivity. Each party has to constantly monitor its own actions as well as reflect on the actions and feelings of the other party in order to be able to accommodate its own action and definition of relation. Sixth, as Giddens (1991, 96) notes such achieved trust is closely related to achievement of intimacy in personal relationships. As discussed above, intimacy is the building brick of a long-lasting and sustainable personal relationship in late modernity. It is a structural precondition of pure relationship because it gives to the parties the needed privacy in the relationship for the emergence of durable and mutual trust. In addition, it also offers to the parties the opportunity of reciprocal self-disclosure that lies at the heart of the modern forms of relating characterized by the blurring of boundaries between instances of commitment and choice (see Spencer and Pahl 2006). Finally, Giddens (1991) suggests that pure relationship presumes a high level of self-exploration of both parties through social interaction (partly supported by the required level of privacy and intimacy). Pure relationship is not only a relational form which is based on a common history of the parties, but it is also a form of individual and social identification, which helps individuals to realize what Giddens (1991) as well as Beck and Beck-Gernsheim (2002a) call the “reflexive project of the self”.

Lastly, it is important to note that the notion of pure relationship is not only limited to the domain of sexual, marital and friendship relationships, yet as Giddens himself argues: “A given individual is likely to be involved in several forms of social relation which tend toward the pure type” (Giddens 1991, 97). It extends beyond the relational structure of the most intimate social circles and could be found also in personal networks which consist of a dynamic amount of weak ties. The proliferation of pure relational types into such, less closely bonded settings, is mainly affected by extension of intimate sphere into the public domains of



social life, which in turn varies according to context and differential socioeconomic position of the individual. However, Giddens adds that specific kinds of intimate relationship (e.g., parent – child relations) have been resistant to the democratic impetus of late modern relation forms, because of their importance in the socialization process which presumes an imbalance in power relations between social actors. To sum up, pure relationship is neither an overreaching form of social connectivity nor is disembedded from the institutional organization of contemporary society. Nevertheless, it represents a structural manifestation of institutional reflexivity that carries implications for sociality beyond the private life of the late modern individual.

Before turning to the discussion about the consequences of the new ways of relating on social integration, which are mostly connected to the reconstructive and deconstructive movements in social theory with respect to late modernity (Heaphy 2007), it is worth examining some of the critics, put forward by Giddens' contemporaries, that were targeted to his interpretation of the democratic potential of transformation of the intimate sphere. Heaphy (2007) observed that there are two main aspects of Giddens' notion of pure relationship that were subjected to critical evaluation. On the one hand, Giddens' ideas were reviewed in light of his understanding of the notion of reflexivity, while, on the other hand, he was reviewed with reference to his idea of equality that is assumed to be an inherent quality of intimate and public life in late modernity.

The former stream of critics largely corresponds to the difference of the theoretical interpretation of institutional reflexivity proposed by Giddens and Beck (Beck et al. 1994). While Giddens understands reflexivity as a process of self-monitoring that allows the individual to influence the organization of social structure through the control of their action that is based on expert knowledge (see Section 3.1), Beck understands institutional reflexivity more in line with the idea of *reflexion* than *reflection* (Heaphy 2007, 83). In other words, for Beck reflexivity belongs to the processes that reflex the reaction of social structures to the uncertainty and risk present in the late modern social environment. Or, as Heaphy observes, "... Beck's discussion of reflexivity emphasizes more the contingencies associated with contemporary modernity, and conjures up to more the unknown, erratic and open implications of the processes that underpin it than does Giddens' analysis" (Heaphy 2007, 84). More precisely, for Beck (1994) reflexivity denotes a "... self-confrontation with the

effects of risk society that cannot be dealt with and assimilated in the system of industrial society.”

This conceptual distinction between Beck and Giddens appears in their interpretation of transformations of personal life in late modernity. While Giddens sees the reflexivity as an opportunity for a reconstruction of personal relationship through social action and personal commitment, Beck’s vision is considerably less “optimistic”: personal relationship may in fact have become more empowered and less suppressed from the institutional order which was supported by traditional structures. Nevertheless, such empowerment does not make them unrelated to the challenges, contradictions and systemic/global risks which have emerged from the falloff of the industrial society and the decline of the welfare state. Hence, in Beck’s opinion, pure relationships are still anchored in gender, class, labor relations and divisions with inscribed potential for social conflicts.

The second branch of criticism about Giddens’ conceptualization of personal life originates from the work of Lynn Jamieson (1998; 1999). Her critical assessment partly derives from Beck’s work, even though she extends her arguments beyond the direct revision of the notion of institutional reflexivity. Jamieson works on the revision of suggestions proposed by Giddens in three directions (see Heaphy 2007, 129-130). First, she argues that what Giddens depicts as a late modern condition of personal relating has already been present in sociological writings at least since the end of the World War II. It is true that those early sociological observations were not directly linked to the issue of dyadic relations between individual actors – but rather more generally to the notion of local community and neighborhood (see Wellman 1979). Nevertheless, while analyzing the post World War II alterations of family and kinship relations sociologists pointed to the trends which closely resemble that put forward by Giddens. With this Jamieson partly undermines Giddens’ proposition of pure relationship as a constitutional element of the late modern project of the self. Second, Jamieson questions the methodological framework undertaken in the study of pure relationship. In particular, she is critical about Giddens’ propensity to locate in the self-help literature the “expert” knowledge on which the individual would draw while establishing and managing their personal relationships. Lastly, she – through the discussion of gender roles and inequality in personal relationships – expresses a high level of doubt with reference to Giddens’ relativization of the role of social structure in contemporary society. In her

opinion, late modern social structures preserve – through the interconnection of gender roles with labor market, distribution of economic resources and political power – an important role in determining how social actors perceive, reflect and act in the private sphere. It cannot be denied that modern dynamism has opened many opportunities to individuals for influencing the organization of social relations. Nonetheless, this does not mean that such agency is undermining the existence and legitimacy of the social structure. She for example notes that “... Few relationships, even friendships, are mainly simply about mutual appreciation, knowing and understanding” (Jamieson 1999, 482).

### 3.3.2 *The “suffusion” of friends and family*

With reference to the friendships, however, some of Jamieson’s criticisms have been put under review recently by British sociologists Liz Spencer and Ray Pahl (2006). They carried out a qualitative research on the role of friendship in personal networks of the British. By introducing a formal model of personal relationships based on degrees of commitment and degrees of choice, Spencer and Pahl explored how the relative importance of *friendship repertoires and friendship modes* has been changing the structural characteristics of personal communities in contemporary Britain. They refer to friendship repertoires as the range of friendship types in which people engage during their life-course (i.e., education, family formation and dissolution, work, leisure, locality, geographical mobility, social mobility and health) and which have consequences for their experience of social connectivity as well as access to social support within personal communities. On the other hand, friendship modes are understood as different patterns of making, retaining, and losing friends.

Starting from the premise that friendship is highly dependent on the personal and contextual characteristics of life-course Spencer and Pahl (2006) suggest that three friendship modes exist: (1) *the bounded friendship mode* – typical of those persons who made most of their friends as young adults or after marriage and have not added new friendships afterwards; (2) *the serial friendship mode* characterized by an almost downright change in friendship repertoires as people enter and leave different life-course stages. Generally, this friendship mode implies a replacement of old friends with the new one; (3) *the evolving friendship mode* embraces elements of bounded and serial modes. According to Spencer and Pahl (2006, 105): “New friends are added to the personal community at the key life-course transitions, but

some friendships are also retained from earlier stages. So, while there is some changeover in membership there is also a degree of continuity in the friendship repertoire.” The origin and history of the evolving mode is, thus, highly depended on the complexity of social context in which the individual has been involved, being associated with a higher level of heterogeneity of their personal network; (4) *the ruptured friendship mode* which usually occurs as a direct consequence of an important change the objective or subjective circumstances that shape the private or public life of people (e.g., marriage, divorce, serious accident or illness or migration abroad), resulting in a dramatic change of pattern of friendship making.

In addition, Spencer and Pahl (2006) introduce in their analysis a third dimension that in their opinion characterizes the development of friendship and family relations in contemporary society. Contrary to the friendship modes and repertoires that third dimension is not related to the *structures* that frame the social representations of friendships. Rather, it refers to the *processes* that structurate the relation between friendship and family relations. In this sense, Spencer and Pahl (2006) talk about a notion of *suffusion* which should delineate a process of blurring of boundaries between friend-like and family-like relationships. By introduction the notion of suffusion authors challenge the assumption about the traditional exclusive distinction of familial and non-familial ties. What they show in the analysis is that according to the nine dimensions linked to the nature of the social bond and interaction (see Figure 3.1) some friendship relationships have acquired the characteristics of kin and family relationship. For example, some participants in their study described their friendships as relations where importance is take-for-granted, the ties are life- or at least long-lasting and characterized by a high level of responsibility and affection (see Figure 3.1). In terms of social support, Spencer and Pahl (2006) observe that friendship is not anymore only a potential resource of confidence and fellowship, but extends its meaning and importance to the domains of instrumental and emotional support. Instead of being only a potential source of help friends are – like family relationships – becoming a source of support where access to help is normatively grounded in the feeling of obligation and duty. Thus, Spencer and Pahl (2006) denote such personal relationship as *friends as family* or *given-as-chosen ties*. On the other hand, they also notice a just opposite trend, where people recognize someone in their family as a friend. They call such relationships *family as friends* or *chose-as-gives ties*. As shown in Figure 3.1 family as friends ties take up some of the attributes that were in traditional societies expected to be qualities of friendship. In terms of the nature of bond, for example,

Spencer and Pahl (2006) provide evidence showing that personal communities encompass a substantial amount of kin ties that are perceived by egos as chosen and not ascribed. For instance, on the interaction level, family bonds are not only expected to be loved but also liked, representing an important resource of companionship, which might in the case of an emotional crisis make people willing to entrust their personal matters / problems.

Moreover, Spencer and Pahl (2006) bring attention to two additional dimensions of suffusion that have a virtual importance for the late modern social connectivity. First, they caution against uncoupling the process of suffusion from the institutional anchors of late modernity. In other words, they suggest that the process of friends becoming family or *vice versa* is still limited by several other factors related to issues of responsibility, authority and lack of equality within family. In fact, only certain kinds of family relationships are likely to be considered friend-like. Similarly, certain types of friendship ties are still very unlikely to qualify as family. Second, the authors suggest that the process of suffusion is most clearly expressed in the transformation of social forms and expectations related to the blurring of friendship and family patterns. Nevertheless, it is not necessarily limited to those two forms of relating. For Spencer and Pahl (2006) evidence can be found of other forms of relating (relations at work, in school, in voluntary organizations) where the transformation of people's experience of choice and obligation has altered their perception of personal relationships. This does not mean that workmates have become friends and that professional colleagues have acquired family-like characteristics; it merely indicates that the structural position of certain social roles has been absorbing new qualities in the collective imaginary of late modern individuals. For example, in the work sphere the suffusion of choice and obligation patterns can be observed in the team-building practices, which are supposed to help organizations to achieve goals effectively, by also improving the companionship and cooperative relations in work teams through higher levels of trust and support between teammates.

In light of what has been argued above, we could claim that Spencer and Pahl (2006) provide a mixed evidence to support Giddens, Beck and Jamieson positions. On one hand, we could hardly ignore how the expectations related to family ties have become more subjected to forms of relating characteristic of friendship. On the empirical level, such lessening of normative determination opens a space for the democratization of relationships (as

highlighted by Giddens). However, on the other hand, Spencer and Pahl (2006) also observe, that friendship ties have become suffused with expectations and demands that in traditional and communal forms of social organization were typical of and limited to the institution of family (Tönnies 1887/1988). With a reasonable amount of discretion, we could say that the above observation generally supports Beck's and Jamieson's suggestions that underline the continuing importance of social structures in limiting the democratic potential of late modern pure relationship. In this sense, we could conclude that despite the mixed results and the qualitative nature of the research – which severely limits the generalizability of its findings – the study of contemporary forms of friendships, nevertheless, shows how the constitutive elements of personal relationships in contemporary societies can change in their nature, facing social actors with new challenges, which demand from them a high level of flexibility, reflexivity and personal engagement, typical of social forms that characterize the conditions of late modernity.

**Figure 3.1: Friends and Family – Expectations and practice**

	<b>Friends – expected qualities</b>	<b>Suffusion process</b>	<b>Family – expected qualities</b>
<b>The nature of the bond</b>			
Choice	A chosen relationship	Becoming more family-like Becoming more friend-like	An ascribed or given relationship (through blood or marriage)
Responsibility	Cannot expect friends to feel a sense of duty or obligation	Becoming more family-like	Expect family to feel a sense of duty or obligation
Importance	Importance linked to quality of relationship	Becoming more family-like	Importance taken for granted
Continuity	Friendships may not last indefinitely, friendships can fade or be ended	Becoming more family-like	Family relationships continue and expect them to continue and survive 'ups and downs'
Affection	Expect to like friends	Becoming more friend-like Becoming more family-like	Expect to love family
<b>The nature of the interaction</b>			
Practical help	Practical help given by some friends but not necessarily expected	Becoming more family-like	Expect family to provide practical help
Emotional support	Emotional help given by some friends but not necessarily expected	Becoming more family-like	Expect family to give emotional support
Confiding	Expect of close friends	Becoming more friend-like	Confiding in family can be problematic
Companionship and fun	Taken for granted that friends will	Becoming more friend-like	Fun with family not expected

Source: Pahl and Spencer (2004, 214)

The sociological debate about late modern character of sociality, however, does not end with the discussion of the reflexive and individualized experience of personal relationships. Several debates focus also on the integrative dimension of these transformations, analyzing

the reverberations of detraditionalization and individualization on structures and processes which create, maintain, and reinforce social integration (e.g., Bauman 2000; Chambers 2006; Heaphy 2007; Spencer and Pahl 2006). Without a better understanding of the integrative aspects of late modern forms of sociality, such as pure relationship, it is not possible to carry out a comprehensive analysis of the role of technologically mediated communication in social interactions in contemporary sociality. Therefore, the aim of the following section is to briefly discuss two alternative interpretations of the implications late modern forms of sociality have on social integration.

### 3.4 BETWEEN FRAGMENTATION AND RECONFIGURATION OF SOCIAL TIES: SOCIAL INTEGRATION IN LATE MODERNITY

The theme of social integration often appears in the sociological literature about late modernity. It is analyzed from various perspectives and across number of levels providing valuable insights that would require a detailed breakdown of conceptual references and empirical studies in order to adequately cope with the notion. As our thesis is focused on the structural interactions between ICTs and socialities in late modernity, we find it adequate for our purpose to limit the argument to two concerns<sup>18</sup> which have often appeared in the discussions on the disintegration of social forms in late modernity and which, consequently, have also been considered in the studies dealing with the social aspects of ICTs.

According to Spencer and Pahl (2006) the first concern is associated with the *wrong level* at which social connections and personal relationships are taking place in late modernity. Such concerns are presented in sociological analysis dealing with the relation between the private and public in terms of social participation. On one hand, it has been suggested that contemporary sociality has become increasingly condensed to the private sphere and intimate relationships. For example, Sennett (1974|1984) – as already noted (see Section 3.3) – in his

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<sup>18</sup> As evident from the numerous articles and books on the topic, our approach may lead to oversimplification and partial views of the related areas we discuss. Nevertheless, this deliberative confinement to only one perspective is (in our opinion) inevitable in some ways due to the scale and diversity of research in this field. Moreover, our aim here is not to provide a detailed overview of conceptual and empirical evaluations. Rather, we have sought to identify a perspective on social integration that would be (mainly) useful for identifying issues of concern in terms of the conceptual discussions related to the sociological analysis of ICTs.

discussion about the dissolution of public life examined the historical evidence in order to support the thesis about public life being torn down by the ideology of narcissistic individualism. Similar concerns were raised by other scholars (e.g., Bauman 2000; Lasch 1978; Putnam 2000; Slater 1970). Although, these authors analyze the relation between public and private from different perspectives, all point to common – in their opinion negative – social trend that have gradually tied the individual to a kind of sociality, which is organized around a succession of highly privatized interactions between family, friends, colleagues and close neighbors.

For example, while surveying the loss of social capital in the United States since 1950, Putnam identifies the reduction in public forms of in-person social interactions upon which cohesive fabric of social life was based in America. When analyzing the trends in civic engagement he notes an aggregate loss in political, social, and civic participation. The latter can be observed in the declining size of membership in various kinds of civic organizations. Moreover, Putnam (2000) points out that the act of individual membership has not migrated to other forms of public social involvement. Instead, it has been partly replaced by informal social connections which, for instance, include visits to friends, relatives or close neighbors (see Putnam 2000, Chapter 6).<sup>19</sup> To support this thesis, Putnam (2000, 112-113) analyzes the rise and decline of League Bowling in the past 50 years. He observes that although the number of people who bowl has increased since 1970s, the number of people who were involved in league bowling competitions has steadily decreased. “Bowling alone” is for him a synonym for a general trend which fosters *bonding* social capital and is characterized by the decline of social participation, caused by the withdrawal of individuals from the public activities, which is associated with four major reasons: television, suburbanization, increased time spent at work (meaning less time for socializing), and the passing of the pre-World War II generation (Putnam 2000). The bonding qualities of social capital cannot replace its

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<sup>19</sup> While analyzing the engagement of Americans in public life, Putnam introduces a conceptual distinction between two types of social groups. On one hand, Putnam refers to *makers* as persons who invest lots of time in formal organizations and, “make things happen in a community” (Putnam 2000, 93). On the other hand, he talks about *schmoozers* as a group of persons who spend much time in informal conversations and interactions within the private sphere. In his opinion, the distinction between these two types of social involvement is central in explaining why and how civic participation in the United States has steadily declined since 1950s.



*bridging* dimension, which requires regular participation in social interactions and civic discussions that might occur in a league environment while a person talks with a set of diverse acquaintances.

On the other hand, in the more recent communitarian studies (e.g., Bauman 1992; Etzioni 1997) – which have been influenced by the postmodern paradigm in sociology (see Heaphy 2007) –, a different concern has been put forward with reference to the corroding effects of individualization. It has been argued that cohesive mechanisms of sociality have not been damaged by the withdrawal of persons into the intimate sphere of informal interactions and strong ties. Instead, they argue that social cohesion has been jeopardized by the disembedding mechanisms of late modern dynamism, which gives people the opportunity to extend their personal relationships over distance. To restate, the dynamism of late modernity – which has been underpinned by time-space distancing, by disembedding of social institutions and by institutional reflexivity (see Section 3.1) – has not trapped persons into the privatized environment of the intimate sphere, but rather pushed them into the reality in which social ties can be established and managed in a space where interactions are disembedded from the institutional ordering which derives its legitimacy from tradition.

It is in this sense, that Bauman talks about late modernity or – to use his own notion – *liquid modernity* as, “... the era of disembedding without reembedding” (Bauman and Tester 2001, 89). Late modernity presents individuals with personal relationships which fall prey to the transitory and liquid nature of all social interactions (Bauman 2000). According to these social commentators, the problem of social integration in late modernity is mostly related to increasing vulnerability of social integration facilitated by the individualized social connectivity that surpasses the local social environment rather than by the demise of social participation fostered by the systematic privatization of everyday life, which stems from the withdrawal of the individual into the private sphere.

The second general concern, as noted by Spencer and Pahl (2006), on the other hand, refers to the *quality* of social relationships. It has been argued that all kind of social interactions and personal relationships have been weakening. The mechanisms which support the late modern dynamism of social relations do not only harm the cohesive potential of personal relationships by pushing them into the private realm or, conversely, by lifting them out of

local environments, but also by affecting their integrative quality. Consequently, individualization does not represent a threat to social cohesion because social interactions are happening at a wrong structural level but rather because their inner qualities support transient, causal, and self-oriented social ties (Spencer and Pahl 2006).

Drawing on a bulk of empirical evidence from the 1990s that identified in the Internet a possible facilitator of negative trends on a community and personal level (e.g., Kraut et al. 1998; Turkle 1995), Putnam (2000) argues that this negative trend can be partly attributed to the increasing technological mediation of social interactions. Although he recognizes that the telephone has not replaced in-person communication, while suggesting, "... the telephone seems to have had the effect of reinforcing, not transforming or replacing, existing personal networks" (Putnam 2000, 168), he is far more doubtful about the integrative potential of social connectedness that is based upon CMC. He considers two characteristic of CMC that in his opinion reduce the integrative potential of social interactions mediated through ICTs and the Internet in particular. On one hand, drawing on the Media richness theory (Daft and Lengel 1984)<sup>20</sup> he contends that CMC transmits much less nonverbal information than in-person communication. This may not present a significant problem in work or organizational communication – in fact, it may even improve the feasibility and effectiveness of communication processes. However, in the everyday life communication the lack of social cues may turn out to be decisive for the weakening of personal relationships. Putnam (2000, 176) contends that, "... The poverty of social cues in computer-mediated communication inhibits interpersonal collaboration and trust, especially when the interaction is anonymous and not nested in a wider social context." Thus, CMC is affected by depersonalization that makes commitment, trustworthiness, and reciprocity hard to develop in social interactions within online settings.

On the other hand, Putnam (2000) associates CMC with the spread of interest-based online communities that might represent a threat to the development of bridging social capital. In his opinion, internet-based communication services give people a better control and more discretionary power in terms of who they want to connect to. Even though he warns against an overly negative interpretation of these CMC affordances and a romanticized view of

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<sup>20</sup> The Media richness theory is presented and discussed in more detail in Section 4.3.

heterogeneous real-world communities, he nevertheless expresses doubts about CMC leading toward forms of selective social connectivity, characterized by less likely serendipitous connections. A similar concern has been shared by Willson (2006, 74) who writes: “While technological mediation extends and expands the capacity of interconnectivity, it simultaneously enhances the individuation and compartmentalization of the individual.” However, Calhoun notes that computers might perfectly assist large social integration, yet at the same time:

There is as much (or more) reason to think that computerization and new communication technologies will lead to or accompany further deterioration of interpersonal relationships. A drift toward relationships of convenience might be accelerated ... A few people might even wind up preferring relations based on single common interests and mediated through computer networks. (Calhoun 1986, 337)

However, what Calhoun also observes – and it is even more interesting for the understanding of the how the means of technologically mediated communication might be related to individualization and institutional reflexivity – is the reshaping of social forms and structures that enable social integration under the conditions of technologically mediated modes of social interactions. Calhoun (1986) proposes that the meaning of new communication technologies cannot be solely understood in terms of their *effects* on various forms of social integration. Rather, their role in social integration should be also analyzed from the phenomenological perspective which would help us to understand how the *experience* of (personal) relationships mediated through new communication technologies has changed. In other words, the individualized and reflexive aspects of personal relationships that are mediated by ICTs cannot be reduced only to a higher or lower “level” and “quality” of social interactions and its consequences for social integration. Instead, as Giddens (1984) suggests, they should be considered in the ways new communication technologies are contributing to human experience of social connectivity determined by disembedding mechanisms and time-space distancing which are associated with late modernity.

Such analysis cannot be carried out if technology and society are conceptualized as separated domains of social reality – an approach that can be clearly observed in the work of Putnam, who falls back on social cues perspective to identify in the technical affordances of CMC a potential resource of impoverished personal relationships. However, the problem is that late

modern theorists have rarely addressed the relation between technology and individualization of social connectivity outside the fragmentation thematization.<sup>21</sup> For instance, Lash (2002b) notes that this dimension of social reality has been largely disregarded. In fact, he clearly expresses this criticism in the foreword to Beck and Beck-Gernsheim's *Individualization* (Lash 2002a) and asks himself, how we could think of institutional individualization and reflexivity in the context of contemporary lifeworld structures that are characterized by an inherent and inseparable connection between the technological and social. He writes (Lash 2002a, xii):

I think that a great number of this characteristically second-modernity institutions, if that is the world for them, are now not solely social, but socio-technical. ... Pivotal for me among the socio-technical (constitutive more than regulatory) institutions that govern the contemporary power relations and platforms, operation system, standards, communications protocols, standards, intellectual property and the likes. ... But I do not think that the technological dimension is sufficiently taken on by the Becks. Nor the dimension and the extent to which social relations are mediated through the (now interactive) mass and non-mass media of communications.

In the same paragraph, while elaborating on the role of socio-technical institutions with regard to Beck's notion of non-linearity of and "place polygamy" of social life in second modernity, Lash (in 2002a, xii-xiii), in addition, argues:

My point is that such "place polygamy" is always necessarily technologically mediated, by cheaper air flights, by mobile phones, by microprocessors in various smart boxes, by protocols and channels enabling communication at distance between individuals. ... The second modernity's totally normal chaos is regulated by non-linear systems. It is also regulated by an extraordinary powerful interlacing of social and technical systems: by precisely, socio-technical systems. It is in the interface of the social and the technical that we

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<sup>21</sup> Conversely, the relation between digital communication technology and globalization has received widespread attention in the sociological theory. Besides Castells (1996; 1997; 1998), who provides the most extensive and wide-ranging analysis of social, cultural, political, economic, and global aspects of modernization in the information age, the globalizing dimension of social reality invoked by digital communication technologies has also been addressed by Giddens (2000), Beck (2000b; 2005), Lash (2002b), Harvey (1989), and Urry (2003) to mention only a few.

find the second-modernity's individual. It is in this interface that we take on the precarious freedom of "a life our own" ... The individual in the second modernity is profoundly a socio-technical subject.

In the above passages Lash put forwards at least three important issues that in our humble opinion deserve further elucidation and contribute to the development of a conceptual framework that could help us to better understand the technologically mediated character of digital sociality. First, it should be noted how Lash theorizes the relation between technology and society. He writes about "... extraordinary powerful interlacing of social and technical systems: by precisely, socio-technical systems," a position that echoes two constitutive assumptions of STIN approach and social informatics: the first contending the indivisible nature of social and technological (or to paraphrase his own words (Lash 2002b): technology is not in society or related to society; technology is society, and *vice versa*); and the second suggesting that the socio-technical environment presumes an individual who is involved in different, often overlapping or even conflicting social relations and commitments, which demand from them an active engagement through sustained interactions that ultimately lead to the articulation of the relations between the social and technical in society.

Secondly, Lash highlights the individualizing nature of modern technologies. For example, Castells (1996) suggested that digital communication technologies have nourished a shift in social order where network nodes have a central role. Although network edges have become based on common interests and needs for informational resources rather than geographical location, they still have a form of high level/complex institutions (e.g., cities, regions, industrial areas, communities, etc.).<sup>22</sup> Conversely, for Lash (2002b) what lies at center of socio-technical structures are not technological systems or complex social structures but rather the late modern individual, whose appropriation of technology is structured by its

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<sup>22</sup> In more recent writings about social impacts of the Internet and mobile communication on social relations (e.g., Castells 2001; Castells et al. 2007) Castells has also applied his "network theory" on the micro level of interpersonal relationships and communication processes. For example, in *The Internet Galaxy* (2001) he grasps the networked nature of personal relationship with the notion of networked individualism, while in *Mobile Communication and Society* (2007) he and his colleagues apply the concept of space of flows and timeless time to the structural reorganization of connectivity experience that has been facilitated by mobile phones and other personal communication media.

material and symbolic characteristics. He makes the case that individualization and reflexivity of modern age are actually reproduced in the actions and attitudes of individuals. Since technology mediates most of their perceptions and actions (Bausinger 1984), the principles and consequences of individualization and reflexivity can be observed through people's ways of using technology in their acting and relating. According to Michele Willson (2006) individualization and reflexivity of the late modern individual can be observed in the increasing autonomy of their social actions and relations. She explains:

It is also necessary to point to the facts that as social relations are increasingly mediated through "individually activated" technological means, that a greater emphasis is placed on the individual and on his/her individual choices and desires. The contemporary (networked) individual can choose quite purposively – and indeed is required to choose in such a way – whom s/he wants to keep in contact with and whom s/he wishes to exclude and ignore, to a degree not possible previously. Phone calls and phone numbers can be screened, and answered selectively. Contact can be initiated and maintained with others on the other side of the world, whilst the neighbors next door can be ignored (or contact not initiated). (Willson 2006, 90)

According to Willson (2006) such institutional individualization of use of mobile phones (as well as other personal communication technologies) may carry negative implications in terms of social integration as they facilitate a selective and privatized connectivity. However, on the other hand, the increased individualization through communication technologies can also be approached from the view which highlights the importance of mobile phones in preserving reciprocity in individualized relationships. For instance, Licoppe and Heurtin (2001) in a case study of the development dynamics of mobile phone use in France identify a set of structural processes that link the uses of mobile phone to the deinstitutionalization of private life, which, as Giddens (1991) suggests, requires a higher level of engagement of individuals in building interpersonal trust. They explain:

The reciprocity of mobile phone interactions may also be placed in the perspective of the evolving management of personal relationships. Peter Berger has argued for the deinstitutionalization of private life; institutionalised relationships with friends leave room for friendships based on choice and elective affinities, where the notion of "friend" is now opposed to that of "acquaintance" rather than that of "stranger". The issue of trust, which previously relied on the institutions supporting friendships, however, takes on a new light in

this process. It becomes, according to Anthony Giddens, the very project of friendship, on which the two concerned parties work in an ongoing manner by building a web of interactions and obligations that must be endlessly sustained. Because it allows for increased personalization and opportunities to manage and activate relationships, the mobile phone becomes a new resource with which to manage such deinstitutionalised privileged relationships. The strata of reciprocity that we saw at work in the dynamics of its use may therefore appear as evidence for that building of trust in the distant management of privileged relationships under the time and space constraints of contemporary life. (Licoppe and Heurtin 2001, 107)

Lastly, by the same token, the embeddedness of the individual in socio-technical systems creates a modified mode of experiencing personal relationships and social reality in general. In contrast with pundits focused on the technological affordances of new communication technologies, Lash contends that ICTs have been involved in the reordering of the spatio-temporal order which represents the framework of human experience of social reality. A technologically-saturated media environment does not only present people with new communication modes; it also opens new conversational spaces that represent a new realm of experience of interpersonal communication and personal relationships (see Section 4.1). In such domains the intersubjective dimension of social interactions is not necessarily tied to the sense of co-presence arising out of the fact the interlocutors share the same physical location but also to the sense of being together with other interlocutors communicating from different physical locations and/or in a technology-generated environment (see Zhao 2006a). In Lash's opinion such remote forms and experiences of being together accentuate reflexivity and individualization.

We suggest that in terms of social interactions and personal relationships the reflexive and individualizing mechanisms of late modernity can be observed on three levels of social reality which is (increasingly) mediated by ICTs: (1) in the emergence of social domains that are mediated by digital communication technologies (Zhao 2006a); (2) in the establishment of new communication practices supporting the ubiquitous modes of social connectivity (e.g., Licoppe 2004; Licoppe and Smoreda 2005; Ling 2004; Ling 2008; Ling and Yttri 2002; Ling and Donner 2009); (3) in the reorganization of the normative structures which determine the relation between different modes of personal communication (e.g., Fortunati 2005; Höfllich and Gebhardt 2005; Licoppe and Smoreda 2006). These three facets of social interaction have

been exhaustively discussed in new media research. Nevertheless, considerably less effort has been devoted to putting together the findings across different levels in order to get a more complete picture of how new communication technology supports the individualization and reflexivity of personal relationships in late modernity. In turn, the aim of the next chapter is to explore and discuss how social interactions undergo a series of alterations across the three levels.



## 4 SOCIAL INTERACTIONS IN DIGITAL SOCIALITIES

The previous chapter introduced late modernity as the main social context of the study of digital socialities and set as research problem the challenge of understanding how reflexivity and individualization as its constitutive elements can be linked to evolving nature of social interactions in the complex scenario of digital technologies. This chapter tackles the interactional aspects related to the issue of digital socialities. As already noted in the Introduction we suggest that it is in the reflexive and individualized management of social connectivity, where the digital technologies for personal communication find their structural expression. This observation is not completely new as the individualized and reflexive aspects of ICTs and their uses are not uncharted territory. Depending on how widely one casts the literature, one can find considerable relevant work across different disciplines, where researchers have already addressed this issue in papers, chapters, and books (Chambers 2006; Ito et al. 2005; Ling 2008; Willson 2006). Some of them (e.g., Baron 2008; Katz and Aakhus 2002; Licoppe 2004; Ling and Yttri 2002; Ling and Donner 2009) have even developed new notions that from different conceptual perspectives catch a remarkable propensity of mobile and internet technologies for personal communication to match with the structural demands for more reflexive and individualized relationality, which is argued to be imposed on people by late modern institutions. The objective of this chapter is to describe and analyze these notions in order to provide a better understanding of the role of ICTs in underpinning the ongoing development of a reflexive and individualized management of social ties in late modernity.

However, when introducing these concepts into the theoretical discussion it should be born in mind that they capture diverse aspects of the altering forms of technologically-mediated social interactions. Some of them address the conversational dynamics and linguistic characteristics of interpersonal communication. Others deal with the relation between public and private communication. Others again seem to focus on the temporal and spatial organization of interpersonal communication which is related to the problem of (social) accessibility of interlocutors on a particular medium. Finally, the experience of social presence in the course of interpersonal communication is a recurrent research question raised by a diverse group of scholars. Because of the many dimensions of the relevant questions an

undertaking of this sort must be based on an interdisciplinary approach. Nevertheless, as Fortunati et al. (2010) suggest, an interdisciplinary approach must not be seen as a burden on developing a conceptual framework that would allow a concise overview of implications of ICTs for social interaction. Accordingly, in order to enhance the understanding of how ICTs advocate the individualized and reflexive characteristics of social connectivity in late modernity, it is first necessary to articulate an analytical framework that would help us to systematically organize and make sense of the complexity of these notions across different fields. For this primary objective, this chapter introduces a conceptual analysis of the role of ICTs in social interactions which is organized across three levels of social reality (i.e., the experience of everyday life, the new modes of ubiquitous connectivity, and the reorganization of normative structures which determine the relation between different modes of personal communication) that correspond to the three sections in this chapter.

The chapter begins by discussing, how the foregoing change in the conditions of social interaction related to the technologically-mediated communication, and in particular the Internet, has resulted in the reconfiguration of the reality of everyday life. Drawing on the structurational approach of Giddens (1984) and the phenomenological analysis of the technological mediation of everyday life advanced by Zhao (2006a) we will suggest that the use of ICTs for interpersonal communications does not only change the way people organize and support personal relationship but also that it is related to the uprising of new realms of everyday life that affect the way people experience their personal relations.

Next, we will suggest that these new modes of experience find their expression in communication practices. These either include new modes of communication, which are a result of the social affordances of new communication technologies, or encompass a set of adjustments of new communication technologies to the present communication practices, which have been based on the existing technologies for interpersonal communication. Moreover, in the second section we will also present arguments as to why the establishment of new communication practices, supporting the ubiquitous modes of social connectivity, brings about a structural demand on individuals to choose how they will manage their personal relationships through different communication technologies. As Bausinger (1984, 349) argues complex media environment is today "... an integral part of the way the everyday is conducted," where communication technology does not only give people

different options to connect with each other but also demands from them to actively manage their social connectivity through different communication channels (Petrič et al. 2010). In this sense the complex media environment actually reproduces the individualized nature of social relations in late modernity: people's active management of their social ties and personal networks is not an expression of their increased personal autonomy but rather a manifestation of structural demands on them if they want to access social resources within the family and their community.

Finally, the last section discusses the reorganization of the normative structures (i.e., practices, rules, conventions) which determine the relation between different mediated and unmediated modes of personal communication. As the uses and gratification research has shown in the context of interpersonal communication (Petrič et al. 2010; Petrič et al. 2011) people increasingly rely on different media and communication means in order to gratify their personal motives and needs. While the uses of new communication technology generally do not replace the uses of the existing ones – but rather as Dimmick et al. (2007) argue accommodate to the old ones by finding new niche dimensions – they, however, represent a potential source of change in the way people experience the relations between different communication technologies. With the turn up of a new communication technology old technologies might acquire a new structural position within the normative framework of social obligations. The discussion on this normative aspect of the mediated nature of social interactions is here developed by presenting the relation between in-person and (technologically) mediated modes of communication. As Fortunati (2005) suggests, it is precisely the analysis of this relation that may help us to better understand why the current dynamic between different modes of communication is not only determined by their social affordances but also by a sociality in which personal relationships have become increasingly a product of reflexive and individualized social connectivity.

#### 4.1 THE SPATIAL AND TEMPORAL DIMENSIONS OF TECHNOLOGICALLY MEDIATED SOCIAL CONNECTIVITY

As already noted in Chapter 3 the reorganization of experience of space and time has been one of the central pillars for the development of modern institutions. Indeed, Giddens (1984; 1990) recognizes in the separation of space and time the driving force of the modern

dynamism that characterizes the formation of social relations. He notes that modernity is inherently connected with the “emptying of time” and “emptying of space” (Giddens 1990). The first notion refers to the standardization of time such as the worldwide standardization of time zones and calendars that have allowed a global temporal organization of social processes and human activities, whereas the latter applies to the separation of *space* from *place*. Giddens introduces this conceptual distinction in order to show how modernization has gradually lifted out social relations from social settings, determined by the physical co-presence of social actors. He defines place “by means of the idea of locale, which refers to the psychical settings of social activity as situated geographically” (Giddens 1990, 18). He suggests that in pre-modern times space and place largely overlapped since the spatial dimensions of social life were for the majority of the population determined by sharing of the same physical/geographical location, while with the advent of modernity and the new communication and transport technologies social relations began to emerge that were not solely confined to the physical space of face-to-face encounters but also localized in geographically remote spaces. Therefore, social actors and practices could become positioned or situated across time-space within a wide range of zones of social world (i.e., home, community, region, nation-state, etc.). As Giddens (1990, 18-19) explains:

The advent of modernity increasingly tears space away from place by fostering relations between “absent” others, locationally distant from any given situation of face-to-face interaction. In conditions of modernity ... locales are thoroughly penetrated by and shaped in terms of social influences quite distant from them. What structures the locale is not simply that which is present on the scene; the “visible form” of the locale conceals the distanced relations which determine its nature.

This positioning of actors that spans across different spatial and temporal regions involves also an important modification in respect of how social actors interact with each other. In most rudimentary sense the change in social interactions is most closely bound up with the level of *co-presence*. Giddens (1984) notes that in the past co-presence was anchored in the perceptual and communicative modalities of the body, while nowadays involves a far more complex set of intersections between absence and presence. He explains:

Although the “full conditions of co-presence” exist only in unmediated contact between those who are physically present, mediated contacts that permit some of the intimacies of co-

presence are made possible in the modern era by electronic communications, most notably the telephone. In contemporary societies, and in differing formats in other cultures, the space contained in a room - with exceptions, such as parties, in which the whole house may be “opened up” - ordinarily defines expected boundaries of co-presence. Of course, there are many “public places”, in jostling crowds on the streets and so on, in which there is no clear physical circumscribing of the conditions of co-presence. (Giddens 1984, 68)

Although Giddens (1984) suggests that the time-space distancing brings about new modes of co-presence that are not necessarily tied to the psychical encounters or gatherings – in Goffmanian terms –, which presume the mutual reflexive monitoring of conduct, he does not indicate in an effective way what are the differences that occur among the co-presence enacted within and across various time-space arrangements. The difference between unmediated and (technologically) mediated modes co-presence has been much studied by scholars of a presence bent (for a review see Zhao 2003). Therefore, we turn to their work in order to comprehensively explicate how the technological conditions that mediate social interaction and human communication have altered people’s experience as well as the sociological notion of co-presence. Following Zhao (2003) we first propose to set off two dimensions of co-presence: co-presence as *spatial/physical condition* in which human individuals interact and co-presence understood as the *emotional and cognitive aspect* of interactions.

To make the differentiation between the two facets of co-presence more explicit, Zhao (2008) introduces the distinction between *co-location* and co-presence, comparing it across four dimensions (see Table 4.1). According to Zhao (2008) co-location refers to relationships that take place in a shared physical or virtual place and are characterized by shared presence in physical or electronic proximity that puts interlocutors within the perceptual range of each other. In offline world, co-location generally takes the form of encounters between two or more persons who share the same spatial location but are not necessarily in contact with each other. However, co-location is not only tied to the physical place; it can also extend in the public and private domains of the online world such as web forums, internet-relay chats, MUDs, social networking sites, blogs, etc. (Zhao 2004; 2006a; 2008). The difference between the two modes of co-location is in the type of proximity which shapes the interaction among the interlocutors. Whereas *physical proximity* “is an area within range of the naked or normal sense perceptions of both individuals,” *electronic proximity* “is an area outside the

range of the individuals' naked sense perceptions but within reach of the extended sense perceptions of the individuals," (Zhao 2003, 446) based on an electronic mediation, such as via landline telephone, mobile phone, email, or other kinds of online communication.

However, neither in physical nor in electronic form, co-location does not imply a sense of being with others in an interactional setting. For instance, people can share the same online domain (e.g., read posts in web forum threads), but they are not necessary involved in interactions that would enable them to mutually exchange the perceptions and feelings they have of one another (e.g., when a member of a web forum directly replies to the posts of another member). Thus, the notion of co-location heightens the distinction between the sharing of the same spatiotemporal location and the sharing of common perceptions and feelings between interlocutors within the same location.

**Table 4.1: Co-presence versus co-location**

<b>Co-location (being in)</b>	<b>Co-presence (being with)</b>
Spatial relationship	Social relationship
Proximity	Reciprocity
Mutually present	Mutually accessible
"Within range"	"In touch"

Source: Zhao (2008)

This conceptual distinction has already addressed by Goffman in his ethnographic studies of human interaction in everyday life. According to him, the interactional prerequisite that generates the needed conditions for being mutually engaged, thereby making them "uniquely accessible, available, and subject to one another" (Goffman 1966, 22) is not co-location but co-presence. While co-location is based on the spatiotemporal proximity that allows persons to be within reach, in co-presence, "persons must sense that they are close enough to be perceived in whatever they are doing, including their experiencing of others, and close enough to be perceived in this sensing of being perceived" (Goffman 1966, 17).

Every social interaction is consisting of both the physical conditions in people interact and the perceptions and feelings they have of one another. The point Zhao would like to advance is that even though the physical conditions make people mutually present, they do not necessarily make them mutually accessible. As Zhao (2008) remarks co-presence is "... a condition that *allows* [italics added by A.P.] for mutual contact". It can be primarily defined as *social presence*, a social relationship "which refers to the sense of being together with

others in a mediated – either remote or virtual – environment” (Zhao 2003, 445). In co-presence, people are not only close to each other in the same physical or online location but are also *reciprocally oriented* in their actions and interactions. Moreover, Zhao (2008) suggests that this conceptual difference between co-presence and co-location when applied to communication research also includes the communicative dimension which has been significantly altered with the recent developments in the technological conditions that mediate social interactions. In communicative terms co-location denotes “... two-way instant human interaction carried out in real-time or near real-time human communication”, whereas co-presence “... is a form of human co-location in space-time that allows for instantaneous and reciprocal human contact” (Zhao 2003, 446).

Before the development of electronically mediated interpersonal communication co-presence could not be developed without co-location. Indeed, only the corporeal proximity gave interlocutors the opportunity for verbal and nonverbal exchanges (e.g., body gestures, facial expressions, postures) needed for the development of a sense of togetherness (Goffman 1966). With social interactions becoming mediated through electronic means of communication physical proximity has not been anymore the necessary condition for the emergence of co-presence. Zhao (2003, 447) exemplifies this in the following way:

Although positioned outside the range of each other’s naked sense perceptions, the individuals are within immediate reach of each other through an electronic communications network. By electronically extending their senses over the Internet, for example, physically separated individuals, who may be half a world apart, can stay in instant contact with each other.

Even though the central task of presence research is to build a conceptual framework in order to understand how a sense of being with others can be affected or created via various electronic means of interpersonal communication (Zhao 2003; 2008), it would not be relevant to pursue the detail of this research any further since we are not interested in technical analysis of the interface parameters (e.g., embodiment, immediacy, scale) that are determined by the co-presence design. Instead, we shall consider in sociological terms the significance which the technological mediation co-location and co-presence can have on people’s experience of social interactions in everyday life. Zhao’s (2006a) sociological research on the impact of the Internet on the social construction of reality in everyday life provides an analytic stance that captures the central social transformations in this regard.

Drawing on a phenomenological account of the social construction of the reality of everyday life, developed by Berger and Luckmann (1966), Zhao aims to show how the Internet and other ICTs have altered the conditions of social interactions, leading to new modes of social contact, which, in turn, have created a new spatiotemporal zone and realm of the lifeworld. For Berger and Luckmann (1966) the reality of everyday life – which is the paramount among the multiple realities of people’s lifeworld – is always organized in terms of time and space arrangements. The combination of spatial and temporal dimensions creates three basic “zones of everyday life”. As shown in Table 4.2 there is (1) the “here and now” zone that contains the “world within reach” – “the world in which I act so as to modify its reality, or the world in which I work”; (2) the “there and then” zone that contains the “world beyond reach” – things “that are not accessible to me in this manner”, and (3) the “there and now” zone that contains “the world within mediated reach” where one can, for example, “telephone, pursue events on the television screen while they occur on other continents” (Schütz and Luckmann in Zhao 2006a).

What, according to Zhao (2006a), Berger and Luckmann understand with “here” is the space which is close and easy accessible to people, whereas the “there” is the space beyond their immediate reach. From the temporal perspective people’s experience of everyday life goes from “now” which is at present to “then” which is located somewhere in the past. They also suggest that the more remote spatial and temporal zones are generally less important for people’s actions and interactions because they cannot be influenced through direct or unmediated action. However, Schütz and Luckmann (in Zhao 2006a), in the revision of the Berger and Luckmann’s original assertion, suggested that the telephone and other electronically mediated forms of communication have importantly altered the organization of everyday life. As Zhao (2006a, 460) notes “Instead of centering on the ‘here’ of my body and ‘now’ of my present, the reality of everyday life is now organized around both the ‘here’ of my body and ‘there’ of my mediated reach.” If at the time of landline telephony these zones played only a marginal role in people’s lives, with the advent of mobile telephone and the Internet the “world within mediated reach” becomes increasingly important in shaping the conditions of social interactions.



**Table 4.2: Zones and realms of everyday life**

<b>Spatiotemporal zone of everyday life</b>	<b>Social world</b>	<b>Realm of everyday life</b>	<b>Social interactions based on...</b>
There and then	World outside reach	Contemporaries	Mediated communication
Here and now	World within reach	Consociates	In-person communication
There and now	World within mediated reach	Consociated Contemporaries	Electronically mediated communication

Source: adapted from Zhao (2006a)

According to Zhao (2006a, 464) the ubiquitous transformation in the conditions of social interaction has resulted “... in the reconfiguration of the reality of everyday life and the transformation of the ways in which individuals construct the lifeworld.” The new modes of internet- and mobile-based communication, the zone of the “there and now,” and expanding number of various online domains has led to the evolution of a new intersubjective realm within which an individual can experience his/her lifeworld in relation to other individuals who share the same lifeworld. Forty years ago, Berger and Luckmann (1966) depicted the intersubjective experience of lifeworld as being divided between two realms: the realm of *consociates* and the realm of *contemporaries*. Consociates, also called fellowmen, are people whose acquaintanceship is based on an intimate long-term in-person communication, whereas contemporaries are the rest of people who are largely unknown to each other because of lack of (frequent) in-person interaction.

In his theoretical application of this two-fold typology to the people’s experience of intersubjectivity on the Internet, Zhao (2004; 2006a) shows that such conceptualization does not include all possible modalities in which the individuals’ experiences of lifeworld intersect, because it is based on the assumption that long-lasting relationships can be established and kept up only through in-person encounters. As a large corpus of literature on social aspects of the Internet has shown by now, such presumption is ill-founded (e.g., Wellman and Haythornthwaite 2002). In fact, the social reality mediated via ICTs is made of a series of long-lasting and intimate relationships whose intersubjectivity does not reside only in a physical proximity or face-to-face interactions (i.e., co-location) but also spans over various electronically mediated forms of communication. According to Zhao these online relationships “... represent an emergent social group that constitutes a new realm of the lifeworld” (Zhao 2006a, 465). He calls them *consociated contemporaries* (Zhao 2004), defining them as individuals who “... have never interacted face-to-face with each other but

have intimate mutual knowledge through frequent online communication” (Zhao 2006a, 465). Consociated contemporaries are not a homogeneous social group but are composed of three categories of persons. Specifically, of persons: (1) who have never met in person, (2) who have met in person but don’t know each other well, and (3) those who have met in person and know each other well (Zhao 2004).

According to Zhao (2004; 2006a) the emergence of consociated contemporaries has two important ramifications that should be considered in terms of the interactional environment in which personal relationships can be conducted. On one hand, this new realm of social interactions modifies the anonymity structure of lifeworld. Unlike in the past, the passage from the zone of “here” to the zone of “there” does not anymore imply an inevitable dissolution of intimacy between the interlocutors that share the same interactional situation or the “now” – in Berger and Luckmann’s terms. In other words, despite the fact that realm of consociated contemporaries by and large involves interactions between anonymous interlocutors (Zhao 2004), it can also provide an environment where close and intimate relationships can emerge and evolve. Consociated contemporaries can, as a matter of fact, include family members, friends, co-workers, colleagues or schoolmates who are an integral part of people's contemporaries, but because of their remote geographical location cannot be met in-person (Wellman and Haythornthwaite 2002). On the other hand, the advent of ICTs, and in particular of the Internet, has made the relation between the realm and mode of interaction extremely complex and multidimensional. As Zhao (2006a, 466) puts it: “Today, in every social realm of the lifeworld there is a plurality of modes of contact an individual can choose from to interact with others.” For instance, the realm of consociates is based on social ties sustained via in-person, mobile phone, landline telephone, email or social network sites conversations (*cf.* Boase 2008; Vehovar et al. 2010). Similarly, in the realm of consociated contemporaries, individuals may interact with each other through social network sites, web forums, blogs, as well as email, instant messaging, mobile and landline telephone – what Boase (2008) calls the *personal communication system*.

However, the difference between various realms is not in any single mode of contact but in the “interactional mix” (Zhao 2006a) of communication modes. Notwithstanding the general availability of various communication technologies across different realms, not all of these technologies have the same importance in the different realms of the lifeworld. For instance,

in-person encounters are still the most common mode of communication in the realm of consociates, all other forms of contact being more or less convenient alternatives when the consociates cannot be contacted face-to-face (e.g., Boase et al. 2006; Petrič et al. 2011; Vehovar et. al. 2009; Wellman and Haythornthwaite 2002). Nevertheless, in-person interaction has a less central role in the realm of contemporaries, while being virtually absent from the realm of consociated contemporaries in which interactions take place in online domains (Zhao 2006a). In addition, the mode-realm relations do not remain static (Hogan 2009). Just the opposite, because they form a socio-technical interaction network – as argued in Chapter 2 and Chapter 3 – they are changing in accordance with various contextual factors (e.g., introduction of new communication devices and applications, the reorganization of people's life such as getting a new job, moving to a different city, marrying, etc.).

This complexity of mode-realm relationships raises the question as to how individuals whose experience of social reality is characterized by a moving forward and backward between these spatiotemporal zones are able to manage their social connectivity with *different* social ties present in *different* realms of everyday life. In other words, what implications has the transformation of spatial and temporal zones for their absence/presence in various realms of everyday life and how these interactions are structured in terms of communication technologies people use for staying in touch with their realms of everyday life. What kinds of co-presence have been augmented by mobile phones, what kinds by internet-based communication platforms, what kinds by the “interactional mix” (Zhao 2006a) of these technologies? Is face-to-face communication still the prototypical mode of interaction in the realm of consociates? Has been maybe replaced by other communication modes, and if so, why? These are the questions we shall conceptually address in Section 4.2 and Section 4.3.

## 4.2 NEW MODES OF TECHNOLOGICALLY MEDIATED SOCIAL INTERACTIONS

Earlier we discussed the relation between notions of co-presence and co-location on the conceptual level. We have suggested that with the advent of new communication technologies and the realms of the lifeworld corporeal co-presence is only one among several other forms of “being together” (Willson 2006; Zhao 2004; 2006a). Moreover, we have moved on to argue that co-location cannot be equated with co-presence anymore because the sharing of the same place does not inevitably lead to conditions of an intersubjective

experience between interlocutors. To be sure, mobile phones and the Internet are not the primary culprits, as the differentiation between co-location and co-presence is a phenomenon that predates them (Baron 2008; McLuhan 1964; Meyrowitz 1985). For instance, the landline telephone (Fischer 1992; Pool 1983) and the telegraph (Standage 1998) have already at the end of the 19<sup>th</sup> century produced a “online” condition in which two persons not mutually present in the same physical place were able to reach each other instantly through space. Yet, electronic mediation through mobile phones and the Internet does not only make possible to overcome physical distance, but it actually allows the communication to bifurcate the space. By bifurcation of space we here mean the qualitative change in the individual’s experience of the interactional setting in which they are co-located during conversation. Such experience is based not only on communication with co-located others but also on personalized communication with others that do not share the same physical space. As Zhao (2004, 98) explains:

Electronic mediation not only makes the transmission of information nearly instant but also greatly extends the perceptual reaches of an individual, hence the scope of his or her secondary zone of operation. The coinciding of two or more “worlds within mediated reach” creates a new contact situation, termed here “telecopresence.” In a situation of telecopresence, individuals are physically separated in different locales outside the range of each other’s, but stay within reach of each other’s mediated senses extended by certain electronic communications devices, such as telephones, CB radios, or networked computers.

Telecopresence can have important implications for social interaction. For instance, it can create a situation where individuals co-located in a given place are actually not co-present. Gergen (2002) calls such condition *absent presence*. He traces the origins of absent presence back to *monologic media* such as radio, newspapers and television. Yet, in his opinion, the *dialogic media*, such as the mobile phone, make absent presence accentuated because “... in contrast to monologic technologies, one participates in the construction of the world ... when we are listening to voices from afar we are no longer building the realities and moralities of the local together” (Gergen 2002, 231-232). Gergen describes absent presence as state of “diverted or divided consciousness” created by mobile communication in which people who share an interactional setting do not share the communal experience of being together in that

space. Bauman (2000) in *Liquid Modernity* provides the following informative illustration of absent presence:<sup>23</sup>

A few months ago I sat with my wife in an airport bar waiting for the connecting flight. Two men in their late twenties or early thirties circled around the next table, each armed with a cellular telephone. Through about an hour and a half of waiting, they did not exchange a word with each other, though they both spoke without interruption – to the invisible conversationalist on the other end of the phone connection. ... Both men spent that hour and a half in what was, in its relation to the airport bar, an outer space. When the flight they were both to take was announced, they simultaneously locked their briefcases with identical synchronized gestures and left, holding their telephones close to their ears. I am sure they hardly noticed me and my wife sitting two yards away and watching their every move. As far as their Lebenswelt was concerned, they were ... physically close to us yet spiritually and infinitely remote. (Bauman 2000, 153-154)

Beyond the obvious – and frequently contended – characteristics of absent presence that have been finely illustrated by Bauman, there are, we suggest, three important implications that the absent presence has upon social interactions. These repercussions are less intuitively perceivable and more latent, yet extremely important for the understanding and reconsidering of our knowledge about social interaction and interpersonal communication in technologically mediated environments.

The first of these implications pertains to the *communicative* aspect of absent presence. According to Gergen (2002) mobile phones reconfigure the communication between what he calls *vertical* and *horizontal* relationships. The former refer to interactions oriented toward close intimates such as partners, parents, and close friends, whilst the latter generally take place among more distant ties such as distant kin, colleagues, co-workers, acquaintances and so on. Vertical and horizontal relationships are in antagonistic relation as the former “... typically require dedicated attention, effort, commitment and sacrifice,” (Gergen 2002, 233) which can hardly be achieved if one is involved in many horizontal interactions. Gergen contends that absent presence of mobile communication accentuates the vertical aspect of interactions

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<sup>23</sup> For an informative overview of social and interactional situations in which absent presence has become a frequently experienced part of social reality see Turkle (2008, 130-131).

giving more room for the expansion of existing relationships into new social zones of the individual's lifeworld than making room for new social ties within existing social circles.

The second implication concerns the *relational* dimension. Gergen (2002) moves on to suggest that the skewed balance between vertical and horizontal relationships caused by mobile communication carries consequences for the (re)organization of personal relationships. He notes that "Rather than the leveling of significance in relationships, the cell phone lends itself to a retrenchment of verticality. Given the privilege granted by the cell phone to a select few, there is less tendency to move laterally and superficially across relationships. Rather, one's communication time is increasingly spent in the presence of 'those who matter'" (Gergen 2002, 238).

Beyond these two aspects there is a third set of implications which belongs to the *integrative* dimension of absent presence. Here Gergen and other commentators underline the "Janus-faces" (Arnold 2003) of the mobile phone. On one hand, due to its high degree of independence and portability the mobile phone enables people to stay in touch with their personal network virtually anywhere and anytime. Absent presence allows individuals to move across the realms of everyday life without entirely losing the contact with their consociates, in turn, fostering a cohesive and supporting personal networks (Ling 2008; Matsuda 2005). On the other hand, this "selective sociality"<sup>24</sup> (Matsuda 2005) and "bounded solidarity" (Ling 2004) can create the "telecocooning" effect (Habuchi 2005), diverting individuals' attention out of their immediate physical place and limiting their propensity to "... extend their communicative practices to new relationships" (Green and Haddon 2009, 94).

The lack of interactions oriented toward the communal space of the "world within reach" certainly does not produce positive outcomes for large-scale – or in Giddens's words – system integration. Several studies could be found in the literature which provide empirical evidence for these theoretical predictions (e.g., Habuchi 2005; Onnela et al. 2007; Petrič et al. 2010; Sooryamoorthy et al. 2008).<sup>25</sup> Nevertheless, mobile communication research also

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<sup>24</sup> The notion of selective sociality is presented in more detail in Section 5.3.

<sup>25</sup> For a detailed literature review consult Chapter 9 in Ling (2008).

reveals the positive role of mobile technologies in fostering social and civic participation. For example, Rheingold (2002) reports various cases of civic and social activism across the globe where mobile phones have played an important role in helping the civic movements and activists to organize their actions against governments. Maybe the best known is the case of the 2001 “SMS-revolution” that took place in Philippines, where the Opposition members broadcasted several millions of text messages in order to organize more than one million protesters in Manila against the government of President Estrada. His government fell only four days after the start of the protests. Recently, Campbell and Kwak (2011) have provided a more nuanced investigation of the role of mobile phone in civic participation. They pointed out that the civic potential of mobile communication is not determined by the technological affordances but rather by the people’s practices associated with different patterns of social uses. According to their study – and in contrast with earlier suggestions –, the use of mobile phones and other personal communication technology in public spaces did not detract people from talking with strangers. Quite the reverse, it is more likely that when people use the mobile phone for coordination and news that will have positive effects on the frequency of their interactions with strangers in public settings. However, Campbell and Kwak (2011) tell us as well that coordination and news represent only one part of the mobile communication practices. The other dimension, which is more wide-spread and common among the users refers to relational uses and is generally oriented toward the inner sociability of mobile phone users; therefore, having little meaning for any kind of social, political or civic participation. From these few illustrations, it becomes apparent that mixed evidence exists about the integrative reverberations of personal communication technologies, presenting the overall difficulty in mapping the consequences of mobile communication for social integration.

Beyond these issues, Fortunati (2002) reminds us of another (dis)integrative aspect of absent presence. She niftily notes how, “The individual's current ambiguous dimension of presence/absence in space means the reconstructing also of the sense of belonging to places, which is a main pillar of the sense of belonging.” This development actually means that sense of belonging once tied to the physical space has now become converted into a sense of belonging to the individual’s personal network which is not located in one single place but is rather spread across different locations. Turkle (2008) provides us we an enlightening example of such conditions, when she argues that public places such as train stations are no longer *communal spaces* but places of *social collection*, where people show no or little

interest in establishing interactions with co-located others. Instead, they prefer to use their mobile phone to stay attached to their private “media bubble” which provides them with the sense of security, ease and comfort (Plant 2002). Castells et al. (2007) described this process of reconfiguration as the *space of flows*. In the space of flows “places do exist, including homes and workplaces, but they exist as points of convergence in communication networks created and recreated by people’s purposes” (Castells et al. 2007, 172). Therefore, the space of flows does not indicate the end of geographical space and distance. Both remain important for the organization of human action. Nevertheless, by selectively connecting geographical locations between one another it creates a new structural logic of social organization, where individuals give a personalized, self-selected identity to geographical places; places become associated with highly individualized meanings as they are understood and employed in terms of their affordances to support the flow of networked interaction (see also Campbell and Park 2008). According to Castells et al. (2007) mobile communication technology takes the space of flows to a higher power because it gives people additional means to personalize their social connectivity across various realms of everyday life. However, it should be noted that not all users experience its implications and that the *space of place* – the notion with which Castells (1996) refers to the territorial form of organization of everyday living experienced by the great majority of human beings – still remains a powerful resource of communal identity. As Stalder (2006, 149) argues: “The dimension of shared culture remains essential for the functioning of loosely coordinated yet highly interactive and complex networks. Ease of communication, personal trust, and the intimacy of face-to-face communication are still essential elements of interaction.” In addition, mobile phones are only one among many personal communication technologies that have shifted the meaning of spatiotemporal arrangements which have been associated with the contemporary rise of network societies (Castells 1996; Castells 2001). In other words, we could say that the space of flows associated with absent presence represents a psychological and communicative experience of the individualized and reflexive relationality which Giddens and Beck define as milestones of late modern organization of personal relationships.

As Fortunati (2002; 2005) suggests the different modalities of co-presence or social presence, which have come out from the intertwining of the mediated and unmediated realms of everyday life, have to do with the structural characteristics of communication practices related to ICTs. Her suggestion leaves a tempting question as to what is the role of ICTs in



shaping the accessibility of the interlocutors across various realms. This question has been frequently addressed by new media and internet researchers from different perspectives in the past, providing a rich and exhaustive description of the phenomenon. An informative overview of these studies is presented later in Section 5.4. For now we will rather focus on those aspects that shall help us to exemplify how people's use of various communication technologies helps to create new instances of co-presence within and across different realms of everyday life.

For this purpose, a useful starting point is provided by Baron (2008) who – while studying the implications of internet and mobile media on language –, lays out a lucidly crafted reflection of how new communication technologies have been altering the experience of social connectivity through the empowerment of individuals in the ways they can exacerbate control over their communication with close and distant others. In Baron's view personal communication technologies have introduced a set of control mechanisms that allow individuals to regulate the “volume” of their social interactions to the extent not possible so far. She mentions two examples of common practices employed by mobile phone users in order to control their accessibility (Baron 2008). One is the use of CALLER ID service which gives them the opportunity to screen the incoming calls before deciding whether they will answer the call immediately or pick it up later. Second relates the use of distinctive ringtones which enable mobile phone users to decide whether or not to answer a call even without looking at the screen of the mobile device.

Extending the circle to other technologies, several additional examples can be mentioned (Baron 2008). For instance, email allows people to manage their correspondence in various ways. They can read incoming messages but postpone the reply or even leave messages unanswered for as long as the situational occurrences or social conventions permit. Further, people can manipulate messages: forward them to a selected group of recipients or send different version of the same message to different groups of addressees. Likewise, instant messaging multiplies the interaction mechanisms that give users more control over when and with whom they will get in contact. For example, people can define their status as “busy” for a certain group of people, while being available for others, or they can make themselves appear to be offline. Finally, they can even block a selected list of their contacts from the

address book. Similarly, people – especially teenagers and youngsters – switch off their mobile phone when they want be unavailable (Ling and Yttri 2002).

Although such practices are widely used and normatively regulated, they can lead to situations where the accentuated control over interactions leads to paradoxes. For example, Baron (2008) reports how American students recognize in the perpetual availability the most important advantage of the mobile phones. Yet, at the same time, what they like the least about mobile connectivity is that they can be always reached by other people. According to these insights the “*always on*” connectivity – the notion Baron uses to denote the continual co-presence which can be established through mobile and online communication – can become problematic since people can run into difficulties with the implosion of public and private social roles (Fortunati 2002; Gergen 1991). Situations when individuals have to manage their intimate relationships while being involved in public roles have been well documented in the literature on mobile communication (Ito et al. 2005; Ling 2004; 2008; Ling and Donner 2009; Rakow and Navarro 1993). If we apply the Goffmanian conceptual framework, we could say that all these studies point to the problem of inconvenience with which an individual has to deal when they are attempting to preserve their “face” in front of the “audience” while the “backstage” is in flux. As Turkle (2008, 126) suggests the pressure of such “parallel roles” can be a burden because it requires a continual psychological effort to achieve and control one’s self-presentation across different realms of everyday life. However, the problem of “always on” connectivity is not in playing different social roles as individuals routinely adopt different social roles within interactional situation (Goffman 1966) – but in its normative guise. That is, people have to keep up with the social expectation of being anytime, anywhere available to others they may interact with because not being available may have negative social implications.

Ling and Donner (2009) note that such normative condition can have important consequences for the organization of interactions and personal relationships in social life. In fact, Baron (2008) brings attention to three further social implications of the “always on” connectivity. First, she mentions the recurring question of internet research which deals with implications the increased control over the volume of interaction has for social integration. Since we already addressed this issue in Section 3.4, we can only add here that Baron shares the point of view which shows interest in analyzing the modalities of transformed sociality rather than

focusing on the issue of increased or decreased social cohesion. To paraphrase Weinberger (2002), for her the question is not “Is the web making us more or less social?”, yet whether, why, and how the “social” is being altered by our use of the web.

Second, Baron (2008) argues that with the increasing dominance of the online and mobile world people are gradually losing a sense of place. This aspect of “always on” connectivity may be best illustrated by the anecdotal evidence suggesting that the most frequent opening statement of voice calls via the mobile phone is “Where are you?” and not “Hello, who is it?” as it used to hold for landline telephone calls (Ferraris 2005). Yet this aspect is not only related to the interlocutors’ inability to locate each other in the physical or geographical space. But it also extends to psychological and social dimensions of space. In this regard, Fortunati (2002) again notes a dialectical reversal. On one hand, she contends that the mobile phone reassures people, when they perceive their surroundings as hostile or unsafe as it allows them to stay in touch with their intimate circles. As the results of a series of ethnographic studies in which Plant (2002) compared the use of mobile phones in various social and cultural environments confirm: mobile phone is a source of security for users. She, for instance, shows that especially women see in the mobile phone a security device which gives them a feeling of safety and of having everything under control while moving across public places (see Plant 2002, 62). Similarly, for many other user groups the mobile phone is perceived as indispensable in critical, unforeseen or risk situations. On the other hand, “This restructuring of people's sense of belonging to places is not without its suffering, because a change of such an important psychologically structure inevitably causes a sense of uncertainty, insecurity and confusion” (Fortunati 2002, 521). Plant (2002), in fact, reports feelings of discomfort, isolation and/or vulnerability expressed by users when they forget their mobile phone at home, when they are located in an area not covered by the signal or when their phone battery is dead. For Vincent (2006) these are not merely signs of strong emotional attachment of the user to the mobile phone but also expressions of how the mobile phone represents a symbolic and operational connection of the user with their personal network.

The final consequence of “always on” connectivity is what Baron (2008, 266) calls “the end of anticipation”. She argues that the “always-on” connectivity reduces the interactional coincidence that comes from meeting and talking to people occasionally. With the help of

mobile phones, texting, social network sites, email and other online services people have today the ability to be informed of important others' ongoings as they happen. Since, according to Husserl in Schütz (1967), anticipation is an essential feature of human action, its dismissal from the experience of everyday life can lead to important changes in the mechanisms underlying social interactions. Regrettably, Baron does not provide us with a conceptual vehicle to understand the processes and implications of the "end of anticipation." Nevertheless, with the help of a selected blend of advances in mobile phone and internet research, developed and emphasized by Licoppe (2004), Ling (2004; 2008) and other sociologists it is possible to identify at least a couple of modalities associated with the "end of anticipation" on small-scale interactions. In addition, the observation of such trends also gives us the material to draw up a tentative assessment of possible implications for social interactions.

Although indirectly, Baron indicates that the "end of anticipation" might be related to two central affordances of personal communication technologies: *individual addressability* and *real-time management of personal relationships*. Ling and Donner (2009) introduce the notion of individual addressability in order to stress the "personal character" of mobile phone in comparison to the landline telephone. While the latter has been used to connect with a fixed place (e.g., home, office), the former is used to get in contact with a specific person. Being a personal device or medium (Ito et al. 2005) the mobile phone alters the way people experience the interactions mediated via mobile and other personal communication technologies. Ling and Donner (2009, 139), in fact, suggest that the rise of mobile and online communication is associated with "a changing logic in an organization of interaction." They call this logic "real-time management of personal relationships". The idea is that personal communication technologies by making people individually accessible considerably lower the threshold of interaction. Hence, communication becomes more frequent and ubiquitous creating a flow of exchanges through which interlocutors experience a feeling of continuous presence. For Ito (2005) the social value of this unremitting presence can be found in the "discursive production of intimacy" which is according to Giddens (1991) essential for building trustworthy personal associations (i.e., pure relationship) that deliver the expected level of emotional satisfaction and personal fulfillment between individuals in late modernity. As we also noted in Section 3.3 such relationship requires a sizable amount of deliberation, reciprocity, self-monitoring, mutual disclosure, and conformation, which cannot be achieved

without an expanded range of communication. This distention spreads across different spatiotemporal zones of everyday life, the real-time management can take up different forms according to the motives and needs that motivate personal associations in various realms of everyday life.

For instance, in the case of practically and functionally motivated communication, Ling and Yttri talk about micro-coordination<sup>26</sup> defining it as a communication practice which can take at least three possible forms (2002, 142-144). The first relates to the so-called “basic logistics”, which includes conversations that aim to redirect one's actions while they have already started (for example, calling a partner to stop at the groceries on the way home). Another strategy is the so-called “softening of time” when a person calls a business partner to let him know that because of her/his tight schedule and traffic congestions s/he will be late to the meeting. The third form of micro-coordination refers to the “progressively exact arrangement of the meeting” when interlocutors who plan to meet in-person use voice calls and texting in order to improve their temporal and spatial accuracy of these meetings while heading to the place where the encounter should be held. All three communication practices are generally based on the exchange of short and informative calls or text messages for instrumental matters.

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<sup>26</sup> Drawing on the analysis of in-depth interviews and focus groups with Norwegian adult (parents) as well as young (adolescents and teenagers) users of mobile phones Ling and Yttri (2002) have besides micro-coordination identified also two other patterns of mobile phone use: the instrumental use and “hyper-coordination” or expressive use. The key distinction between the three types of mobile phone uses stems from the different needs which drive people's use of the mobile phone. On one hand, instrumental uses include simple everyday arrangements that have little or almost no emotional content. On the other hand, hyper-coordination is best expressed through genuine emotional and social forms of communication aimed at mutual exchange of emotional preferences and networking with others. An important aspect of expressive uses are the frequent intra-group negotiations about material and symbolic meanings of things as well as the understanding about what an appropriate self-presentation via mobile phone should look like if one has to confirm its belonging to a group of peers. In terms of socio-demographic characteristic of mobile phone users Ling and Yttri note that instrumental uses and micro-coordination are equally distributed across various social groups. Conversely, hyper-coordination is an age-specific phenomenon: it belongs to the expressive communication among younger adolescents who in search of their personal identity want to get emancipated from their parents longing for their affirmation among their peers.

Besides micro-coordination other colloquial uses of mobile phones have been reported in mobile communication literature, which pertain more to the expressive conversational domain. The most well known is the case of “*connected*” *presence* – a term suggested by Licoppe (2004) to denote a relationship repertoire in which the (physically) absent interlocutor gains presence through the multiplication of mediated communication gestures on both sides, up to the point where co-present interactions and mediated distant exchanges seem woven into a single, seamless web. From the communicative view “connected” presence consists of “... short, frequent calls, the content of which is sometimes secondary to the fact of calling” (Licoppe 2004, 141). The relational value of the “connected” presence repertoire cannot be founded in the exchange of single messages but rather in the stream of correspondence that is formed through a fast, continuous and reciprocal exchange of short calls. If analyzed separately the discursive content of such calls may appear trivial and futile as they generally do not carry any specific meaning. Yet when one considers a longer sequence of these brief communications they appear as “new forms of sharing and the construction of common space and experience” (Licoppe 2004, 154) of social connectivity.

Licoppe (2004) contrasts “connected” presence with an alternative way of managing personal relationship he calls the *conversational mode* (see Table 4.3). This communicative repertoire is based on less frequent but longer, open and dialogical conversations in which the interlocutors take the time to express their thoughts and feelings. In another study Licoppe and Smoreda (2006) found that the conversational mode is mainly used in intimate social circles where people live far away from one another and use the landline telephone as their primary means of communication. Conversely, the “connected” presence relational mode pertains to the localized ties in one’s personal network. That is, persons who are emotionally and geographically close to the individual. In addition, “connected” presence and the conversational mode also differ according to the mode of reciprocal commitment. According to Licoppe and Smoreda (2006) in “connect” presence interlocutors associate commitment with the frequency of calls<sup>27</sup> – the more intensive the stream of exchange the more

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<sup>27</sup> This reflection is shared also by Matsuda (2005) in her study of mobile phone use of Japanese youth in communication with their family and peers. She contends that mobile communication correlates with a new form of relational consciousness which prefers quantity over quality of conversation. In her words: “What I want to stress here is a trend toward a consciousness that is important for families to frequently exchange words.

reciprocative are the social ties or as they explain “... the strength of the tie is lived rather than said” {Licoppe, 2006 #1292, 309. Consequently, this also means that calls are made at any time of the day from different places – mobile phones being particularly suitable for this purpose. In contrast, in the conversational mode the mutuality of the relationship is associated with the length or “deepness” of the exchange. According to Licoppe (2004) this partially stems from the fact that in this relational mode in-person encounters are occasional but, nevertheless, carefully planned and organized.<sup>28</sup>

**Table 4.3: Connected presence vs. conversational mode**

	<b>“Connected” presence</b>	<b>Conversational mode</b>
Call length	Short	Long
Frequency of calls	High	Low
Calls made	At any time	At appropriate times
Discursive content	Low (phatic communication)	High (dialogical communication)
Reciprocal commitment	Visible in the <i>frequency</i> of calls	Visible in the <i>duration</i> of calls
Geographical proximity	Close	Distant
In-person encounters	Frequent	Scarce to occasional
Communication channel	Mobile phone (voice calls, SMS)	Landline telephone

Note: adapted from Licoppe (2004), Licoppe and Smoreda (2005; 2006)

“Connected” presence, however, is not a culturally specific form of communication. Similar modes of connectivity were also ascertained in other cultural settings. For example, Okabe and Ito (2005) while conducting an ethnographic study of mobile text chat among the student population in a campus near Tokyo discovered a relationship repertoire they named *ambient virtual co-presence*. As for “connected” presence the point of ambient virtual co-presence is conversational but the phatic dimension of communication. They explain:

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This consciousness is one foundation upon which the current *keitai* (jap. mobile phone) communication has flourished. In fact, I might argue that *keitai* has increased the quantity through communication of everyday business rather than quality through facilitating understanding among family members” (Matsuda 2005, 132).

<sup>28</sup> From this perspective Licoppe's conversational mode is conceptually very close to the Urry's notion of intermittent co-presence. With this notion Urry describes those kinds of sociality in which regardless of the fact that the interlocutors are in contact through communication technologies, occasional face-to-face encounters “(...) are necessary to sustain normal patterns of social life often organized on the basis of extensive time-space distancing with lengthy periods of distance and solitude” (Urry 2002, 61).

These messages define a social setting that is substantially different from direct interpersonal interaction characteristic of a voice call, text chat, or face-to-face one-on-one interaction. These messages are predicated on the sense of ambient accessibility, a shared virtual space that is generally available between a few friends or with a loved one. They do not require a deliberate opening of a channel of communication but are based on the expectation that one is in “earshot.” ... As a technosocial system ... people experience a sense of persistent social space constituted through the periodic exchange of text messages. These messages also define a space of peripheral background awareness that is midway between direct interaction and noninteraction. (Okabe and Ito 2005, 265)

Lastly, the conceptual distinction between the two relational repertoires introduced by Licoppe (2004) brings out an additional important observation. He suggests that “connected” presence does not pertain only to mobile communication but can also be observed in reference to other communication technologies (see also Licoppe and Smoreda 2005; 2006). For example, in the streams of status updates<sup>29</sup> – a form of microblogging messages in which people write a phrase about where they are, what they are doing, thinking or feeling – supported by the social networking software, such as Facebook and Twitter, there can also be identified some of characteristics typical of “connected” presence. As (Marwick and boyd 2011) observe status updates are generally seen by the users as conversational expressions which obtain a relational meaning when seen as part of a longer stream of information posted by an individual. Put it differently, the relational is not expressed through the length or conversational quality but rather through a frequent and constant flow of messages addressed to “friends” and “followers”.

Referring to these observations, it may be concluded that the implications of these conversational practices on social connectivity cannot be accurately analyzed if one does not take into consideration the various technological means available to people for staying in touch with their ties today. The following section, thus, expounds in more detail on the technological facet of digital sociality. More precisely, it discusses the complexity of technological landscape in relation to the social uses of technologies, their normative frameworks and social accessibility.

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<sup>29</sup> On Twitter, which is a microblogging service which enables users in the system to share messages with the maximum length of 140 characters, status updates are generally referred to as “tweets”.



### 4.3 PERSONAL CONNECTIVITY IN THE COMPLEX MEDIA ENVIRONMENT

The new modes of communication that have been discussed in the previous section can be also observed from an alternative perspective which explores the relation between different modes of (technologically mediated) communication. In fact, as already noted by Licoppe and Smoreda (2006) while discussing the notion of “connected” presence, social connectivity is nowadays embedded in a matrix of communication technologies that forms a complex (see also Fortunati 2005; Matsuda 2005; Miyata et al. 2005; Petrič et al. 2011; Zhao 2006a) or total media environment (Cowles 1989). Accordingly, the “connected” presence has not been enabled only by mobile voice calls and texting but also by in-personal communication and the contacts mediated via landline telephone. In another study, when investigating the reciprocity of personal relationships mediated through mobile communication Licoppe and Heurtin (2001, 107) mention how “Reciprocity does not occur only within the improvised regulation of sequences of telephone calls between two parties; it pervades a web of interactions through different channels”. Hence, they conclude that if one wants to assess the role of a single communication technology in a network of personal relationships one would need to extend the analysis to the whole set of communication channels available to the individual, because social interactions are not restricted to one mode of connectivity but rather span across different communication technologies.

Additionally, Petrič et al. (2010) suggest that in the contemporary media environment the use of communication devices is not limited to characteristic social contexts like it used to be. Mobile phones, telephones, internet-based channels are not tied to a specific social sphere such a work, home, school, etc. On the contrary, they extend over various domains where people are confronted in the same social context with many communication channels and none of them is any less accessible than another. They explain:

If, for example, one wishes to arrange a meeting with a co-worker there are many options to choose: meet them in-person, call them by mobile phone, send them a text message, call them by landline telephone, write them an email, poke them on Facebook, Skype them etc. With the new hybrid communication formats, multitasking devices and converging technologies that are expanding rather than reducing interactional diversity, such decision-demanding situations are becoming inseparable elements of everyday life. (Petrič et al. 2010, 50)

What this short citation illustrates is that researchers who are grappling with the issue of media choice in the complex media environment are not only faced with the problem of variety of media alternatives but also with the complexity of social contexts in which this media choices happen. Nowadays in every social realm of the lifeworld exists a “plurality of modes of contact” a person might choose in order to keep in touch with his/her social circle (Zhao 2006a).

In his reflection of the embeddedness of social relations and human activities in the (mass) media environment Bausinger (1984) identifies and discusses five points that should help researchers in conceptualizing the implications of complex media environments on social relations and activities in daily life. First, similarly as other scholars (e.g., Boase 2008; Höflich and Gebhardt 2005) he recognizes that in order to carry out a meaningful study of the use of the media, it is necessary to analyze how people combine the use of different media: people do not perceive the media environment as a system made out of separate communication technologies but rather they experience it as a reality where the practical uses and symbolic meanings of media emanate from a comparison of one technology to another. Second, people neither use a single communication technology for only one purpose nor they achieve a single goal with the use of only one technology. In their interactions with the social environment people use and combine diverse media in order to achieve different goals. Consequently, one cannot think of media and communication technologies as a separate part of social reality; technologies and media intertwine with every single dimension of the way people confront with the everyday. Fourth, for Bausinger (1984) the usage practices in symbolic meaning of communication technologies cannot be seen as an outcome of an isolated, individual process, but of a collective process. The uses and meanings of communication technologies are a result of dynamic “social” negotiations between different actors and institutional arrangements. Therefore, they embody a set of norms and conventions that guide social behavior in general. Finally, since Bausinger’s focus is on mass media, he also underlines how media communication cannot be separated from direct personal communication. In his opinion mass media technologies (e.g., television, radio) and personal communication technologies converge through social interactions.

#### 4.3.1 *The problem of media choice*

The observations put forward by Bausinger point us to the question of how people decide which communication technology they will use in order to contact other people or to fulfill communicative goals in different social contexts. In communication theory this question refers to the problem of *media choice* in interpersonal communication which has been addressed most comprehensively by three theoretical approaches: *the social presence theory*, *the media richness theory*, and *the uses and gratifications theory* (Baym 2010). Although these approaches have very diverse historical and paradigmatical origins (i.e., while the social presence and media richness theory were developed in the organizational research in the mid 1970s which was driven by the managerial concerns regarding the introduction of CMC in work tasks and demands, the uses and gratifications approach has its roots in the mass media effect research) all focus on the issue of analyzing the appropriateness of different media for interpersonal communication, which was generally (on the empirical level) boiled down to the comparison of usage patterns for various communication technologies. Let us provide a brief overview of these theories.

The social presence theory was introduced into the communication theory by Short et al. (1976), who were intrigued by the question of how different degree of social cue might create different senses of social presence during communication. They conceptualized social presence as “the degree of salience (and perceived intimacy and immediacy) of the interpersonal relationships” (Short et al. cited in Baym 2010, 52), arguing that the perception of social presence is dependent on a series of verbal and non-verbal clues which are exchanged between interlocutors during communication. Given the importance of these verbal and, in particular, non-verbal cues in coordinating social interactions, social presence theorists assumed that certain media may better serve in conveying meaning and social presence than other. In addition, as Baym (2010, 53) notes, “Social presence theorists argued that if you knew which social cues served which functions in conversation, and you knew which media transmitted which cues, you would be able to predict how much social presence people using a medium would experience.” Drawing on this supposition a series of studies has been carried out showing that independently of the social context in which the interactions were analyzed, people generally perceived the most social presence in in-person

communication, while the mediated forms of communication showed substantially lower levels of perceived social presence (Fulk and Collins-Jarvis 2001; Short et al. 1976).

While social presence theory concentrates on a psychological phenomenon referring to the question of how interlocutors experience the level of interpersonal contact and feelings of intimacy during conversation (Thurlow et al. 2004), the media richness theory turns its attention to the objective characteristics of the medium itself. Daft and Lengel (1984) conceptualized the media richness theory in the mid 1980s. They defined the notion of (media) richness in relation to the information-carrying capacity of a medium that may be observed on four levels: the speed of the feedback, the ability to convey multiple cues, its affordances to allow people to use their natural language, and its propensity to promptly communicate feelings and emotions (Daft and Lengel [1984] in Baym 2010, 53). Daft and Lengel further suggested that the different suitability of media can be observed when they are used to convey messages that vary according to the equivocality and uncertainty of tasks the communicator aims to accomplish. What media richness scholars generally found out was that lean media, which conveyed less social cues, worked better with tasks low in equivocality and uncertainty, whereas rich media, which convey a substantial amount of social cues, turned out to be better when employed for tasks that presumed high levels of uncertainty.

Even though social presence and media richness research provides us with insightful knowledge on the interplay between different media in accomplishing various communicative tasks, it is subject to two shortcomings. On one hand, it advances the idea that if one wants to analyze the usage patterns related to different media it is enough to break down their technological characteristics, because they determine the communication quality. On the other hand, one cannot pass over the fact that media richness and social presence research has been tied to the specific context of organizations (Fulk 1993; Trevino et al. 2000; Webster and Trevino 1995). Accordingly, it has been interested mainly in the ability of communication technologies to address instrumental needs that occur in the execution of organizational tasks. Hence, it provided only limited insight into how the processes of the overall mediatization of everyday life's interpersonal communication are affecting people's communicative practices, which in many aspects differ considerably from those in organizations and institutions (Gebhardt 2008).

The second limitation has been partly overcome by the uses and gratification approach (Blumler and Katz 1974) that addressed the question of motives and needs that lead people to use mass and/or interpersonal communication media. The uses and gratifications approach put forward a set of premises that have helped researchers to compare the usage patterns of various communication technologies. In their seminal article Katz et al. (1973) assert that uses and gratifications approach assume that: (a) people are active in selecting a medium for their interpersonal communication since they have more or less definite expectations of which communication goals a certain medium can offer; (b) people are using communication media rather than communication media are “using” or having a straightforward effect on them; (c) two interpersonal communication media can serve to satisfy the same communication goals and the degree to which certain communication goals can be met through various media varies; (d) people are able to report communication goals or at least recognize them when confronted with them. In conceptual terms these assumptions represent a shift away from the premises advanced by the social presence and media richness theory. While the latter viewed the problem of media choice as springing from the technical affordances of the medium, the former underscores the role of the active user in managing their personal relationships. Ruggiero (2000) argues that attributes of ICTs, and in particular the Internet, related to their augmented interactivity, demassification, and asynchronicity give to the user-centered perspective in media choice studies an increased validity, “... as emerging technologies provide users with a wider range of source selection and channels of information, individuals are selecting a media repertoire in those areas of most interest” (Ruggiero 2000, 16). This suggestion has found support in a series of empirical studies which have investigated the use of internet-based technologies for interpersonal communication and compared it with the uses and gratifications of existing interpersonal channels such as the landline telephone, letters, in-person conversation and so on.

The rich tradition of the uses and gratifications empirical research has resulted in a substantial amount of studies that compared the uses of various interpersonal technologies. The first comparative studies that, for instance, analyzed the choice of computer-mediated communication in comparison with other mass media channels, and in-person conversation in the broader social context appeared in late 1980s (Perse and Courtright 1993). Due to the small diffusion of computers and the low adoption of e-mail and bulletin boards, the analysis from the media choice perspective could not however be well informative for the general

population. Half a decade later, when the lack of exposure and access to the Internet were no longer such limiting factors, Flaherty et al. (1998) examined the relationships between the motives for using the Internet and the motives for in-person interactions. They found that use of the Internet among students was not perceived as a functional alternative to in-person communication. The latter was positioned as the most preferred way to fulfill communication needs and achieve all communication goals. Similar results were produced by a study conducted by Westmyer et al. (1998). They examined the perceived appropriateness and effectiveness of e-mail and five other communication channels, including in-person interaction and the landline telephone, used in relation with several interpersonal communication motives (i.e., inclusion, affection, control, relaxation, escape, pleasure) in other-directed and self-directed need-fulfillment situations. In-person communication was found to be the most appropriate and effective channel for communicative needs given and received, while the telephone was, in almost all instances, an equal but less used functional alternative. E-mail and other channels were possible, in many instances, as a third or fourth choice. Obviously, when given the opportunity to choose the channel for interpersonal communication people preferred oral communication (i.e., in-person and the landline phone) over written communication (i.e., e-mail, letters, etc.). Dimmick et al. (2000) focused on patterns of uses of e-mail and the landline telephone and assessed that a wider spectrum of needs is being served by the landline telephone, whereas e-mail provides greater opportunities for strategic use. While respondents looked at the landline telephone and e-mail as two competitive media for sustaining particular relationship activities, they were not seen as functional alternatives since e-mail was viewed as not being particularly helpful for providing the sociability gratifications of companionship, advice and care.

Lately, Ishii (2006), for instance, discovered that the landline telephone, the mobile phone, e-mail and in-person conversation are basically all used for expressive and relational purposes where some specifics of mobile communication channels use exist. On one hand, short text messages and mobile voice calls appeared to support only a closed friendship network, whilst e-mail was found to promote relational-oriented communication with distant friends. On the other hand, compared with other media the landline telephone was more closely associated with relational uses in the domestic environment. Likewise, Cummings et al. (2002) found in their comprehensive research based on students' interaction diaries that the landline telephone and in-person meetings were perceived as the most suitable for relational use,

whilst the Internet was rated the lowest for maintaining relationships and better for arranging school work and exchanging information. Finally, some important differences among interpersonal communication technologies were identified by Flanagin's study (2005). Unlike most previous studies, in this one the landline telephone was found to be the least useful for need satisfaction since it ranked lowest on all gratifications factors. This was probably due to the specific sample of students who used the landline telephone less frequently than other age groups. E-mail was generally ranked low on relational uses. By contrast, both the mobile phone and instant messaging were used significantly more than e-mail for all needs satisfaction factors, showing that instant messaging is viewed to be more effective than e-mail for both strategic and relational uses. Although Flanagin (2005) identified on the basis of statistical analyses that the mobile phone and instant messaging are high in functional equivalence, his research showed that the former was used more for relational and informational-cooperative purposes, while the latter was mostly employed for a specific relational use, i.e., meeting new people.

#### *4.3.2 The normative aspects of media choice*

In general, uses and gratification studies, as well as the research work carried out in the media richness and social presence framework provides us with convincing empirical evidence, showing for changes in media use patterns following the adoption of new ICTs such as internet-based communication media and mobile phones. Although ICTs are increasingly filling similar human motives and needs, these studies also show that ICTs are by and large not replacing the use of "old" media like landline telephones and in-person communication among the general population (Petrič et al. 2011). Rather, what we are witnessing is a complementation process where technologies accommodate to each other depending on the contextual situations in which people use them. For example, a recent study investigating the social uses of five different technologies for interpersonal communication (i.e., in-person, the landline telephone, texting, mobile phone voice calls, the Internet) in Slovenia concluded that all analyzed media are opened to various combinations of social uses and are rarely confined to single uses (Petrič et al. 2011). According to the same study, such complementation of technologies can be most clearly observed when analyzing the relation between in-person and technologically-mediated forms of communication. In terms of the frequency of communication across the four social uses (i.e., informational-cooperative, socializing,

expressive, strategic use in their case) in-person communication seems to preserve the leading role in people's life and personal relating.

One viable explanation of these results could be that people due to the increased individualization of their sociality need to communicate more than ever before to be able to successfully manage their personal relationships. Because of the flexibility of people's activities and interactions they are compelled to more mindfully coordinate their communication and, consequently, use more of what we could call meta-communication in order to carry out their commitments. Alternatively, following the suggestions put forward by Ling and Donner (2009) we could suppose that certain forms of building up and maintaining social connectivity preserve the central role of in-person encounters (e.g., micro-coordination), which are in turn coordinated via electronically mediated modes of communication.

Urry (2002) addressed this issue in a discussion about the importance of travel in modern societies. He brings attention to at first sight trivial question of why does travel occur in societies where all communication could be potentially conducted via media technologies. He suggests that corporeal proximity cannot be substituted by virtual proximity since there are many situations in social life where what he calls intermittent co-presence appears to be normatively prescribed and obligatory. Urry identifies six types of such obligations (2002, 262-263): legal, economic and familial obligations; social obligations; time obligations; place obligations; live obligations; object obligations.

These obligations may be seen as expressions of normative rules which determine the appropriateness of communication technologies according to the social context in which they are used. They show us that the social uses of different communication technologies are not only shaped by their technical affordances but also by a set of commonly shared notions that Lichtenstein and Rosenfeld (1983) call *media images*. They define them as "individual characterizations of a medium with regard to its expected functional usage, which are related to individual's use of and attitudes toward various media" (Lichtenstein and Rosenfeld 1983, 1). Referring to the often contradictory conclusions of previous uses and gratifications studies, which derived from the scarce clarity for the gratifications sought, gratifications obtained, and gratifications expected relationships, Lichtenstein and Rosenfeld (1983) also

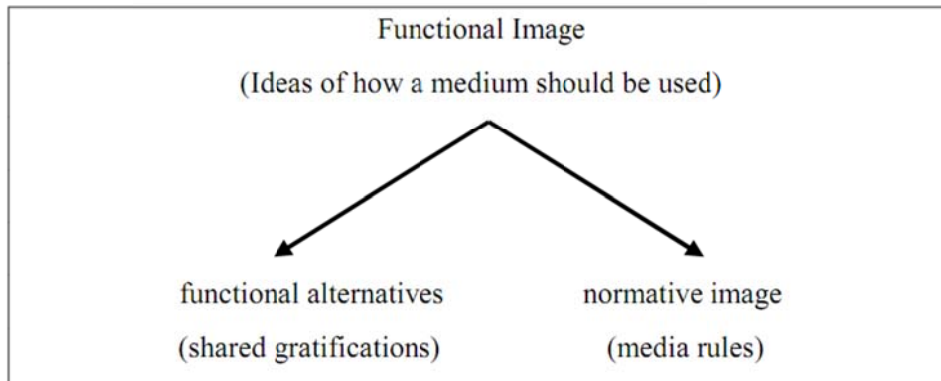


claimed that media images may be less a consequence of unidentified and indefinable internal needs of individuals and more a consequence of social learning and/or media self-definition.

Following Lichtenstein and Rosenfeld (1983), Perse and Courtright (1993, 486) presented the notion of *normative images* of communication media and defined it as “the widely shared perceptions about medium’s typical usage, which are based on the functions that they serve.” Their study, in which they explored how well twelve different mass and interpersonal communication channels fill eleven communication needs, showed that communication channels possess “normative images”, and that certain channels are functional alternatives, that is, channels that fill similar needs and have similar normative images. However, Perse and Courtright (1993) also noted that normative images can also limit the functionalities of a certain medium. As Fortunati (2002) explains the lightning-like irruption of mobile phones in public places has created a series of rules and norms of conduct on the communicative level which regulate the adequacy of mobile conversations and its various aspects according to the situations in which they take place: not speaking too loud on means of public transport, switching off the handheld devices in theaters, cinema, hospitals, and so on.

Combining the various explanations of media choice and use, Höflich and Gebhardt (2005) proposed that functional images of media distinguish communication technologies according to their functional alternatives and normative images (see Figure 4.1). In other words, the functional image of a medium, on one hand, depends on collectively held notions of how the medium should be used, which are formed through its long term use and presence in social environments, and, on the other hand, it is shaped by the technical affordances that make a particular medium a functional alternative to other media. What is from the perspective of the process of media choice even more important is that this two-part composition of a medium’s functional image can help us explain why in-person communication still preserves an important role in interpersonal communication. Although new communication technologies can be functional alternatives to in-person communication the normative image (widely shared perceptions of a medium’s use in social contexts) prevent them from taking a more central role within determined social contexts. Consequently, in-person contacts still appear to have a central position in interpersonal communication.

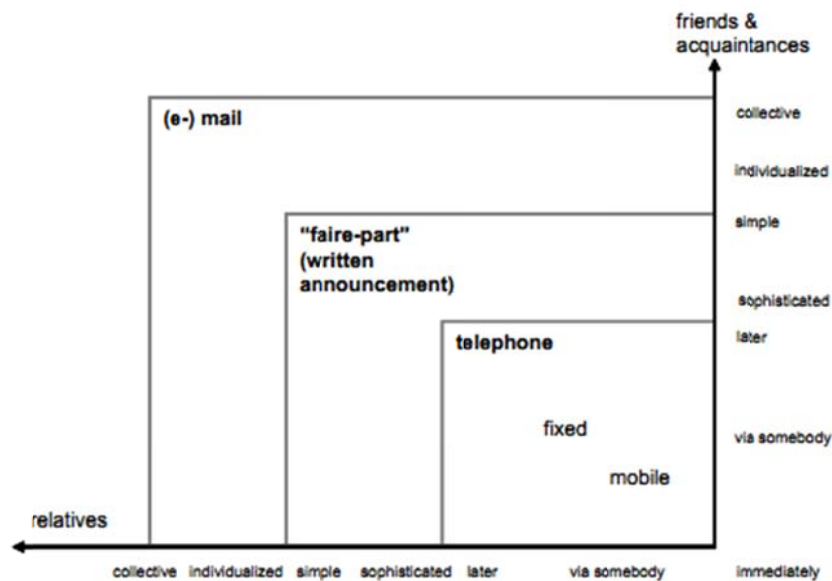
**Figure 4.1: Functional image of media.**



Source: Höflich and Gebhardt (2005, 25)

The implications of normative images may be most clearly illustrated in the study of Licoppe and Smoreda (2006), who tried to grasp how the timing of sending birth announcements is related to the choice of the medium and the type of the tie in the personal network to which the announcement has been sent. The authors assumed that announcements represent a generic form of communication. Hence, a particular way of announcing a birth should reaffirm the strength and the reciprocity of a tie. In other words, social ties which are deemed more important, close, strong, and desirable were supposed to be contacted sooner using communication technologies which allow higher levels of responsiveness. In fact, after observing the use of in-person, telephone, mobile, email and letter correspondence in relation with the strength of ties, they found that a hierarchy of relationships emerges where in-person, mobile and landline telephone conversation is associated with the most inner social circle (i.e., parents, siblings, close friends), written letters are tied to the middle social circle (i.e., other relatives), while email were used to contact relationships in the outer social circle (i.e., friends, colleagues, acquaintances; see Figure 4.2). Moreover, the results suggest that the structural characteristics of social ties correlate with the use of communication technologies in personal networks. As authors pinpoint: “The differential use of particular means of communication thus lays down a space of relational practices in which ties of similar closeness are treated in a similar way, and in which this degree of closeness is publicly expressed and negotiated” (Licoppe and Smoreda 2006, 298). In this specific case, it can be observed that in-person contact still holds a central and valued normative position in how we relate to one another, because it is strongly associated with personal relationships which are most committing in terms of reciprocity.

**Figure 4.2: Media and timing of announcements of birth of a child, by proximity of the correspondent**



Source: Licoppe and Smoreda (2006, 299)

Nevertheless, Fortunati (2005) observes the normative centrality of in-person communication (she refers to it as to the prototypical role of body-to-body communication) could be under question. In support of her account she puts forward four points (Fortunati 2005, 56-57). First, she recognizes how physical co-location has become only one among various modes of experiencing the intersubjective aspect of social interactions. Under the circumstances when people are faced with the structural limitations that prevent them from meeting in-person, mediated modes of connectivity are not seen any more as “second options” but rather as an equivalent “contact situation” (Zhao 2006a) because of their capacity to give users more control, more specialized content, more speed of transmission, higher responsiveness, and nonlinear access. Second, as technologically mediated modes of co-presence gradually become a take-for-granted aspect of social connectivity people generally lose the awareness at the social level of limitations of mediated modes of interpersonal communication (see also Section 4.1). In other words, normative images that once preferred in-person contact to mediated communication may gradually be replaced by new notions that give to mediated modes of communication a larger legitimacy. Zhao points out this argument further, explaining that Berger and Luckmann’s (1966) assumption of face-to-face communication being the “prototypical case of social interaction” with other modes being its derivatives, may not any more hold true today. “Online communication, for example, can now become the

basis upon which offline face-to-face contacts develop” (Zhao 2006a, 471). Third, as she explains, “The problem here is that this range of choices is intimately connected to the management of complexity of everyday life. This complexity makes it increasingly necessary for us to resort to artificially and to underdeveloped ‘naturalness’ of mediated communication” (Fortunati 2005, 56). The choice here is not between technologies that convey more or less bandwidth – as the media choice proponents would argue – but rather between technologies that are more or less compatible with the social context within which the social interactions are embedded (*cf.* Licoppe and Smoreda 2006). Since new mediated interpersonal technologies are especially prone to appropriation and redefinition by users (Fortunati et al. 2010) they might not only better accommodate to the functional demands of various contexts, but also become quickly integrated in the normative images which are established in these contexts. As suggested in Section 4.2 the contemporary trend toward what Giddens calls pure relationship, demands from people more communication, personal investment, and reciprocal engagement. Since the time people nowadays spend at home together is smaller than in the past, remote modes of communication and social interaction get grip in everyday life. Finally, the normative position of in-person communication has become worn out by the growing fragmentation of sociality which can be observed on different levels of social reality; for example, in the increased dynamism of social roles people enroll during the day, in the accentuated blurring of the boundaries between the work and family activities, or in the emphasized need for a timely coordination of activities and interactions. The result of these evolvments is the perception of in-person communication as an increasingly planned and prearranged event. Put it differently, the “normativeness” of face-to-face communication is not derived anymore from its taken-for-grantedness but from the condition where personal relationships are embedded into a technologically-mediated matrix of technologies from time to time “... it appears obligatory for sustaining much social life” (Urry 2002, 258). There are many examples of changed normative position of in-person communication in the new media literature. An instance is the notion of micro-coordination (Ling and Yttri 2002) which – as already discusses in Section 4.2 – points precisely to this reorganization of normative experience that frames the distribution of social interactions across diverse modes of communication. The primary role of the third form of micro-coordination is not to convey meaning but rather to temporally and spatially coordinate the actions of individuals that require physical encounters (Ling and Yttri 2002).

According to some authors such as Castells, Wellman, Licoppe, Hampton, Wittel, Mascheroni this “new normative order of interaction” (Zhao 2006a, 466) can be associated with the networked organization of social and personal relationship which has emerged with the advent of modernity. The increasingly spatially and temporally dispersed social interactions that are embedded in a progressively more complex technological landscape become objectified in relational structures, which have taken the shape of personal networks in which social accessibility is less and less based on external social structures (Hogan 2009). Rather, the contexts which frame the interactions are more focused on individuals, their actions, and abilities. As we will see below the new modes of technologically mediated social interactions, their spatial, temporal, and normative dimensions which have been discussed in this chapter are tightly related to the prominence of personal networks in contemporary sociality.

## 5 SOCIAL NETWORKS AND THE TRANSFORMATION OF SOCIALITY

While the previous chapters focused on technology, social context, and social interactions, here the objective is to describe social networks as the fourth facet of the transformation of sociality in late modernity. The chapter has two central aims: firstly, to demonstrate that from the network perspective social connectivity has undergone a transformation with the advent of late modernity. This change can be described on two levels. In a societal sense, networks play an increasing role in the organization of social connectivity and personal relating. The argument advanced here is that social networks have always been an organizational principle of social and personal relationships. Yet, they were part of larger social structures, consequently, being determined by wider institutional forms such as communities. With the advancement of individualization their position has changed in relation to these institutional structures and forms. Pescosolido and Rubin (2000) drawing on the early Simmel's writing on social networks grasp this trend with the notion of the *spoke structure*, whilst Wellman (1979) develops the notion of *personal community* to specify that social networks in contemporary society are less bound up to institutional forms such as family, neighborhood, and social class.

This change in the position of social networks in the social structure goes along with the structural transformation *within* the networks. In this sense, one can observe how the organization of modes and frequency of interactions between network members is increasingly centered on the individual (Wellman 1979; Wellman and Leighton 1979). This central position of the individual in the late modern forms of social connectivity seems to appear important for understanding the mechanisms that underlie the late modern form of personal relating. In fact, social theorists have developed different notions such as networked individualism (Castells, Wellman), network sociality (Wittel), mobile sociality (Mascheroni), and selective sociality (Matsuda) to account for these structural changes. Section 5.3 briefly reviews this work indicating the main features which have been advanced with these notions.

After characterizing the transformation of social networks on a societal and structural level, the second objective of the chapter is to illustrate various ways of how ICTs have been involved in this process. An extensive literature has documented the relationship between

structural characteristics of social networks and the use of ICTs for interpersonal communication. On the general level, this discussion has involved two main concerns: First, new media sociologists have showed interest for the question of whether new means of communication have weakened the traditional forms of sociality based on local, intermittent, real-world face-to-face encounters, which take place in physical community. Secondly, scholars tried to find out if and how new communication technologies have been contributing to the structural (re)organization of social ties *within* people's personal networks. In this context, the analysis of the social affordances of different ICTs for weak and strong social ties has often appeared in scholarly endeavor to trace the role new communication technologies play in the reorganization of social connectivity. By contrast, research drawing on the concept of social support in egocentered networks is scarcer. The second part of this chapter provides a brief and informative review of the empirical research and the main conceptual theses which have been advanced with regard to these two concerns. This step allows connecting the technological and interactional facet of digital sociality to the network organization of personal relationships setting up a conceptual background for the research framework which has been developed to organize data gathering and to enable the development of research hypotheses of this study.

Before we proceed with the analysis of the four above mentioned points, first a conceptual clarification is needed regarding the approach to and definition of social network that we employ in this study. This is done in the following section.

## 5.1 LOCATING NETWORKS IN THE DIGITAL SOCIALITY

There are many definitions and approaches to study social networks. As Marin and Wellman note (2011, 12): "Researchers collecting network data must first decide what kinds of networks and what kinds of relations they will study." For example, on a very formal level a social network can be defined as a as a set of network members (or nodes) that are tied by one or more types of relations (Wasserman and Faust 1994). The network members can be persons, organizations, institutions, or – as we have learned while discussing the ANT and STIN approach – even technologies such as web pages, mobile phones, computers, internet domains, servers and so on. In contrast with this broad definition of a social network, various

researchers have proposed a more detailed formal description of a social network. For instance, Stalder (2006, 180) explains:

A network is an enduring pattern of interaction among heterogeneous actors that define one another (identity). They coordinate themselves on the basis of common protocols, values and goals (process). A network reacts nondeterministically to the self-selected external influences, thus not simply representing the environment but actively creating it (interdependence). Key properties of a network are emergent from these processes unfolding over time, rather than determined by any of its elements (emergence).

In other words, Stalder (2006) suggests that a social network can be defined along four dimensions: (1) identity which emerges out a stabilization of interactions between network members; (2) processes that represent the common goals or values which hold the network nodes together; (3) forms and types of interdependence which evolve between the network members; (4) the characteristics of the structures that emerge out of the interactions among the network nodes. Such conceptualization provides a better framework to identify the structural characteristics of a social network. Nevertheless, it still does not specify which members of a selected population should be defined as nodes and, thereby, be included in a network analysis – Laumann et al. (1983) refer to this question as the *boundary specification problem*.

In social network analysis there are two main approaches to study social networks and, consequently, to deal with the boundary specification problem (Wasserman and Galaskiewicz 1994). On one hand, the *whole network* approach views a network as a matrix of all of the ties containing specified relations in a defined population. Usually, the members of a whole network (also known as complete network) are defined on the basis of some formal criterion of population boundaries that might be related with the membership in a formal group, association, organization or institution. The relations among the network units can be determined in different ways; for example, in the terms of a membership, information flows, interactions, exchange of material and immaterial resources, biological relations and so on. The whole network approach is interested in both the presence and absence of relations among all network members, therefore, in the context of organizational or communication research, the whole network data are collected with the help of survey instruments which



include a roster of all potential network members; respondents being ask to mark a relation with every network member.

On the other hand, the *personal network* approach (also known as egocentered network approach) views networks from the position of a focal individual (ego) who is linked with his/her network members (alters) (Wasserman and Galaskiewicz 1994). In contrast with whole network approach, in the analysis of personal networks (also known as egocentered networks) the researcher is not interested in the relations between the focal individuals, but only in the relations between the focal individual and his/her network members. These relations can be one-dimensional (e.g., an alter can be a friend of the focal individual) or multiplex (e.g., an alter can be a friend and at the same time a colleague of the focal individual). The personal network approach proved to be useful especially when the boundaries of the population are difficult to set out because of the size of other characteristics the network (Laumann et al. 1983).

Various analytical approaches exist to define relations among the members of an egocentered network. Van Sonderen et al. (1990), for instance, have identified a three-fold typology of determining relations between the ego and his/her alters in an egocentered network: (1) the *exchange approach* is based upon the idea of interaction between network members. Interactions might include different kinds of action such a writing, talking, helping, supporting, etc.; (2) the *affective approach* is focused on idea of emotional closeness which is based on network members' feelings for other persons; (3) the *role-relation approach* defines the relations between network members in accordance with the particular formally-defined position or social role of network members in a selected social context (e.g., partner, friend, colleague, sibling).

In accordance with the different definitions of relations two different conceptualizations of personal networks have appeared in social network literature. On one hand, researchers (Antonucci 1985; Antonucci and Akiyama 1987; Boissevain 1968; Kahn and Antonucci 1981) understand relations in a personal network in terms of emotional closeness and define it as a set of concentric circles which represent the ego's extended, social, and intimate network. The suggestion here is that the focal individual (also known as ego), who is in the center of the network, nourishes qualitatively different relations with network members (also

known as alters) from different concentric circles. The extended network represents weak, shallow, and passing relationship with persons toward whom the focal individual does not feel very close. The social network involves more stable relationships with persons to whom the focal individual feels at least somewhat close. These ties are supportive and might be activated from time to time. Moreover, they provide specialized support and are generally role dependent (Antonucci 1985). Finally, the inner or core circle involves those persons toward whom the ego feels very close. These relationships are the most stable, supportive, and multiplex (i.e., providing different kinds of social support), being less dependent on role relationships and less likely to change over time. Consequently, the inner circle is related to close confidants such as parents, partners, children, siblings, and close friends. As for the middle circle, it involves mainly extended kin and friends, while the extended network is characterized mostly by neighbors, colleagues, workmates, and acquaintances.

The affective approach is closely related to notion of *tie strength*. Granovetter (1973) recognizes emotional closeness as one of the three dimensions of tie strength. More precisely, for him tie strength can be seen as a "... combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (Granovetter 1973, 1361). Drawing on this definition, he presented a three-fold typology of social ties including strong ties, weak ties, and absent ties. As regards absent ties they are generally connected to "the lack of any relationship and ties without substantial significance" (Granovetter 1973, 1361) such as strangers or people with whom the ego interacts but without any feeling of commitment or reciprocity. By contrast, strong ties include usually most intimate relationships with close family members or close friends which are mutually reciprocal and supportive (see Table 5.1), whilst weak ties include people who the ego know a bit but are not very close to him/her such as acquaintances, work colleagues and association members.

In spite of their emotional remoteness, lack of frequent interaction and mutual obligations, weak ties can, nevertheless, be extremely important in ego's life, because they live in and visit different social circles from the ego, thus, having access to different experiences, contacts, social and economic resources as well as knowledge and information. In addition, Granovetter (1973, 1378) in his *strength of weak ties* argument observes that weak ties are "indispensable to individuals' opportunities and to their integration into communities," as

opposed to “strong ties that can breed local cohesion and lead to overall social fragmentation.” A suggestion shared also by Friedkin (2004, 418) who argues that “social cohesion does not require small networks, high density networks, or networks based on strong interpersonal ties.” In fact, he claims that if the social network has particular structural characteristics, even large, complex, and differentiated networks with lots of indirect and weak ties may be cohesive.<sup>30</sup>

**Table 5.1: Differences associated with the strength of ties**

<i>weak ties</i>	<i>strong ties</i>
Acquaintances, casual contacts, others in an organization	Friends, close friends, co-workers, team-mates
Tend to be unlike each other	Tend to be like each other
Travel in different social circles	Travel in the same social circles
	Experience, information, attitudes and resources, contacts come from same pool
<i>resource and information exchanges</i>	<i>resource and information exchanges</i>
Infrequent, primarily instrumental	Frequent, multiple types: emotional as well as instrumental
Share few types of information or support	High level of intimacy, self-disclosure
Low motivation to share information, resources, etc.	Reciprocity in exchanges
<i>strength of weak ties</i>	<i>strength of strong ties</i>
Experience, information, attitudes, resources, and contacts comes from different social spheres	High motivation to share what resources they have

Source: Haythornthwaite (2005, 128)

Besides the differences between strong and weak ties which have been mentioned in the previous paragraph, the large amount of social network research has explored other characteristic of these two groups of ties (for an overview see Granovetter 1973; Lin 2002; Wasserman and Faust 1994). The Table 5.1 (reported from Haythornthwaite 2005, 128) summarizes some of the general findings which are relevant for this study.

<sup>30</sup> Interestingly, in recent research that captured the mobile phone interaction patterns of a society-wide communication network, Onnela et al. (2007) found support for these predictions. In fact, their study shows that in a mobile communication network, tie strengths correlate with the local network structure around the tie, as well as that weak “mobile” ties appear to be crucial for maintaining the network’s structural integrity, yet strong ties have an important role in maintaining local communities (i.e., the removal of weak ties breaks the network apart, while the removal of strong ties only locally disintegrates a community).

The second conceptualization of egocentered networks is based on the understanding of the relations as interactions. Here a personal network is seen as social structure through which social support – in terms of exchange – is provided (Vaux 1988). In the literature many different definitions of social support can be found (for an overview see Hinson Langford et al. 1997; Vaux 1988) and as Tanis (2007, 140) notes, “It is impossible to find a generally accepted definition.” Broadly, social support has been defined as a form of tangible and intangible assistance given to others, especially individuals (Hinson Langford et al. 1997, 95), while Albrecht and Adelman (1987, 19) define it as the “communication between recipients and providers that reduces uncertainty about the situation, the self, the other or the relationship and functions to enhance a perception of control in one’s life experience.” Besides this general definition, the research on social support networks provides us with many diverse definitions and conceptualizations of social support (for an overview see Hlebec and Kogovšek 2006; Vaux 1988). As to attempt a thorough review would be beyond the scope of this section, let us briefly mention only that social support is a multidimensional concept, which can be according to Burt (1984) and Cohen and Wills (1985) – see also Hlebec and Kogovšek (2004) – divided in four main groups: *instrumental (material) support*, *informational support*, *emotional support*, and *the support in terms of socializing*. Instrumental support is defined as the provision and exchange of tangible goods, services, or aid (House 1981; Tilden and Weinert 1987). Instrumental support can take different forms from the financial help to other forms of concrete assistance such as performing assigned work for others, running errands, providing goods and services. Informational support is defined as the necessary knowledge and skills provided to others in order to resolve various problems and stressful situations (House 1981). It may include practical advice, health information, and information on legal issues, medical treatments or job opportunities and so on. Emotional support, according to House (1981), refers to the provision of empathy, love, trust and caring. He argues that emotional support is the most important category through which individuals perceive the supportive dimension of personal relationships. In addition, scholars underline other dimensions of emotional support such as mutual obligation and reciprocal exchange (Cobb 1976) and empathy (Levenson and Ruef 1992). Finally, socializing (also known as social companionship) involves a broad range of social and cultural practices that aim at interacting for social purposes. This might include visiting

family, friends, colleagues, attending concerts, theater, cinema, making trips, or simply eating out or chatting with neighbors (Hlebec and Kogovšek 2006).

Both conceptual definitions of personal networks are used in the empirical part of this study. However, before discussing the research framework employed in this study, we will take some time to illustrate some of the possible changes that according to network sociologists have transformed the role of personal network in society as well as the structural characteristics of personal networks. As stated above, this should help us to identify and make sense of the possible ways in which new communication technologies have contributed to these processes.

## 5.2 PERSONAL NETWORKS AND THE NETWORKED INDIVIDUALISM: FROM CONCENTRIC CIRCLES TO PERSONAL COMMUNITIES

In sociological theories which deal with the organization of personal relationship in contemporary societies the notion social network often takes a central position in explaining the character of structures and processes occurring in relation with new communication technologies (Stalder 2006; Webster 2002; Willson 2010). These approaches generally suggests that communication technologies, and in particular ICTs, have accentuated the networked structure of social connectivity putting networks in a structural different position according to other institutional forms such as family, kinship, community, working organizations, civic associations and so on.<sup>31</sup> As Castells (1996) notes these changes have occurred at various social levels, leading to qualitatively and quantitatively structural forms which have had different implications for the organization of social relations. Due to our focus on personal networks we lay out the major elements of two congruent accounts that are in our humble opinion highly significant for understanding the central position of personal networks in contemporary sociality. On one hand, the arguments developed by Pescosolido and Rubin (2000) are important because they show how with the emergence and growth of modernity the normative position of social networks<sup>32</sup> has acquired a different position in

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<sup>31</sup> For a critical overview of these ideas see Willson (2010).

<sup>32</sup> Pescosolido and Rubin (2000) use different terms when referring to the notion of network (i.e., network structure, network form, network profile, social network structure, social network, ego network). However,

relation to traditional institutional forms. On the other hand, Wellman's notion of personal community is helpful in tracing the pathways of possible transformations *within* the personal networks.

Pescosolido and Rubin (2000) core argument is that personal networks are not an outcome of the information age or network society but rather an outcome of long-lasting historical development of modernity that has changed their position with reference to other institutional forms of modernity. Drawing on the basic network forms that Simmel introduced in his analysis they develop a conceptual framework that distinguishes three ideal types of network structures, which characterized the development of social connectivity in modern history: the *concentric circles*, the *intersecting circles*, and the *spoke structure*. They suggest that these concepts can be useful in explaining how the formation of social networks has changed with the advent of modernity.

According to Pescosolido and Rubin (2000) concentric circles refer to traditional or premodern forms of social network formation. They are organized around place-based geographic "reference points" which determine the individuals involvement in local institutional forms and structures. These structures are organized in such a way that networks embedded in low-level structures are fully enveloped into high-level contexts (see Figure 5.1). In other words, concentric circles represent a "total environment" in which social networks are enveloped into "overlapping" and "redundant" settings (Pescosolido and Rubin 2000, 55). However, the concentric nature of social network structures does not preclude diversity within social networks. According to the authors "... a social circle can have many or few relations (i.e., number of ties), and there can be areas of the social circle in which network ties are dense (e.g., the ties are closer together)..." (Pescosolido and Rubin 2000, 55). This means, that the concentric nature of social circles does not put all individuals in an equal position within that structure. Consequently, individuals can have a more or less advantageous arrangement in terms of their access to social resources. Further, the concentric organization of personal networks brings about a series of implications for the position of the

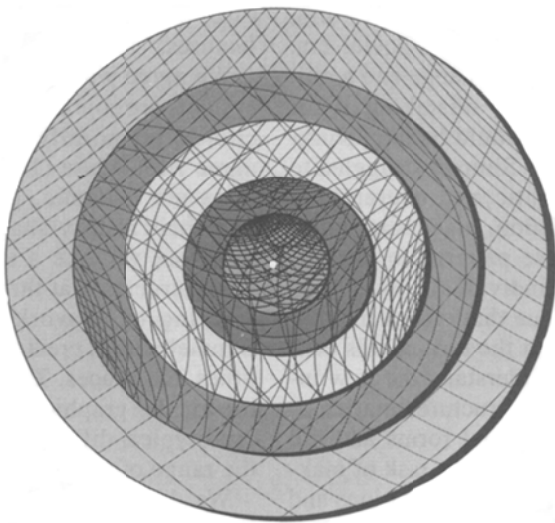
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considering their arguments and the central position they give to the individual in these network structures, it is safe to deduce that they are actually talking about what in social network theory is defined as an egocentered or personal network.

individual in relation to the social structure. Among the most important are: a demand for high level of commitment and loyalty, a high level of social safety in terms of social support and solidarity at the expense of a low level of individuality.

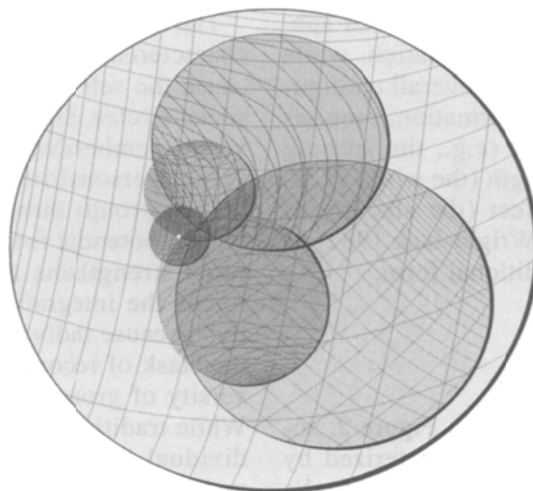
By contrast, the modern forms of network formation or intersecting circles allow a higher level of individualization and diversity since “Social circles do not necessarily overlap, but represent spheres of activity in which membership may be chosen (e.g., work) or inherited (family)” (Pescosolido and Rubin 2000, 56; see Figure 5.2). They are characterized by an accentuated “element of choice” which leads to, “The unique configuration of membership in social circles, their number, and their degree of overlap define the individual socially. Singular social institutions move from their earlier dominance over individual and community life” (Pescosolido and Rubin 2000, 57). Yet this does not mean that the “element of choice” is unlimited and independent from social structures in which the individual is embedded. Social circles still shape the individual’s opportunities to access social resources and to make connections with new environments. Nevertheless, in comparison with concentric circles the intersecting circles heighten processes of network formation which place more emphasis on information and choice, rather than on kinship and place, whereby creating forms of trust and solidarity that rest on abstract systems. Unavoidably, the lessening of traditional reference points brings about negative implications which are according to Pescosolido and Rubin (2000) related to the following categories: weaker social support networks, less pronounced solidarity structures on the community level, and higher uncertainty regarding the social and personal identity of the individual.

**Figure 5.1: Concentric circles.**



Source: Pescosolido and Rubin (2000, 54)

**Figure 5.2: Intersecting circles.**

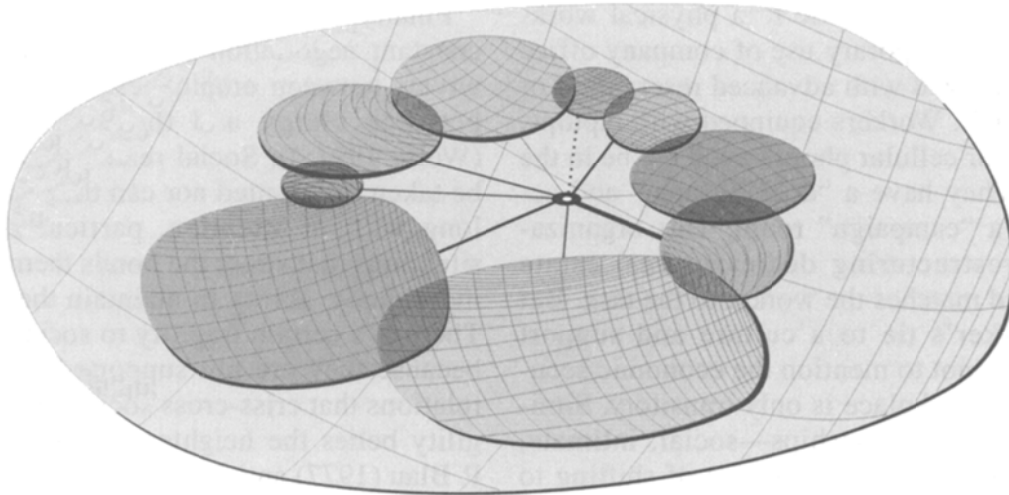


Source: Pescosolido and Rubin (2000, 55)

Finally, Pescosolido and Rubin (2000) argue that the postmodern turn in organization of social relations has reconfigured the institutional and individual basis of social networks into a spoke structure, which is placed into an elliptical space resulting “... from the presence of connected but distinct social circles with some circles only loosely bound” (Pescosolido and Rubin 2000, 65; see Figure 5.3). The distinctive characteristics of the spoke structure are as follows: (1) individuals stand out of the social circles which do not necessary overlap but can only loosely connected through the individual who has a bridging position in the spoke structure; (2) connections between the individual and surrounding circles are contingent and flexible or as the authors explain: “... the basis for this network structure lies in the recognition that, in this era, social life is based on serial, ephemeral, short-term, contingent relationships with comparably limited contracts” (Pescosolido and Rubin 2000, 63). In contrast with concentric and intersecting circles an important part of relations in the spoke structure is indirect and technologically-mediated; (3) the individual becomes central for the integration of social structures as they often represent the only link between social realms that would otherwise not have been connected; (4) the geographical reference point of social networks that are formed within the spoke structure is neither the local community nor the national state, but the “global village” (Pescosolido and Rubin 2000, 65). Accordingly, social ties become even more spread in space, which facilitates a further diversification of social networks.



**Figure 5.3: Spoke structure**



Source: Pescosolido and Rubin (2000, 63)

The authors discuss several implications of the spoke structure in terms of personal relationships. In particular, they find that individuals are enabled to change or redefine their position within the social world in accordance with their subjective understanding, experience, expectations, and entitlement. They benefit from a more empowered and flexible position in conducting social interactions as well as in developing personal and social identity. This means that interactions and relationships are spread across different regions of actions, involving a wide network of weak ties. The latter have an increasing role in the provision of social support and personal well-being. Yet, they also imply a more active role of the individual in nursing and reaffirming the personal bonds since “Social relations can neither be taken for granted nor can they survive for long without attention ...” (Pescosolido and Rubin 2000, 64). In addition, it not only the weak ties that are under flux but also the whole network structure becomes more fragile because it is not “... supported by webs of relations that crisscross social life” (Pescosolido and Rubin 2000, 64). The accentuated negotiation of social roles across various contexts is an additional burden the spoke structure puts on the individual. Under such conditions, the social inequalities might also become more brought out since not all individuals have the required flexibility, knowledge, motivation, and adaptability which are needed to cope with a multiplicity of social contexts. The authors, thus, observe that with the institutionalization of the spoke structure “... the rich might get richer”, in particular the ones who “... are resource rich, and those on the cutting edge of societal developments (e.g., technology)” (Pescosolido and Rubin 2000, 65). All together,

these developments might lead to decentralizing tendency which according to Pescosolido and Rubin (2000, 64-65), "... increases the inability to integrate the whole individual, social group, or society," and consequently, "... increases the potential for alienation, isolation, and fragmentation."

The theme of social integration is precisely the focus and preoccupation of the so called *community question* which gave to Wellman and Leighton (1979) the occasion for outlining the concept of *personal community*.<sup>33</sup> The community question refers to the study "... of how large-scale social systemic divisions of labor affect the organization and content of primary ties" (Wellman 1979, 1201). The authors suggest that in the past three conceptual arguments have evolved in (urban) sociology in relation to this question: *the community lost*, *the community saved* and *the community liberated* argument.

The proponents of the community lost argument suggest that the primary ties which used to exist in neighborhoods or spatially-based communities have been gradually dissolved with the advance of the industrial revolution and bureaucratic structures in the Western societies. Various scholars have listed a number of concurrent factors that appear to be structurally related to this process: the advance of the national state; the development of bureaucratic institutions that have undertaken some of the social and organization functions that used to be in the domain of the family and community; the urbanization and growth of cities that resulted in a higher population density and heterogeneity; the development of transport and telecommunication infrastructure which facilitates contacts with social environments and people outside the most inner circle. According to Wellman (1979) the proponents of the community lost argument have seen in the development of personal networks a possible threat for the cohesiveness and solidarity of locally-based communities. In their opinion, more narrowly defined, weak, fragmented and often dyadic social ties are not capable of providing a suitable basis for the maintenance of communal solidarities. To recap, the community lost argument suggests a sort of a general decline of relationships between people.

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<sup>33</sup> According to Lugano (2010) the notion of personal community was introduced into sociological discourse by Henry (1958).

Since little support has been found in empirical research for the suggestions advanced by the proponents of the community lost argument, many (urban) sociologists have expressed skepticism to the potential dissolution of locally-based solidarities (Wellman 1979; Wellman and Leighton 1979). In fact, the community saved argument argues that regardless of various industrial and bureaucratic process neighborhoods still remain the center of community life in modern cities. Despite of the reorganization of personal networks and a gradual disembeddedness of personal networks, primary ties remain important resources of a range of social support, which cannot be replaced by the governmental and public institutions. Wellman (1979, 1205), in fact, explains that members of personal networks are "... often important sources of assistance in mediating with formal bureaucratic structures and in coping with contingencies." Drawing on the empirical studies on the cohesive and solidarity structures in contemporary urban environments the proponents of the community saved argument conclude that the organization of supportive and solidarity structures that were once characteristic of a neighborhood might have changed, yet this does not mean that they have been dissolved. Strong and supportive ties still exist in these settings and, despite their larger size and smaller density personal networks, represent a foundation for collective action and mobilization.

The community liberated argument emerged as a response to the community lost and saved argument. Although it assumes that the primary ties have not been dissolved with the advent of urbanization and modernization of societies, it also contends that the urban communities are not anymore tied to neighborhood but they are rather organized as personal networks. The increasing social mobility and spatial mobility, the advance of transportation and communication means, and the separation of residence, workplace and kinship groups have contributed to a partial dissolution of place-based solidarity and to the liberation of personal network from the neighborhood community. Individuals have become embedded in different networks with social ties that range from weak to strong. Hence, the personal networks are loosely bounded, more spatially dispersed and heterogeneous. Yet, according to Wellman (1979) this does not mean that they are not supportive. In fact, they provided the basis for a

new kind of social solidarity which is not place-based, but rather relies on the mobilization of social resources on a personal network basis. As Wellman (1979, 1207) explains:<sup>34</sup>

Obtaining resources through such a sparsely knit network is not a matter of obligations due to a member of a solidarity. Instead, it is a matter of a quality of the particular dyadic ties, the ease of maintaining contact, the ability of network members to provide indirect connections to additional resources, the extent to which additional members of a network can be mobilized to provide assistance, and the connectivity between networks.

In other words, the key suggestion of the liberated argument to the community question is that community has experienced since the industrial revolution, “a shift away from communities based on small-group-like villages and neighborhoods and towards flexible partial communities based on networked households and individuals” (Wellman et al. 2003). In advancing the notion of personal communities Wellman and his colleagues (e.g., Chua et al. 2011; Wellman 2002; Wellman and Berkowitz 1988; Wellman and Gulia 1999; Wellman and Haythornthwaite 2002; Wellman et al. 2003), however, do not contend that personal communities are an “exclusive” outcome of modernization.<sup>35</sup> Quite the contrary, personal communities have always existed in society, yet what has changed are their structural characteristics (Chua et al. 2011).

For Wellman (2001), the historical trajectory of personal community transformation can be observed through a comparison of three ideal types which reflect the changes in the modes and forms of connecting between individuals in personal communities. The first type, “little boxes” (Wellman 2002), denotes the organization of human associations which are based on door-to-door interactions. In other words, the personal networks that existed in such kind of communities were spatially determined by “a common sense of place” (Tönnies 1887/1988),

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<sup>34</sup> See also Wellman and Leighton (1979).

<sup>35</sup> This is one of points which distinguish the notion of personal community from the notion of *Gemeinschaft* (Tönnies 1887/1988). Tönnies, in fact, concluded that urban environments are characterized by a low level of mutual solidarity, which stems from the sense of common place. Thus, in the urban environment, according to Tönnies, one cannot talk about communities in the traditional sense, but only of networked forms of human association, which serve the individual to gratify their partial and self-oriented needs. Conversely, Wellman (2001) suggests that also “networked” communities can be cohesive and supportive, yet the institutional and normative forms through this solidarity can be achieved have been reorganized.

which is rooted on mutual solidarity among the members who share a common geographical location. According to Wellman (2001) this form of personal communities was especially prevalent before the advent of transport means and the landline telephone. In fact, as he shows in his writings, the proliferation of transportation means such as trains, cars, ships and the landline telephone signed a beginning of a new mode of social connectivity that were still place-based but not necessary spatially bounded. Wellman (2001) calls this second ideal type of social connectivity in personal communities, “glocalization”. Glocalization has several implications for the structural characteristic of personal networks. For example, among other things, Wellman (2001) mentions that glocalization fosters a partial privatization of personal network since people are more apt to interact in small groups in private homes rather than in larger groups in public spaces. Second, physical proximity does not necessary lead to social closeness, while geographical distance not necessary obviates the maintenance of personal relationships and the existence of a sense of belonging to a social group – see Webber’s (1963) notion of “community without propinquity”. Third, individual agency becomes more important because “... place-to-place connectivity creates a more fluid system for accessing resources – material, cognitive and influential” (Wellman 2001, 237). In order to have access to different resources people have to have the capacity to switch among different networks, which are spatially and temporary dispersed. Lastly, place-to-place connectivity underlines the increased importance of ego’s structural position in different networks. Unlike in the door-to-door settings where the structural position of each network member has been defined by its geographical location, glocalization fosters an organization of social connectivity based on social and cultural structures where forms of belonging are closely tied to different modes of communication<sup>36</sup> or as Delanty (2003, 188) explains: “The ways of belonging differ from group ties in the past in that they are characterized by a stronger communicative component.”

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<sup>36</sup> The contextual/communicative facet of new modes of social connectivity is taken up also by Wittel (2001), who – when discussing the notion of network sociality as a late modern form of social connectivity (for more details see Section 5.3) – points out that in technologically mediated social interactions due to the absence of contextual cues the interlocutors have to be able to establish a shared contextual experience. In his words: “To mention briefly the most important difference, any online communication lacks a common and mutual perception of the context. *Online sociality cannot rely on exogenous (external) or contextual forms of structuration* [italics added by A.P.]. Thus, any structuration of sociality has to be produced endogenously (internally) by the participants” (Wittel 2001, 63).

For Wellman, with this communicative component being increasingly important the individual agency and action in personal communities becomes more pronounced to the point that “Each person is the operator his/her personal community network” (Wellman 2001, 247).

Such “person-to-person” connectivity creates a unique pattern of sociality that Wellman (2001) calls *networked individualism*. It is characterized by a network structure in which “Each person is a switchboard, between ties and networks. People remain connected, but as individuals, rather than being rooted in the home bases of work unit and household. Each person operates a separate personal community network, and switches rapidly among multiple sub-networks” (Wellman et al. 2003). The personal communities, thus, take a different shape, being “... better understood as networks of sociability, with a variable geometry and changing composition according to the evolving interests of social actors and to the shape of the network itself” (Castells 2001, 130). Yet, what is central for this new organization of networked relations are the personal communication technologies which enable and enhance multiple social connections by minimizing some temporal and spatial constraints. In contrast with transportation means and the landline telephone, which have been associated with the advancement of place-to-place connectivity, mobile phones and the Internet provide “an appropriate material support” (Castells 2001, 131) for the spread of highly individualized modes of connectivity or as Wellman et al. (2003) observe: “People remain connected, but as individuals, rather than being rooted in the home bases of work unit and household.”

Yet, the individualization of personal connectivity does not necessary impede a formation of mutually supportive and reciprocal personal communities. Even though in these personal networks support, social resources, and a sense of belonging are provided separately to each individual: “This is neither a *prima facie* loss nor gain in community, but rather a complex, fundamental transformation in the nature of community” (Wellman et al. 2003). In other words, the individualized nature of social connectivity, described by Wellman and his colleagues, should not be understood in postmodern terms (associating individualism with a direct decrease in social cohesion and solidarity) but rather as part of the late modern argument which sees individualization (Beck and Beck-Gernsheim 2002; Giddens 1991) as a new structural principle of social relations. Put it differently, networked individualism demands from the individual a more active involvement in establishing and cultivating

resourceful relationships. This might create a dissonance between his/her security and individual risks. These dissonance might lead to positive outcomes for the individual as and/or of the entire social environment in which they live. Yet, as the individual is becoming more and more freed from the traditional communal structures networked individualism can also enhance the possibilities of individual risks. Beck (1992) lists various social articulations of individual risks when referring to the changing role of the family (which is, interestingly, taken by Castells (2001, 132) as an example where the "... practice of networked individualism may be redefining the boundaries and meaning of traditional institutions of sociality."). For instance, Beck argues that the support networks of family have been increasingly replaced by one's personal ability to develop personal support networks. The same holds true for the individual's economic security: once provided by the nuclear or extended family, today it rests on shoulders of the individual and their responsibility.

### 5.3 DIGITAL SOCIALITY OR DIGITAL SOCIALITIES?

Yet, networked individualism is not the only form of person-to-persona sociality that has been – at least implicitly – linked to idea of the “digitalization” or “informatization” of personal communities. Andreas Wittel (2001) suggests that *network sociality* is developing within increasingly networked social realms that rest on the technological meditation of interpersonal relationships. He introduces network sociality to describe the practices and experience of new media and economy consultants who perceive networking and personal relationships as an increasing important way of “production” and “reproduction” of social relationships (Wittel 2001, 52). In fact, Wittel suggests that such practices and experiences have reached a level of formalization and institutionalization, which made them associated also with the general “middle class” and “postindustrial” milieu of everyday life.

But what precisely is captured in the notion of network sociality? The author argues that network sociality can be described along four dimensions (see Wittel 2001, 65-69): (1) network sociality is framed by individualization processes, in that people actively construct social bonds, having experienced less historically prescribed social forms and commitments and higher levels of geographical mobility and trans-local communications; (2) network nodes are connected through ephemeral, transient, contingent, but intense, focused, fast, and overloaded social ties, which extend weak ties; (3) it is based less on a shared (institutional)

history of interacting subjects and more on their common interests, goals, and objectives (what is important is the peculiarity of the interactional situation, of what information each interlocutor can quickly exchange, and the active production of trust); and (4) this sociality is also a “sociality with objects” since it is deeply embedded in new communication technologies, including Internet-based communication services such as e-mail, online communities, and web sites, as well as mobile communication technologies such as notebooks and mobile phones.

As explained earlier in Chapter 4, with mobile communication expanding the communication forum as a network of unlimited time and space interactions (Pajnik 2007), social ties not only extend through time and space and are organized as networks but also become parts of novel forms of connectedness (e.g., “connected” presence, “always on” connectivity, absent presence) which span across a plurality of private and public spaces. For Meyrowitz (2005) such relational repertoires give to networked modes of sociality a mobile dimension.

Mascheroni (2007) contends that with the convergence of social uses of mobile telephony with other new media (such as web forums, social network sites, microblogging services), personal relationships are reshaped and activated through reconfigurations of social and spatial co-presence she calls *mobile sociality*. Individuals equipped with mobile communication devices, besides establishing networked forms of sociality, also create and maintain “... mobile spaces of sociality founded on a complex intersection of in-person interaction and mediated communication, co-presence and virtual proximity, corporeal travel and virtual mobilities” (Mascheroni 2007, 527). Rheingold (2002) places these processes into a broader institutional framework, arguing that mobile communications leads to the creation of new network structures that are called “mobile virtual communities” and a mix of interactive features of mobile communication and virtual communities. In a general way, mobile virtual communities are according to Rheingold (2002) characterized by the following features: (1) electronically mediated communication based on the integration of various interactive technologies, which takes place between several people at once, regardless of their spatial and temporal separation; (2) individuals coordinate their actions and activities of their networks in geographic space. Although in this way they can mobilize a large number of ties and large networks, most mobile virtual communities are limited small cliques; (3) mobile communication between individuals is associated with different realms of everyday life.



Mobile virtual communities may include professional, social or personal networks, as well as they can be part of larger political or civic society movements.

Nevertheless, such patterns of social connectivity are mostly limited to the most intimate circles of social ties, thus, constituting what Matsuda (2005) refers to as *selective sociality* in order to stress the *personal choice* as a factor in interpersonal relations and in family relation in particular. She explains that "... through *keitai* [jap. mobile phone] ... one fixes appointments and reduces chance encounters and spontaneous gatherings. Now people must always make conscious choices of whom to call and meet. *Keitai*, or more accurately, the *keitai* use of Japanese youth increases the opportunities to choose their relationships" (Matsuda 2005, 134). In addition, what Matsuda observes is that for the Japanese youth mobile phone voice calling and text messaging with the closes friends and family represents a reassuring routine. That is why mobile and selective socialities are gaining grounds in late modernity (Ling 2008). In Giddens's words, the Internet, the mobile phones, and other ICTs have accentuated the "pure" character of (personal) relationships, enabling the establishing and maintenance of interpersonal trust and intimacy that is need in order for these relationships to be supportive.

These notions indicate that the digital sociality consists of many diverse modes and forms of personal relating. Hence, it should not be understood as an undiversified but rather as a multilayered and multidimensional phenomenon, which finds it expression in a variety of social forms. In other words, we cannot reduce all forms of social connectivity to "a single model of sociability" (Ito et al. 2005, 51). Instead of speaking about digital *sociality* we should rather refer to this variety of phenomena as digital *socialities*. However, regardless of this plurality of social practices and experiences that are unique to different forms of digital socialities, a common trend toward person-to-person organization of social connectivity can be noted in all these forms, which are according to Wellman (2010) typical of personal communities (see also Pescosolido and Rubin 2000). Unlike in the past when personal communities were spatially-based, closely knit and broadly based, in recent years they have acquired a more flexible structure and an increasingly differentiated character. The most important characteristic attributes of contemporary personal communities are the following (see Chua et al. 2011; Wellman 2001): (1) focused, ephemeral, and intense social ties that are specialized in their resources for an individual; (2) sparsely knit, loosely linked social

connectedness; and (3) a move from locally embedded social ties to geographically dispersed networks (Wellman 2001). Consequently, interactions span across different social contexts, people are involved in various groups with less solid boundaries, and social resources are exchanged among multiple networks (Chua et al. 2011); (4) they involve a selected group of ties, which are more homogenous than a random distribution would predict. This means, that the focal individual and his/her network members have similar attributes in terms of class, race, life-styles, tastes, and other cultural interests (although this does not mean that individuals do not meet other persons from different social, cultural, etc. backgrounds); (5) finally, the structural characteristics of personal communities are highly dependent on the ego's social location, which is determined by their gender, age, education, social role, marital status, class, race, occupation, socio-economic profile and so on (for a detailed review see Chua et al. 2011).

It appears that personal communities as egocentered networks which are embedded in wide array of technologically-mediated social interactions have made more pronounced the mobile, individualized, self-reflexive, selective, and personalized aspect of late modern sociality. However, this does not necessarily mean that personal communities do not include mechanisms of cohesiveness, solidarity and social support (for a review of empirical evidence in this respect see Section 5.4). For Pahl and Spencer (2006) the phrase "personal community" in itself points to a paradoxically relationship as it connects elements of social structure that have been conceived in classical sociology as *opposing* forces in social order assessment (e.g., Bauman 2000; Lasch 1978; Slater 1970; Tönnies 1887/1988). For example, Bauman sees the rise of individualization as a potential threat to the communal nature of societal forms that once existed in the so called traditional society. He explains that by arguing that in liquid modernity, where the individualistic nature of human autonomy is expressed through the power of choice (see also Salecl 2010), long-term commitments and long-term engagement are rare to expect. Nevertheless, as Delanty (2003) suggests such a view draws on a "romantic" conception of the territorially based and small-scale community, which nowadays certainly is not the only form that provides a sense of belonging to the individual. Under the circumstances of (late) modern life, he observes:

That community is not the opposite to individualism in might be illustrated by the fact that participation in many kinds of community requires highly individualized egos who are willing

to support collective goals and values. Community is today a product of modernity, not of a premodern traditional world. It presumes individualism, resilience, and a certain reflexivity by which the boundaries between the self and other are less significant in the making of community (Delanty 2003, 189-190).

Not surprisingly, it is precisely in the dispute about the future of community in late modernity that initially fueled the research about the role of technologically mediated communication in contemporary sociality. The following section summarizes the key findings of this work.

#### 5.4 DIGITAL SOCIALITIES AND PERSONAL NETWORKS: AN OVERVIEW OF EMPIRICAL EVIDENCE

Scholarly discussions dealing with the role of ICTs in social connectivity, social interactions and personal networks are actually implicitly present throughout the history of the research on social aspects of CMC (Rice et al. 2007). Since the early 1990s, when research was focused on exploring e-mail, USENET news groups, MUDs, MOOs, and similar virtual communities (e.g., Baym 2000; Jones 1994; Rheingold 1993; Turkle 1995), to present research focused on social network sites such as Facebook (e.g., boyd and Ellison 2007; Steinfield et al. 2008; Subrahmanyam et al. 2008) the social connectivity issue has appeared in the focus of new media research scrutiny. For parsimony, we could think of this research as evolving through two consecutive phases: the first phase being concerned with the question of whether online sociability is dismissing offline sociability and the second phase studying the potential reorganization of social connectivity in terms of the structural characteristics of social networks between ICTs users and non-users. This section aims to present a brief overview of the empirical evidence gleaned from studies carried out in both phases. However, before turning to the overview we briefly discuss the socio-historical background that led to the emergence of the two research phases.

##### 5.4.1 *The socio-historical context of social connectivity research*

The relation between social connectivity and ICTs has been a matter of academic debates for more than two decades now. Its beginning is located at the end of the 1980s when email and first online community services were massively taken up by internet users. This was precisely the time when the postmodern claim gave an important impetus to sociological discussions about the bearing of individualization and globalization on social relations. The postmodern approaches often highlight the negative effects of post-industrial, individualized, and

globalized social relations on social integration (see Heaphy 2007). Thus, early social science reflections of CMC and online communities represent a kind of response to these broader social circumstances, making it possible to divide them into two streams of thinking about the affordances of CMC for social connectivity.

On the one hand, writers, scholars and researchers – with Howard Rheingold (1993) being the most known among them – understand CMC and online communities as an opportunity to stop the collapse of social fabric both on local and global level. They talk about the development of better, more democratic, more tolerant and more cohesive society coming out of the rise of internet technology. For example, in these writings online community is shown as part of a “virtual-technological revolution” (Oblak 2000, 1054), which will reduce social inequalities, fuel the revitalization of a participatory culture and community organization, thereby, representing a counterbalance to the postmodern condition of “anomic reality” in contemporary society (Etzioni and Etzioni 1997).

On the other hand, a group of scholars presents a substantially different interpretation of the postmodern condition. They argue that online communities and the Internet in general correspond to a radicalization of the individualistic and postmodernist logic of social order. In this respect, the most discussed thesis was put forward by Sherry Turkle (1995). For her internet users are embodiments of egocentric, strategically-oriented individuals, who under the pretense of anonymity are looking online for their “second-self” that should gratify their selfish motives. Even though Turkle believes that people meet and connect online with sincere proposes, she also suggests that their intention is not to create lasting mutually-supportive bonds, based on sincerity, reciprocity, trust and solidarity, but rather to instantly satisfy their individual desires and needs. A similar understanding of the online social structures is contented by Porter (1997). For him online community is a *virtual* space wherein individuals draw manifold, anonymous, volatile, changing personal *identities* as opposed to a recognizable, rational, stable and autonomous character of their offline social *identity*.<sup>37</sup>

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<sup>37</sup> The contrast between the volatile nature of virtual identities and stable structure of social identity is very insightfully presented in Slevin's evaluation of Bauman's typology of four types of postmodern life strategies and personalities, namely the stroller, the vagabond, the tourist, and the player. Slevin draws on this four-tier typology in order to present a criticism of the postmodern argument in internet research by showing that the

The postmodern interpretation of the social consequences of the enlargement of Internet technologies has culminated in Putnam's (2000) view of the relationship between the Internet and social capital. As previously noted in Section 3.4 the author draws parallels between the attraction of the apparent freedom of cyberspace and the empirical evidence suggesting a withdrawal of individual into the private sphere, taking place in the post-war modernization of the United States. The decline in social participation in the form of civic society initiatives, reduced social cohesion and increased social isolation as reflected in the reduction of the size of personal networks of Americans can be according to Putnam (2000) directly associated that Internet technology, which with its time and space affordances pulls the individual out of the local (public) environment, reducing socialization with bridging ties outside the home in exchange for intensive interactions with strong ties inside the home. Kraut et al. (2002, 50), for example, observe: "Many writers have worried that the ease of Internet communication might encourage people to spend more time alone, talking online with strangers or forming superficial 'drive by' relationships, at the expense of deeper discussion and companionship with friends and family." Within internet research literature, such suggestions have been extended in turn to include questions about what internet-based communication is doing to social interactions and whether internet-based online domains detract people from real-world environments (i.e., communities). In fact, Hampton and Wellman (2003, 278) observe that early internet research has been mainly focused on three issues: the weakening of private (interpersonal) community, the disengagement from the neighborhood, and the decline of public community. The next section presents a brief overview of this research.

#### *5.4.2 The corroding effects of the online communication under question*

The first empirical evidence about the corroding effect of the Internet use and online communication for social interactions dates back to mid 1990s, when a series of empirical studies investigated the association of internet use and time spent online with social participation, offline socializing and psychological well-being of individuals. In this context, considerable significance has been accorded to the *Carnegie-Mellon HomeNet Project* carried out by Kraut and colleagues (1998). The HomeNet project was a longitudinal study

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interactive environments within cyberspace give to their members necessary means to create coherent and cohesive "virtual" self-presentations (see Slevin 2000, 162-166).

conducted on a sample of almost 256 inhabitants of Pittsburgh, Pennsylvania, USA, who have recently bought a computer of a TV-set and have used the Internet for one or two years. In 1995 and 1996 two subsamples of respondents living in 93 families were equipped with internet access in their households. The researchers had measured demographic characteristics, social involvement, and psychological well-being of participants on a pre-test questionnaire before the participants were given access to the Internet. After two to one year participants were asked to complete a follow-up questionnaire<sup>38</sup> containing measures of dependent variables. In the period between the pretest survey and the follow-up survey the researchers also automatically recorded the logs of participants' internet use.

The result from the first follow-up survey showed that Internet users had reported lower level of in-person socializing with family and other groups of strong ties than internet non-users. Moreover, internet users were more likely to report greater loneliness, stress and depression (Kraut et al. 1998). Hence, the authors concluded that we were witnessing an “internet paradox” as what was thought to be a “social technology” had actually reduced the levels of social involvement and psychological well-being. The conclusions of Kraut et al. (1998) sparked a strong response in the general public and in the academic community, which ultimately created a body of literature that investigated the methodological procedures and analytical tools used in their study. Since the authors themselves cautioned that the results of their study must be interpreted in attention to the biased sample and the causal direction between internet use and the observed social/psychological phenomena, several scholars tested their methods. Some of them concluded that the originally presented results of Kraut et al. were more a consequence of a methodological artifact than a substantive finding. For instance, LaRose et al. (2001) analyzed the same Pittsburgh data with different causal assumptions and found that Kraut et al.'s conclusions were indeed misleading. They found no direct causal relation between depression and internet use. They also showed that the positive association between internet use and decreased level of contact with friends was less positive with other close (unspecified) social circles. LaRose et al. (2001), therefore, concluded that the “internet paradox” might not exist; being more an outcome of analytical procedures than a

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<sup>38</sup> The follow-up questionnaire was administrated to participants in three waves (i.e., spring and fall 1998 and spring 1999).

function of true differences caused by internet use. In fact, a year later Kraut et al. (2002) revised their original position that heavy internet users suffer from depression and lack of well-being. Drawing on a three-year follow-up survey of 208 participants involved in the original HomeNet sample and on the original data of television and computer purchasers from 1998-99 they suggested a revision of the “internet paradox”. According to their findings respondents from both samples generally experienced positive effects of using the internet on communication, social involvement, and psychological well-being. The only persistent negative correlation was found with increased stress. Moreover, Kraut and his colleagues made two further conclusions. On one hand, they found that internet use amplified the existing differences between the “haves” and “have-nots”: participants with more social resources amplified their benefits from using the Internet on several dependent variables, whilst those who did not use the Internet experienced an increased difficulty to access social resources. On the other hand, differences across age cohorts were reported: “adults and teens gained somewhat different benefits from Internet use, with adults more likely to increase their face-to-face interactions locally and their closeness to geographically distant relatives and friends” (Kraut et al. 2002, 67). In sum, the researchers concluded that the “internet paradox” was a consequence of the sample bias: in the early stage of the study the participants had been new to the Internet, spending more time on non-rewarding activities; in the later phase when they got more experienced they managed to replace those activities with more rewarding ones, experiencing higher levels of positive outcomes in terms of social connectivity and personal well-being. Therefore, Kraut et al. (2002) ended up with arguing that the possible positive or negative outcomes of internet use may more depend on “quality of people’s on-line relationships” and “what people give up to spend time on-line” than to the mere issue of internet use intensity.

These findings, however, did not lead to consensus regarding the positive or negative role of internet technology for social connectivity and personal well-being. Nie and Hillygus (2002) analyzed the time-diary data to test the “displacement” theory of Internet use, which contends that the time spent online reduces the time people allocate for in-person interactions. They found that internet use at home had a strong negative impact on time spent for socializing with friends and family as well as on time spent on other social activities. Such effect was not discovered for internet use at work. In line with these findings, the results also showed that internet use during weekdays less strongly correlates with the diminution of socializing with

friends and family and on social activities than during weekend days. According to the authors the results support the “displacement” theory since “... time online is largely an asocial activity that competes with, rather than complements, face-to-face social time” (Nie and Hillygus 2002, 1), although the location and timing of Internet use are interaction factors in the size of the effects.

As Rice et al. (2007, 10) note Nie and Hillygus’s study has been criticized for using a biased sample, an intrusive data collection method, and an atypical technology. Therefore, we present the results of two additional studies which tested the “displacement” theory of Internet use while investigating the relation between the internet use and physical communities. A Netlab research group at the University of Toronto carried out a study of “Netville”, a suburb in Toronto area, in which 60% of households were provided with access to broadband internet, while the resting 40% were not connected to the Internet. In exchange for free access to high-speed internet the residents agreed to be studied by a group of scholars interested in the comparison of the two groups of residents in terms of their global and local as well as online and offline structure of community ties. As part of the empirical work Hampton and Wellman (2003) surveyed the residents using a whole network approach, founding a positive correlation between internet use and the size of neighborhood networks. Moreover, internet use was positively associated with more recognition of neighbors, more intense communication both on- and offline, and participation in the public and private realms. Additionally, the results brought to light several other benefits of internet use. First, the increased contact with local ties in the neighborhood did not come about at the expense of a decreased communication with distant ties of the residents. On the contrary, the wired residents even experienced a slight increase in contacts with distant ties living outside Netville. Second, the Internet somewhat buffered the negative effects of moving into a new neighborhood: while the non-wired residents after the move experienced a reduced amount of social support exchanged with existing pre-move social network members, this was not the case with wired residents. Their exchange of social support with pre-move ties remained stable. Third, internet use did not replace other modes of communication, in-person or over the telephone, which means that the wired residents relied on an interplay of forms of social contact to communicate with their local and distant ties. Although some care is needed when interpreting the results of the Netville survey because of the small sample size and resultant



high level of sampling error, the overall conclusion is that in empirical evidence a support for the assumption about the corroding nature of internet use can hardly be found.

As a matter of fact, further evidence came from *Camfield Estates – MIT Community Connections Project* (Pinkett 2003) that internet use may be positively associated with social interaction measures such as frequency of contact with a diverse range of social ties or offline socializing with family and friends. The researchers took a proactive approach in the study working with residents to set up a technological infrastructure, which would enable every family in the neighborhood to access high-speed internet and to get involved in community activities via a web-based community-building system. As part of the research activities, the project included a pre- and postassessment small-scale survey ( $n = 26$ ) in order to ascertain whether and in what ways the implementation of community supportive technology can activate and increase the community social and cultural capital.<sup>39</sup> With reference to the social capital the study found that participants have expanded their local ties (e.g., the percentage of residents that were recognizable by name increased for 33%; the number of people contacted via telephone and email doubled, and more than half of the respondents gave an account of being more connected to local family and friendship ties), becoming more aware of the community resources. Likewise, positive outcomes were found in terms of cultural capital: the improved communication and information flow in the community network contributed positively to knowledge and informational support available to participants, they showed and reported improvement in technological and computer literacy, and expressed more positive attitudes in relation to the local environment in which they dwelled (see Pinkett 2003, 375-377). It seems that with the appropriation of ICTs the local character of community structures gets enhanced. Accordingly, a tentative conclusion might be that internet use and community-

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<sup>39</sup> Community social capital was defined as "... the extent to which members of a community can work and learn together effectively", whereas community cultural capital was defined as "... various forms of knowledge, skills, abilities, and interests, which have particular relevance or value within a community" (Pinkett 2003, 374-375). According to Pinkett (2003), on one hand, increased community social capital included four dimensions: reconfigured social networks, increased trustfulness between community members, expanded access to informational support, and a strengthened normative framework. On the other hand, increased community cultural capital involved: accentuated exchange of knowledge resources, higher levels of informational and computer literacy, collaboration on shared projects and interests, and a general shift in residents' attitudes toward the community in which they lived (see Pinkett 2003, 375-376).

based online services empower local ties and real-world social structures and not dissolve them in the virtual space.

From today's perspective, it seems that *Netville* and *Camfield Estates – MIT Community Connections Project* study have turned the spotlight on the questionable appropriateness of the assumption about the division of the “real” and “virtual” space which lied at the heart of the most important internet research projects in the mid 1990s. Papacharissi (2005), in fact, suggests that the dichotomy between the “virtual” and the “real” has been deceptive because it has assumed a sharp and clearly visible separation between the online and offline world.<sup>40</sup> This might be seen if one makes a brief snapshot of the recent internet research terminology which reveals that the terms such as “virtual” identity and “virtual” community have been replaced by “personal profiles” and “online communities” respectively (Papacharissi 2005). This does not mean that while being online individuals no longer create multiple personas or personal profiles. On the contrary, a recent survey of the Pew Internet and American Life Project showed that regular Internet users (still) tend to have more profiles (Lenhart 2009, 13), which according to the same study make it easier for them to connect with others online. In such circumstances, “identity” game is rather an exception than a rule. Social network services (e.g., Facebook, LinkedIn) are the strongest example of this trend. They are generally used by people to: (1) stay in touch with their personal network of friends, family, acquaintances, and colleagues from everyday life, (2) meet with people who have been part of their “personal biography”, and (3) communicate with people, with whom they share common interests and activities in daily life (boyd and Ellison 2007). Such online domains, of course, still provide opportunities for meeting new people, they also allow deceptive self-presentation, and cannot prevent disintegrative activities (e.g., cyber-bulling, hate speech or other forms of verbal violence), but these are far from being the most important reasons why these services are so widely used today. Hence, the history of internet

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<sup>40</sup> A similar suggestion is also advanced by Baym (2010, 150-155) when she writes about the “myth of the cyberspace.” Baym suggests that the assumption of “cyberspace” as a social world outside people's everyday life has been found to be faulty since the experience of social connectivity in contemporary society is characterized precisely by the increasing inability of people to separate these two worlds in their actions and activities. In other words, online actions are “real” actions as their reverberations can be observed in the structures and process of the “real” social world (see also Wynn and Katz 1997; Zhao 2006a).

connectivity can be seen as a social process, in which the social relations of everyday life have (gradually) filled the “virtuality” of CMC and online domains. This is precisely the theoretical stance that underlies the reconfiguration argument.

#### 5.4.3 *ICTs and the structural characteristics of personal networks*

The studies that we discuss as part of the “reconfiguration” thesis are not focused anymore on the question as to whether and why ICTs and especially the Internet have detracted people from real-world settings and increased or decreased the level of contact people have with their social circles. Rather the “reconfiguration” research asks how and why the use of ICTs has been involved into the possible rearrangement of interpersonal communication and of the structural characteristics of social networks. Here the rearrangement does not only refer to frequency of communication, but also to the change of relational practices (see Section 4.2) and “media” alternatives (see Section 4.2) which people can use to keep up with their network members. For instance, in an overview of the recent research on the social aspects of the Internet in Britain and the United States, Rice et al. (2007, 26) note that the results show that:

... the most important effect of the Internet is not to increase or decrease the overall level of contact in any one direction in all, or most, circumstances but to *reconfigure* [italics added by A.P.] access. That is, it helps to change who users interact with and what medium they use to conduct that interaction. ... This is not a whole sale change in one’s social relations, but a change at the margins that can significantly affect who one has access to and who one gets to know.

The early research conducted as part of the “reconfiguration” thesis has provided mixed evidence about the relation between internet use and social connectivity. On one hand, some researchers found that the use of the Internet may have positive outcomes on social relationships since internet users were found having larger networks in comparison with the general population (e.g., Franzen 2002; Horrigan and Rainie 2002; Katz and Rice 2002; Neustadtl and Robinson 2002; Norris 2002) and being in more frequent contact with their social contacts (e.g., Franzen 2002; Horrigan and Rainie 2002; Katz and Rice 2002; Wellman et al. 2003; Zhao 2006b). In addition, the Internet creates new social contexts and environments (e.g., discussion boards, virtual worlds, social network sites, wikis), where

people can get in touch with others who share similar interests (e.g., health online communities, hobby discussion boards). Thus, they have an increased opportunity to retrieve and/or exchange various kinds of social support (e.g., Baym 2000; Katz and Rice 2002; Tanis 2007; Tanis 2008). On the other hand, however, many authors presented a more pessimistic view of the internet's role in the "reconfiguration" of social connectivity. For example, McPherson et al. (2006) reproduces the Putnamian argument when suggesting encounters with friends and neighbors in local spaces attrite with the use of the Internet. In addition, they argue, internet users tend to cultivate more strong, more localized, core confidants on account of geographically dispersed weak ties. This argument was also put forward more recently.

One problem with the early studies was that they did not measure the role of the Internet in social networks directly using a social network methodology, but rather indirectly through concepts such as social capital, social cohesion, empowerment, and social participation. Some authors developed alternative measurement tools. Hlebec et al. (2006, 12) made a review of the methodological instruments, noting that, for instance, Franzen (2002) asked respondents about the overall size of their social networks; Mandelli (2002) asked respondents to directly reported change in the size of their social networks that, in their opinion, has resulted from their internet use; again, in other studies respondents were asked about the time they spent together with their online and offline ties (e.g., Franzen 2002; Neustadtl and Robinson 2002) or about the frequency of contact with social ties (e.g., Birnie and Horvath 2002). A small set of research also investigated the relation between multiple media use and tie strength. For example, Haythornthwaite (2005) and Haythornthwaite and Wellman (1998) found that stronger ties (formal work ties; close friend or friend) were more likely to have more relationships, to be in more frequent contact, and to be associated with media multiplexity than weaker ties (the so called media multiplexity theory). Focusing on an online distance learning setting Haythornthwaite (2000) also found that students with strong ties were more likely to use email and instant messaging more intensively than those with weak ties, while Boneva and Kraut (2002) using the HomeNet study data found support for the gendering of email use. First, email had beneficial effects on personal relationships for both men and women, although the latter rip greater benefiting than the former. Second, women used more email to maintain and even extend their social circles than man. Finally, both men and women used email to keep up with their siblings, parents and friends; yet

women used email more than men for staying in touch as well as for reviving their relationships with family ties.

In contrast, Hlebec et al. (2006) collected survey data on egocentered social support networks with the standard name-generator approach.<sup>41</sup> They carried out two surveys in Slovenia in 2001 (Survey 2) and 2002 (Survey 1) in which they investigated how is internet use associated with size, structure, and five types of social support networks (i.e., emotional, financial, social companionship, informational, and instrumental). In addition, they also analyzed the role of the Internet for communication within the five types of social support networks and compared the structure of what they called “internet” and “traditional” social support sub-networks. In Survey 1 the data were collected with a telephone survey on a representative sample of 5013 respondents, which was treated as a representative sample of the general population of Slovenian adults. The sample of 1009 respondents from Survey 2 was a self-selected sample of internet users as the data were collected with a web survey. After running a series of multiple classification analyses (Andrews et al. 1973) with the structural characteristics of the social support networks (size, role composition [% of family, friends, neighbors, etc.], frequency of contacts, importance of ties, geographical distance, tie duration and multiplexity of ties) as a dependent variables and internet use, gender, age, education, marital status as independent variables, they concluded that internet users had slightly larger social support networks. Noteworthy, among the socio-demographic groups the difference was more pronounced for females, low educated, single, and middle-aged respondents. Interestingly, at that time these were the groups which less likely used the internet. However, it seems that in comparison with other more experienced internet users they had taken a bigger advantage from the communication via the Internet. Moreover, Hlebec et al. (2006) ascertained that the difference in network size was also larger for single, widowed or divorced people – all groups who generally had smaller social networks (e.g., Hlebec and Kogovšek 2006; Novak et al. 2004). These results confirm earlier findings (i.e., LaRose et al. 2001) suggesting that the Internet could trim down depression by providing access to social support through email communication with significant others.

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<sup>41</sup> See Section 6.4 for a detailed presentation of the name-generator approach.

As regards the structural characteristics of social networks Hlebec et al. (2006) found the following changes: internet users rely more on friends than on relatives or neighbors; the network members of internet users on average include more geographically distant ties which are less important to them; internet users known their ties for less time, and their role is less specialized in the sense that they provide more types of social support. In addition, internet usage was not associated with more frequent contacts between the ego and his/her alters.

The data from Study 2 revealed that within social support networks the role of the Internet was less central than the one of in-person encounters and telephone calls, yet being more important in comparison with the ordinary mail. They, in fact, found that respondents kept in contact via the Internet on average "... with 7 percent of their network members on a daily basis, while everyday face-to-face communication was used with 37 percent of network members, the telephone with 27 percent, and mail with 2 percent" (Hlebec et al. 2006, 23). Furthermore, the Internet was rarely the only communication mode used. In addition, when analyzing the potential differences between internet sub-network (i.e., alters with whom the ego communicated regularly via the Internet) with the traditional sub-network (i.e., alters with whom the ego did not communicate via the Internet), the former had more men, younger and more educated alters. Further, in the internet sub-network there was a higher proportion of friends and co-workers (whereas the proportion of friends and co-workers was higher in internet sub-networks) as well as of alters who lived in geographical proximity and who had been known on average for shorter time.

In this sense, the results of the study carried out by Hlebec et al. (2006) seem to confirm the "glocalization" thesis earlier advanced by Hampton and Wellman (2003). In fact, they argue that "... there are no simple, one-sided interpretations as regards the internet's impact on social relationships. On the one hand, the internet is a modern device fostering newer, more diverse and also less intense contacts. On the other hand, it also fosters communication with people who are already communicated with through other communication means and have stronger ties" (Hlebec et al. 2006, 27).

The glocalization thesis has also been confirmed Hampton (2007) in his study of Boston neighborhoods. He found that internet use is associated with a higher number of local weak ties. In addition, he ascertained that more experienced internet users were more likely to enter

in contact with more weak ties over time in the neighborhood. Not surprisingly, other evidence from the United States supports his findings. Boase et al. (2006) assessed precisely the question of which kind of social ties are better supported by the use of the Internet. Their study distinguished between two types of social ties: core ties (bonds that are affective, including only one's closest friends and relatives) and significant ties (defined as bonds characterized by a "somewhat close" relationship). The results showed that people who use email are more capable to be in touch with a large proportion of their personal network than the ones who use only in-person or phone communication. Indeed, while for almost all forms of contact analyzed in the survey the percentage of alters contacted was declining as network size grows, this did not hold true for email communication. As the network size increases the proportion of alters contacted weekly by email remained stable at about 20% of core and significant ties. Looking at the relation between core and significant ties, the authors provided evidence which suggested that the use of email does not replace in-person and telephone contact for staying in touch with core and significant ties. People who email to a majority of their core confidants on a weekly level are in phone contact with 25% more of their core ties than the ones who do email. Further, egos, who contact via email the vast majority of their significant ties weekly, are in phone contact with twice as many of their significant ties than email non-users. In addition, Boase et al. (2006) also ascertained that the median size of internet users' personal network (core and significant ties) was 37; while for non-users it was 30 (total average was 35).

In other words, what Boase et al. (2006) suggested is that what makes the largest difference in the structure of personal networks is not the question of (non)access to the Internet, but what applications and services people use on the Internet. This point is underscored also by Hampton et al. (2011; 2009), when they note: "Simply having access to the Internet, as well as frequency of internet use has no impact on core discussion network size, what matters is what people do online" (Hampton et al. 2009, 22). As part of Pew Internet and American Life Project, Hampton et al. (2011) conducted a telephone and mobile phone survey on a representative sample of 2,512 adults living in households in the United States to verify the McPherson et al.'s (2006) thesis, which suggested that the diffusion of the Internet might be one of the possible causes for the shrinkage of Americans core networks. Hampton et al. (2011; 2009), thus, measured the core discussion networks by using the same name generator that was developed by Burt (1984) for the *General Social Survey*. The exact wording of the

question was: “From time to time, most people discuss important matters with other people. Looking back over the last six months, who are the people with whom you discussed matters that are important to you?” (Hampton et al. 2011, 137). The results showed that the thesis about internet and mobile phone use being associated with having fewer confidants did not find support in their data. Indeed, the use of ICTs had a very strong positive relationship to the size of core networks in comparison to other important demographic variables such as race, gender, and education. Both mobile phone and the participation in a variety of internet activities fostered larger and more diverse core discussion networks. In addition, respondents with a mobile phone were found to have about 15% more family members with whom they discuss important matters and were no more or less likely to discuss important matters with non-kin, whereas internet users were more likely to have non-kin in their discussion network.

However, what was even more interesting was the evidence supporting their original hypothesis about the differences between various internet activities in terms of network size and composition. For instance, they found that uploading photos and doing instant messaging resulted in having almost 10% more core confidants, while the use of social network services, blog and online journals had no relationship to the number of confidants. Hampton et al. (2009) recognized additional benefits from the use of social media. For instance, they noted that social media activities correlated with more heterogeneous composition of core discussion networks. Respondents who actively used social media (in particular, social networking services such as Facebook) more frequently were more likely to have confidants from different social backgrounds, thus, having a more diverse personal network. However, no notable association was found between frequency of internet use, the use of a mobile phone, instant messaging, uploading photos online, blogging, and using social networking websites and the likelihood of having non-kin core discussants. Hampton et al.’s data again provide support the “glocalization” argument: email, social networking services, and instant messaging promote as much local contact as distant communication. In-person contact, the landline telephone, the mobile phone, and SMS are used most frequently for communication with local social ties, whilst letters or cards are generally sent to more distant social ties. Accordingly, people had contact via letters and cards with their core network ties on average only on eight days in a typical year; they have in-person contact on about 210 days; mobile-phone contact on 195 days of the year; landline phone and SMS contact on 125 days. Internet-based channels were used less often; email contact 72 days in a typical year, instant



messaging contact 55 days, while contact via social networking websites 39 days (Hampton et al. 2009, 4). In sum, the results suggest that people still predominantly rely on in-person contact for keeping up with their core discussion networks.

On the other hand, some researchers have focused on the role-relation approach to study the role of ICTs in relations between network members. Focusing on friendship and family ties, Howard (2004) analyzed the representative survey data collecting within the Pew Internet and American Life Project. He found that more experienced Internet users were more likely to report that they have called a friend or a relative “yesterday” just to talk about and also to turn more people to help. Internet experience, however, did not only increase the actual socializing with friends and relatives, but also contributed to a feeling of an increased connection with family and friends, as well as to the ability to meet and know new ties (Howard 2004, 15-16).

By contrast, the British representative survey data from 2003 seem to not fully support Howard’s findings. Rice et al. (2007), in fact, note that internet use is slightly negatively correlated with coming together with friends and family, who live in vicinity. The same holds for the relation between internet use and writing to friends and family, who live out of time or country. Thus, the authors assume that in these two contexts “... internet users do socialize less via other media than do non-users” (Rice et al. 2007, 25). However, when it comes to other contexts (email and the landline telephone) the glocalization phenomenon could be again observed: both frequent and less frequent internet users email their friends and family (living close and far away) more often than non-users. They also use all other media (including in-person gatherings) to socialize at least as often as less experienced internet users. Rice and his colleagues, therefore, conclude that when studying socializing with family and friends in relation to internet use, one should consider the experience level of internet users.

In the context of friendship relations Wang and Wellman (2010) after an insightful overview of existing social network research suggested that (1) internet communication provides means for forming and developing new friendships that usually continue in-person and by telephone, and (2) in comparison with non-users, Internet users may have more – and more diverse – friends. To test the two hypotheses, Wang and Wellman (2010) used two cross-sectional data

sets from 2002 and 2007 both collected with a telephone survey on a representative sample of adult Americans aged 25-74. In both years identical friendship network questions were asked. Specifically, they focused on three questions about the size of offline, online, and migratory friendship and how each is correlated with the frequency of internet use (i.e., non-users, light, moderate, and heavy users).

They found that respondents had on average about 10 offline friends, with a few additional virtual friends and migratory friends. In general, the frequency of internet use was not associated with fewer offline friends. Moreover, their analyses showed that the average number of friends consistently and significantly increased in five years in offline, virtual, and migratory context with no significant differences across the four (non)user groups. In addition, with the use of the linear decomposition method they controlled if the potential change in the size of friendship networks is associated with intracohort change (i.e., the aggregated individual change within each age cohort) or with the cohort replacement (i.e., the change in composition of the cohort as a result of population turnover). Significant intracohort effects would suggest that internet use has contributed to the possible changes in network size, while significant cohort replacement effect would suggest that the differences that occurred in five years were a consequence of cohort replacement as a result of population turnover (e.g., those who had been 74 years old in 2002 were replaced in the survey population by respondent who were at that time 20 years old; as the internet usage rates among the latter is higher than among the former this the potential changes in network size would not be the consequences of internet use but actually of the replacement of older with younger cohorts). Wang and Wellman (2010) found that intracohort change outweighed cohort replacement for all three types of friendships. For example, for virtual friendships the total contribution of aggregated individual change accounted for four fifths of the total change, while cohort replacement accounted for one fifth of the total change. More precisely, for offline friendships, coefficient values indicated an increase in the average number of offline friends within cohorts per year, yet a decrease in the average number of offline friends across cohorts with younger cohorts having smaller friendship networks. As regards virtual and migratory friendships, the results were slightly different; namely, both coefficients were positive indicating that younger and older users accounted for a moderate increase in the number of friends within cohorts per year, as well as across cohorts. In conclusion, Wang and Wellman's study also revealed that making new friendships online is more an exception than

a common experience. Only one out of five Internet users reported having virtual friends, and only 15% reported encountering virtual friends face-to-face. Yet, those who have virtual friends, usually have quite a few with heavy internet users being particularly active in that sense (Wang and Wellman 2010).

This issue of “virtual” social ties and “online” friendship was also addressed by other scholars. The RIS 2009 Survey from Slovenia (Vehovar et al. 2010) and the Oxford Internet 2009 Survey in the UK (Dutton et al. 2009), for example, provide additional evidence in this respect. In the RIS 2009 Survey regular internet users (respondents who have used the Internet in the last three months) were asked whether they have ever met any person on the Internet, who they did not know before, and if so, they were further asked whether they met any of these persons offline. The results showed that almost two out of five regular internet users (27% of Slovenian population in the age of 10-75 years) met someone online they had not known personally before (on average, respondents had met almost 15 “new” people on the Internet). Following the suggestion of previous studies (e.g. Boase et al. 2006; Hampton et al. 2009; Wang and Wellman 2010), Vehovar et al. (2010) also analyzed whether the respondents’ frequency of active and passive involvement in different types of online communities (i.e., wikis, dating sites, blogs, web forums, multiplayer games, chat rooms, virtual worlds, photo and video community, social network sites) has different implication for meeting new people online. After controlling for socio-demographic characteristics of the respondents (i.e., gender, age, education, employment status, marital status, and having children), they found that the probability that a respondent had met someone online s/he did not know before, was higher if the respondent was male, younger and a more frequent user of chat rooms and virtual worlds. In addition, frequent visits to chat rooms, virtual worlds and social network sites increased the probability that respondents had met a larger number of persons online. The same held true for younger respondents.

Using a logistic regression model they also tested whether the fact that a respondent had met offline with persons s/he had encountered for the first time online was associated with his/her involvement in different online communities (see above). The evidence presented in their report shows that frequent visiting of multiplayer online games decreased the probability for an offline meeting, yet frequent visiting of social network sites increases it. The control for the socio-demographic predictors, further, revealed that if the respondent has children the

probability of meeting an “online” tie offline decreases, while if the respondent is male, the probability increases. In the sample, one quarter of regular internet users has also met offline with persons they have encountered online and they did not know before.

Comparing the RIS 2009 data with Oxford Internet Survey 2009 data (Dutton et al. 2009), Vehovar et al. (2010) ascertained that in the UK the percentage of internet users, older than 13 years, who have met someone online, they did not know before, is slightly higher than in Slovenia (38% and 36%, respectively). Further, the gendering of the social network sites usage is less pronounced in Slovenia than in the UK. Finally, the comparison demonstrated that the regular internet users in Slovenia more often than British meet offline with persons they have encountered online and did not know before. According to gender and labor status the trends are similar in both countries: higher percentage of males and students have met offline someone they first got to know online. Yet, what is interesting is that, at least in Slovenia, only an extremely small proportion of the online ties, which migrated to the offline world, provides people with emotional support and social companionship. Petrovčič et. al. (2010) reported that in Slovenia only 0.11% of alters who offered social companionship to egos were met for the first time on the Internet, while no such alters were reported in the emotional support networks. Hence, the implications of claims, which come from studies using different methodological approaches, should be carefully considered before drawing to general conclusions.

Most recently, the empirical evidence from the RIS 2005 Study (Petrovčič et al. 2011) on a representative sample of Slovenian residents aged 10-75, showed that there are significant differences in the size of emotional support network between users of different communication technologies. While studying the communication practices of ICT users, Petrovčič et al. (2011) – see also Petrič et al. (2010) and Vehovar et al. (2009) – analyzed the “interactional mix” (Zhao 2006a) of five technologies (i.e., in-person communication, the landline telephone, the mobile phone, texting, the Internet) for five social uses (i.e., work-related use, micro-coordination, instrumental use, and expressive use), discovering four distinct clusters of users. They named them: techno-ascetics, cyber-communicators, techno-rationalists, and mobile-traditionalists. The techno-ascetics, like all the other clusters, possess all modern information and communication devices, yet they are quite reserved in their use as they are the least intense users of all technologies. Conversely, the cyber-communicators

have fully integrated and taken advantage of the interactive affordances of new communication technologies – especially, the Internet – in everyday life activities. The techno-rationalists tend to have a “rationalized,” work-oriented approach to their use of all communication channels, whilst the mobile-traditionalists have integrated the mobile voice calls and SMS into their lives and use them especially as a tool for socializing.

The results of the RIS 2005 Study showed that those clusters of users who use various modes of communication for socializing and personal sharing have larger emotional support networks than clusters of users with a more reserved attitude to technology or with more focused and rationally driven usage patterns. Their conclusion was that the intense adoption of mobile phones and internet-based interpersonal communication services tends to make emotional networks larger and more interconnected. Indeed, the largest core discussion networks were noted for the cyber-communicators, followed by the mobile-traditionalists, techno-rationalists, and techno-ascetics. With reference to the structural characteristic of emotional support network after controlling for selected socio-demographic characteristics, Petrovčič et al. (2011) found no difference between clusters in terms of age, gender, role composition, geographical distance, or the duration of ties in emotional support networks. The authors explained that because the information about the structural composition of personal networks was collected on the first four alters cited, it was reasonable to expect a small variation in the composition of personal networks depending on communication patterns. Therefore, it is still plausible to hypothesize that the different usage patterns of ICTs may change the structure of social networks if other types of social support had been analyzed. Conversely, the high frequency of communication technology use for the various purposes characteristic of the first two groups was associated with the intensive use of mobile phones (both voice and SMS/MMS) in combination with either the Internet (cyber-communicators) or landline telephones (mobile-traditionalists) to communicate within the personal network of core confidants.

Considering the issue of online-offline socializing, their study largely confirmed the finding of other internet studies. Indeed, Petrovčič et al. (2011) found evidence about internet communication correlating positively with offline socializing. However, it was not only the more frequent and heterogeneous use of the Internet that was associated with more visits to both kin and non-kin; positive association was also uncovered for the use of the mobile

phone. Mobile phone calls and text messages as means of “fine-tuning” emotional ties provided a pattern of mediated interactions that did not substitute or compensate for in-person communication, but rather coexisted with previous ways of managing (mediated) relationships. These findings have found support in more recent survey data in Slovenia. For instance, Lavrič et al. (2010) in the “Youth 2010” Study – the nation-wide survey on a representative sample of Slovenian youth aged 15-29 – suggest that “Using information and communication technology does not displace direct interpersonal communication, but it is largely positively correlated. In the Slovenian youth a similar positive relationship can also be found between the frequency of use of ICT, on one hand, and cultural, artistic, humanitarian and political activities, on the other” (Lavrič et al. 2010, 230).

Further, similar observations were reported by many other studies carried out across different social and cultural contexts. For example, in Korea Kim et al. (2007) using quota sampling collected information on the relationship between media use and people’s personal networks which were measured with a role relation name generator. They also studied how the closeness of those relationships and a limited set of social contexts (i.e., employment category) is potentially influencing media use. They found that independent of the social context respondents reported the largest number of communication partners for face-to-face communication, followed by mobile phone voice calls, texting, email, and instant messaging. Instant messaging was used for communicating with weak relations, whereas mobile phone for strong ones. As for the email, only students were found to email less close others in comparison to other employment categories. In addition, a visual analysis of configurations of relationships by medium revealed that these five media were not interchangeable: in-person and mobile phone communication were quite similar, while other text-based media were separately clustered and less similar to in-person communication. As regards the analysis of configuration of relationships by medium the following associations emerged: instant messaging and texting appeared to be facilitating relations among the nuclear family as well as some work relations; face-to-face communication was most central for the contact with spouse and children, while friends and fellow students were surprisingly quite distant; the mobile phone was found to integrate all social roles, except for college friends and boy/girl friends; finally, email facilitated communication with coworkers and among geographically distant relatives.

Research from Japan to a certain extent paints a similar picture of the relation between different media and role relationships. For example, Ishii (2006) analyzed data from a two-wave panel survey on a representative sample of nearly 1,245 19–69 year old Japanese in order to find out whether there are differences in the use of landline phone, mobile phone, mobile email (text messaging), and personal computer email (PC email) by respondents and their reported partners. The results showed several important insights for the understanding of the role of mobile communication in digital sociality. First, Ishii (2006) suggested that mobile communication is gradually but steadily replacing the use of the landline telephone in dyadic relationships. More specifically, if 39.0% and 20.4% of dyads used mobile phones and mobile mail respectively in 2001, and 44.2% of the dyads used mobile phones and 33.2% used mobile mail in 2003, the use of landline phone decreased from 67.6 to 58.9% of dyads. Second, compared to other communication technologies, landline phones were more closely associated with family interactions. Third, the results showed that PC email fostered friendship with distant friends whereas “... nonfamily-related pairs of friends, living close to each other with frequent face-to-face contact were more likely to use mobile media” (Ishii 2006, 346). Fourth, Ishii (2006) reported that respondents were involved on average in approximately five communication relationships. Lastly, he also found differences in the use of communication technologies in dyads according to the gender, partners’ social roles, use of other media, and distance between partners. Specifically, the use of mobile and landline telephones was gendered: women used more mobile mails and landline phones, whilst men were more likely to use mobile voice call. In terms of age, young adults were keener to make mobile calls, texting and PC emails than older respondents (who, as already noted, stuck to the landline telephone). In addition, respondents reported that they use landline telephones for calling confidants of the same gender, while mobile phones were used for calls between people of different genders.

Another panel survey from Japan (Miyata et al. 2005) which compared mobile phone email and mobile phone voice communication from over 1,000 nationally representative Japanese respondents also focused on the diversity of social roles in the respondents’ egocentered networks. The results showed that PC emails increased network diversity, mainly through more weak ties, whereas mobile emails did not contributed to diversification of personal networks but anyway facilitated more supportive network ties. In an earlier cross-sectional study based on a large-scale representative sample of residents of a big city in Japan, Miyata

and her colleagues (2005) also compared mobile phone and PC email in relation to structural characteristics of respondents' personal networks. Their findings confirmed that the use of mobile phone is tied to local, supportive, and strong ties, while PC email serves as a means of communication with local and distant as well as strong and weak ties (i.e., these results once again confirmed the "glocalization" thesis). Further, Miyata et al. (2005) provides evidence of mobile phones (or as they name them "webphones") being in use for micro-coordination and constant contact. They explain: "Webphones are most often used to send short quick messages with close friends and family, allowing them to keep emotionally connected and organize meetings, or with those who are nearby, facilitating arrangement of everyday activities" (Miyata et al. 2005, 158). The results, further, showed that the intense users of emails were more likely to have larger and more diverse networks, even though dual-mode users (respondents using two modes of communication) were the ones with the largest personal networks.

This complementarity of mobile phones and email is in accord with a survey of Sooryamoorthy and his colleagues (2008) who compared mobile phone and email use (and face-to-face communication) to find out if and how important they are in extending or maintaining social relationships in Kerala (India). More precisely, they studied the size, role, and geographical composition as well as the diversity of Indians' personal networks. In short, their material suggests that (see Sooryamoorthy et al. 2008, 745): (1) more intense users of mobile phones and email are more likely to draw on ICTs for maintaining their networks than non-frequent users; (2) there is no difference between more and less intensive users of mobile phones and emails in the overall size of personal networks; (3) intense users of both media have larger external and smaller local networks, having more friends and fewer family ties within their pool of significant relationships; (4) mobile phone and email use are not related to the role composition (i.e., family, coworkers, friends) of their network,<sup>42</sup> yet both uses are associated with the local ties; (5) the largest difference between mobile and email use is found with reference to the geographical dispersion of social ties. Whereas email use is positively associated with external network ties, the mobile use is negatively associated. Finally, email use is the best antecedent of geographical diversity in social relationships.

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<sup>42</sup> This finding somehow differs from what has been reported by Kim et al. (2007) in Korea.



Broadly speaking, recently these findings were confirmed by Palackal et al. (2011), who also analyzed network data from Kerala. When testing the “bounded solidarity” thesis (Ling 2008) they compared network data from year 2002 with the data from 2007 and found that core networks of Kerala inhabitants shrank and embraced more family and friends. However, this reconfiguration in size and structure of core networks was not associated with the frequency of use of mobile phone. Yet more frequent use of email contributed to a more pronounced presence of confidants who lived in remote geographical locations.

The results of the research overviewed in this section do not purport to be fully consistent in temporal and cross-cultural perspective. To a certain extent, this is comprehensible since we know that studying new media is like trying to hit a moving target. New communication means pop up every day, the existing technologies acquire new functional purposes and normative images, the social conditions that frame the personal relationship are influenced by individualization forces and so on. In addition, the studies presented herein adhere to different age cohort (youth, general population, residents of cities and neighborhoods) and cultural contexts (i.e., Central and Western Europe, Asia, the United States). Nevertheless, the findings summarized in this section provide some points of convergence that are worth mentioning with regard to the social network perspective on digital sociality:

- With the diffusion of ICTs personal networks have become increasingly embedded into the context of technologically mediated social interactions and personal relationships. This does not hold only for people with specific socio-demographic profiles as it used in the past, but is increasingly valid for all social groups that have access to ICTs;
- In order to grasp the technological embeddedness of personal networks one has to focus on the complex system of technological means that people have at their disposal to communicate with their network members. Focusing on one single technology might not reveal the actual role of a selected technology, since its position in social interactions within a network is determined in relation to other communication means that are part of the ego’s “interactional mix”;
- The use of ICTs for interpersonal communication neither decreases the frequency of in-person communication with network members nor replaces the existing modes of technological mediated communication. Instead, people use ICTs in line with the normative frameworks that determine how social accessibility to various (groups of)

network members is mediated via various communication technologies. Due to the interpretative flexibility of communication technology “old” media adjust their position in the normative structures which determine why, when, where, and with whom people use certain means of communication. Thus, new technologies can be generally seen as vertices of reconfiguration of social connectivity;

- Some ICTs better serve certain types of personal relationship than others in terms of social support and tie strength. Therefore, different implications for the structure of personal networks can be expected for various ICTs. Mobile communication (voice calls and texting) is generally found to be more closely associated with local, emotional, multiplex and strong ties, whereas internet-based communication media are associated with strong, close and multiplex ties (which generally live distant from the ego) as well as with weak and specialized ties (i.e., the glocalization thesis);
- The use of ICTs is generally found to be associated with network diversity since electronically mediated communication can overcome spatial, temporal, and social barriers to personal networks with a more differentiated structure in terms of social support; or, alternatively, as in the case of online communities, establish a social context, in which people are able to access a more diversified range of social resources. Yet, the frequency of contact with the personal network members via various ICTs mainly depends on the structural characteristics of personal networks (i.e., duration of tie, role relations, geographical proximity, gender and age composition) as well as on the socio-demographic profile of the focal individual in the personal network;
- Finally, ICTs can represent a social infrastructure for a possible overcoming of social isolation for people who suffer from a lack of social support and integration in social circles. However, this positive role of ICTs usage is mediated by the structural characteristics of their personal networks as well as by ego’s socio-demographic characteristics.

## 5.5 THE RESEARCH FRAMEWORK AND WORKING HYPOTHESES

In the previous chapters, we introduced a theoretical framework for a socio-technical research on digital sociality, explained the need for such a framework, and discussed the recent advances in understanding of interactions between social interactions, technological landscape and social networks. A research framework that would allow us an empirical

verification of all arguments requires a detailed explication of every concept and relation contained in them. Only in this way we could establish a methodologically valid connection between the theoretical constructs and the observed reality. Considering that the relationships between the discussed constructs are multilayered and multidimensional we were faced with the unavoidable necessity for reduction in our attempt to empirically assert their foundation. Reduction is a common procedure when testing a middle-range theory (Kaplan 1964). It appears in terms of the focus of research questions, definitions of concepts, hypotheses, cause-effect relations, and in terms of measurement instruments. This neither means that theoretical arguments cannot be verified, nor that concepts cannot be empirically measured. Nevertheless, when making conclusions about the strength of the empirical evidence for the theoretical framework presented in this dissertation it should be born in mind that the collected data capture only certain aspects of that framework. Therefore, in strict methodological terms, the explicative power of the empirical insights remains limited to those aspects.

In line with the above considerations, the research framework of our empirical enquiry is focused on the three aspects of the heretofore elaborated arguments which have been implicitly highlighted in the theoretical discussion about digital sociality. The first pertains to the relationship between the structural characteristics (i.e., size and composition) of personal network, use of new communication technology, and social integration in terms of social isolation. The second touches upon the notion of complex media environment, concentrating on the patterns of ICTs use for communication within personal networks and the pattern differences arising from structural characteristics of personal networks according to network size, composition (e.g., role-relation, age, gender, geographical distance, tie duration), and tie strength (strong vs. weak ties), which have been captured in notions such as “connected” presence, individual addressability, networked individualism, and network sociality. The third refers to the diachronic perspective on connectivity in digital sociality, which can be accomplished through an analysis of the role of ICTs use in the potential compositional change of personal networks. Based on these aspects, we formulated the research questions as follows:

- RQ1: What are the structural characteristics of people's personal networks and how they are associated with people's socio-demographic profile and their use of communication technologies?*
- RQ2: How are the structural characteristics of personal networks and internet use associated with social integration in terms of social isolation?*
- RQ3: How people combine old and new communication technologies to get in contact with those in their personal networks and is there any difference in the usage patterns according to the type of social support and strength of social ties?*
- RQ4: Is there any change in the structural characteristics of personal networks between 2002 and 2009 and can the potential modifications in the network structure be associated with the substantial growth of access to and use of the Internet that characterized the evolution of the technological landscape in Slovenia in the last decade?*

From each research questions a set of working hypotheses was derived in line with the positivistic research approach. Specifically, Hypothesis 1 and 2 refer to RQ1 and RQ2, Hypothesis 3 to 6 refer to RQ3, and Hypothesis 7 refers to RQ4. In what follows, we present the wording of each hypothesis along with a succinct of its rationale which is based on the theoretical discussion.

**Hypothesis 1:** *Internet use will not be associated with the size of personal networks and social isolation.*

Although internet-based communication means and online services give people the opportunity to meet new people and establish new social ties, these personal relationships rarely become part of personal networks and social circles that provide people with stable social resources in terms of emotional support and social companionship. On the other hand, however, the use of internet-based communication services neither detracts people from their existing personal relationships, leading to a smaller number of confidants or social companions. Instead, in line with the glocalization argument together with other communication means, it rather represents an additional way to keep in touch with both close and weak ties, thus not affecting the availability of social support.

**Hypothesis 2:** *Internet use will be more strongly associated with the composition of socializing networks than with the composition of emotional support networks.*

Socializing networks generally include less strong and long lasting social ties, which are also more geographically dispersed than the strong, multivalent, and long-lasting ties in emotional support networks, which, thereby, have a more stable composition (e.g., Wellman et al. 1997). Since the Internet affords personal connection with graphically dispersed weak ties, it is suggested that internet use will be more correlated with the compositional characteristics of socializing networks than with the emotional support networks.

**Hypothesis 3:** *The frequency of contact via communication channels within the personal networks and the proportional size of media sub-networks in personal networks will be associated with the structural characteristics of personal networks, the presence of communication means, and the socio-demographic characteristics of individuals.*

This working hypothesis is derived from the central argument of the notion of digital sociality. As it was suggested, digital sociality can be conceptualized as a form of STIN in which the practices and experiences of social connectivity emerge out of social interactions related to the technological environment, social networks, and social context. However, to this general hypothesis, addressing the relation between social interaction and the structural characteristics of personal networks, we can add a couple of other more specific hypotheses based on insights from this chapter. Hypothesis 3a and Hypothesis 3b relate to the differences in the size and composition of networks with regard to the frequency of in-person and mobile communication and to the proportional size of in-person and mobile communication sub-networks respectively. It is known that in-person and mobile communication better facilitate the activation and management of the portion of personal network, which mostly embraces most close intimates, who are contacted on daily basis and live in local area. On the other hand, people with bigger and more geographically dispersed personal networks will draw on email and internet-based communication services in order to achieve the full “coverage” of their network (see the literature review in Section 5.4.3). The third and fourth hypothesis (Hypothesis 3c and Hypothesis 3d) stem from the normative aspect of the media choice argument, which suggests that new media are not competing with existing communication technologies in the sense that their presence would lead to less frequent contact via existing

means. Rather, new media gradually accommodate “old” technologies by finding their communication niche in the complex media ecology; on the network level, this can be observed when certain communication technologies better serve particular personal relationship (see Section 4.3 and Section 5.4.3). In sum, we suggest that:

**Hypothesis 3a:** *Smaller and local networks will be associated with more frequent in-person and mobile phone communication (voice calls and texting), whereas geographically more dispersed and larger networks will be associated with more frequent landline telephone, email and internet communication.*

**Hypothesis 3b:** *Smaller and local networks will be associated with larger mobile phone and SMS/MMS communication sub-networks, whereas geographically more dispersed and larger networks will be associated with larger landline telephone, email and internet communication sub-networks.*

**Hypothesis 3c:** *The frequency of contact via a selected communication channel will be positively associated with the frequency of contact via other means of communication, although they represent functional alternatives to the selected communication channel.*

**Hypothesis 3d:** *The proportional size of a selected medium sub-network will be positively associated with the proportional size of other media sub-networks, even though they represent functional alternatives to the selected medium.*

**Hypothesis 4:** *Communication multiplexity within personal networks will be more strongly associated with compositional characteristics of emotional support network than with socializing networks.*

As the theory of media multiplexity (Haythornthwaite and Wellman 1998) argues closer and stronger ties will show a higher propensity to maintain contact via various communication means due to their multivalent social nature. Conversely, less strong or weak ties, which are more specialized in the provision of social resources and support, will be generally related to a specific form of contact. The suggestion that communication multiplexity is related to stronger and closer social ties is also advanced by the notion of “connected” presence (Licoppe 2004), which argues that individuals, who share personal and intimate relational spaces, rely on various communication channels to maintain the stream of communication

and relational consciousness high, while in conversational mode the contact with network members is generally sustained via a single communication channel.

**Hypothesis 5:** *Media sub-networks will differ in terms of the network composition.*

Prior research has found that contacts with certain social ties and social support networks are better maintained via some communication technologies rather than via others. Consequently, different implications for the size and composition of media sub-networks can be expected for various modes of communication. According to theoretical discussion about the role of mobile communication in personal connectivity mobile sub-networks (voice calls and texting) are expected to be more closely associated with local, emotional, multiplex and strong ties, whereas email and internet-based communication media are associated with both strong, close and multiplex ties (which are generally located in a remote setting) as well as with weak and specialized ties (i.e., the glocalization thesis).

**Hypothesis 6:** *In the complex media environment, in which are embedded the communication processes within personal networks, distinctive clusters of people will emerge who are characterized by typical combinations of contacts via different communication channels. These specific clusters of people are interrelated with their socio-demographic characteristics and with the structural characteristics of their personal networks in terms of network size and composition.*

Digital socialities are nowadays embedded into a “complex media environment” (Petrič et al. 2011) within which each individual establishes a “personal communication system” (Boase 2008). This system represents a stable social form that does not rest on single communication technology, but rather on a set of communication means which create specific patterns of media use that depends on the structural characteristics of personal networks (such as size and composition) as well as on socio-demographic characteristics of people. Thus, it is safe to hypothesize that clusters of people exist with specific personal communication systems, which will be associated with diverse structural characteristics of personal networks.

**Hypothesis 7:** *Internet use will contribute to the potential structural change of personal networks.*

Hypothesis 7 will address the relation between the frequency of internet use and the size and compositional in personal network over time. This issue has been a recurring theme in theoretical discussion about the impact of internet communication on social connectivity. However, surprisingly, little empirical research exist that would analyze the relation between the (frequency) of internet use and the structural characteristic of personal networks over time.<sup>43</sup> The literature review presented in the theoretical part of this study suggests that the social use of the Internet is generally associated with positive outcomes on personal networks. Specifically, it has been often speculated that frequent use of the Internet will result in a larger and more diversified social network which encloses a larger proportion of weak ties over time (e.g., Bargh and McKenna 2004; Gennaro and Dutton 2007; Kavanaugh et al. 2005; Miyata and Kobayashi 2008). Hypothesis 7a and Hypothesis 7b stem from these suggestions and refer to the differentiation between strong and weak ties argument, which has been frequently advanced in the internet research on social connectivity (see Rice et al. 2007). However, the problem of time comparisons referring to internet related phenomena is particularly acute in light of the fact that both personal network size and (frequency of) internet use are highly generationally conditional social phenomena (see Section 9.1). For instance, prior research shows that older people have smaller personal networks than young people (e.g., Dremelj et al. 2004; Marsden 1987). Similarly, the percentage of internet users and the frequency of internet use decrease with age (see Section 9.1). Thus, the question comes down to whether the overtime personal network size can be attributed to intracohort change (i.e., change in internet use within the same cohort) or to cohort replacement (i.e., changes in internet use as a consequence of replacement of older with a small proportion of internet users with younger cohorts that are heavy internet users) or alternatively to both processes. Considering the internet use cohort trends we hypothesize that for internet users the personal network size change will be mainly associated with within-cohort change (Hypothesis 7c). Finally, following the rationale expounded in the presentation of Hypothesis 7a and 7b we also expect that intra-cohort change in the size of socializing networks will be relatively more important for internet users than for internet non-users (Hypothesis 7d). To recap, the below specific hypotheses were derived under the working Hypothesis 7:

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<sup>43</sup> To our best knowledge, only two examples of such studies were published in English; namely, Miyata and Kobayashi (2008) and Wang and Wellman (2010).



**Hypothesis 7a:** *The frequency of internet use will be positively associated with the potential change in the size of socializing networks, but will have no association with the potential change in size of emotional support networks.*

**Hypothesis 7b:** *The frequency of internet use will be positively associated with the potential change in the composition of socializing networks, but will have no association with the potential change in composition of emotional support networks.*

**Hypothesis 7c:** *For internet users the potential changes in personal network size are mostly related to changes in internet use within the same cohort.*

**Hypothesis 7d:** *The intra-cohort change in the size of socializing networks will be relatively more important for internet users than for internet non-users.*

## 6 RESEARCH METHODS AND MEASURES

In this study we draw on two Slovenian national cross-sectional surveys to analyze the role of ICTs for the size and structural characteristics of personal networks. The original dataset for this study was collected by the author of this study in 2009 with a telephone survey as part of the Research on Internet in Slovenia (RIS<sup>44</sup>) project carried out by the Centre for Methodology and Informatics at the Faculty of Social Sciences of the University of Ljubljana (hereafter referred to as RIS 2009). In addition, for the analysis of the structural changes in the personal networks we also carried out a secondary analysis of an existing dataset with information about personal networks which was collected with a computer-assisted telephone survey on a representative sample of Slovenian population in 2002 by Ferligoj et al. (2002) at the Centre for Methodology and Informatics at the Faculty of Social Sciences of the University of Ljubljana (hereafter referred to as CMI 2002). This chapter will lay out an overview of methodology used for data collection in RIS Survey 2009, including survey methods, sample characteristics and its representativeness, as well as measurement instruments used to assess the structural characteristics of personal networks and communication technology use. In the last section of this chapter a brief overview of the survey CMI 2002 is presented.

### 6.1 SURVEY IMPLEMENTATION: CONTACT PROCEDURE, SAMPLE DESIGN AND WEIGHTING

The RIS Survey 2009 data were collected with computer-assisted telephone interviewing (CATI) survey carried out by Valicon, a marketing research company specialized in conducting CATI surveys. Interviews were conducted in Slovenian between 27 November 2009 and 22 December 2009. The sample was drawn at random from the database of all landline telephone numbers in Slovenia. The sample frame was stratified on the level of 12 NUTS3 regions. Differential response rates across regions were also taken into account when the sample was selected. At least five attempts were made to complete an interview at sampled telephone number. The calls were staggered over times of day and days of the week

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<sup>44</sup> RIS is a non-profit longitudinal research project that collects and analyses data about social, cultural and economic aspects of ICTs use in Slovenia since 1996. For more information visit: <http://www.ris.org> (accessed May 14, 2011).

to maximize the chances of making contact with a potential respondent. Last birthday rule with correction for gender (for too many females) was used to select the respondent within the household.

In total 14,258 telephone numbers were contacted. The survey delivery process resulted in 1,209 completed interviews. There were 6,444 refusals or break-offs, 4,460 numbers were non-contacts, for 2,215 telephone numbers it could not be established whether they are residential or household numbers, whereas 2,146 numbers were not eligible (see Table 6.1). This means that according to the AAPOR survey standard definitions<sup>45</sup> the contact rate (CON1) was 53%, the cooperation rate (COOP1) was of 16%, while the refusal rate (REF1) was 16%, resulting in a final response rate (RR5) of 10%. Of course, this is a relatively low response rate, when we aim for a representative sample. However, it is very much reality in telephone research in many countries (De Leeuw and de Heer 2002; Grapentine 2008; Hox and De Leeuw 1994). Nevertheless, the validation conducted (see below), gave very positive results. In addition, other research in Slovenia which is based on telephone surveying – including public polls and voting studies (which are all providing accurate population estimates) – showed that nonresponse bias is not yet damaging telephone surveys. On the other hand, various internet panels – which might also be candidates for this type of research – are very much far from being representative.

**Table 6.1: Interview status**

Interview status	n
Completed interview	1,209
Refusal and breakoff	6,444
Non-contact	4,460
Unknown if household	2,215
Non eligible	2,146
Total	14,258

Nevertheless, a quality-control survey was organized by the author of this study to evaluate the survey quality (Biemer and Lyberg 2003). The back-check CATI survey was conducted between 15 December 2009 and 9 January 2010. We called 150 random respondents who completed the original questionnaire, which is 12.5% of the total sample of respondents who

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<sup>45</sup> AAPOR survey standard definitions are available at: [http://www.aapor.org/Standard\\_Definitions2.htm](http://www.aapor.org/Standard_Definitions2.htm) (accessed 2 May 2011).

participated in the survey. At least five attempts were made to complete an interview at sampled telephone number. We managed to contact the 136 persons (90.6%) and 105 respondents, who claimed to have personally participated in the survey, took part in the control survey – the latter representing 70% of those involved in the control sample and 8.3% of all persons who participated in the survey. The respondents who took part in the control survey reported a very high level of satisfaction with the conduct of the interview in general. In addition, the analysis of correlation data of selected benchmark indicators (e.g., gender, age, internet use, email use) between the original survey and control survey showed only minor deviation which could be with no trouble explained.<sup>46</sup> Thus, the evaluation provided outcomes that seem to speak in favor of the quality of collected survey data.

In order to compensate for sample designs and patterns of nonresponse that might bias results weighting was used in the survey analysis. The *raking* weighting procedure was employed to balance sample demographics to match the following population parameters: age, education, gender, region, place, and employment status. In addition to these variables (margins) the weighting also considered the interaction of gender and age as well as education and employment status. Therefore, in all these control variables the sample matches the Slovenian population.

## 6.2 SAMPLE: BASIC DEMOGRAPHICS AND REPRESENTATIVITY

The questionnaire used in this study was divided in several question modules. Hence, the original sample was split into two subsamples (i.e., subsample “A” and subsample “B”) to which respondents were randomly assigned.<sup>47</sup> Since the data about personal networks were collected in the subsample “A”, we briefly presented the socio-demographic characteristics of this subsample.<sup>48</sup>

The sample “A” consists of 602 respondents of whom 47.8% is male and 52.2% is female. Almost one third of the respondents is 29 years old or younger, 29.8% is between 40 and 59 years of age, while 37.8% is older than 60 years. Half of the respondents (51.4%) has a lower

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<sup>46</sup> The full report with the results of the quality-control survey is available from the author of this study.

<sup>47</sup> More details about questionnaire design and question modules are available in Section 6.3.

<sup>48</sup> All statistical analyses in this study were performed with the PASW Statistic 18 software.

and middle vocational education, 16.5% has secondary vocational education, while 17.5% of them has some university education. Nearly one out of four respondents (24.4%) attends school (primary, secondary, university), 39.9% of respondents is employed or self-employed, whereas 27.4% of them is retired. One out of ten (10.1%) lives in an extramarital relationship, 42.9% is married, 5.6% has a partner but they do not live together, whilst 29.0% is single and has been never married. Finally, more than a half of the subsample “A” lives in rural areas (53.7%) – villages and towns with up to 2,000 inhabitants. Almost 30% of them lives in cities with up to 50,000 inhabitants, while 17.2% of respondents resides in the two largest Slovenian cities, Ljubljana and Maribor.

Although weighting was also applied to the subsample “A” before data analysis, the comparison of socio-demographics from the SURS IKT 2009 survey, which is the representative national survey on the use of ICTs in Slovenia, conducted on an annual level by the Statistical office of the Republic of Slovenia, shows that the survey subsample “A” is somewhat biased in terms of age, education and employment status. In the subsample “A” the younger age groups (39 years and below) are overrepresented. Respondents with elementary school or lower and middle vocational education are overrepresented, while the ones with secondary vocational education or university education are underrepresented in the sample. In addition, the subsample “A” is also slightly biased against schooling age and retired respondents, while the employed and self-employed are underrepresented. Nevertheless, the deviations were moderate and in expected range as for any telephone survey conducted in Slovenia (Kalton and Vehovar 2002). Moreover, the existing practice confirms that the potential nonresponse/noncoverage bias can be effectively removed by proper weighting strategy. An additional *raking* weighting was thus routinely separately applied to the subsample “A” before data analysis. After a separate weighting for subsample “A” was applied, the available controls performed confirm that survey data are representative across all socio-demographic characteristics of participants.

**Table 6.2: The RIS 2009 sample**

Statistics	Sample		Subsample "A"		SURS IKT Survey 2009	
	n	%	n	%	n	%
<b>Gender</b>						
Male	593	49.1	287	47.8	834	47.5
Female	616	50.9	315	52.2	920	52.5
<b>Age</b>						
10-19	184	15.3	89	14.8	322	12.9
20-29	197	16.4	105	17.5	387	15.5
30-39	166	13.8	79	13.1	438	17.5
40-49	204	16.9	100	16.7	470	18.8
50-59	211	17.5	105	17.4	478	19.1
60-69	176	14.6	89	14.8	280	11.2
70-75	64	5.4	34	5.6	129	5.2
No answer	7		1			
<b>Education</b>						
No formal education, 1 – 3 years of elementary school	25	2.1	10	1.7	24	1.4
4 – 7 years of elementary school	87	7.2	43	7.1	107	6.1
Elementary school	268	22.2	133	22.1	323	18.4
Lower and middle vocational education	259	21.5	123	20.5	338	19.3
Secondary vocational education	195	16.2	97	16.1	399	22.7
General upper secondary education	162	13.5	90	15.0	212	12.1
College	67	5.6	32	5.3	121	6.9
Higher professional education	27	2.3	14	2.2	72	4.1
University education	95	7.9	49	8.2	134	7.6
MA, MSc, PhD	21	1.7	11	1.8	24	1.4
No answer	3					
<b>Employment status</b>						
Employed	453	37.4	226	37.5	795	45.3
Self-employed	45	3.7	15	2.4	71	4.0
Farmer	6	0.5	3	0.5	22	1.3
Schooling age youth	281	23.2	147	24.4	344	19.6
Retired	317	26.2	165	27.4	380	21.7
Working at home	2	0.2	0	0.0	2	0.1
Unemployed	68	5.6	39	6.5	102	5.8
Housewife	14	1.1	1	0.1	22	1.3
Unable to work due to age, disability, illness	17	1.4	4	0.7	16	0.9
Other	7	0.6	3	0.5	0	0.0
<b>Marital status</b>						
Married	525	44.2	255	42.9		
Extramarital relationship	119	10.0	62	10.3		
Partnership	56	4.7	33	5.6		
Single, never married	349	29.4	173	29.0		
Single, divorced	51	4.3	22	3.7		
Single, widowed	88	7.4	50	8.4		
No answer	21		7			
<b>Urban area</b>						
A village with up to 500 inhabitants	386	32.2	197	32.8		
A village or small town with ,more than 500 to 2,000 inhabitants	258	21.5	125	20.9		
City with more than 2,000 to 10,000 inhabitants	208	17.3	111	18.4		
City with more than 10,000 to 50,000 inhabitants	143	11.9	65	10.8		
Ljubljana, Maribor	204	17.1	103	17.2		
No answer	10		1			
Total	1209	100	602	100	1754	100

Note: Total percentages may not add up to 100, owing to rounding errors.

### 6.3 QUESTIONNAIRE DEVELOPMENT AND TESTING

The questionnaire<sup>49</sup> was developed by the author of this study in collaboration with the staff of the RIS Project at the Centre of Methodology and Informatics. It included a series of question modules on different survey topics: the ICTs use module, the Personal network module, the Social inclusion module, the Safe.si module, the E-government module, and the Socio-demographic module. The ICTs use and socio-demographic module which included basic questions on the use of the mobile phone, the landline telephone, the Internet, and online communities as well as social-demographic questions were compulsory. After the ICTs use module, each respondent was randomly assigned (based on an ID number assigned when the first call was made on the telephone number) to one of the two subsamples. The subsample “A” contained questions from the Personal networks and the Social inclusion module, whereas in the subsample “B” respondents received questions from the Safe.si and the E-government module (see Table 6.3). The data used in this study are from the subsample “A”. Consequently, they are related only to the ICTs use, the Personal networks module and the socio-demographic module.

**Table 6.3: RIS 2009 questionnaire design and the subsamples**

Survey module	Subsample “A” (n = 602)	Subsample “B” (n = 609)
ICTs use	X	X
Personal networks	X	
Social inclusion	X	
Safe.si module		X
E-government		X
Demography	X	X

To test the measurement instruments and improve the quality of the data in these three modules the instruments were pretested in a pilot survey implemented on a convenient sample of internet users in Slovenia. This was a self-selected web survey of internet users that was carried out in June 2009. It was advertised in Slovenian on Facebook through Facebook Ads service for two weeks. In addition, almost 300 email invitations were sent to addresses from the author private email directory. The pilot survey delivery process resulted in 244

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<sup>49</sup> The Slovenian full version of the RIS 2009 questionnaire administered to Subsample A is available from the RIS project web page at the following permalink: [http://www.ris.org/uploadi/editor/1310732811vprasalnik\\_esocnet\\_04\\_12\\_09.pdf](http://www.ris.org/uploadi/editor/1310732811vprasalnik_esocnet_04_12_09.pdf) (12 June 2011).

completed interviews. After analyzing the results of the pilot survey some changes were made in order to improve the validity and reliability of measurement instruments as well as to control for possible question order effects in the personal network module.<sup>50</sup>

Further, the complete questionnaire (including the modules which are not used in this study) was pretested by Valicon with a small number of respondents using RDD telephone number samples in November 2009. The pretest interviews were conducted using experienced interviewers who judged the quality of the answers, the degree to which respondents understood the questions, and the length of the interviews. Using recordings, the author of this study reviewed the pretest interviews. Some final changes were made to the questionnaire, based on the reviewed pretest interviews and a written report, compiled by the interviewers. Based on this data the author of this study also organized a seminar where interviewers were trained on how to introduce the survey to respondents, on how to avoid biased responses, and on how to administer the questions in the personal network module.

#### 6.4 MEASUREMENT INSTRUMENTS

The aim of this study is to analyze the role of ICTs in mediating the compositional characteristics and communication processes within personal networks. Therefore, in developing the measurement instruments we have been primarily focused on media use and personal networks operationalizations. The strategy employed in our research was not to develop new measurement tools but rather to draw on existing methodological techniques, developed and tested in social network analysis, in order to grasp various structural characteristics of a personal network. Nevertheless, such research strategy still presents the researcher with a series of methodological challenges. This section shall overview specific instruments that were used in order to capture the size and composition of personal networks as well as the media use patterns within personal networks.

##### 6.4.1 *Personal network measures*

As already mentioned in Section 5.1 various analytic approaches exist to define relations among the members of an egocentered network (Van Sonderen et al. 1990). The selection

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<sup>50</sup> The report with the results of the pilot study is available from the author of this study.



measurement instrument depends on the decision of which approach is applied. Since the objective of this study was to investigate the relation between the use of ICTs and the size and composition of the personal network according to differences between strong and weak ties, we decided to draw on the emotional and exchange approach. Therefore, the questionnaire included two types of network measures which all together included five name generators and 12 name interpreters.<sup>51</sup>

On one hand, we employed a modified version of the personal network measures developed by Antonucci (1985; see also Antonucci and Akiyama 1987; Kahn and Antonucci 1981) in her hierarchical approach for measuring personal networks. This technique is based on the emotional closeness and defines a personal network as a set of concentric circles that represent the egos extended, social, and intimate network. In the original, paper-and-pencil version, of the questionnaire the respondent (ego) is at the center of the three circles. The closer are the people (alters) to the center of the circles the closer and more important are supposed to be for the ego. In the paper-and-pencil mode the interviewer begins the technique by inviting the individual to check the concentric diagram and imagine that s/he is in the center of the three circles. Each respondent is then invited to think about this sociogram as a social space which includes “people who are important in your life right now” but who are not necessarily equally close. Persons in the inner-most circle are described as “those people to whom you feel so close that it is hard to imagine life without them.” The middle circle is described as “people to whom you may not feel quite that close but who are still important to you,” while the outer-circle individuals are defined as “people whom you have not already mentioned but who are close enough and important enough in your life that they should be placed in your personal network” (Antonucci 1985). The procedure of alter solicitation ends when the participant writes the names (or acronyms) of the persons into the appropriate circles.

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<sup>51</sup> According to Hlebec et al. (2006, 28) a name-generator “... is an open-ended survey question where the names (also nicknames, shortened names, etc.) of the actual people providing social support to the respondents are obtained,” whereas a name interpreter “... is a question on the ties between the alters within an individual network.”

For the purpose of this study the original procedure was slightly modified in order to be applied to computer assisted telephone interviewing. Instead of showing to respondents the diagram with the three concentric circles, participants were first invited to think about “the people in your life – please focus on people who are important to you – not just people who happen to know whether you are related,” and then asked whether there are people among them, “without whom it would be hard to imagine your life?” If respondents replied “yes” they were asked to list the names (or acronyms) of those persons (as many as they want). When respondents named all the persons they wanted or if they replied “no”, they were asked whether there are people “to whom you may not feel quite that close but who are still important to you.” If respondents replied “yes” they were again asked to list the names (or acronyms) of those persons (alters). When respondents mentioned all the persons they wanted in the middle circle or if they replied “no” the procedure was repeated for alters in the out-most circle. Here respondents were asked whether there are people “whom you have not already mentioned but who are close enough and important enough in your life that they should be placed in your personal network”. If respondents replied “yes” they were (for the third time) asked to list the names (or acronyms) of those persons (alters). If they reply “no” they were redirected to the next question.

The original paper-and-pencil procedure has been often used in research on egocentered support networks, demonstrating high reliability and validity (see Hlebec and Kogovšek 2006; Nadoh et al. 2004). Yet, to our best knowledge, this is the first study to use the hierarchical technique in a CATI survey mode. Therefore, possible mode effects could exist, which, unfortunately, could not be tested and assessed in this study. Nevertheless, since Nadoh et al. (2004, 381) argue that “... this method is simple, efficient and comprehensible to the general public,” we suggest that the magnitude of possible survey mode effects should not interfere with the conclusions drawn from the analysis. In addition, the conceptual background for concentric circles technique lies in Granovetter’s (1973) definition of tie strength as a four-dimensional notion which involves the frequency of contacts, the emotional closeness, the intimacy (mutual confiding), and the reciprocity in the provision of support between two persons. In a seminal study Marsden and Campbell (1984) tested the role of each of these dimensions in order to find out which better predicts the strength of tie. They assessed that emotional intensity was a better indicator of strength of friendship than the other three criteria. Since the notion of emotional closeness in concentric circles technique closely

approximates the idea of “intensity”, we suggest that Antonucci’s network generators could provide valid and reliable data also in the CATI survey mode.

On the other hand, the conceptual background for the remaining two network generators was social support. As discussed above in Section 5.1 the theory and empirical evidence suggests that different typologies of social support exist (see Hlebec and Kogovšek 2006). When defining the types of social support provision in this study, we relied on a typology given by Burt (1984) and Cohen and Wills (1985).<sup>52</sup> They suggest that four distinctive types of social support exist: emotional support, material (instrumental) support, informational support, and social companionship (socializing). However, due to the length of the questionnaire as well as to minimize response burden we decided to include into the questionnaire only the network generators for emotional support and social companionship (socializing).<sup>53</sup> The exact translated wording of the two name generator questions was as follows:

1. EMOTIONAL SUPPORT: *For time to time, people discuss important personal matters with other people; for instance, when they have problems with other people or at work, and so on. Who are the people with whom you discuss personal matters that are important to you?*
2. SOCIAL COMPANIONSHIP: *For time to time, people socialize with other people; for instance, they take a trip together or go out to dinner, and so on? Who are the people you usually socialize with?*

The rationale for using these network generators stems from two points. First, it has been established that emotional support is strongly correlated with close, reciprocal, intimate, and lasting ties with which the ego is in frequent contact (Hlebec and Kogovšek 2004; Hlebec and Kogovšek 2006). As for the social companionship evidence exists that this is generally provided by less intimate, less reciprocal and more emotionally distant people who get in

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<sup>52</sup> See also Hlebec et al. (2006), Hlebec and Kogovšek (2006), Lozar Manfreda et al. (2004), Novak et al. (2004).

<sup>53</sup> As Pustejovsky and Spillane (2009) note the survey collection of egocentered network data is for respondents one among the most cognitively demanding survey techniques in social sciences which can lead to a series of serious survey errors that stem from response burden. Hence, when designing the egocentered network questionnaire the researcher has to carefully consider the fatigue of respondents in compiling the questionnaire.

contact with the ego from time to time and are more life-course dependent (Hlebec and Kogovšek 2006). In other words, emotional support can be approximated with strong ties, while social companionship can be associated with weak or at least less strong ties. Secondly, both network generators have already been extensively tested in different social and cultural settings as well as administrated via the telephone. The emotional support generator is actually a modified version of the core discussion network generator developed by Burt (1984) which has been used in the *General Social Survey*. The social companionship generator was originally developed by McCalister and Fischer (1978) and later use in a modified version also by Van de Poel (1993). Moreover, both measures have been recurrently used and tested in telephone surveys in Slovenia (e.g., Hlebec et al. 2006; Kogovšek 2001; Kogovšek and Hlebec 2005; Lozar Manfreda et al. 2004; Novak et al. 2004) demonstrating high levels of validity and reliability – telephone interviewing has been shown to be at least as reliable and as valid as face-to-face data collection modes (Kogovšek and Ferligoj 2004; Kogovšek and Ferligoj 2005; Kogovšek et al. 2002).

In measuring social support networks, the identification of existing ties according to different contents and strength is only the first step in data collection. The second step consists in assessing the reciprocity and multiplexity of ties as well as the socio-demographic characteristics of alters. Identification of ties' and alters' characteristics is done by network interpreters. In this study name interpreters were administered after the list of alters was collected with emotional support and social companionship network generator for each respondent. The respondents were asked a set of questions for each of the first five alters, as a concession to time constraints.<sup>54</sup> If the alter was named by the respondent among the first five alters providing both emotional support and social companionship, name interpreters referring to that alter were administrated to the respondent only once. The sequence of name interpreters was organized question-wise. This means that every name interpreter had to be answered for all named alters before the next name interpreter was asked for, going question by question until the end of the network part of the questionnaire (Kogovšek et al. 2002, 3).<sup>55</sup>

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<sup>54</sup> This is a very common technique used in ego-centered network questionnaires administered on large-scale samples (cf. Burt 1984; Marsden 1987; McPherson et al. 2006).

<sup>55</sup> An alternative strategy would be the so called alter-wise method, where all name interpreters had to be answered by a respondent for one alter before the characteristics of the next alter are measured. Although Kogovšek and

The questionnaire contained 12 network interpreters aimed at assessing the characteristics of their ego-alter ties (geographical distance; role relation – partners, parents, siblings, friend, co-worker, neighbor, etc.; frequency of contact via different communication means; duration of the tie – time having known each other; whether the alter is a “Facebook friend” of the respondent) as well as the socio-demographic characteristics (i.e., age, gender) of the alters themselves. Name interpreters, measuring the age and gender of alters as well as the duration, geographical distance and role relation of the ties, were adopted from previous research by Burt (1984) and Ferligoj et al. (2002). The name interpreters measuring the frequency of contact via different communication channels were adopted from Hlebec et al. (2006) and will be covered in more detail in the following section.

#### *6.4.2 Media use measures*

Measuring the use of various technologies for interpersonal communication with members of personal networks can be an arduous undertaking. There are two major methodological issues related to this process. On one hand, we have to deal with the temporal structure of the communicative process; on the other hand, the issue of complexity of the technological environment which today mediates interpersonal communication has to be addressed.

With regard to the temporal structure of communication process Hogan (2009, 85-86) suggests that media use is related to different socio-temporal structures (i.e., sequence, duration, temporal location, and recurrence) which can be conceptualized as dimensions that shape the use of different communication technologies. For example, a mother can make every day (recurrence) a short call (duration) in the evening (temporal location) via the mobile phone to her son studying in a distant city. This means that developing a valid operational definition of media use would imply to grasp all four dimension of this process. In other words, this would mean at least four questions (name generators) per single communication technology, resulting in our case in a total of 24 name generators (six technologies  $\times$  four dimensions). As the personal network module was only a part of a larger

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Ferligoj (2005) showed that a telephone survey gave more valid measures when the alter-wise method was used, we decided to use the question-wise strategy because of time constraints.

questionnaire as well as to limit response burden<sup>56</sup> a decision was taken to reduce the complexity of the instrument and to measure only the frequency of media use. This certainly represents a serious limitation in terms of operationalization of the conceptual definition of media use. Nevertheless, Licoppe (2004) – in presenting the notion of “connected” presence – suggested that frequency of media use appears as one of the most relevant dimensions that distinguishes various technologically mediated modes of communication. Similar suggestions are to be found in other works (e.g., Boase 2008; Boase et al. 2006; Hampton et al. 2009; Matsuda 2005). In addition, such operationalization has been elaborated and suggested in other large-scale ego-centered network surveys that measured the use of various media (including ICTs) ego – alter communication (e.g., Ferligoj et al. 2002; Hampton et al. 2009; Hlebec et al. 2006; Hogan 2009).

With reference to media complexity a key decision has to be taken about which communication modes to include in the questionnaire in order to capture the “wholeness” of respondents’ “personal communication system” (Boase 2008). Drawing on existing empirical evidence about use of media for interpersonal communication in Slovenia (see Vehovar et al. 2009) we decided to include four communication modes (i.e., in-person, the landline telephone, mobile phone, SMS/MMS). However, a selection problem emerged with the use of the Internet. In fact, the Internet consists of several communication platforms and channels for interpersonal communication (e.g., email, instant messenger, social network sites, web forums, skype, chat rooms) that might serve different uses and needs in different social contexts (see Section 4.3.1). In this study we focused only on the distinction between email communication and communication via other Internet’s interactive services. There are four main reasons for such choice. First, previous research has been mainly focused on comparing email communication with other non-internet based communication media (e.g., Boase et al. 2006; Hampton et al. 2009) suggesting that email is associated with the “glocalization” of social ties – a process central for understanding the structural organization of personal communities (e.g., Hampton and Wellman 2003; Hampton et al. 2006; Wellman 2001). Second, Zhao (2006b) suggested that it is important to differentiate between the email

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<sup>56</sup> Considering that the use of network interpreters is based on an iterative procedure where the respondent can learn the sequence of questions during the interview, this would most likely result in an even higher number of break-offs or drop-outs, thereby increasing the non-response error.

communication and other forms of interpersonal internet communication (e.g., web forums, online chat services, etc.) when investigating the relation between internet use and social connectivity as email users tend mainly to communicate with who they also know offline, while the users of other internet-based online communication services are more likely to keep in touch with some of their social ties exclusively online. Third, we mainly aimed to examine the differences between the Internet and other communication technologies and not to analyze the structural diversity of different modes of Internet-based interpersonal communication (e.g., communication via instant messenger, social network sites, web forums, skype, etc.). Finally, as already explained with reference to media use temporality, since response burden can be a serious methodological problem in ego-centered network surveys because of the length and cognitive intensity of the questionnaire, leading to item and unit nonresponse (e.g., Burt 1984), we decided to limit the overall number of name interpreters to 12 – a threshold commonly applied in other similar ego-centered network surveys (e.g., Burt 1984; Hampton et al. 2011). Since six name interpreters were already administrated for measuring other characteristics of ties and alters we were left with six questions for media use (Petrovčič et al. 2011).

The frequency of media was thus operationalized by a single name interpreter for each of five communication technologies (i.e., the landline telephone, mobile phone, SMS/MMS, email, and the Internet's interactive services)<sup>57</sup> and for in-person communication. For example, the name interpreter for measuring the frequency of in-person communication was as follows:

*IN-PERSON COMMUNICATION: Now we would like to ask you a few quick questions about the use of communication technologies for keeping up with each person in your network. Please consider all conversations you have with each person and not just those on important personal matters (or those during socializing). Let's start with the question of how often do you meet or talk with each person face-to-face?*

For each statement the respondents answered on an eight-point ordinal scale, where 1 = “never”, 2 = “once a year or less”, 3 = “several times a year”, 4 = “several times a month”, 5

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<sup>57</sup> Name interpreters about the use of communication technologies were put only to respondents who reported to be users of a selected communication technology.

= “about once a month”, 6 = “several times a week”, 7 = “every day or almost every day”, 8 = “several times a day”.

This name interpreter was then repeated in the personal network module for mobile phone, SMS/MMS, landline telephone, email, and internet communication.<sup>58</sup>

## 6.5 THE CMI SURVEY 2002

The survey CMI 2002 was carried out by the Centre for Methodology and Informatics at the Faculty of Social Sciences of the University of Ljubljana within a study of social support networks of the general population of Slovenia that was sponsored by the University of Ljubljana and the Social Protection Institute of the Republic of Slovenia (Ferligoj et al. 2002). The data were collected with CATI interviewing between February 2002 and April 2002 on a representative sample of 5013 adults (aged 18 years and more) from the Slovenian general population. According to the information reported by the authors of this survey (Ferligoj et al. 2002; Hlebec and Kogovšek 2005a; Hlebec and Kogovšek 2005b) the overall response rate for this survey was 48% (the number of completed interviews among all eligible units in the initial sample), which was treated in that period as a standard response rate in Slovenia when conducting telephone surveys on representative household samples.

The questionnaire included six name generators and eight name interpreters. The wording of the name generators for emotional support and social companionship was exactly the same as it appeared in the RIS Survey 2009 (see Section 6.4.1). In contrast with the RIS Survey 2009 the respondents were asked a series questions for each alter named. The sequence of name interpreters was alter-wise.<sup>59</sup> Among the eight name interpreters asked in CMI 2002 five of them used exactly the same wording as in RIS Survey 2009. These were name interpreters measuring the gender and age of alter as well as the geographical distance, role relation, and duration of the ties.

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<sup>58</sup> See the full version of the questionnaire for the exact wording of other name interpreters measuring the frequency of use of communication technologies.

<sup>59</sup> Personal correspondence of the author of this study with Tina Kogovšek, one of the leading investigators in the CMI 2002 study.



According to the authors of the study (Ferligoj et al. 2002; Hlebec et al. 2006) the sample of 5013 respondents from CMI 2002 can be treated as a representative sample of the general population of Slovenian adults as the socio-demographic structure is similar to the 2002 Slovenian census (see Table 6.4). Half of the respondents are males, 63.9% have vocational or secondary education, 56.7% of them are employed or self-employed, whilst 12.8% percent attend school (primary, secondary, university). One out of four (27.4%) respondents is single (never married), while more than a half (54.6%) of them lives in a household with three or four members. On average, respondents are 44 years old (from 16 to 97 years of age).

**Table 6.4: The CMI 2002 Survey sample**

<b>Statistics</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
female	2418	50.1
male	2405	49.9
<b>Age</b>		
18-24	718	14.3
25-36	1175	23.4
37-52	1583	31.6
53-75	1347	26.9
76- above	190	3.8
<b>Education</b>		
Elementary school or less	803	16.7
vocational or secondary education	3033	62.9
Professional, college, university education or higher	986	20.4
<b>Employment status</b>		
Employed, self-employed farmer	2732	56.7
Retired, housewife, unemployed, other	1470	30.5
Schooling age youth	619	12.8
<b>Marital status</b>		
Married, extramarital partnership	3018	62.6
Single (never married)	1322	27.4
Single (widowed, divorced)	478	9.9
<b>Household size</b>		
Single member	449	9.3
Two members	1028	21.3
Three or four members	2631	54.6
Five or more members	715	14.8
<b>Total</b>	<b>5013</b>	<b>100.0</b>

Note: Total percentages may not add up to 100, owing to rounding errors.

## **7 A GENERAL DESCRIPTION OF PERSONAL NETWORKS**

With Chapter 7 we turn to the empirical part of this study which is divided into three chapters. This chapter offers a general description of personal network characteristics of Slovenians. It aims to present the results regarding the size and composition of social circles and emotional supportive and socializing networks. It also investigates whether internet use is associated with the size of personal networks, their composition and social isolation (i.e., whether internet users are more or less likely to have no one with whom to discuss personal matters and socialize). Chapter 8 presents the empirical results about how different communication technologies mediate the contact of egos with the members of their emotional support and socializing networks. It examines how frequency of contact via a specific communication mode and the proportion of alters with whom the ego is in contact via a specific communication mode are associated with the structural characteristic of their personal networks, with communication via other communication channels, and with socio-demographic characteristics of egos. Next, Section 8.3 compares the structural characteristics of communication sub-networks that are maintained via six channels. Chapter 8 proceeds with a presentation of the results of cluster analysis which shows that distinctive clusters of egos exist with specific patterns in communication with alters according to the frequency of contact via six communication channels. It also describes the differences in the socio-demographic profile of these clusters. The last empirical chapter (Chapter 9) offers an insight into the role the Internet has played in the reconfiguration of the emotional support and socializing networks in Slovenia in the last decade. By comparing the data collected with two cross-sectional surveys in 2002 and 2009 it shall shed light on the association between internet use and the change in the size and composition of personal networks in Slovenia.

Before we proceed with the presentation of the results a short explication is needed regarding the sample, methods, and procedures applied in the analysis of the data. As already explained in the previous section the personal network module was administered to respondents in sample "A" ( $n = 602$ ). However, only respondents aged 15-75 answered to questions in the network module. The decision to introduce the above age limit was taken as a consequence of the results of a pretest survey which suggested that teenage participants have had problems with the understanding of the network generators. In addition, due to refusals not all

respondents answered to all network questions. Hence, the final sample of consisted of 519 respondents<sup>60</sup> who all together cited 4,082 different alters, while information about alters was collected on 1,941 alters.<sup>61</sup>

With reference to the methods and procedures it should be mentioned that in social network analysis the data can be analyzed on three basic levels (Hlebec and Kogovšek 2006). The first level are egocentered networks, in which the researcher is interested in individual units (e.g., respondent) and their ties with other units (e.g., alters). Generally, on the level of egocentered networks researchers analyze the number of ties as well as other characteristics of ties between the ego and his/her alters. For example, the percentage of certain types of ties (e.g., kinship or friendship ties), the percentage of certain types of units in the network (e.g., the proportion of males/females), the average and variability of selected characteristics (e.g., geographical proximity, tie duration, age of alters) or structural characteristics (e.g., network homogeneity). These characteristics of the network can be analyzed according to demographic and personal characteristics of the respondent (such as gender, age, education, marital status, social class, personality characteristics). The second level of analysis is related to dyads and triads. A dyad consists of two units that are tied, while a triad is formed by three units that are tied together. Both on the level of dyads and triads the network is analyzed as a function of certain common characteristics of a pair/triad of units (e.g., frequency of communication via mobile phone between the pairs/triads of units in the network). At the third level, complete networks are analyzed. At this level the researchers are interested in the structural characteristics of the network as a whole (e.g., density, centralization) and their impact on various social phenomena (e.g., homogeneity, information flows, cohesion).

In this study personal network data are analyzed on the level of egocentered networks. This means that for each respondent the data about the characteristics of his/her alters (which were collected with name interpreters) were first aggregated on the level of egocentered networks.

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<sup>60</sup> Since individuals below 15 years of age were not included in personal network module additional *raking* weighting was applied to the sample data in terms of gender, age, education, region, place, and employment status to arrive at national estimates.

<sup>61</sup> Information about alters was collected only for the first five alters cited in emotional support or socializing network name generator.

Therefore, the unit of analysis in this study is the egocentered network and not an individual respondent or an individual ego-alter tie (i.e., dyad). All the variables used are aggregated averages from egocentered networks (e.g., average proportion of partners, friends, males, average frequency of contact, average duration of ties between ego and his/her alters, average geographical distance of the ego from his/her alters).

An implication of this method is that some caution is needed when interpreting the aggregated averages of these measures. More precisely, geographical distance was measured with an indicator that was calculated as an average on the scale from 1 (living in the same household) to 5 (living 1 hour or more away by car). However, the new aggregated variable (which measures the average geographical distance of all alters in ego's network) should not be interpreted in relation to the categories of the original variable, but as an ordinal variable indicating the range of geographical distance on a scale from 1 (least distant) to 5 (most distant). Likewise, the aggregated averages of variables measuring the frequency of contact via communication channels should not be interpreted in terms of the original scale from 1 (never) to 8 (several times a day); but as an ordinal variable indicating the range of frequency of contacts on a scale from 1 (least frequent) to 8 (most frequent). In addition, aggregation can also render the comparison of network characteristics between respondents difficult. For instance, if tie duration were measured with absolute values (in years), older respondents would have higher aggregated averages than younger respondents not only because they know their alters for a longer period of time but also because they are older than younger respondents. In order to remove the effect of ego's age the aggregated average of tie duration has to be normalized with respect to the respondent's age. The aggregate value of the variable tie duration represents an average time on scale 0 (known for 0 time) to 1 (known for the whole life). An average value of tie duration of 0.5 would mean that the ego knows his/her alters for half of his/her life. In a similar way, the variable measuring the average age of alters in ego's network was normalized with respect to the ego's age: the alter's age was divided by the ego's age to arrive at an age quotient. Afterwards, an aggregated average of the age quotient was calculated for each ego (respondent). For instance, if the alter were of the same age as ego the value of the aggregated variable age would be 1. Yet, if the alter were twice the ego's age, the value of the aggregated variable would be 2.

In what follows, the results of the empirical study are described and discussed. For reasons of clarity, only the most relevant findings which are central to the verification of hypotheses are summarized and reviewed. For a full account of parameters calculated in the statistical analyses see the corresponding tables/figures.

## 7.1 PERSONAL NETWORK SIZE

One of the commonly observed characteristics of personal networks is network size or the number of persons in the ego's networks. As Kogovšek (2001) notes the size of personal (egocentric) network of social support in most studies in the Western world varies between 10 and 20 persons. However, the network size is highly dependent on various methodological factors. For Hlebec and Kogovšek (2006) the most significant is probably the selection of name generators (i.e., their content and number) and whether the researcher sets a limit for the number of alters that an ego can name. For example, studies using data from the *General Social Survey* show that Americans have on average 3 persons with whom they discuss important matters (Marsden 1987). According to McPherson et al. (2006) by 2004 this number dropped by about 33%. In addition, the authors also report that the percentage of respondents who were socially isolated – those with no persons in core discussion networks – increased from 10% to almost 25% from 1985 to 2005 (McPherson et al. 2006). Dremelj et al. (2004), for example, found that in Slovenia the average size core discussion networks was 1.7 persons, while the average size of socializing networks was 4.3 persons with 7.3% participants having no confidants and 1.2% of participant having no social companions.

Broadly speaking, these findings were also confirmed in this study. Table 7.1 presents basic data on the distributions and averages of the network size for emotional support and socializing networks. On average, respondents cited 2.1 persons in emotional support networks, whilst the average size of socializing networks was 3.73. In the absolute sense the network size ranged from 0 to 14 alters for emotional support and from 0 to 18 for socializing. For both dimensions of social support the distributions are skewed to right: half of the sample has emotional support networks of size 0 and 1, and nearly 25% of the sample

has socializing networks of size 0 or 1. More precisely, both in emotional support and socializing networks participants most frequently listed one person.<sup>62</sup>

**Table 7.1: Univariate distribution of network size of emotional support and socializing networks**

Size	Emotional support		Socializing	
	N	%	N	%
0	46	8.9	36	7.3
1	213	41.1	87	17.6
2	104	20.0	73	14.8
3	78	15.1	86	17.3
4	34	6.5	69	14.0
5	13	2.6	34	6.9
6	10	1.9	35	7.0
7	7	1.3	25	5.0
8	6	1.1	9	1.9
9	3	0.6	13	2.7
10	3	0.7	9	1.7
11	0	0.1	5	1.0
12	0	0.0	7	1.3
13	0	0.0	3	0.6
14	1	0.2	1	0.2
15	0	0.0	4	0.7
16	0	0.0	0	0.0
17	0	0.0	0	0.0
18	0	0.0	1	1.0
Mean		2.11		3.73
SD		1.88		2.98
Median		1.63		3.00
Mode		1		1
N		519		496

The analysis of social circles shows that respondents named on average 6.6 persons in all three social circles together (see Table 7.2). Specifically, on average they have 3.5 persons to whom they feel so close that it is hard to imagine life without them, 2.1 persons to whom they may not feel quite that close but who are still important to them, and 1.3 persons whom they perceive as somewhat close. In the absolute sense the size of social circles ranged from 0 to 24 (overall), from 0 to 17 (first circle), from 0 to 11 (second circle), from 0 to 9 (third circle). In addition, overall 3.4% of participant reported that they have no one in their social circles, while there are 7.7% of participants who did not have anyone in the first circle, 25.2% in the second circle, and 53.7% who have no one at least somehow close to them.

Previous research on social support networks also ascertained important differences in networks according to the socio-demographic characteristics of respondents. For instance,

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<sup>62</sup> See Section 9.1 for the comparison with the data from CMI 2002.

Fischer (1982), Marsden (1987), Dremelj et al. (2004) found that ego's age is negatively associated with the size of social support networks. For Kogovšek (2001), Kavčič (2011), and Hlebec (2004) this trend can be partially explained with the fact that especially elderly people progressively "lose" their ties with ageing because of a set of objective conditions such as retirement, death, various health and physical problems, etc. Kogovšek (2001) and Marsden (1987) also report that people with a higher degree of education have larger social support networks.

In this study we used multiple classificatory analysis (MCA) to estimate the association between the personal network size and the socio-demographic characteristics of egos. MCA provides differences in average values for each category of a predictor variable that make the statistical effects of other predictors equal (Andrews et al. 1973). Unlike simpler forms of other multivariate methods, MCA can handle predictors with no better than nominal measurements and interrelationships of any form among the predictor variables or between a predictor and dependent variable.

In Table 7.3 (emotional support and socializing) and Table 7.4 (social circles) the results of MCA using the network size as the dependent variable are presented, where three sets of parameters carry substantive relevance: betas (with corresponding significances), which are effect estimates indicating the importance of the dependent variable in the explanation of the variance of the independent variable; and the unadjusted (M) and adjusted predicted means (Adj. M). The former reveal the difference between the categories of independent variable according to the dependent variable, whereas the latter indicate the differences in the values of the dependent variable between the categories of the independent variable when controlled for all other predictors included in the model (in this case socio-demographic factors). It should be noted that the statistical meaning of betas obtained with MCA is similar to the standardized regression coefficient in linear regression. Nevertheless, two important differences should be born in mind when reading the results of MCAs. First, the standardized coefficients in MCA are calculated for each categorical variable, instead of for each category. Second, contrary to the regression procedure, betas do not express the direction of the influence but only estimate the size of the effect (i.e., the parameters estimating the effects should be interpreted in terms of associations or correlations).

The findings show that there are no statistically significant differences in the size of socializing networks with respect to the analyzed socio-demographic characteristics of respondents (see Table 7.3). Conversely, significant differences exist in the size of emotional support networks with respect to labor status, living area, and having children. More precisely, schooling age and retired respondents report more confidants than employed persons as well as those whose employment status was coded as other. A larger network was also reported by participants living in urban areas and by those having children.

**Table 7.2: Univariate distribution of network size of social circles**

Size	Overall		1st circle		2nd circle		3rd circle	
	N	%	N	%	N	%	N	%
0	18	3.4	38	7.7	119	25.2	246	53.7
1	19	3.6	36	7.2	67	14.2	39	8.5
2	35	6.8	86	17.4	104	21.9	59	12.8
3	42	8.2	128	25.7	88	18.5	63	13.7
4	47	9.3	80	16.1	50	10.5	24	5.3
5	59	11.6	51	10.2	24	5.2	14	3.0
6	55	10.8	26	5.1	10	2.1	8	1.7
7	62	12.1	22	4.4	6	1.3	1	0.3
8	37	7.3	14	2.9	2	0.4	2	0.5
9	28	5.4	11	2.2	2	0.4	1	0.3
10	35	6.8	3	0.5	0	0.0	0	0.0
11	19	3.7	2	0.4	1	0.3	0	0.0
12	19	3.8	0	0.0	0	0.0	0	0.0
13	9	1.8	0	0.0	0	0.0	0	0.1
14	7	1.4	0	0.1	0	0.0	0	0.0
15	7	1.4	0	0.0	0	0.0	0	0.0
16	3	0.5	0	0.0	0	0.0	0	0.0
17	2	0.5	1	0.1	0	0.0	0	0.0
18	0	0.1	0	0.0	0	0.0	0	0.0
19	2	0.4	0	0.0	0	0.0	0	0.0
20	2	0.4	0	0.0	0	0.0	0	0.0
21	0	0.0	0	0.0	0	0.0	0	0.0
22	1	0.2	0	0.0	0	0.0	0	0.0
23	1	0.1	0	0.0	0	0.0	0	0.0
24	1	0.3	0	0.0	0	0.0	0	0.0
Mean		6.59		3.52		2.13		1.32
SD		3.96		2.24		1.85		1.78
Median		6.00		3.00		3.00		0
Mode		7		3		0		0
N		509		497		473		458

With reference to social circles women report larger networks (see Table 7.4). They also have more very close and close ties than males. The overall size of social circles is also statistically significantly associated with education and employment status with highly educated people and schooling age youth having larger circles in comparison with other groups. In addition, schooling age and retired participants have also more very close ties. Besides gender the



number of close ties also correlated with education; with more educated participant having more close ties. The number of somewhat close ties is again correlated with education; although this time the mean network size among those holding a vocational high school degree is nearly 15% larger than among those who have at least a university degree. Having children also correlates with the mean number of somewhat close ties: participant without children have 7.5% more network members in the third circle than those with children.

**Table 7.3: Summary of MCA for subgroup differences in network size of emotional support and socializing networks**

		Emotional support				Socializing			
		Beta	p	M	Adj. M	Beta	p	M	Adj. M
Gender	Male	0.04	0.42	2.04	2.03	0.01	0.92	3.76	3.79
	Female			2.16	2.17			3.78	3.76
Age	15 - 19	0.10	0.72	2.16	2.49	0.19	0.27	3.29	2.22
	20 - 27			2.32	2.14			4.38	3.67
	28 - 34			2.46	2.37			4.59	4.39
	35 - 44			1.92	2.15			3.52	3.91
	45 - 75			2.01	1.96			3.59	3.98
Education	Elementary school or less	0.10	0.38	2.02	1.95	0.11	0.20	3.36	3.61
	Vocation high school			1.91	2.00			3.64	3.68
	High school			2.48	2.42			4.09	3.53
	University or higher			2.33	2.29			4.49	4.50
Labor status	Employed, self-employed, farmer	<b>0.17</b>	0.05	1.99	1.99	0.16	0.33	3.76	3.53
	Children, pupil, student			2.28	1.79			4.1	4.63
	Retired			2.23	2.6			3.65	3.65
	Other			1.81	1.76			3.44	3.18
Marital status	Married, non-marital partnership	0.10	0.34	2.05	2.23	0.10	0.54	3.53	3.59
	Having a permanent relationship			1.88	1.5			3.8	3.67
	Single, never married			2.36	2.03			4.37	4.26
	Single, widowed, separated			1.99	2.02			3.61	3.66
Children	Yes	<b>0.19</b>	0.04	1.96	1.84	0.05	0.60	3.52	3.66
	No			2.36	2.57			4.18	3.96
Living area	Rural area	<b>0.12</b>	0.04	1.93	1.96	0.09	0.14	3.44	3.54
	Semi-urban area			2.00	2.00			4.23	4.25
	Urban area			2.52	2.46			4.07	3.87
Social class	Low, lower middle class	0.09	0.16	2.21	2.42	0.06	0.41	3.64	3.93
	Middle class			2.07	2.01			3.86	3.80
	Higher middle. High class			2.08	2.01			3.45	3.20

Note: Statistically significant betas at  $p < .1$  are presented in bold.

**Table 7.4: Summary of MCA for subgroup differences in network size of social circles**

		Total				1st circle				2nd circle				3rd circle			
		Beta	Sig.	M	Adj. M	Beta	Sig.	M	Adj. M	Beta	Sig.	M	Adj. M	Beta	Sig.	M	Adj. M
Gender	Male	<b>0.12</b>	0.01	6.05	6.09	<b>0.14</b>	0.00	3.19	3.18	<b>0.04</b>	0.46	2.03	2.08	0.07	0.16	1.19	1.2
	Female			7.07	7.04			3.76	3.77			2.26	2.21			1.45	1.44
Age	15 - 19	0.08	0.81	6.95	5.76	0.13	0.34	3.57	3.72	0.11	0.44	2.02	1.71	0.16	0.28	1.59	1.41
	20 - 27			7.46	6.56			4.05	3.89			2.59	2.38			1.23	0.8
	28 - 34			6.80	7.03			3.71	3.84			2.24	2.11			1.06	1.04
	35 - 44			5.60	6.35			2.77	2.99			1.63	1.92			1.42	1.57
	45 - 75			6.46	6.75			3.44	3.38			2.15	2.24			1.34	1.49
Education	Elementary school or less	<b>0.14</b>	0.08	6.17	5.89	0.11	0.36	3.3	3.19	<b>0.20</b>	0.00	1.97	1.94	<b>0.18</b>	0.02	1.16	0.9
	Vocation high school			6.51	6.80			3.38	3.49			1.94	2.04			1.58	1.64
	High school			6.98	6.39			4.09	3.87			2.25	1.95			1.09	1.18
	University or higher			7.12	7.48			3.52	3.66			2.87	2.99			1.31	1.5
Labor status	Employed, self-employed, farmer	<b>0.29</b>	0.00	5.87	5.55	<b>0.16</b>	0.04	3.14	3.09	0.17	0.08	1.93	1.84	0.18	0.16	1.18	1.08
	Children, pupil, student			7.76	8.58			3.99	3.85			2.42	2.59			1.52	1.9
	Retired			6.85	6.78			3.66	3.83			2.35	2.34			1.33	1.19
	Other			6.43	6.26			3.33	3.28			1.88	1.95			1.59	1.58
Marital status	Married, non-marital partnership	0.07	0.56	6.43	6.74	0.14	0.05	3.52	3.64	0.10	0.54	2.01	2.07	0.20	0.13	1.31	1.51
	Having a permanent relationship			6.84	5.99			3.54	3.28			2.21	2.05			1.19	0.71
	Single, never married			7.06	6.69			3.68	3.59			2.46	2.47			1.27	0.87
	Single, widowed, separated			6.28	6.09			2.95	2.73			2.18	2			1.63	1.8
Children	Yes	0.01	0.96	6.34	6.61	0.07	0.44	3.4	3.61	0.04	0.68	2.05	2.21	<b>0.21</b>	0.04	1.29	1.04
	No			7.05	6.57			3.64	3.28			2.33	2.06			1.4	1.82
Living area	Rural area	0.06	0.42	6.37	6.50	0.08	0.20	3.35	3.41	0.04	0.74	2.04	2.12	0.06	0.44	1.4	1.41
	Semi-urban area			7.24	7.07			3.95	3.86			2.11	2.1			1.5	1.39
	Urban area			6.58	6.45			3.43	3.38			2.39	2.26			1.1	1.16
Social class	Low, lower middle class	0.02	0.89	6.20	6.45	0.03	0.85	3.44	3.6	0.07	0.40	1.86	2.02	0.03	0.82	1.4	1.39
	Middle class			6.68	6.66			3.48	3.45			2.26	2.24			1.27	1.29
	Higher middle. High class			7.03	6.54			3.7	3.49			2.16	1.91			1.56	1.45

### 7.1.1 Internet use and personal network size

To test the first part of Hypothesis 1 suggesting internet use will not be associated with the size of personal network and social isolation we carried out six one-way ANOVA tests with network size as dependent variable and internet use coded into three categories (non-user, monthly or weekly user, daily user) as the independent variable. It was found that for all dependent variables in Table 7.5 the ANOVA test was non-significant. Based on this result we could not reject the first part of Hypothesis 1.

**Table 7.5: Analysis of variance for personal network size by frequency of internet use**

Personal network	Internet use	Descriptive Statistics				ANOVA	
		N	M	SD	SE	F	p
Overall	Non-users	152	6.51	4.40	0.36	0.16	0.853
	Monthly, weekly users	58	6.25	3.67	0.48		
	Daily users	300	6.70	3.80	0.22		
	Total	509	6.59	3.97	0.18		
1st circle	Non-users	147	3.45	2.45	0.20	0.87	0.420
	Monthly, weekly users	57	3.65	2.51	0.33		
	Daily users	293	3.52	2.07	0.12		
	Total	497	3.52	2.24	0.10		
2nd circle	Non-users	138	2.04	1.99	0.17	1.48	0.230
	Monthly, weekly users	55	1.91	1.62	0.22		
	Daily users	279	2.22	1.83	0.11		
	Total	473	2.13	1.85	0.09		
3rd circle	Non-users	132	1.51	1.92	0.17	0.36	0.699
	Monthly, weekly users	49	1.03	1.37	0.20		
	Daily users	277	1.28	1.76	0.11		
	Total	458	1.32	1.78	0.08		
Emotional support	Non-users	150	2.12	2.14	0.18	0.02	0.982
	Monthly, weekly users	59	2.07	1.74	0.23		
	Daily users	310	2.10	1.77	0.10		
	Total	519	2.11	1.88	0.08		
Socializing	Non-users	146	3.42	3.41	0.28	1.27	0.282
	Monthly, weekly users	55	4.06	3.62	0.49		
	Daily users	295	3.82	2.60	0.15		
	Total	496	3.73	2.98	0.13		

Note: Due to unequal size of the variance and group sizes the Brown and Forsythe's F test of equality of means and Welch's test of equality of means were calculated. However, both tests were non-significant, indicating no differences among internet groups in terms of dependent variables.

As already mentioned this was not a surprising finding. We believe that there are two plausible explanations for such results. First, as proposed by Hlebec et al. (2010), a social support network and core discussion network in particular is generally a highly stable social structure embedded into a constellation of institutional and normative forms which determine

its characteristics. The (frequency of) social use of the Internet (Zhao 2006b) may to some extent alter the communicative facet of this institutional envelopment, yet it is less likely that it would significantly increase the number of social support network relationships. Second, as Hampton et al. (2011) note, what most probably generates differences between internet users and non-users in terms of the social network size is not the extent of internet use but rather the type of internet use. In fact, their recent study on new media and core network ascertained an especially positive connection between specific uses of social media (e.g., use of social networking services, blogging, sharing of digital photos online) with network size was disclosed. As one of possible explanations of this association the authors consider what they call the “pervasive awareness” or “...the push of personal information through social media about and from network members” (Hampton et al. 2011, 110). For them, social media provide users with a qualitatively different way to stay in perpetual touch with their network members which combines various and frequent forms electronically mediated exchanges of personal information that become integrated into the individual experience of everyday life. This new experience might affect the individual’s subjective definition of who is a close or important person.

#### *7.1.2 Internet use and social isolation*

The second part of Hypothesis 1 deals with the question of whether internet use facilitates social isolation. Drawing on the literature review presented in Section 5.4.1 and 5.4.2 we have suggested that internet use is not associated with social isolation since it represents just one among the many technological means of communication that enable people to stay in touch with the members of their personal networks.

The hypothesis addressing the relationship between social isolation and internet use was tested by means of a series of binary logistic regressions. There are two reasons why we used this statistical method. First, the dependent variable, social isolation is a categorical variable – whether a respondent has someone to discuss important matters with/socialize or has no one. Second, we can estimate the significance of each variable in the model as well as the variance explained as a new variable (block of variables) is added in the model. Within this procedure, for every type of social support two models of logistic regression analyses were tested with one model with the socio-demographic factors, and the other with socio-demographic factors

and internet use factor.<sup>63</sup> This hierarchical approach was used to assess the mediating effect of the internet use factor. The mediating effect was tested by a  $\chi^2$  difference test in logistic regression (Hosmer and Lemeshow 2000), which is equivalent to the change in  $R^2$  in linear regression (Alwin and Hauser 1975). Specifically, Model 1 contains five socio-demographic factors: gender, age, education, labor and marital status.<sup>64</sup> Model 2 adds the internet use factor to Model 1. To examine a mediating effect of the internet use factor in Model 2, the difference in model  $\chi^2$  statistics for Model 1 versus Model 2 was calculated.

**Table 7.6: Summary of logistic regression for socio-demographic variables and internet use predicting social isolation – emotional support networks**

	Model 1				Model 2			
	B	S.E.	p	Exp(B)	B	S.E.	p	Exp(B)
Gender (male)	0.68	0.33	0.036	<b>1.98</b>	0.66	0.33	0.046	<b>1.93</b>
Age	0.03	0.01	0.009	<b>1.03</b>	0.03	0.01	0.012	<b>1.03</b>
Education (high school or higher)	-0.01	0.37	0.969	0.99	-0.05	0.38	0.885	0.95
Labor status (active)	0.54	0.35	0.127	1.71	0.50	0.36	0.162	1.65
Marital status (married)	-1.01	0.33	0.002	<b>0.36</b>	-1.03	0.34	0.002	<b>0.36</b>
Internet (user)					0.25	0.45	0.589	1.28
Constant	-3.52	0.63	0.000	0.03	-3.79	0.79	0.000	0.02

Note: Model 1: -2 Log likelihood = 294.426; Nagelkerke  $R^2$  = 0.071;  $\chi^2$  = 16.867 (p = 0.005); Model 2: -2 Log likelihood = 294.132; Nagelkerke  $R^2$  = 0.072;  $\chi^2$  = 17.162 (p = 0.009);  $\Delta\chi^2$  = 0.294 (p = 0.587).

The hierarchical binary logistic regression results for the two models for emotional support are presented in Table 7.6. In Model 1 for emotional support, having no one to discuss important matters (i.e., being socially isolated) was significantly associated with gender and marital status. Men were significantly more likely to be socially isolated than women. The likelihood of isolation increased with age. In addition, single persons had a higher likelihood to be socially isolated than married people. When the frequency of internet use factor was added to Model 1 as a block, none of the significant effects from Model 1 disappeared. Yet, the frequency of internet use was not significantly associated with social isolation. In fact, the significant effect of adding the cultural factor was tested by using changes in model  $\chi^2$

<sup>63</sup> Internet use was measured on a five-point scale (1 = every day or almost every day, 2 = at least once a week (but not every day), 3 = at least once a month (but not every week), 4 = less than once per month, 5 = never). However, in this analysis, due to small sample size internet use categories were collapsed into two categories (non-user vs. user) to avoid empty cells in the analysis that would make the parameter estimates of logistic regression unstable.

<sup>64</sup> Other socio-demographic factors were excluded from analysis because of the small sample size.

statistics. The difference was not significant at  $p < .05$  level indicating that internet use did neither increase nor decreased the likelihood of social isolation.

In an analog way social isolation related to socializing was analyzed. The hierarchical binary logistic regression results for the two models for social companionship are presented in Table 7.7. In Model 1, age, education, employment and marital status were significantly associated with a greater likelihood of having no one to socialize with. Elders were significantly more likely to be socially isolated than young: the odds of being social isolated increase by a factor of 1.06 for each year age increase, controlling for other variables in the model. In addition, married and more educated participants had a lower likelihood to be socially isolated than single participants and those with lower education, respectively. The odds of social isolation are increased by a factor of 5.87 when the respondent is active compared to being not-active. When the frequency of internet use factor was added to Model 1, all significant effects from Model 1 remained. Yet, the frequency of internet use was not significantly associated with social isolation. In fact, the change in model  $\chi^2$  statistics was not significant at  $p < .05$  level.

**Table 7.7: Summary of logistic regression for socio-demographic variables and internet use predicting social isolation – socializing networks**

	Model 1				Model 2			
	B	S.E.	p	Exp(B)	B	S.E.	p	Exp(B)
Gender (male)	0.25	0.37	0.499	1.29	0.27	0.38	0.474	1.32
Age	0.06	0.02	0.000	<b>1.06</b>	0.06	0.02	0.001	<b>1.06</b>
Education (high school or higher)	-1.18	0.40	0.003	<b>0.31</b>	-1.16	0.41	0.005	<b>0.32</b>
Labor status (active)	1.77	0.48	0.000	<b>5.87</b>	1.79	0.49	0.000	<b>5.98</b>
Marital status (married)	-0.74	0.38	0.053	<b>0.48</b>	-0.74	0.38	0.054	<b>0.48</b>
Internet (user)					-0.13	0.49	0.791	0.88
Constant	-5.23	1.04	0.000	0.01	-5.09	1.17	0.000	0.01

Note: Model 1: -2 Log likelihood = 221.981; Nagelkerke  $R^2 = 0.174$ ;  $\chi^2 = 36.358$  ( $p = 0.000$ ); Model 2: -2 Log likelihood = 221.911; Nagelkerke  $R^2 = 0.174$ ;  $\chi^2 = 36.428$  ( $p = 0.000$ );  $\Delta\chi^2 = 0.07$  ( $p = 0.792$ ).

As hypothesized, the results of the binary logistic models showed that internet use was not associated with social isolation in both emotional support and socializing networks. The only group of variables that contributed significantly to the models were socio-demographic characteristics of alters. Both findings are in line with recent research which revealed that age and marital status are significant predictors of social isolation in emotional support networks (McPherson et al. 2006), while internet communication is not associated with smaller network size or lack of core discussants (e.g., Hampton et al. 2011). Therefore, we conclude

that internet use is unlikely to contribute to the fact that people have no close confidants or social companions.

**Table 7.8: Summary of MCA for socio-demographic variables predicting the size of social circles**

		Total				1st circle				2nd circle				3rd circle			
		Beta	P	M	Adj. M	Beta	P	M	Adj. M	Beta	P	M	Adj. M	Beta	P	M	Adj. M
Gender	Male	<b>0.12</b>	0.01	6.05	6.09	<b>0.14</b>	0.00	3.19	3.18	<b>0.04</b>	0.46	2.03	2.08	0.07	0.16	1.19	1.2
	Female			7.07	7.04			3.76	3.77			2.26	2.21			1.45	1.44
Age	15 - 19	0.08	0.81	6.95	5.76	0.13	0.34	3.57	3.72	0.11	0.44	2.02	1.71	0.16	0.28	1.59	1.41
	20 - 27			7.46	6.56			4.05	3.89			2.59	2.38			1.23	0.8
	28 - 34			6.80	7.03			3.71	3.84			2.24	2.11			1.06	1.04
	35 - 44			5.60	6.35			2.77	2.99			1.63	1.92			1.42	1.57
	45 - 75			6.46	6.75			3.44	3.38			2.15	2.24			1.34	1.49
Education	Elementary school or less	<b>0.14</b>	0.08	6.17	5.89	0.11	0.36	3.3	3.19	<b>0.20</b>	0.00	1.97	1.94	<b>0.18</b>	0.02	1.16	0.9
	Vocation high school			6.51	6.80			3.38	3.49			1.94	2.04			1.58	1.64
	High school			6.98	6.39			4.09	3.87			2.25	1.95			1.09	1.18
	University or higher			7.12	7.48			3.52	3.66			2.87	2.99			1.31	1.5
Labor status	Employed, self-employed, farmer	<b>0.29</b>	0.00	5.87	5.55	<b>0.16</b>	0.04	3.14	3.09	0.17	0.08	1.93	1.84	0.18	0.16	1.18	1.08
	Children, pupil, student			7.76	8.58			3.99	3.85			2.42	2.59			1.52	1.9
	Retired			6.85	6.78			3.66	3.83			2.35	2.34			1.33	1.19
	Other			6.43	6.26			3.33	3.28			1.88	1.95			1.59	1.58
Marital status	Married, non-marital partnership	0.07	0.56	6.43	6.74	0.14	0.05	3.52	3.64	0.10	0.54	2.01	2.07	0.20	0.13	1.31	1.51
	Having a permanent relationship			6.84	5.99			3.54	3.28			2.21	2.05			1.19	0.71
	Single, never married			7.06	6.69			3.68	3.59			2.46	2.47			1.27	0.87
	Single, widowed, separated			6.28	6.09			2.95	2.73			2.18	2			1.63	1.8
Children	Yes	0.01	0.96	6.34	6.61	0.07	0.44	3.4	3.61	0.04	0.68	2.05	2.21	<b>0.21</b>	0.04	1.29	1.04
	No			7.05	6.57			3.64	3.28			2.33	2.06			1.4	1.82
Living area	Rural area	0.06	0.42	6.37	6.50	0.08	0.20	3.35	3.41	0.04	0.74	2.04	2.12	0.06	0.44	1.4	1.41
	Semi-urban area			7.24	7.07			3.95	3.86			2.11	2.1			1.5	1.39
	Urban area			6.58	6.45			3.43	3.38			2.39	2.26			1.1	1.16
Social class	Low, lower middle class	0.02	0.89	6.20	6.45	0.03	0.85	3.44	3.6	0.07	0.40	1.86	2.02	0.03	0.82	1.4	1.39
	Middle class			6.68	6.66			3.48	3.45			2.26	2.24			1.27	1.29
	Higher middle. High class			7.03	6.54			3.7	3.49			2.16	1.91			1.56	1.45

Note: Statistically significant betas  $p < .1$  are presented in bold.



## 7.2 THE COMPOSITION OF EMOTIONAL SUPPORT AND SOCIALIZING NETWORKS

Previous work on personal networks shows that significant differences exist in network composition of different types of social support according to the role-relation, geographical distance and duration of ties as well as according to the gender and age of alters. For example, studies of Fischer (1982), Wellman (1979), and Kogovšek (2001) suggest that the closest kin ties (i.e., partners, parents, siblings) represent important source of strong and diversified social support; this means that ego turns to a small number of close ties more often for various types of social resources (e.g., material, financial, emotional, information support). Dremelj et al. (2004) and Dremelj (2007) note how parent-child relationship generally provides all types of support with except of socializing. The relationships between siblings are important resources of material and emotional support; the latter is generally also provided by (close) friends, while socializing is mainly associated with friendship relations (see also Dremelj 2007; Dremelj et al. 2004; Fischer 1982).

The results of this study suggest that highly significant differences exist in the composition of emotional and socializing networks in terms of role-composition. The data demonstrated in Table 7.9 indicate that on average, emotional support networks mainly contain partners, parents, whereas socializing networks are composed by friends and other kin.<sup>65</sup> They also contain more neighbors and men than emotional support networks. Differences between emotional support and socializing network pertain also to age, geographical distance and tie duration. Emotional support networks contain on average older alters as well as more durable and less geographically distant social ties than socializing networks.

Moreover, prior research has indicated that the composition of social support networks is associated the socio-demographic characteristics of respondents such as gender, age,

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<sup>65</sup> This is an example of how the percentages related to the role-relation composition of personal network should be interpreted: For example, a respondent mentioned two friends and his/her partner as providers of emotional support. In this case, the number of friends (2) and partners (1) are divided by the total network size (3). This means that 66.6% of his/her core discussants were friends and 33.3% were partners. Therefore, the average for the proportion of partners in emotional support network presented in Table 7.9 should be interpreted in the following way: 30.08% of alters named by the respondents as core discussants were their partners.

education, race, socio-economic status, etc. (e.g., Antonucci 1985; Dremelj 2007; Dremelj et al. 2004; Fischer 1982; Kogovšek 2001; Marsden 1987). The results of this study are, by and large, in line with these suggestions. For instance, men have more partners, parents, siblings, and neighbors in emotional networks, whereas women have more children, other kin, friends, and men (see Table 12.1 and Table 12.2). Older respondents reported on average more partners, other kin, neighbors, and children, while younger participants reported on average more parents, friends, and siblings. As expected participants who said to be single (never married, widowed, or separated) have more friends, while married participants and the ones living in a permanent relationship with a partner have a larger proportion of partners. Widowed and separated participants had also an above-average proportion of children and other kin in the emotional network. Perhaps the most interesting are the differences in composition in relation to social class: participants who consider themselves to members of the middle or higher social classes have more friends and parents in the emotional support network, whereas participants from lower social classes have more partners and children. In addition, on average alters of married respondents or the ones living in an extramarital union are less geographically distant.

**Table 7.9: Differences in network composition between emotional support and socializing networks**

	Emotional support		Socializing	
	Mean	SD	Mean	SD
% partners	<b>30.08</b>	40.12	<b>12.74</b>	24.87
% parents	<b>11.32</b>	25.59	<b>5.37</b>	15.08
% siblings	7.38	20.26	8.43	19.34
% children	9.74	24.62	9.05	20.22
% other kin	<b>5.76</b>	18.95	<b>10.18</b>	22.79
% friend	<b>27.99</b>	39.60	<b>41.27</b>	41.55
% neighbor	<b>2.67</b>	14.77	<b>6.69</b>	22.24
% male	<b>37.10</b>	38.64	<b>44.30</b>	35.18
age	<b>1.05</b>	0.42	<b>0.99</b>	0.31
tie duration	<b>0.55</b>	0.24	<b>0.51</b>	0.23
distance	<b>2.04</b>	1.05	<b>2.29</b>	0.89

Note: Statistically significant differences for paired-samples t-tests at  $p < .01$  are presented in bold.

Features of network composition differ also in socializing networks. Table 12.3 and Table 12.4 present the composition of socializing networks broken down by the socio-demographic characteristics of respondents. In general, differences are greatest for subgroups defined by age, education, and marital status. For example, the citation of neighbors, children, and other kin rises with age, while the proportion of friends falls with age (the number of friends cited

is largest for persons aged 15-27 years). As for the marital status, the proportion of alters who are neighbors, children, or other kin is relatively large for widowed and separated persons. Yet the proportion of friends rises for people who are in a relationship or are single, while the number of partners rises for married. In contrast with emotional support networks differences between men and women pertain only to the proportion of men in the network (men have more male ties than women).

Perhaps what is also interesting is that on average alter's age and geographical distance fall with age, while geographical distance and tie duration rise with education. Further, the results clearly indicate that the proportion of men in socializing networks grows with social class, whereas, interestingly, the geographical distance of ties decreases. Finally, respondents in higher social classes on average know their supportive ties in socializing networks for less time than respondents from middle and low social classes.

### *7.2.1 Internet use and the composition of personal networks*

From the literature review in Section 5.4.3 we derived the Hypothesis 2 suggesting internet use will be more strongly associated with the composition of socializing networks than with the composition of emotional support networks. To verify this hypothesis and check for the potential differences between emotional support and socializing network among two groups we conducted a series of MCAs with internet use<sup>66</sup> as independent variable and variables measuring the composition of emotional support and socializing networks as dependent variables.<sup>67</sup>

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<sup>66</sup> Internet use was measured on a five-point scale (1 = every day or almost every day, 2 = at least once a week (but not every day), 3 = at least once a month (but not every week), 4 = less than once per month, 5 = never). However, in this analysis, Internet use was split into two categories (non-user vs. user) due to the small number of respondents who used the Internet at least once a week or less often.

<sup>67</sup> For reasons of clarity only the effect of internet use as a predictor variable on dependent variables measuring network composition is presented in more detail. The effect of the socio-demographic variables (i.e., gender, age, education, employment status, marital status, having children, living area, and social class), which were also included in the analysis as predictor variables, is not presented. They were included in the analysis in order to identify the pure effect of internet use on the dependent variable (the effect that would occur if all socio-demographic characteristics were held constant).

As hypothesized, after controlling for the selected socio-demographic variables the results of MCA indicated no significant differences at  $p < .05$  between internet users and non-users in the composition of emotional support networks in terms of proportion of kin, non-kin, and men, as well as in the age and tie duration composition. As shown in Table 7.10, the only marginally significant difference ( $.05 \leq p < .1$ ) between the two groups existed in relation to the average geographical distance of ties: the adjusted means show that internet users have on average more geographically dispersed emotional support networks than non-users – a result which is in line with prior research findings (Hlebec et al. 2006).

**Table 7.10: Summary of MCA for internet use variable predicting the composition of emotional support and socializing network**

Composition	Internet use	Emotional support				Socializing			
		Beta	Sig.	M	Adj. M	Beta	Sig.	M	Adj. M
% Kin	Non-user	0.04	0.46	73.16	68.41	<b>0.12</b>	0.06	58.52	54.27
	User			62.45	64.31			41.52	43.10
% Non-kin	Non-user	0.04	0.46	26.84	31.59	<b>0.12</b>	0.06	41.48	45.73
	User			37.55	35.69			58.48	56.90
% Men	Non-user	0.02	0.75	35.41	38.30	0.04	0.56	40.39	46.81
	User			37.70	36.57			46.36	43.97
Age	Non-user	0.00	0.94	0.85	1.04	<b>0.10</b>	0.07	0.89	1.04
	User			1.12	1.05			1.02	0.96
Tie duration	Non-user	0.06	0.35	0.56	0.57	<b>0.15</b>	0.03	0.56	0.57
	User			0.54	0.54			0.50	0.50
Geo. distance	Non-user	<b>0.10</b>	0.09	1.85	1.84	0.09	0.18	2.12	2.15
	User			2.07	2.07			2.34	2.33

On the other hand, in MCAs that controlled for selected socio-demographic factors internet use was at least marginally associated with the composition of socializing networks in terms proportion of kin, non-kin, and the average age of alters, whereas a significant correlation ( $p < .05$ ) was found for the factor of tie duration. Specifically, in socializing networks internet users seemed to socialize more with non-kin (e.g., friends, colleagues, workmates, neighbors) than with kin as internet non-users. Further, when compared with non-users network members of internet users were found to be on average younger and they have known them for less time. Hence, the findings seem to reinforce the hypothesized connection between the malleable configuration of socializing networks and the social affordances of the Internet for sustaining weak, non-kin, and transient ties that might have been originally established both off- and online. This is consistent with prior research showing the aptness of internet

communication services for sustaining a large and diversified set of social ties (e.g., Boase et al. 2006; Hampton 2007; Wang and Wellman 2010; Zhao 2006b). However, the mere use of the Internet (or any other communication technology) does not tell us much about how this technology is integrated into the communication between the ego and his/her alters. Being an internet users and having more non-kin in the personal network does not necessary imply that one would use the Internet to contact their network members. Due to the integration of the Internet in complex media environment the ascertained associations might actually be results of frequent contacts carried out via other communication channels which similarly allow access to socializing ties. It is therefore necessary to get an insight into the role of the Internet (and other communication channels) within personal networks, figuring out how they are used to access network members.

## **8 SOCIAL CONNECTIVITY WITHIN PERSONAL NETWORKS**

Chapter 8 analyses how different communication technologies mediate the social connectivity within people's personal networks. The chapter is organized into five sections. Section 8.1 gives a brief overview of the mediation of communication within emotional support and socializing networks. It analyses how often people use different communication channels to stay in touch with their network members, what is the proportion of such members in the network, and how the frequency of communication varies according to the compositional characteristics of personal networks such as proportion of kin and non-kin, duration and geographical distance of ties. In this sense, the first section provides a contextual ground to help to situate the multivariate statistical analysis of network data in the following sections. Section 8.2 deals with media communication patterns in personal networks. It analyses how frequency of communication and the proportion of alters is associated with the composition of networks, communication with other media and the socio-demographic characteristics of egos. Further, the second section provides an insight into the communication multiplexity (i.e., the percentage of communication technologies an ego uses to contact his/her network members) is associated with the size and composition of personal network as well as with the socio-demographic characteristics of egos. In Section 8.3 the composition of media sub-networks is analyzed in order to ascertain whether the sub-networks of the alters with whom the ego is in contact via different technologies vary in composition. Section 8.4 provides the results of cluster analysis aimed to verify whether distinctive groups of respondents exist with specific patterns of communication within their networks. This section describes the socio-demographic profile of the identified clusters, suggesting that they have a distinctive composition. The last three sections correspond to the hypotheses this study is seeking to verify regarding the role of ICTs in communication processes and configuration of composition of personal networks.

### **8.1 MEDIA AND COMMUNICATION WITHIN PERSONAL NETWORKS: A DESCRIPTIVE OVERVIEW**

In the last section of the theoretical part of this dissertation a series of hypotheses have been set out on how multiple communication channels are associated with the structural characteristics of different types of personal networks. The prior chapter examined the relation between size and composition of personal networks and internet use. The aim of this

chapter focuses on verification of hypotheses that address the relation between the composition of personal networks and communication between egos and alters within personal networks. Before the empirical assessment of specific hypotheses, this section shall briefly demonstrate how often respondents contact their network member via different communication channels and how this frequency of contact is related to the size and composition of personal networks.

**Table 8.1: Frequency of contact via six communication channels in emotional support and socializing networks**

<b>Emotional support</b>	<b>In-person</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
Never	0.2%	49.7%	8.1%	33.1%	45.7%	70.0%
Once a year or less	0.4%	3.1%	0.5%	1.6%	1.5%	0.3%
A few times per year	2.1%	5.2%	2.4%	6.5%	4.1%	1.1%
Approximately once a month	8.6%	11.0%	7.7%	16.0%	14.2%	4.3%
Once a week	8.1%	8.6%	15.3%	12.5%	14.3%	5.6%
A few times per week	12.3%	8.2%	19.7%	13.6%	11.7%	6.1%
Every day or almost every day	26.7%	10.1%	28.8%	8.5%	5.1%	8.5%
More than once a day	41.6%	4.2%	17.4%	8.2%	3.3%	4.0%
Mean	<b>6.8</b>	3.1	<b>5.8</b>	<b>3.9</b>	3.2	<b>2.5</b>
SD	1.3	2.2	1.7	2.2	2.1	2.3
N	476	475	444	365	297	343
<b>Socializing</b>	<b>In-person</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
Never	0.1%	50.1%	9.8%	34.0%	44.2%	65.6%
Once a year or less	0.4%	2.2%	0.5%	2.6%	1.1%	0.4%
A few times per year	3.1%	6.0%	3.9%	8.3%	3.9%	0.8%
Approximately once a month	11.5%	13.9%	14.5%	16.5%	13.6%	4.4%
Once a week	18.6%	9.8%	17.8%	11.8%	14.1%	8.1%
A few times per week	19.3%	10.4%	24.3%	14.1%	14.6%	7.9%
Every day or almost every day	23.7%	6.2%	20.7%	6.7%	5.7%	8.6%
More than once a day	23.3%	1.4%	8.4%	5.9%	2.7%	4.2%
Mean	<b>6.2</b>	2.9	<b>5.3</b>	<b>3.7</b>	3.3	<b>2.7</b>
SD	1.3	1.9	1.6	2.0	2.0	2.2
N	469	469	438	360	292	341

Note: Statistically significant differences for paired-samples t-tests at  $p < .05$  are presented in bold.

Table 8.1 shows the frequency of contact via the six communication channels in emotional support networks.<sup>68</sup> The results generally confirm the earlier observations in the literature

<sup>68</sup> In all tables included in Chapter 8 the label “In-person” corresponds to in-person communication; “Landline” to communication via the landline phone; “Mobile” to mobile voice calls; “SMS/MMS” to communication via

(Boase et al. 2006; Kennedy and Wellman 2007) suggesting the dominance of in-person communication. In fact, a comparison of the average frequency of communication via the six media shows that in-person communication is the most frequent communication mode for keeping in touch with core discussants and socializing companions, followed by mobile phone, SMS/MMS, email, landline telephone, and internet communication. In addition, the results show that respondents are in more frequent contact with members of their emotional support network than with the members of socializing networks via in-person, mobile phone, and texting communication, while internet communication is more frequently used to contact members of their socializing networks.

**Table 8.2: Frequency of media sub-network size – emotional support and socializing**

<b>Size of emotional support network</b>	<b>In-Person</b>	<b>Landline</b>	<b>Mobile phone</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
1	100.0	53.2	92.3	61.4	53.8	28.6
2	99.8	39.7	93.2	74.6	49.4	27.2
3	99.0	49.0	91.4	69.2	61.4	31.8
4	100.0	58.0	90.4	65.4	49.5	34.2
5	100.0	66.8	87.3	73.2	49.5	28.8
6	100.0	35.1	90.6	34.3	18.7	0.0
7 or more	100.0	52.4	86.7	69.2	67.7	36.4
Total	99.8	49.9	91.8	66.3	53.4	<b>29.2</b>
<b>Size of socializing network</b>	<b>In-Person</b>	<b>Landline</b>	<b>Mobile phone</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
1	99.6	59.6	91.6	63.9	53.9	26.4
2	100.0	60.8	93.8	61.0	58.5	31.8
3	100.0	44.6	91.2	77.5	56.4	50.9
4	100.0	43.4	85.0	67.4	56.1	36.9
5	100.0	34.6	90.2	69.5	52.6	30.6
6	100.0	48.6	83.9	53.2	47.7	17.9
7	100.0	38.8	88.4	65.1	62.7	40.0
8	100.0	27.8	90.3	54.5	47.1	35.1
9 or more	100.0	48.3	91.3	53.1	46.0	13.0
Total	99.9	49.1	90.0	65.2	54.9	<b>33.9</b>

Note: Statistically significant differences for paired-samples t-tests at  $p < .05$  are presented in bold.

SMS/MMS messages; “Email” to email communication; “Internet” to communication via internet services such as instant messenger, chat rooms, private messages on web forums and/or social network sites.



However, the frequency of contact with network members represents only one dimension of social connectivity (Hogan 2009), not telling us much about the number of network members with whom the ego is in contact via different communication channels.

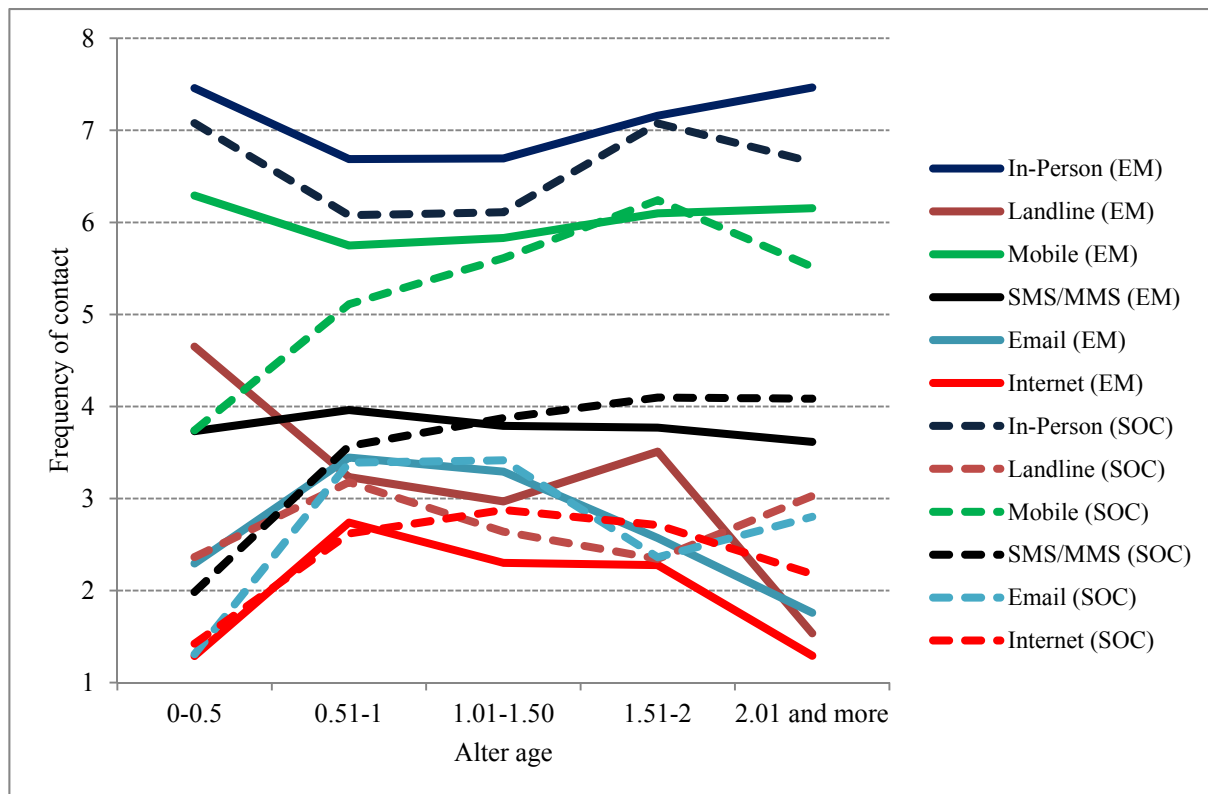
Table 8.2 reports the distributions of the proportional media sub-network size in relation to the network size of emotional support and socializing networks. Three important findings can be drawn from these comparisons in accordance with the objectives of this study. First, network size seems not to be related to the proportional media sub-networks size. In other words, the proportion of alters with whom the ego is in contact via a selected communication channel is more or less stable with regards to the network size. Second, overall egos are in face-to-face contact with almost every member of their network; meaning that in-person contact is not used selectively to contact specific ties but rather is used on a daily basis as a default mode of contact. In terms of the proportional size of media sub-networks in-person communication is closely followed by mobile phone for which it seems that it has acquired a similar taken-for-grantedness as in-person communication, since it is used to keep up with more than 90% of network members. The mobile phone is followed by SMS/MMS, email, landline telephone, and the Internet. Third, there are no statistically significant differences in the proportional size of media sub-networks between emotional support and socializing networks with the exception of internet sub-networks, which are larger for socializing than for emotional support networks.

Further, bivariate inspection of the egocentered network data reveals some interesting trends associated with the average age, duration, and geographical distance of ties in emotional support and socializing networks. For example, for egos who have an average alters' age between 0 and 1 (i.e., the alters are on average younger than the ego) an increase in the frequency of communication via mobile phone, texting, email, and the Internet can be observed, while a decrease in the frequency of in-person communication is present (see Figure 8.1). Yet for the egos with the average alter's age of 1 and above (i.e., the alters are on average older than the ego) the frequency of contact via ICTs decreases, while the frequency of in-person contact moderately increases.

With reference to tie duration and frequency of communication three patterns can be described (see Figure 8.2). The first is associated with the frequency of in-person, mobile phone, and

email communication, which all show a virtually small variation in relation to duration of tie. Second, landline phone communication is characterized by a different trend in emotional support and socializing networks: in emotional support networks landline phone communication is generally independent of tie distance, while in socializing networks the frequency of telephone communication grows with egos knowing their network members for longer time. The third pattern is associated to internet communication and texting. In this context, we observe what we might call a “V” trend; the frequency of communication via the Internet and email first decreases, while for the most long-lasting ties it increases.

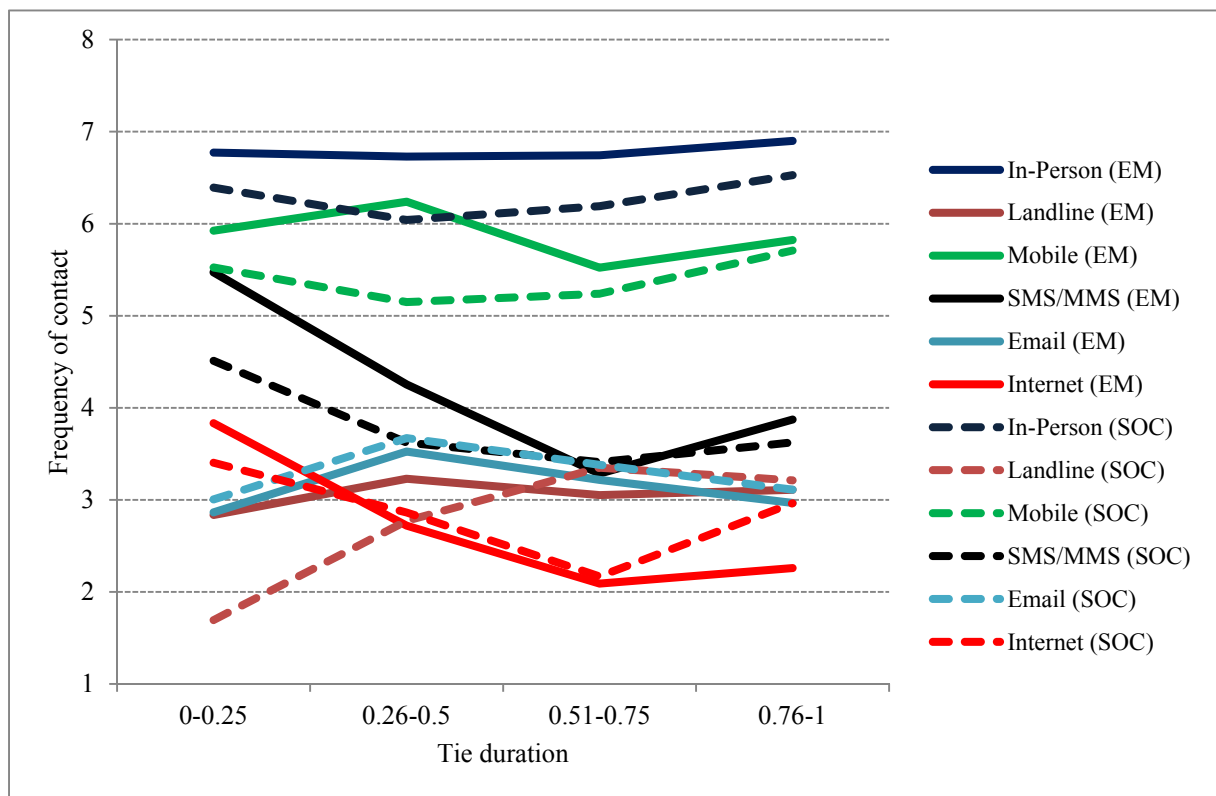
**Figure 8.1: Alter age and frequency of contact via six communication channels in emotional support and socializing networks**



It seems that the clearest set of trends across communication modes can be identified for the relation between geographical distance and frequency of communication (see Figure 8.3). The first is associated with decrease of in-person contact with the increasing geographical distance of alters. This trend can be also ascertained for mobile phone communication (although in a significantly less pronounced way). Conversely, the frequency of emailing, texting and internet communication increases with the geographical distance of network

members. In other words, respondents who on average have more geographically dispersed networks generally use more frequently email, texting, and internet communication for being in contact with their alters. It should be also noted that in emotional support network the highest frequency of SMS/MMS and internet communication was reached for the category “3-4” of the variable geographical distance.

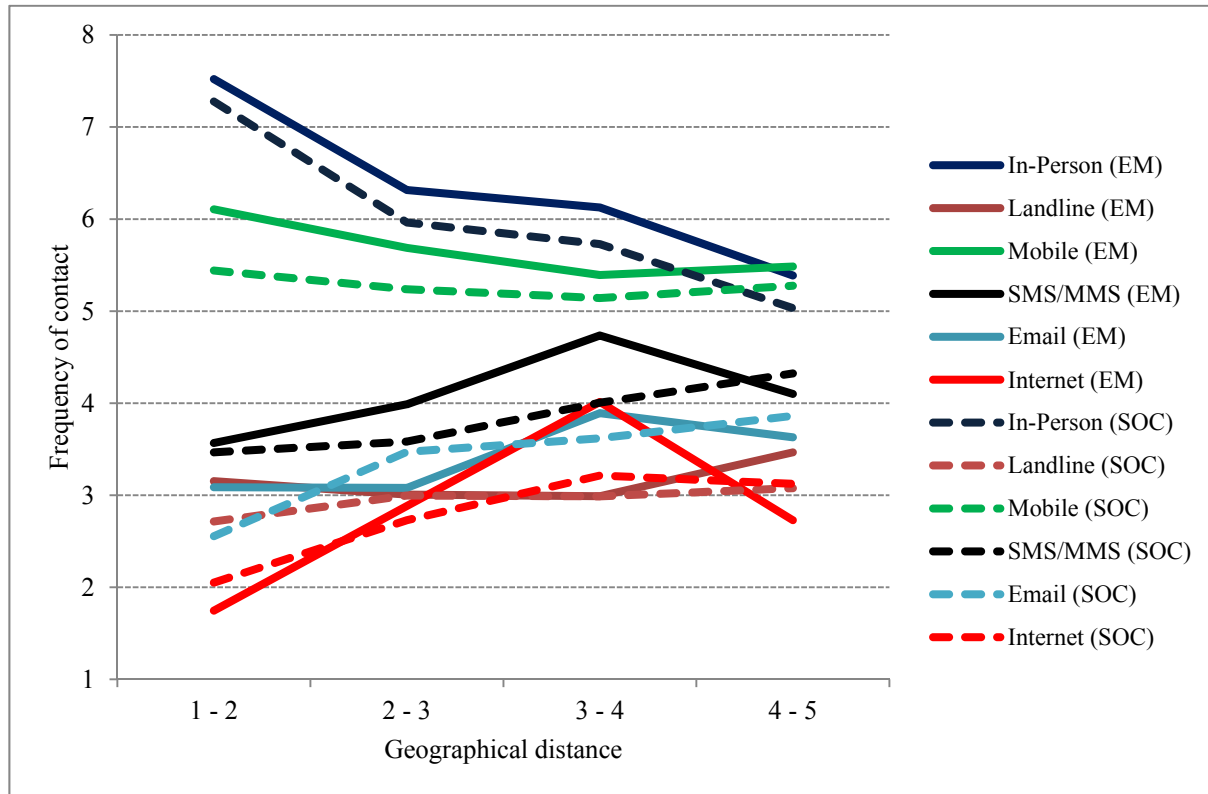
**Figure 8.2: Tie duration and frequency of contact via six communication channels in emotional support and socializing networks**



These results, by and large, confirm the hypothesis that the frequency of in-person and mobile communication is associated with stable, long-lasting ties that live in geographical proximity (Boase et al. 2006; Ishii 2006; Kennedy and Wellman 2007; Matsuda 2005; Sooryamoorthy et al. 2008), whereas frequent internet, email and texting communication serves *also* new, geographically dispersed ties that are on average younger or at least the same age as the ego (e.g., Boase et al. 2006; Hlebec et al. 2006; Zhao 2006b). Yet, such analysis does provide only a descriptive insight into the patterns of relation between the composition of personal networks and communication practices within networks. In other words, it does not enable us to identify how different elements of social reality set out in

Hypothesis 3 contribute to the distribution of social connectivity via the six communication channels within personal networks.

**Figure 8.3: Geographical distance and frequency of contact via six communication channels in emotional support and socializing networks**



## 8.2 MEDIA COMMUNICATION PATTERNS IN PERSONAL NETWORKS

In order to test the Hypothesis 3 and the four specific hypotheses, which have been derived from it, we conducted a series of hierarchical multiple regressions where frequency of contact via different media and the proportional size of different media sub-networks were regressed on the structural characteristics of personal network, frequency of communication via six communication channels/proportional size of six media sub-networks, and the socio-demographic characteristics of respondents. We performed separated regression analyses to investigate whether differences can be observed in the validity of specific hypotheses. Hierarchical regression is similar to stepwise regression, with exception of the fact that it is the researcher (and not the statistical package) who determines the order of entry of the independent variables (or the blocks of the independent variables). Hierarchical multiple regression analysis has several analytical advantages. Among the most important is the

splitting and identification of unique variance in the dependent variable accounted for by the addition of variable(s) at each step or block (Cohen and Cohen 1983).

To test Hypothesis 3a and Hypothesis 3c we ran six hierarchical multiple regressions with the frequency of communication via a selected technology (i.e., in-person, the landline phone, the mobile phone, texting, email, and the Internet) as a dependent variable and three blocks of independent variables. In the first step of the regression model (Model 1) independent variables consisted of structural characteristics of personal networks (i.e., network size, alter age, tie duration, and geographical distance<sup>69</sup>). In the second step (Model 2) a block of variables was entered that measure the frequency of communication via a selected technology.<sup>70</sup> Model 3 contained all the variables in Model 2 plus the socio-demographic variables (gender, age, education, labor status, marital status, children, urban area, and social class). This procedure was applied to emotional support and socializing network data separately.

### *8.2.1 Communication patterns in emotional support network – frequency of communication*

Let us first analyze the results of hierarchical multiple regression analysis for emotional support network. The model statistics and change statistics reported in Table 8.3 show that with exception of Model 1 for frequency of landline phone communication (marginally significant at  $p < .1$ ) all other models were highly statistically significant. Moreover, model statistics indicate that adding a step in all models (with exception of Model 3 for landline telephone and mobile phone communication) accounts for some additional unique variance in the outcome (i.e., a significant  $\Delta R^2$ ), suggesting that including that step and corresponding

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<sup>69</sup> The variable gender (percentage of male in the social network) was omitted from the analysis because the results of the preliminary analysis showed that it was not a significant predictor in any of the analyzed models.

<sup>70</sup> When regressing the dependent variable on the frequency of contact via different communication channels, multicollinearity can be a concern, since we cannot assume that, for instance, frequency of in-person contact is not correlated with the frequency of mobile phone contact. To address these concerns, we examined the values of tolerance and the Variance Inflation Factor (VIF; the reciprocal value of tolerance) for each independent predictor entered into the regression analysis as two collinearity diagnostic factors that are used to identify multicollinearity. As the value of tolerance and VIF for all factors was close to 1 (the common rule of thumb is that only  $VIF \geq 4.0$  indicates a multicollinearity problem), we assumed that none of the factors was affected by the multicollinearity problem.

variables in the model provides more explanatory power. The variables included in Model 3 were significant predictors across all communication technologies, accounting for from a minimum of approximately 15% for landline communication to a maximum of 46% of the variance for internet communication.

**Table 8.3: Model statistics of regression models - frequency of communication in emotional support networks**

		Model statistics		Change statistics		
		F	p	Adj. R <sup>2</sup>	$\Delta R^2$	$\Delta p$ F-test
In-Person	Model 1	41.021	0.000	0.376	0.386	0.000
	Model 2	25.436	0.000	0.453	0.086	0.000
	Model 3	13.571	0.000	<b>0.446</b>	0.010	0.786
Landline	Model 1	1.970	0.099	0.014	0.029	0.099
	Model 2	3.335	0.001	0.073	0.076	0.001
	Model 3	3.727	0.000	<b>0.149</b>	0.098	0.000
Mobile	Model 1	9.885	0.000	0.118	0.131	0.000
	Model 2	10.667	0.000	0.247	0.141	0.000
	Model 3	6.556	0.000	<b>0.262</b>	0.037	0.104
SMS/MMS	Model 1	3.264	0.012	0.033	0.048	0.012
	Model 2	17.221	0.000	0.355	0.329	0.000
	Model 3	12.971	0.000	<b>0.434</b>	0.094	0.000
Email	Model 1	5.032	0.001	0.057	0.071	0.001
	Model 2	8.486	0.000	0.202	0.158	0.000
	Model 3	6.532	0.000	<b>0.262</b>	0.079	0.001
Internet	Model 1	6.143	0.000	0.072	0.086	0.000
	Model 2	10.369	0.000	0.241	0.181	0.000
	Model 3	14.264	0.000	<b>0.459</b>	0.227	0.000

The Model 1 in hierarchical multiple regression analysis revealed that network size, alter age, tie duration, and geographical distances were highly significant predictors of the frequency of in-person communication in emotional support networks (see Table 8.4). In Model 2 in-person communication was regressed on network size, alter age, tie duration, geographical distances as well as frequency of communication via the landline phone, the mobile phone, texting, email and the Internet. Geographical distance was the most influential negative predictor, followed by texting, the mobile phone, alter age, tie duration, the Internet, and email. In Model 3 a block of socio-demographic variables was added to the independent variables from Model 2. The results show that geographical distance was still the most influential negative predictor of the frequency of in-person communication, followed by mobile communication, texting, the Internet and alter age.

As regards the frequency of landline phone communication with network members the Model 1 in hierarchical multiple regression analysis revealed alter age was the only negative significant predictor. In Model 2 landline communication was regressed on network size, alter age, tie duration, geographical distances as well as frequency of communication via the in-person, the mobile phone, texting, email and the Internet. Texting was the most influential negative predictor, while mobile communication was the most important positive predictor. They were followed by geographical distance, alter age, and the Internet. In Model 3 a block of socio-demographic variables was added to the independent variables from Model 2. The results show that geographical distance, mobile communication, age, children and social class were positive predictors of the frequency of communication via landline phone, while marital status was the only statistically significant negative predictor.

In Model 1 the frequency of mobile communication with network members was regressed onto network items. Mobile communication was found to be significantly negatively associated with network size and geographical distance. After controlling for the communication via other modes of interaction these two variables still had a significant negative influence on mobile communication, while in-person, landline phone, and texting communication were positive predictors. When a block of socio-demographic variables was added to the independent variables from Model 2 the results showed that age was negatively associated with mobile communication while urban area was positively associated. In addition, network size and geographical distance were again negative predictors, whereas in-person, landline phone, and texting communication were positive predictors.

The hierarchical multiple regression model for the frequency of texting with network members revealed that in Model 1 tie duration was the only negative significant predictor. In Model 2 the only significant negative predictor of texting was landline phone communication, whereas geographical distance, in-person, mobile, email and internet communication were found to be positively influencing the frequency of texting. In Model 3 texting was in addition regressed onto a block of socio-demographic variables. The results showed that alter age, the gender of respondent, and the fact that the respondent had children were highly significant negative predictors of texting, while in-person, mobile, email, and internet communication were positive predictors. Finally, texting was positively predicted by the education of respondents.

The results of the hierarchical multiple regression analysis for the frequency of emailing with network members showed that in Model 1 the age of alters was the only negative significant predictor. In Model 2 the significant negative predictors of emailing were alter age and in-person communication, whereas mobile communication was found to be positively influencing the frequency of emailing. In Model 3 emailing was also regressed onto a block of socio-demographic variables. The results showed that alter age remained a highly significant negative predictors of email communication, while texting, the Internet, employment status and urban area were all positive predictors.

The right-most panel in Table 8.4 shows the results of the hierarchical multiple regression analysis for the frequency of internet communication with network members. In Model 1 tie duration revealed to be highly significantly negatively associated, while as expected geographical distance was found to be highly significantly positively associated with internet communication. In Model 2 tie duration, in-person and telephone communication were negative predictors, while texting was a highly significant positive predictor. When the socio-demographic variables were entered in Model 3, the alter age turned out to be a negative predictor of internet communication. The same held for in-person communication, while the frequency of email and texting correspondence was positively associated with internet communication. In addition, respondent's age, education and labor status were highly significant negative predictors of the frequency of communication with alters, while social class was a significant positive predictor.



**Table 8.4: Summary of hierarchical regression analysis for variables predicting frequency of communication in emotional support network**

		In-Person			Landline			Mobile			SMS/MMS			Email			Internet		
		B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p
<b>Model 1</b>	Intercept	8.395		0.000	3.296		0.000	7.723		0.000	5.374		0.000	4.036		0.000	2.783		0.000
	network size	-0.094	<b>-0.135</b>	0.007	-0.104	-0.084	0.180	-0.148	<b>-0.182</b>	0.002	-0.043	-0.037	0.553	0.068	0.056	0.357	0.054	0.040	0.510
	alter age	0.378	<b>0.144</b>	0.013	-0.773	<b>-0.167</b>	0.023	-0.028	-0.009	0.893	-0.092	-0.021	0.772	-1.152	<b>-0.255</b>	0.000	-0.039	-0.008	0.915
	tie duration	-0.778	<b>-0.169</b>	0.005	0.771	0.095	0.206	-0.547	-0.103	0.148	-1.483	<b>-0.192</b>	0.010	0.165	0.021	0.777	-1.710	<b>-0.191</b>	0.009
	geographical distance	-0.647	<b>-0.596</b>	0.000	0.083	0.043	0.504	-0.373	<b>-0.296</b>	0.000	0.043	0.024	0.712	0.142	0.076	0.230	0.355	<b>0.168</b>	0.008
<b>Model 2</b>	Intercept	6.672		0.000	1.161		0.382	3.764		0.000	-1.592		0.131	2.380		0.047	2.739		0.038
	network size	-0.054	-0.077	0.106	-0.056	-0.045	0.468	-0.109	<b>-0.135</b>	0.015	-0.015	-0.013	0.800	0.091	0.075	0.193	0.035	0.026	0.647
	alter age	0.347	<b>0.132</b>	0.019	-0.765	<b>-0.165</b>	0.025	0.034	0.011	0.868	-0.021	-0.005	0.939	-0.980	<b>-0.217</b>	0.001	0.102	0.020	0.764
	tie duration	-0.594	<b>-0.129</b>	0.025	0.528	0.065	0.388	-0.188	-0.035	0.602	-0.480	-0.062	0.323	0.662	0.083	0.232	-1.184	<b>-0.132</b>	0.051
	geographical distance	-0.563	<b>-0.519</b>	0.000	0.311	<b>0.162</b>	0.040	-0.2	<b>-0.159</b>	0.025	0.286	<b>0.156</b>	0.017	0.016	0.009	0.907	0.155	0.073	0.307
	in-person				0.127	0.072	0.377	0.313	<b>0.27</b>	0.000	0.451	<b>0.268</b>	0.000	-0.244	<b>-0.141</b>	0.061	-0.307	<b>-0.158</b>	0.032
	landline	0.024	0.042	0.377				0.098	<b>0.15</b>	0.007	-0.123	<b>-0.129</b>	0.013	0.051	0.052	0.369	-0.116	<b>-0.105</b>	0.063
	mobile	0.169	<b>0.196</b>	0.000	0.283	<b>0.185</b>	0.007				0.217	<b>0.149</b>	0.010	0.188	<b>0.126</b>	0.049	0.046	0.027	0.666
	SMS/MMS	0.135	<b>0.227</b>	0.000	-0.194	<b>-0.185</b>	0.013	0.119	<b>0.174</b>	0.010				0.360	0.352	0.000	0.446	<b>0.386</b>	0.000
	email	-0.056	<b>-0.097</b>	0.061	0.062	0.060	0.369	0.08	<b>0.119</b>	0.049	0.278	<b>0.284</b>	0.000				0.063	0.056	0.362
	internet	-0.058	<b>-0.114</b>	0.032	-0.116	<b>-0.128</b>	0.063	0.016	0.027	0.666	0.283	<b>0.328</b>	0.000	0.052	0.058	0.362			
	Intercept	7.204		0.000	-3.111		0.071	4.416		0.000	1.410		0.293	0.745		0.635	6.714		0.000
	network size	-0.049	-0.070	0.158	0.000	0.000	0.996	-0.124	<b>-0.153</b>	0.007	-0.072	-0.061	0.224	0.053	0.044	0.444	0.022	0.016	0.745
	alter age	0.212	<b>0.081</b>	0.265	-0.037	-0.008	0.930	-0.064	-0.021	0.801	-0.903	<b>-0.205</b>	0.005	-0.806	<b>-0.178</b>	0.033	-1.629	<b>-0.319</b>	0.000
	tie duration	-0.407	-0.089	0.161	0.292	0.036	0.647	-0.102	-0.019	0.794	-0.565	-0.073	0.254	0.609	0.077	0.294	-0.114	-0.013	0.839
	geographical distance	-0.542	<b>-0.499</b>	0.000	0.347	<b>0.181</b>	0.020	-0.198	<b>-0.157</b>	0.030	0.177	0.097	0.130	0.036	0.019	0.791	0.140	0.066	0.291
<b>Model 3</b>	in-person				0.150	0.085	0.282	0.294	<b>0.254</b>	0.000	0.386	<b>0.229</b>	0.000	-0.178	-0.103	0.158	-0.305	<b>-0.157</b>	0.012
	landline	0.031	0.055	0.282				0.117	<b>0.179</b>	0.002	-0.038	-0.040	0.444	0.046	0.047	0.425	-0.030	-0.028	0.586
	mobile	0.165	<b>0.191</b>	0.000	0.316	<b>0.207</b>	0.002				0.151	<b>0.104</b>	0.062	0.118	0.079	0.212	0.054	0.032	0.557
	SMS/MMS	0.133	<b>0.224</b>	0.000	-0.063	-0.060	0.444	0.093	<b>0.135</b>	0.062				0.310	<b>0.303</b>	0.000	0.180	<b>0.155</b>	0.012
	email	-0.045	-0.077	0.158	0.056	0.054	0.425	0.053	0.079	0.212	0.227	<b>0.232</b>	0.000				0.111	<b>0.098</b>	0.070
	internet	-0.082	<b>-0.161</b>	0.012	-0.039	-0.043	0.586	0.026	0.044	0.557	0.141	<b>0.163</b>	0.012	0.119	<b>0.134</b>	0.070			
	gender (male = 1)	0.089	0.037	0.447	-0.156	-0.037	0.543	-0.016	-0.006	0.917	-0.026	-0.006	0.896	0.060	0.015	0.795	0.236	0.050	0.293
	age	-0.007	-0.080	0.334	0.028	<b>0.185</b>	0.071	-0.02	<b>-0.197</b>	0.038	-0.033	<b>-0.229</b>	0.006	-0.002	-0.016	0.868	-0.056	<b>-0.339</b>	0.000
	education	-0.037	-0.063	0.287	-0.097	-0.093	0.199	0.063	0.092	0.172	0.125	<b>0.126</b>	0.032	0.103	0.101	0.136	-0.279	<b>-0.243</b>	0.000
	labor status (active = 1)	-0.050	-0.021	0.708	0.437	0.103	0.138	-0.013	-0.005	0.944	-0.343	-0.085	0.133	0.964	<b>0.232</b>	0.000	-0.460	<b>-0.098</b>	0.075
	marital status (married = 1)	0.102	0.042	0.466	-0.605	<b>-0.140</b>	0.048	0.259	0.092	0.165	-0.102	-0.025	0.668	0.274	0.065	0.324	0.002	0.000	0.993
	children (yes = 1)	0.043	0.018	0.824	0.986	<b>0.229</b>	0.019	0.173	0.061	0.502	-0.753	<b>-0.183</b>	0.021	-0.499	-0.118	0.193	-0.380	-0.080	0.305
	urban area (urban = 1)	-0.006	-0.002	0.964	-0.310	-0.073	0.248	0.344	<b>0.123</b>	0.035	0.172	0.043	0.409	0.469	<b>0.113</b>	0.054	0.076	0.016	0.748
	social class	-0.048	-0.022	0.657	0.591	<b>0.152</b>	0.013	-0.131	-0.052	0.368	0.153	0.041	0.408	0.118	0.031	0.585	0.652	<b>0.153</b>	0.002

Comparing the results of hierarchical multiple regression analysis for Model 3 across the six communication modes, the following points become apparent: (1) having older alters in the emotional support network is negatively associated with the frequency of texting, email, and internet communication, while a positive association exists with landline phone communication; (2) the size of emotional support network is not related with the frequency of communication, with exception of texting: people with larger emotional support networks less frequently use texting stay in touch with their network members; (3) having a larger proportion of more distant ties in the network is negatively associated with frequency of in-person and mobile phone communication, whilst a positive association exists with the frequency of telephone communication; (4) as regards the relations between communication modes, more frequent in-person communication with alters is positively associated with mobile communication and texting, while it is negatively associated with internet communication. Landline telephone contacts are positively associated with mobile phone contacts. The latter are also positively associated with in-person communication and texting, while texting is also positively associated with the frequency of email and internet communication. In addition, as expected email and internet communication are positively correlated; (5) in terms of socio-demographic factors we can note that gender is not associated with any of the analyzed technologies. However, older respondents more frequently stay in touch with emotional ties via landline phone, while less often use mobile phone, texting, email, and the internet. Having a higher education is positively correlated with higher frequency of texting and negatively with internet communication. Active respondents (i.e., employed, self-employed, and farmers) are in a more frequent contact with their ties via email and less frequently via the Internet. Having children is positively associated with the frequency of landline communication and negatively with the frequency of texting. Respondents who perceive themselves as members of higher social class are more frequently in contact with their network ties via landline telephone and the Internet, whereas living in urban area is positively associated with mobile phone and email correspondence.

### 8.2.2 *Communication patterns in socializing network – frequency of communication*

The same procedure as specified for testing the Hypothesis 3a and Hypothesis 3c for emotional network was also followed for socializing network. The model statistics and

change statistics reported in Table 8.5 show that all models for communication within socializing networks were highly statistically significant at  $p < .01$ . Moreover, model statistics indicate that adding a step in all models (with exception of Model 3 for landline telephone and mobile phone communication) accounts for some additional unique variance in the outcome (i.e., a significant  $R^2\Delta$ ), suggesting that including that step and corresponding variables in the model provides more explanatory power. The variables included in Model 3 were significant predictors across all communication technologies, accounting for from a minimum of approximately 27% for landline communication to a maximum of more than 50% of the variance for internet communication.

With reference to socializing network the Model 1 in hierarchical multiple regression analysis revealed that geographical distance is the only highly negative significant predictor of the frequency of in-person communication (see Table 8.6). In Model 2 in-person communication was regressed on network size, alter age, tie duration, geographical distances as well as frequency of communication via the landline phone, the mobile phone, texting, email and the Internet. Geographical distance remained the most influential negative predictor. Moreover, email communication turned out to be negatively associated with in-person communication, while mobile phone and texting were positive predictors. In Model 3 a block of socio-demographic variables was added to the independent variables from Model 2. The results show that the size and direction of significant predictors from Model 2 remained unchanged. The only socio-demographic predictor, which was significantly associated with in-person communication, was urban area.

As regards the frequency of landline phone communication with network members the Model 1 in hierarchical multiple regression analysis revealed that tie duration was a positive significant predictor, whilst alter age and network size were moderately significantly predicting landline telephone communication. In Model 2 variables measuring the frequency of communication via the in-person, the mobile phone, texting, email and the Internet were added to the Model 1. Tie duration continued to be the most influential positive predictor, while alter age and network size remained significant negative predictors. Internet communication was the only significant predictor in the block of media use variables. In Model 3 a block of socio-demographic variables was added to the independent variables from Model 2. The results show that tie duration, geographical distance, texting, age, children and

social class were positive predictors of the frequency of communication via landline phones, while education was the only statistically significant negative predictor.

**Table 8.5: Model statistics of regression models - frequency of communication in socializing networks**

		Model statistics			Change statistics	
		F	p	Adj. R <sup>2</sup>	$\Delta R^2$	$\Delta P$ F-test
In-Person	Model 1	24.021	0.000	0.262	0.273	0.000
	Model 2	22.048	0.000	0.422	0.169	0.000
	Model 3	12.377	0.000	<b>0.427</b>	0.023	0.256
Landline	Model 1	12.752	0.000	0.153	0.167	0.000
	Model 2	7.265	0.000	0.179	0.041	0.028
	Model 3	6.726	0.000	<b>0.273</b>	0.114	0.000
Mobile	Model 1	4.350	0.002	0.049	0.064	0.002
	Model 2	14.762	0.000	0.323	0.283	0.000
	Model 3	8.164	0.000	<b>0.320</b>	0.017	0.576
SMS/MMS	Model 1	3.847	0.005	0.042	0.057	0.005
	Model 2	18.810	0.000	0.382	0.347	0.000
	Model 3	12.739	0.000	<b>0.435</b>	0.068	0.000
Email	Model 1	3.643	0.007	0.039	0.054	0.007
	Model 2	10.346	0.000	0.245	0.217	0.000
	Model 3	7.669	0.000	<b>0.304</b>	0.079	0.000
Internet	Model 1	5.736	0.000	0.068	0.082	0.000
	Model 2	11.483	0.000	0.267	0.210	0.000
	Model 3	16.406	0.000	<b>0.503</b>	0.243	0.000

In Model 1 the frequency of mobile communication with network members was regressed onto network items. Mobile communication was found to be significantly negatively predicted by network size and geographical distance (as in the case of emotional support), while alter age was a positive predictor. After controlling for the communication via other modes of interaction only network size still had a marginal significant negative influence on mobile communication, while in-person, email, and texting communication were highly significant positive predictors. The frequency of internet use was negatively associated with mobile phone communication. Adding a block of socio-demographic variables to the independent variables from Model 2 did not improved the model significantly: network size still had a marginal significant negative influence on mobile communication, while in-person, email, and texting communication were highly significant positive predictors.

**Table 8.6: Summary of hierarchical regression analysis for variables predicting frequency of communication in socializing network**

		In-Person			Landline			Mobile			SMS/MMS			Email			Internet		
		B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p
<b>Model 1</b>	Intercept	7.585		0.000	1.780		0.000	5.826		0.000	3.628		0.000	2.368		0.000	2.296		0.000
	Network size	-0.022	-0.049	0.379	-0.075	<b>-0.111</b>	0.061	-0.080	<b>-0.152</b>	0.016	-0.084	<b>-0.119</b>	0.059	-0.048	-0.063	0.318	-0.117	<b>-0.131</b>	0.036
	Alter age	0.306	0.090	0.132	-0.934	<b>-0.183</b>	0.004	0.560	<b>0.139</b>	0.040	0.980	<b>0.183</b>	0.008	0.090	0.016	0.817	0.797	<b>0.118</b>	0.080
	Tie duration	-0.019	-0.004	0.947	3.159	<b>0.455</b>	0.000	0.269	0.049	0.473	-1.169	<b>-0.160</b>	0.020	-0.189	-0.024	0.725	-1.563	<b>-0.169</b>	0.013
	Geographical distance	-0.651	<b>-0.511</b>	0.000	0.136	0.071	0.222	-0.217	<b>-0.144</b>	0.020	0.173	0.086	0.167	0.474	<b>0.220</b>	0.000	0.441	<b>0.173</b>	0.005
<b>Model 2</b>	Intercept	6.148		0.000	1.769		0.058	1.925		0.004	-2.577		0.002	3.556		0.000	0.358		0.761
	Network size	0.003	0.008	0.881	-0.086	<b>-0.129</b>	0.031	-0.048	<b>-0.091</b>	0.096	-0.007	-0.010	0.848	0.009	0.012	0.834	-0.100	<b>-0.112</b>	0.046
	Alter age	0.028	0.008	0.881	-0.860	<b>-0.169</b>	0.009	0.275	0.068	0.245	0.444	0.083	0.141	-0.263	-0.046	0.462	0.161	0.024	0.698
	Tie duration	0.135	0.029	0.620	2.912	<b>0.419</b>	0.000	0.385	0.070	0.269	-0.930	<b>-0.127</b>	0.036	0.142	0.018	0.787	-0.128	-0.014	0.835
	Geographical distance	-0.567	<b>-0.445</b>	0.000	0.203	0.106	0.127	-0.094	-0.063	0.322	0.338	<b>0.168</b>	0.005	0.049	0.023	0.732	0.366	<b>0.144</b>	0.028
	In-person				-0.017	-0.011	0.881	0.348	<b>0.294</b>	0.000	0.378	<b>0.239</b>	0.000	-0.617	<b>-0.365</b>	0.000	0.195	0.097	0.171
	Landline	-0.005	-0.008	0.881				0.036	0.046	0.422	0.016	0.015	0.781	0.014	0.012	0.842	-0.255	<b>-0.192</b>	0.001
	Mobile	0.212	<b>0.251</b>	0.000	0.071	0.056	0.422				0.419	<b>0.314</b>	0.000	0.408	<b>0.286</b>	0.000	-0.217	<b>-0.128</b>	0.050
	Sms/mms	0.141	<b>0.224</b>	0.000	0.019	0.020	0.781	0.257	<b>0.344</b>	0.000				0.191	<b>0.179</b>	0.010	0.447	<b>0.354</b>	0.000
	Email	-0.166	<b>-0.280</b>	0.000	0.012	0.013	0.842	0.179	<b>0.256</b>	0.000	0.137	<b>0.146</b>	0.010				0.236	<b>0.199</b>	0.001
	Internet	0.038	0.077	0.171	-0.162	<b>-0.215</b>	0.001	-0.070	<b>-0.119</b>	0.050	0.236	<b>0.298</b>	0.000	0.174	<b>0.205</b>	0.001			
<b>Model 3</b>	Intercept	5.855		0.000	-1.434		0.242	1.895		0.042	0.208		0.855	0.671		0.619	3.904		0.004
	Network size	0.006	0.014	0.787	-0.063	-0.093	0.107	-0.056	<b>-0.105</b>	0.060	-0.027	-0.038	0.461	-0.018	-0.024	0.676	-0.026	-0.030	0.537
	Alter age	-0.004	-0.001	0.985	-0.008	-0.002	0.983	0.169	0.042	0.547	-0.140	-0.026	0.681	0.380	0.066	0.347	-1.239	<b>-0.183</b>	0.002
	Tie duration	0.113	0.024	0.681	2.669	<b>0.384</b>	0.000	0.372	0.068	0.295	-0.874	<b>-0.119</b>	0.043	-0.098	-0.013	0.848	0.167	0.018	0.744
	Geographical distance	-0.545	<b>-0.428</b>	0.000	0.217	<b>0.113</b>	0.097	-0.098	-0.065	0.326	0.208	<b>0.103</b>	0.086	0.104	0.048	0.472	0.250	<b>0.098</b>	0.081
	In-person				0.000	0.000	0.999	0.352	<b>0.297</b>	0.000	0.381	<b>0.241</b>	0.000	-0.513	<b>-0.304</b>	0.000	0.004	0.002	0.971
	Landline	0.000	0.000	0.999				0.051	0.064	0.300	0.101	<b>0.096</b>	0.090	0.021	0.019	0.768	-0.086	-0.064	0.226
	Mobile	0.212	<b>0.250</b>	0.000	0.087	0.069	0.300				0.332	<b>0.249</b>	0.000	0.328	<b>0.230</b>	0.000	-0.148	-0.088	0.110
	Sms/mms	0.155	<b>0.244</b>	0.000	0.117	<b>0.123</b>	0.090	0.224	<b>0.299</b>	0.000				0.142	<b>0.133</b>	0.061	0.320	<b>0.253</b>	0.000
	Email	-0.148	<b>-0.250</b>	0.000	0.017	0.019	0.768	0.157	<b>0.225</b>	0.000	0.101	<b>0.108</b>	0.061				0.276	<b>0.233</b>	0.000
	Internet	0.001	0.003	0.971	-0.071	-0.094	0.226	-0.071	-0.120	0.110	0.228	<b>0.288</b>	0.000	0.276	<b>0.327</b>	0.000			
	Gender (male = 1)	0.157	0.070	0.177	-0.252	-0.074	0.201	-0.132	-0.049	0.379	-0.361	<b>-0.101</b>	0.048	0.242	0.063	0.266	0.162	0.036	0.456
	Age	-0.003	-0.036	0.649	0.023	<b>0.181</b>	0.043	-0.007	-0.068	0.432	-0.015	-0.117	0.138	0.005	0.035	0.693	-0.042	<b>-0.251</b>	0.001
	Education	0.008	0.015	0.809	-0.094	<b>-0.112</b>	0.099	0.031	0.046	0.483	0.117	<b>0.132</b>	0.028	0.162	<b>0.171</b>	0.010	-0.275	<b>-0.246</b>	0.000
	Labor status (active = 1)	-0.153	-0.068	0.237	0.152	0.045	0.485	0.139	0.052	0.404	0.054	0.015	0.791	0.764	<b>0.200</b>	0.001	-0.569	<b>-0.126</b>	0.017
	Marital status (married = 1)	0.006	0.003	0.964	-0.232	-0.068	0.286	0.013	0.005	0.936	0.092	0.026	0.648	0.367	0.095	0.125	-0.182	-0.040	0.448
	Children (yes = 1)	0.005	0.002	0.981	1.045	<b>0.300</b>	0.001	-0.164	-0.060	0.500	-0.693	<b>-0.189</b>	0.019	-0.391	-0.100	0.266	-0.311	-0.067	0.377
	Urban area (urban = 1)	-0.233	<b>-0.103</b>	0.041	-0.175	-0.052	0.366	0.183	0.069	0.214	0.273	0.077	0.128	0.215	0.056	0.314	-0.093	-0.021	0.664
	Social class	0.139	0.068	0.187	0.349	<b>0.114</b>	0.049	0.113	0.047	0.405	-0.435	<b>-0.134</b>	0.008	0.089	0.026	0.648	0.628	<b>0.154</b>	0.001

The results of the hierarchical multiple regression analysis for the frequency of texting with network members showed that in Model 1 network size and tie duration were negative significant predictors, whereas alter age increased the amount of texting in socializing network. In Model 2 the only significant negative predictor of texting was tie duration, whilst geographical distance, in-person, mobile, email, and internet communication were found to positively influence the frequency of SMS communication. In Model 3 texting was also regressed onto a block of socio-demographic variables. On one hand, the results showed that respondents' gender and social class as well as whether s/he has children were together with tie duration highly significant negative predictors of SMS communication. On the other hand, geographical distance and all modes of communication including in-person encounters were all positive predictors.

The hierarchical multiple regression model for the frequency of emailing with network members revealed that in Model 1 geographical distance was the only significant predictor. In Model 2 the only significant negative predictor of email communication was in-person communication, whereas texting, email and internet conversations were found to positively influence emailing. In Model 3 emailing was also regressed onto a block of socio-demographic variables. The results showed that education and employment status of respondents as well as internet, SMS, and mobile communication were significant positive predictors of email communication, while in-person communication was the negative predictor.

The right-most panel in Table 8.6 shows the results of the analysis in which the frequency of internet communication with alters was regressed in the three models. In Model 1 all predictors turned out to be statistically significantly associated with internet communication: as expected tie duration and network size were negative predictors, whereas geographical distance and alter age were positive predictors. Model 2 confirmed the negative association with network size and the positive association of internet communication with geographical distance. Moreover, it revealed that email and texting are positively associated with internet communication, whereas landline and mobile phone communication are negatively. After entering the socio-demographic variables in the Model 3, SMS and email communication turned out to be the most important positive predictors of internet communication – together

with geographical distance which was only marginally significant. On the other hand, age, education, and employment status of the ego as well as the age of alters were highly significant negative predictors of the frequency of internet communication with alters.

Comparing the results of hierarchical multiple regression analysis for Model 3 across the six communication modes with reference to socializing, the following points become apparent: (1) respondent with larger socializing networks are less frequently in touch with their alters via mobile phone; (2) having older socializing companions correlates with less frequent communication via the Internet; (3) respondents with more durable relationships in socializing network have less frequent SMS contacts, yet more frequent landline phone conversations; (4) geographic distance negatively affects the frequency of in-person communication, while it is positively associated with internet and SMS communication; (4) as regards the relations between communication modes, more frequent in-person communication with alters is positively associated with mobile communication and texting, while it is negatively associated with email communication. Communication over the telephone is positively associated with texting. The latter is positively associated also with mobile, internet, and email communication, while email communication is also positively associated with the frequency of internet communication; (5) in terms of socio-demographic factors the results show that males less frequently stay in touch with their alters via SMS. Older respondents more frequently stay in touch with socializing companions via landline phone, while younger are more often in touch with their ties via the Internet. Further, egos with higher education use less often the Internet and more often email and texting. As in the case of emotional support, active respondents (i.e., employed, self-employed, and farmers) are in a more frequent contact with their ties via email and less frequently via the Internet. Having children is positively associated with the frequency of landline communication and negatively with the frequency of texting. Respondents who perceive themselves as members of higher social class are more frequently in contact with their network ties via landline telephone and less through the Internet, whereas residence in urban area has a moderate negative effect on the frequency of in-person encounters.

### 8.2.3 Summary of the results regarding frequency of communication within personal networks

Hypothesis 3a suggested that smaller and nearby networks will be associated with more frequent in-person, mobile voice and texting communication, whilst larger and far-flung networks will be associated with more frequent landline telephone, email and internet communication. We found partial support for this hypothesis (see Table 8.7). For example, the frequency of mobile communication is more intense in smaller and proximate networks, while the number of contact via landline phone is associated with more far-flung ties. Yet the frequency of texting appears to be unrelated to the number and geographical location of ties. The same conclusion can be drawn for email and internet communication, which seem to be unrelated to the size and remoteness of emotional support and socializing networks. With reference to the comparison of the types of support network, only two differences should be mentioned. In contrast with emotional support networks, mobile communication seems to be unrelated to the propinquity of socializing networks, while, as hypothesized, the frequency of internet communication is associated with the remoteness of socializing network.

**Table 8.7: Summary for the verification of Hypothesis 3a**

<b>Emotional support</b>	<b>In-person</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Landline</b>	<b>Email</b>	<b>Internet</b>
Small network	No	Yes	No	—	—	—
Local network	Yes	Yes	No	—	—	—
Large network	—	—	—	No	No	No
Remote network	—	—	—	Yes	No	No
<b>Socializing</b>	<b>In-person</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Landline</b>	<b>Email</b>	<b>Internet</b>
Small network	No	Yes	No	—	—	—
Local network	Yes	No	No	—	—	—
Large network	—	—	—	No	No	No
Remote network	—	—	—	Yes	No	Yes

Note: “Yes” indicates a confirmed hypothesis. “No” indicates a rejected hypothesis. Blank cell indicates that a hypothesis was not verified. The evaluation of the hypotheses is based on Model 3.

Hypothesis 3c stated that the frequency of contact via a selected communication channel will be positively associated with the frequency of contact via other means of communication. Our results generally support this claim since in both types of networks eight out of 15 correlations between the frequency of interaction variables were found positive and significant (see Table 8.8). In both types of networks the largest number of significant positive associations was found for mobile and SMS/MMS communication, which together



with face-to-face encounters are the most common access points in personal networks. Moreover, in both networks a notable alliance exists between text-based channels: frequent emailing is positively associated with texting and internet contact. This finding might be partly explained by the fact that individuals who combine these modes of communication have a very similar composition of personal networks.<sup>71</sup> Finally, it should be mention that the only negative associations were found between in-person communication and email (emotional support) and internet communication (socializing).

**Table 8.8: Summary for the verification of Hypothesis 3c**

<b>Emotional support</b>	<b>In-person</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
<b>In-person</b>	—		P	P		N
<b>Landline</b>		—	P			
<b>Mobile</b>			—	P		
<b>SMS/MMS</b>				—	P	P
<b>Email</b>					—	P
<b>Internet</b>						—
<b>Socializing</b>	<b>In-person</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
<b>In-person</b>	—		P	P	N	
<b>Landline</b>		—		P		
<b>Mobile</b>			—	P	P	
<b>SMS/MMS</b>				—	P	P
<b>Email</b>					—	P
<b>Internet</b>						—

Note: “P” indicates a statistically significant positive association. “N” indicates a statistically significant negative association. Blank cell indicates a non-significant association. Associations are based on Model 3.

#### 8.2.4 *The proportional size of media sub-networks in emotional support sub-networks*

To test the Hypothesis 3b and Hypothesis 3d, which have addressed the relation between the proportions of alters, with whom the ego is in contact via various communication technologies, and the structural characteristics of personal network, proportional size of other media sub-networks, and the socio-demographic characteristics of respondents, we again conducted a series of hierarchical multiple regressions. The procedure was similar to the one used for the testing of Hypothesis 3a and Hypothesis 3c. We ran five hierarchical multiple

<sup>71</sup> The results of cluster analysis, for example, show that an individual who often contacts their network members via email, texting, and the Internet would most likely be a 15-27-year-old single middle-class person without children, who lives in an urban area (for more details see Section 8.4).

regressions with proportion of alters with whom the ego is in contact via various communication technologies (i.e., the landline phone, the mobile phone, texting, email, and the Internet)<sup>72</sup> as a dependent variable and three blocks of independent variables. In the first step of the regression model (Model 1) independent variables consisted of structural characteristics of personal networks (i.e., network size, alter age, tie duration, and geographical distance). In the second step (Model 2) a block of variables was entered that measure proportion of alters with whom the ego is in contact via selected communication technologies (i.e., the landline phone, the mobile phone, texting, email, and the Internet). Model 3 contained all the variables in Model 2 plus the socio-demographic variables (gender, age, education, labor status, marital status, children, urban area, and social class). This procedure was applied to emotional support and socializing network data separately.

The model statistics and change statistics reported in Table 8.9 for emotional support networks show that with exception of Model 1 for frequency of mobile communication (non-significant) and SMS communication (marginally significant at  $p < .10$ ) all other models were highly statistically significant. Moreover, model statistics indicate that adding a step in all models (with exception of Model 1 and 3 for mobile phone and Model 1 for SMS communication) accounts for some additional unique variance in the outcome (i.e., a significant  $\Delta R^2$ ), suggesting that including that step and corresponding variables in the model provides more explanatory power. The variables included in Model 3 were significant predictors across all communication technologies, accounting for from a minimum of approximately 5% for mobile phone communication to a maximum of approximately 37% of the variance for internet communication.

The Model 1 in hierarchical multiple regression analysis revealed that the average alter's age was the only highly significant negative predictor of the proportion of alters with whom egos are in contact via landline phone in emotional support networks (see Table 8.10). In Model 2 the significant negative association of alter's age remained, yet also the proportion of alters

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<sup>72</sup> In-person communication was omitted from the analysis due to the lack of diversity in those surveyed; almost all respondents were in-person contact with all their alters in their emotional and social companionship networks (see Table 8.2).

with whom egos are in contact via internet turned out to negatively predict the proportion of “landline ties”. Geographical distance was the most influential negative predictor, followed by texting, the mobile phone, alter age, tie duration, the Internet, and email. When a block of socio-demographic variables was added to the independent variables from Model 2 both effects disappeared. Instead, the results showed respondent’s age, employment status, social class and the fact whether s/he has children were positively associated with the proportion of ties with whom the ego kept in contact via the landline phone.

As regards the proportion of “mobile phone ties” the Model 1 in hierarchical multiple regression analysis revealed that network size was the only (negative) significant predictor: participants with a larger network had a smaller proportion of alters in their emotional support networks with who they were in contact via the mobile phone. In Model 2 the negative association with network size remained significant. In addition, the proportion of “mobile phone ties” was positively associated with the proportion of “SMS/MMS ties” and “email ties”: participants with more email and SMS/MMS contacts in their network had also a larger proportional size of mobile phone sub-network. In Model 3 the significant effect of “email” network disappeared while the effect of network size remained significant. Moreover, social class is negatively associated with the proportional size of mobile phone sub-network.

In Model 1 the proportional size of SMS/MMS sub-network was regressed onto network items. The dependent variable was found to be marginally negatively associated with tie duration. After controlling for the proportional size of other media sub-networks this negative effect became highly significant, while the proportional sizes of mobile phone, email, and internet sub-networks were highly significant positive predictors. When a block of socio-demographic variables was added to the independent variables from Model 2 the results showed that duration of tie was again associated with the proportional size of texting sub-network. This also held for independent variables measuring the proportional size of mobile phone and email sub-networks. In addition, education and urban area appeared to be positively, yet marginally associated with the dependent variable: respondents from urban dwellings with higher education had a larger proportional size of texting sub-network in emotional networks.

The hierarchical multiple regression model for the proportional size of email sub-network revealed that in Model 1 alter's age was highly significant negative predictor while geographical distance was marginally significant positive predictor. In Model 2 alter's age remained a significant negative predictor, the proportional size of mobile phone and texting sub-networks were positive predictors. In Model 3 all predictors from Model 3 remained significant at  $p < .05$ . In addition, the results showed that proportional size of email sub-network (marginal significance) and having children were associated with the dependent variable: having children negatively affected the proportional size of email sub-network, while the proportional size of internet sub-network was positively associated.

**Table 8.9: Model statistics of regression models – proportion of alters in emotional support network**

		Model statistics			Change statistics	
		F	P	Adj. R <sup>2</sup>	$\Delta R^2$	$\Delta p$ F-test
Landline	Model 1	3.388	0.010	0.035	0.049	0.010
	Model 2	2.984	0.003	0.056	0.036	0.043
	Model 3	4.965	0.000	<b>0.193</b>	0.157	0.000
Mobile	Model 1	1.879	0.115	0.013	0.028	0.115
	Model 2	2.298	0.022	0.038	0.039	0.033
	Model 3	1.862	0.024	<b>0.049</b>	0.040	0.198
SMS/MMS	Model 1	2.08	0.084	0.016	0.031	0.084
	Model 2	6.312	0.000	0.138	0.133	0.000
	Model 3	6.055	0.000	<b>0.234</b>	0.116	0.000
Email	Model 1	4.838	0.001	0.055	0.069	0.001
	Model 2	7.289	0.000	0.159	0.116	0.000
	Model 3	5.666	0.000	<b>0.220</b>	0.082	0.001
Internet	Model 1	5.568	0.000	0.064	0.079	0.000
	Model 2	5.517	0.000	0.120	0.068	0.001
	Model 3	10.924	0.000	<b>0.374</b>	0.266	0.000

The last vertical panel in Table 8.10 shows the results of the hierarchical multiple regression analysis for the proportional size of internet sub-network. In Model 1 tie duration revealed to be marginally significantly negatively associated, while geographical distance was found to be highly significantly positively associated with the proportional size of internet sub-network. In Model 2 the effect of tie duration disappeared, while the effect of geographical distance remained significant. Further, the proportional size of internet sub-network was found to be positively associated with the proportional size of mobile phone and negatively with the proportional size of SMS/MMS communication sub-network. When the socio-

demographic variables were entered in Model 3, alter's age, respondent's age, gender, education were found to be negative predictors of the proportional size of internet communication sub-networks, while geographical distance and the proportion of "email ties" (marginal significance) were positive predictors of the dependent variable.

To sum up, the results of hierarchical multiple regression analysis for Model 3 across the six communication sub-networks in emotional support network serve us with the following suggestions: (1) having a larger emotional support network is associated with a smaller proportional size of mobile communication sub-networks; (2) having older alters in the emotional support network is negatively associated with the proportional size of texting, email, and internet sub-networks; (3) having a larger proportion of more distant ties in the network is positively associated with the proportional size of internet communication sub-network; (4) as regards the relations between different communication sub-networks, the proportional size of landline communication sub-network is not associated with any other communication mode, mobile phones are associated with texting, while more pronounced positive associations were ascertained between texting and email as well as between email and internet sub-networks; (5) in terms of socio-demographic factors we found that this block of factors has the largest association with the proportional size of landline and internet sub-networks. Interestingly, some independent variables have contrary effects on the size of the two sub-networks. For example, while age and employment status are positive predictors of landline telephone sub-network size, they are negative predictors of the proportional size of internet sub-networks.

**Table 8.10: Summary of hierarchical regression analysis for variables predicting the proportional size of media sub-networks (emotional support)**

		Landline			Mobile			SMS/MMS			Email			Internet		
		B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p
<b>Model 1</b>	Intercept	57.107		0.000	98.802		0.000	94.930		0.000	65.753		0.000	31.896		0.002
	Network size	-1.503	-0.059	0.339	-1.461	<b>-0.148</b>	0.018	-0.535	-0.026	0.675	0.448	0.017	0.778	1.051	0.041	0.494
	Alter age	-22.810	<b>-0.239</b>	0.001	-0.958	-0.026	0.722	-4.310	-0.056	0.440	-25.592	<b>-0.262</b>	0.000	-3.708	-0.039	0.582
	Tie duration	18.560	0.111	0.136	4.518	0.070	0.353	-17.804	<b>-0.132</b>	0.078	15.236	0.089	0.226	-21.720	<b>-0.131</b>	0.075
	Geographical distance	2.242	0.057	0.373	-0.577	-0.038	0.558	0.107	0.003	0.958	4.733	<b>0.117</b>	0.064	7.481	<b>0.190</b>	0.003
<b>Model 2</b>	Intercept	50.221		0.009	89.202		0.000	52.866		0.000	0.305		0.987	23.190		0.213
	Network size	-1.141	-0.045	0.468	-1.410	<b>-0.143</b>	0.021	-0.419	-0.020	0.729	0.969	0.037	0.524	0.774	0.031	0.609
	Alter age	-22.675	<b>-0.238</b>	0.001	0.822	0.022	0.768	2.053	0.027	0.707	-22.749	<b>-0.233</b>	0.001	-4.541	-0.048	0.506
	Tie duration	13.112	0.078	0.296	4.458	0.069	0.363	-19.795	<b>-0.147</b>	0.039	22.135	0.129	0.067	-16.580	-0.100	0.168
	Geographical distance	3.599	0.091	0.158	-0.776	-0.051	0.437	-1.674	-0.053	0.394	4.053	0.100	0.100	7.376	<b>0.188</b>	0.002
	Landline				0.019	0.049	0.433	-0.009	-0.011	0.856	0.029	0.028	0.634	-0.176	<b>-0.177</b>	0.003
	Mobile	0.125	0.048	0.433				0.241	<b>0.116</b>	0.049	0.263	<b>0.100</b>	0.087	-0.044	-0.017	0.775
	Sms/mms	-0.015	-0.012	0.856	0.062	<b>0.129</b>	0.049				0.365	<b>0.287</b>	0.000	0.176	<b>0.143</b>	0.023
	Email	0.031	0.031	0.634	0.043	<b>0.114</b>	0.087	0.231	<b>0.294</b>	0.000				0.096	0.099	0.120
	Internet	-0.191	<b>-0.190</b>	0.003	-0.007	-0.019	0.775	0.113	<b>0.140</b>	0.023	0.097	0.095	0.120			
<b>Model 3</b>	Intercept	-45.988		0.108	106.959		0.000	88.889		0.000	-20.092		0.486	92.678		0.000
	Network size	0.101	0.004	0.946	-1.439	<b>-0.146</b>	0.021	-1.446	-0.070	0.217	0.303	0.012	0.840	0.270	0.011	0.836
	Alter age	3.201	0.034	0.702	0.789	0.021	0.822	-17.293	<b>-0.225</b>	0.008	-21.948	<b>-0.225</b>	0.009	-38.561	<b>-0.407</b>	0.000
	Tie duration	2.193	0.013	0.864	5.157	0.080	0.336	-15.416	-0.115	0.123	18.782	0.110	0.143	1.741	0.010	0.876
	Geographical distance	3.519	0.089	0.159	-0.906	-0.059	0.389	-1.436	-0.045	0.464	3.022	0.075	0.230	5.927	<b>0.151</b>	0.006
	Landline				0.023	0.058	0.396	0.078	0.097	0.116	0.064	0.062	0.317	-0.007	-0.007	0.903
	Mobile	0.128	0.049	0.396				0.221	<b>0.107</b>	0.060	0.304	<b>0.115</b>	0.044	0.004	0.001	0.978
	Sms/mms	0.127	0.102	0.116	0.064	<b>0.132</b>	0.060				0.268	<b>0.211</b>	0.001	-0.037	-0.030	0.598
	Email	0.063	0.064	0.317	0.053	0.140	0.044	0.163	<b>0.207</b>	0.001				0.093	<b>0.096</b>	0.091
	Internet	-0.009	-0.009	0.903	0.001	0.002	0.978	-0.030	-0.037	0.598	0.123	<b>0.119</b>	0.091			
	Gender (male = 1)	-3.026	-0.035	0.557	1.544	0.046	0.475	5.454	0.077	0.176	-6.346	-0.071	0.220	4.407	0.051	0.328
	Age	1.055	<b>0.339</b>	0.001	-0.093	-0.077	0.475	-0.909	-0.364	0.000	-0.124	-0.039	0.692	-1.215	<b>-0.393</b>	0.000
	Education	-3.221	-0.150	0.030	-0.074	-0.009	0.906	2.149	<b>0.125</b>	0.065	2.991	0.136	0.046	-2.978	<b>-0.140</b>	0.022
	Labor status (active = 1)	11.960	<b>0.137</b>	0.041	-1.061	-0.031	0.667	-1.228	-0.017	0.790	15.112	0.169	0.010	-12.438	<b>-0.143</b>	0.015
	Marital status (married = 1)	-9.390	-0.106	0.126	-2.507	-0.073	0.331	-5.991	-0.084	0.213	8.229	0.091	0.183	-4.205	-0.048	0.434
	Children (yes = 1)	19.117	<b>0.215</b>	0.022	4.367	0.127	0.214	-5.804	-0.081	0.376	-18.386	<b>-0.202</b>	0.028	-8.776	-0.099	0.231
	Urban area (urban = 1)	-5.783	-0.066	0.278	1.274	0.038	0.569	7.490	<b>0.106</b>	0.072	8.439	0.094	0.115	1.348	0.015	0.773
	Social class	9.564	<b>0.120</b>	0.045	-5.489	<b>-0.178</b>	0.006	3.673	0.057	0.327	2.573	0.032	0.593	12.229	<b>0.154</b>	0.003

**Table 8.11: Summary of hierarchical regression analysis for variables predicting the proportional size of media sub-networks (socializing)**

		Landline			Mobile			SMS/MMS			Email			Internet		
		B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p	B	Beta	p
Model 1	Intercept	61.687		0.000	88.659		0.000	27.435		0.012	35.732		0.002	20.455		0.079
	Network size	-1.607	<b>-0.123</b>	0.055	-0.844	<b>-0.115</b>	0.075	-1.983	<b>-0.123</b>	0.043	-1.639	-0.100	0.116	-2.325	<b>-0.139</b>	0.026
	Alter age	7.258	0.073	0.287	5.130	0.092	0.184	-21.819	<b>-0.179</b>	0.006	9.498	0.076	0.264	16.870	<b>0.133</b>	0.048
	Tie duration	0.065	0.000	0.994	4.688	0.062	0.377	66.096	<b>0.397</b>	0.000	-5.685	-0.034	0.627	-21.809	<b>-0.126</b>	0.064
	Geographical distance	5.710	<b>0.153</b>	0.015	0.394	0.019	0.765	2.711	0.059	0.320	8.390	<b>0.180</b>	0.004	9.198	<b>0.193</b>	0.002
Model 2	Intercept	24.111		0.058	79.456		0.000	31.861		0.042	-27.889		0.071	24.356		0.134
	Network size	-0.817	-0.062	0.304	-0.594	-0.081	0.201	-2.403	<b>-0.149</b>	0.014	-0.095	-0.006	0.921	-2.403	<b>-0.144</b>	0.017
	Alter age	3.050	0.031	0.636	3.655	0.065	0.332	-18.524	<b>-0.152</b>	0.019	2.757	0.022	0.725	9.135	0.072	0.267
	Tie duration	-0.266	-0.002	0.977	5.338	0.070	0.326	61.599	<b>0.370</b>	0.000	-7.479	-0.044	0.508	-3.281	-0.019	0.782
	Geographical distance	3.159	0.085	0.157	-0.756	-0.036	0.563	4.120	0.090	0.135	4.061	0.087	0.135	7.460	<b>0.157</b>	0.009
	Landline				-0.010	-0.022	0.740	-0.044	-0.020	0.740	0.070	0.069	0.257	-0.251	<b>-0.242</b>	0.000
	Mobile	0.018	0.022	0.724				0.028	0.022	0.724	0.406	<b>0.182</b>	0.002	-0.117	-0.051	0.398
	Sms/mms	0.314	<b>0.176</b>	0.003	0.107	<b>0.191</b>	0.003				0.343	<b>0.274</b>	0.000	0.076	0.059	0.347
	Email	0.232	<b>0.291</b>	0.000	0.094	<b>0.210</b>	0.002	0.073	0.074	0.257				0.242	<b>0.237</b>	0.000
	Internet	0.046	0.059	0.347	-0.024	-0.056	0.398	-0.235	<b>-0.244</b>	0.000	0.219	<b>0.224</b>	0.000			
Model 3	Intercept	92.850		0.000	98.054		0.000	-49.463		0.071	-69.659		0.010	86.943		0.000
	Network size	-1.092	-0.083	0.157	-0.619	-0.084	0.196	-1.863	<b>-0.116</b>	0.051	-0.732	-0.045	0.444	-1.086	-0.065	0.207
	Alter age	-12.348	<b>-0.124</b>	0.089	0.736	0.013	0.871	5.275	0.043	0.559	13.829	0.111	0.124	-25.840	<b>-0.203</b>	0.001
	Tie duration	2.645	0.020	0.767	6.594	0.087	0.233	50.468	<b>0.303</b>	0.000	-11.396	-0.067	0.301	5.409	0.031	0.586
	Geographical distance	2.241	<b>0.060</b>	0.313	-1.159	-0.055	0.400	3.135	0.068	0.255	3.323	0.071	0.226	6.120	<b>0.128</b>	0.013
	Landline				-0.004	-0.009	0.903	-0.016	-0.007	0.903	0.060	0.059	0.344	-0.055	-0.053	0.337
	Mobile	0.107	<b>0.132</b>	0.037				0.165	<b>0.134</b>	0.037	0.397	<b>0.178</b>	0.002	-0.106	-0.047	0.357
	Sms/mms	0.232	<b>0.130</b>	0.024	0.089	<b>0.159</b>	0.024				0.273	<b>0.218</b>	0.000	-0.015	-0.011	0.838
	Email	0.179	<b>0.224</b>	0.000	0.100	<b>0.222</b>	0.002	0.061	0.062	0.344				0.270	<b>0.264</b>	0.000
	Internet	-0.012	-0.015	0.838	-0.033	-0.075	0.357	-0.069	-0.071	0.337	0.332	<b>0.339</b>	0.000			
	Gender (male = 1)	-2.138	-0.032	0.578	-2.255	-0.061	0.344	-3.851	-0.047	0.419	-1.307	-0.016	0.784	0.182	0.002	0.966
	Age	-0.819	<b>-0.337</b>	0.000	-0.245	<b>-0.179</b>	0.086	0.990	<b>0.331</b>	0.000	0.218	0.071	0.445	-0.992	<b>-0.319</b>	0.000
	Education	2.242	<b>0.137</b>	0.044	0.403	0.044	0.560	-2.434	<b>-0.121</b>	0.078	3.883	<b>0.190</b>	0.005	-3.207	<b>-0.153</b>	0.009
	Labor status (active = 1)	5.959	0.090	0.162	0.419	0.011	0.874	3.292	0.040	0.534	11.849	<b>0.143</b>	0.024	-11.491	<b>-0.136</b>	0.015
	Marital status (married = 1)	-2.265	-0.034	0.600	-4.439	<b>-0.119</b>	0.096	-1.680	-0.021	0.753	9.709	<b>0.117</b>	0.068	-6.350	-0.075	0.186
	Children (yes = 1)	-7.167	-0.106	0.243	5.411	0.142	0.155	12.571	<b>0.151</b>	0.098	-10.209	-0.120	0.178	-11.107	-0.128	0.104
	Urban area (urban = 1)	7.764	<b>0.118</b>	0.040	-1.549	-0.042	0.511	-5.939	-0.073	0.207	4.994	0.060	0.288	-1.312	-0.016	0.757
	Social class	-9.470	<b>-0.158</b>	0.007	-2.068	-0.061	0.342	7.842	<b>0.106</b>	0.071	0.146	0.002	0.973	9.660	<b>0.126</b>	0.013

### 8.2.5 *The proportional size of media sub-networks in socializing network*

The model statistics and change statistics reported in Table 8.12 show that with exception of Model 1 for frequency of mobile communication (non-significant) all other models were statistically significant at  $p < .05$ . Moreover, model statistics indicate that adding a step in all models (with exception of Model 1 and Model 3 for mobile phone communication) accounts for some additional unique variance in the outcome (i.e., a significant  $\Delta R^2$ ), suggesting that including that step and corresponding variables in the model provides more explanatory power. The variables included in Model 3 were significant predictors across all communication technologies, accounting for from a minimum of approximately 9% for mobile communication to a maximum of more than 43% of the variance for internet communication.

With reference to socializing network the Model 1 in hierarchical multiple regression analysis revealed that alters with more geographically distant ties are in contact via landline phone with a larger proportion of their socializing network, while those with larger networks are in contact with a smaller proportion of “landline telephone” alters (see Table 8.11). In Model 2 landline communication was regressed on network size, alter age, tie duration, geographical distances as well as frequency of communication via the landline phone, the mobile phone, texting, email and the Internet. Email and texting turned out to be the only statistically significant predictors of the proportion of “landline telephone” alters. In Model 3 a block of socio-demographic variables was added to the independent variables from Model 2. The results show that email and texting remained significant predictors together with mobile phone communication, education and urban area. On the other hand, alter age, respondents’ age and their social class were negatively associated with the proportion of alters with whom the ego was in contact via telephone.

In Model 1 the proportion of alters who are in contact with egos via mobile communication was regressed onto network items. Mobile communication was found to be significantly negatively predicted only by network size: the larger the ego’s socializing networks the



smaller the proportion of alter with who s/he is in contact via the mobile phone.<sup>73</sup> After controlling for the communication via other modes of interaction the marginal effect of network size on mobile communication disappeared, yet email and texting communication turned out to be highly significant positive predictors. Adding a block of socio-demographic variables to the independent variables from Model 2 did not improve the model significantly: email and texting communication again had a marginal significant positive influence on mobile communication, while respondents' age and marital status were marginally significant negative predictors.

The results of the hierarchical multiple regression analysis for the proportion of alters with whom the ego is in contact via SMS showed that in Model 1 network size and alter age were the negative significant predictors, whereas time of knowing someone increased the proportion of "texting" alters in the socializing network. In Model 2 the significance and size of predictors from Model 1 remained almost unvaried. Indeed, only internet communication was found to negatively influence the proportion of "texting" alters. In Model 3 texting was also regressed onto a block of socio-demographic variables. On one hand, the results showed that respondents' age and social class as well as whether they have children were together with tie duration and landline communication highly significant positive predictors of SMS communication sub-network size. On the other hand, network size and communication were marginally significant negative predictors.

The hierarchical multiple regression model for the proportion of alters with whom the ego is in contact via email revealed that in Model 1 geographical distance was the only significant predictor: having on average more distant ties in socializing network was associated with a higher proportion of email contacts. The effect of geographical distance on the proportion of alters with whom the ego is in contact via email disappeared in Model 2. In Model 2, those who had a larger proportion of alters with whom they stayed in touch through mobile phone, texting, and the Internet were more likely to have more email alters. The effect of mobile communication, texting, and the Internet on the proportion of alters with whom the ego is in

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<sup>73</sup> This result should be interpreted with caution since Model 1 for mobile communication is non-significant (see Table 8.12).

contact via email remained significant in the Model 3. Further, the proportion of “email alters” was larger for active, married, and more educated respondents.

The right-most panel in Table 8.11 shows the results of the analysis in which proportion of internet sub-network was regressed in the three models. As in the case of frequency of communication, all predictors in Model 1 turned out to be statistically significantly associated with the proportion of “internet ties”: as expected tie duration and network size were respectively marginally and highly significant negative predictors, whereas geographical distance and alter age were significant positive predictors. In Model 2 the significant effect of alter age and tie duration disappeared, whereas the negative association with network size and the positive association with geographical distance remained highly significant. Moreover, Model 2 revealed that proportion of “email ties” is positively associated with “internet ties”, whilst the proportion of landline ties is negatively associated. After entering the socio-demographic variables in the Model 3, alter’s and respondent’s age turned out to be the most important highly significant negative predictors – together with employment status and education. On the other hand, geographical distance and social class were highly significant positive predictors, while the proportion of “email ties” was marginally significant predictor of proportion of alters with whom the ego was in contact via the Internet.

**Table 8.12: Model statistics of regression models – proportion of alters in socializing network**

		Model statistics			Change statistics	
		F	p	Adj. R <sup>2</sup>	Δ R <sup>2</sup>	Δ p F-test
Landline	Model 1	9.663	0.000	0.118	0.132	0.000
	Model 2	7.038	0.000	0.157	0.052	0.004
	Model 3	6.145	0.000	<b>0.241</b>	0.105	0.000
Mobile	Model 1	1.448	0.219	0.007	0.022	0.219
	Model 2	4.309	0.000	0.093	0.098	0.000
	Model 3	2.595	0.001	<b>0.090</b>	0.025	0.522
SMS/MMS	Model 1	2.521	0.042	0.023	0.038	0.042
	Model 2	7.231	0.000	0.161	0.149	0.000
	Model 3	6.452	0.000	<b>0.252</b>	0.111	0.000
Email	Model 1	3.015	0.019	0.030	0.045	0.019
	Model 2	9.683	0.000	0.211	0.191	0.000
	Model 3	7.053	0.000	<b>0.272</b>	0.081	0.001
Internet	Model 1	5.537	0.000	0.065	0.080	0.000
	Model 2	7.359	0.000	0.164	0.110	0.000
	Model 3	13.382	0.000	<b>0.433</b>	0.278	0.000

The following general conclusions can be drawn from Model 3: (1) smaller socializing networks with more long-lasting ties were associated with a larger proportional size of SMS/MMS communication sub-networks; (2) landline telephone, mobile phone, and SMS/MMS communication sub-networks seemed to be highly intertwined with other media sub-networks; (3) socio-demographic characteristics of respondents seemed to have different effects on the proportional size of media sub-networks. Except for email sub-networks, respondents' age decreased the size of media sub-networks. Education was positively correlated with the proportional size of landline telephone and email sub-networks, while being negatively associated with the size of texting and internet sub-networks. Employed and married participants had larger email sub-networks, while non-active and single respondents had a smaller number of network members with whom they were in contact via mobile phone and the Internet. Lastly, having children was positively associated with the proportional size of SMS/MMS sub-networks, whereas living in urban areas was positively correlated with larger landline telephone sub-networks.

#### *8.2.6 Summary of the results regarding frequency of communication within personal networks*

Hypothesis 3b has suggested possible differences among media sub-networks in terms of their size and geographical location. Specifically, it proposed that mobile phone and texting sub-networks will be smaller and locally based, while landline telephone, email and internet communication sub-networks will embrace a larger proportion of the personal network and will be characterized by geographical remoteness. The empirical findings seem to at least partly support this hypothesis for mobile communication and internet communication (Table 8.13): the size of mobile communication sub-networks (emotional support) and texting sub-networks (socializing) is significantly smaller, whereas internet communication sub-networks on average enclose a larger proportion of geographically remote ties. As for the other media sub-networks in both social support networks, Hypothesis 3b was not supported, although the values of regression coefficients indicate that the direction of associations is in accord with the hypothesis.

**Table 8.13: Summary for the verification of Hypothesis 3b**

<b>Emotional support</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Landline</b>	<b>Email</b>	<b>Internet</b>
Small network	Yes	No	—	—	—
Local network	No	No	—	—	—
Large network	—	—	No	No	No
Remote network	—	—	No	No	Yes
<b>Socializing</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Landline</b>	<b>Email</b>	<b>Internet</b>
Small network	No	Yes	—	—	—
Local network	No	No	—	—	—
Large network	—	—	No	No	No
Remote network	—	—	No	No	Yes

Note: “Yes” indicates a confirmed hypothesis. “No” indicates a rejected hypothesis. Blank cell indicates that a hypothesis was not verified. The evaluation of hypotheses is based on Model 3.

**Table 8.14: Summary for the verification of Hypothesis 3d**

<b>Emotional support</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
<b>Landline</b>	—				
<b>Mobile</b>		—	P	P	
<b>SMS/MMS</b>			—	P	
<b>Email</b>				—	P
<b>Internet</b>					—
<b>Socializing</b>	<b>Landline</b>	<b>Mobile</b>	<b>SMS/MMS</b>	<b>Email</b>	<b>Internet</b>
<b>Landline</b>	—				
<b>Mobile</b>		—	P	P	
<b>SMS/MMS</b>			—	P	
<b>Email</b>				—	P
<b>Internet</b>					—

Note: “P” indicates a statistically significant positive association. “N” indicates a statistically significant negative association. Blank cell indicates a non-significant association. Associations are based on Model 3.

With reference to the Hypothesis 3d which has stated that the proportional size of a selected medium sub-network will be positively associated with the proportional size of other media sub-networks, we might conclude that the results provide support for it. For example, having more alters in mobile communication sub-network seems to positively correlate with larger texting and email sub-networks (see Table 8.14). In other words, this results support the complex media argument thesis (Bausinger 1984; Höflich and Gebhardt 2005; Petrič et al. 2011) which suggests that people nowadays maintain contact with network members via various communication channels and that these sub-networks generally overlap. Nevertheless, it should be also noted that this argument is partly valid in the case of landline phone and internet communication sub-networks. Accordingly to the findings of this study, they seem to embrace what we might call “media specific ties” that can be accessed only via

landline phone/the Internet. Presumably, part of this pattern can be attributed to the specific social profile of both sub-networks (see Table 8.10 and Table 8.11).

### 8.2.7 *Communication multiplexity within personal networks*

Hypothesis 4 was that communication multiplexity will be more strongly associated with compositional characteristics of emotional support network and less with the compositional features of socializing network. To test this hypothesis, two hierarchical multiple regressions were run with multiplexity of communication<sup>74</sup> as a dependent variable and two blocks of independent variables. In the first step of the regression model (Model 1) independent variables consisted of measures related to the composition of personal networks (i.e., network size, percentage of kin, alter age, tie duration, and geographical distance<sup>75</sup>). In the second step (Model 2) a block of variables was entered that measure the socio-demographic characteristics of participants (gender, age, education, labor status, marital status, children, urban area, and social class). The procedure was first applied to emotional support and later repeated for socializing network data separately.

In Model 1 for emotional support the five predictors accounted for approximately one-tenth of the variance in communication multiplexity ( $R^2 = .116$ ), which was highly significant at the  $p = .000$  level (see Table 8.16). Network size was the most influential highly significant predictor, followed by proportion of kin and geographical distance which were only marginally significant ( $.05 \leq p < .1$ ; see Table 8.16). The multiplexity of communication increased with the rise of network size and geographical distance, whereas it decreased with the rise of the proportion of kin in emotional support network. When socio-demographic

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<sup>74</sup> Multiplexity of communication was calculated as a percentage of communication technologies the ego uses at least yearly to contact the alters in his/her network among all technologies that s/he uses. For instance, if a respondent reported that s/he is a mobile phone user (but not an internet and email user), and that s/he does not use landline phones to keep up with his/her network member, the value of communication multiplexity for him would be 0.75 (3 [in-person, mobile phone, SMS/MMS] / 4 [mobile phone, SMS/MMS, in-person, landline phone]). Alternatively, if a participant reported that s/he is a user of all six communication technologies, but used only email and landline phone at least yearly to contact his/her network member, his/her value of the multiplexity variable would be 0.33 (2 [email and the Internet] / 6 [all communication channels]).

<sup>75</sup> The variable gender (percentage of male in the social network) was omitted from the analysis because the results of the preliminary analysis showed that it was not a significant predictor in any of the analyzed models.

factors were entered into the equation,  $R^2$  increased to 14%, with a statistically significant positive relationship found for network size and negative for alter age and the marital status of respondents – the latter was only marginally significant ( $p = .057$ ). Thus, with respect to communication multiplexity in emotional support networks, network size seemed to increase the multiplexity, while being married and having older alters in the network seemed to be associated with fewer points of access to alters across several media.

**Table 8.15: Model statistics for regression models predicting communication multiplexity in personal networks**

		Model statistics		Change statistics		
		F	p	Adj. $R^2$	$\Delta R^2$	$\Delta p$ F-test
Emotional support	Model 1	12.927	0.000	0.116	0.126	0.000
	Model 2	6.675	0.000	0.140	0.039	0.010
Socializing	Model 1	6.579	0.000	0.059	0.070	0.000
	Model 2	4.473	0.000	0.093	0.049	0.003

In Model 1 for socializing networks a hierarchical multiple regression analysis revealed that alter's age and geographical distance of ties were highly significant predictors of communication multiplexity, while network size was only marginally significant. Together these variables accounted for approximately 6% of the variance in communication multiplexity (see Table 8.15). In Model 2, with socio-demographic characteristics of respondents also included in the equation all independent variables accounted for approximately 9% of the variance in communication multiplexity. Thus, the addition of these variables resulted in a 3 percentage points increment in the variance accounted for; an increment that did reach statistical significance at  $p < .01$ . In the Model 2, the proportion of kin, geographical distance, and marital status highly significantly predicted communication multiplexity ( $p < .05$ ), while gender was only marginally significant ( $.05 \leq p < .1$ ). This indicates that women and married respondents with more geographically distant ties and a higher proportion of kin in their socializing network relied on more communication means to stay in touch with their network members.

**Table 8.16: Summary of hierarchical regression analysis for variables predicting communication multiplexity in personal networks**

	Emotional support			Socializing		
	B	Beta	p	B	Beta	p
Model 1						
Intercept	0.737		0.000	0.610		0.000
Network size	0.027	<b>0.270</b>	0.000	0.005	<b>0.082</b>	0.078
% Kin	0.000	<b>-0.103</b>	0.052	0.000	0.082	0.115
Alter age	-0.027	-0.060	0.223	0.069	<b>0.127</b>	0.010
Tie duration	-0.005	-0.006	0.909	0.029	0.040	0.454
Geographical distance	0.018	<b>0.102</b>	0.051	0.034	<b>0.184</b>	0.000
Model 2						
Intercept	0.890		0.000	0.775		0.000
Network size	0.026	<b>0.263</b>	0.000	0.003	0.059	0.204
% Kin	0.000	-0.042	0.450	0.000	<b>0.114</b>	0.030
Alter age	-0.085	<b>-0.189</b>	0.002	0.024	0.045	0.448
Tie duration	0.005	0.007	0.902	0.052	0.070	0.205
Geographical distance	0.013	0.073	0.170	0.030	<b>0.161</b>	0.001
Gender (male = 1)	-0.017	-0.047	0.296	-0.029	<b>-0.086</b>	0.067
Age	-0.001	-0.107	0.159	-0.001	-0.062	0.422
Education	0.000	-0.002	0.961	-0.003	-0.035	0.501
Labor status (active = 1)	-0.006	-0.015	0.765	0.007	0.020	0.693
Marital status (married = 1)	-0.039	<b>-0.100</b>	0.057	-0.059	<b>-0.173</b>	0.001
Children (yes = 1)	-0.034	-0.089	0.238	-0.014	-0.042	0.601
Urban area (urban = 1)	0.014	0.039	0.391	0.017	0.050	0.281
Social class	-0.002	-0.007	0.885	-0.013	-0.054	0.272

From the results of multiple hierarchical regression analysis we can conclude that Hypothesis 4 cannot be rejected since the values of standardized regression coefficients in Model 2 are higher for emotional support than for socializing. The network size and average alter age of network members in emotional support network seem to better predict communication multiplexity in emotional support networks, than the percentage of kin and the average geographical distance in socializing network do it for socializing networks. What these results ultimately tell us is that it is highly plausible that the structural determinants of communication multiplexity differ in terms of tie strength. On one hand, in emotional support networks, which are composed of closer, stronger and multiplex ties, individuals with larger networks seem to use more points of access to maintain contact with their network members, while those who have on average an “older” network are more likely to show particular media behaviors. On the other hand, in socializing networks, which include weaker and more specialized ties, communication multiplexity seems to increase with the growth in the proportion of kin and average geographical distance of network members. Since higher geographical distance is related to less frequent in-person communication in socializing networks (see Section 8.2.2), it is plausible to assume that communication multiplexity

increases because of the more frequent reliance of individuals on technologically mediated forms of communication. Lastly, more variety of media access associated with higher proportion of kin in socializing network could be at least partly explained by a higher diversity of kin ties, which do not include only partners, parents, and siblings as in emotional support networks but also other kin such as grandparents, cousins and so on (Dremelj et al. 2004), who most probably do not live in close proximity, which is associated with more frequent in-person encounters.

### 8.3 MEDIA SUB-NETWORKS

We also explored whether the six communication modes were used to communicate with all network members or only with certain members in emotional support and socializing networks. Prior research, for instance, found that mobile communication networks contain more close than weak ties (e.g., Matsuda 2005), while internet communication networks are associated with both strong and weak ties (e.g. Boase et al. 2006). Further, evidence exists that mobile communication is mainly used to contact local ties, while email communication is associated with the glocalization – people use email to contact network members both in close vicinity and afar (e.g., Boase et al. 2006; Sooryamoorthy et al. 2008).

To our best knowledge, the only study that examines the differences between communication sub-networks in social support networks is Hlebec et al. (2006). Distinguishing between traditional (i.e., and those alters with whom a respondent did not communicate regularly via the internet) and internet sub-networks (i.e., alters with whom the respondent communicated regularly (also) via the Internet) they found that alters who regularly communicated with egos via the Internet were more likely to be men, younger and more educated (Hlebec et al. 2006, 25-26). Moreover, traditional sub-networks contained more kin, while the number friends and co-workers was higher in internet sub-networks. The analysis of role composition also showed that both sub-networks contained a small proportion of neighbors. Further, they found that internet sub-networks were associated more geographical dispersed and less long-lasting ties (alters from internet sub-networks had been known on average for a shorter time than in traditional sub-networks), yet they also consisted of more strong ties in comparison with traditional sub-networks.



In this study we have hypothesized that media sub-networks will differ in terms of their network composition (Hypothesis 5). We, thus, analyze the composition of six media sub-networks for emotional support, and at least for the internet sub-network the results are, broadly speaking, in line with prior research. As shown in Table 8.17 internet sub-networks on average contain more alters who are younger than ego, more males, more friends, and more alters who live at a distance of over half an hour by car from the ego. On the other hand, egos have cited fewer kin in internet sub-networks. The alters from internet sub-networks had been known on average for a shorter time (44% of the ego's life for the internet sub-network vs. 55% of the ego's life for the in-person sub-network or 59% for the landline sub-network).

**Table 8.17: The size and composition of media sub-networks – emotional support**

	<b>In-person N = 455</b>	<b>Landline N = 202</b>	<b>Mobile N = 394</b>	<b>SMS/MMS N = 192</b>	<b>Email N = 131</b>	<b>Internet N = 104</b>
Network size	1.91	1.53	1.9	1.69	1.61	1.72
% Of alters younger than ego	50.0	53.1	47.2	42.1	48.0	40.8
% Of alters of the same age as ego	13.5	10.8	15.7	22.6	20.4	35.0
% Of alters older than ego	36.6	36.1	37.1	35.3	31.6	24.2
% Male	36.9	33.1	36.4	37.3	35.9	39.3
% Kin	68.9	70.4	66.1	55.0	50.4	32.2
% Coworkers / schoolmates / colleagues	3.4	2.1	3.9	3.0	5.1	4.9
% Neighbors	2.6	3.5	1.5	0.0	2.1	0.0
% Friends	24.8	24.0	28.2	41.5	41.7	63.0
Duration of tie	0.55	0.59	0.54	0.50	0.49	0.44
Geographical distance <sup>a</sup>	9.6	17.7	13.9	18.1	18.2	24.6

Note: The composition of media sub-networks was calculated on those alters with whom the egos stayed in touch through a selected medium at least once a week. <sup>a</sup>Geographical distance indicates the proportion of alters living at a distance of over half an hour by car from the ego.

With reference to the composition of other sub-networks perhaps two general observations can be made. On one hand, contrary to expectation, the composition of email sub-network is more similar to texting sub-network than to internet sub-network. In fact, email sub-networks contain more kin and less friends than internet sub-networks, as well as a higher proportion of alters older than ego (although they also contain a higher proportion of alters younger than ego in comparison with internet sub-network). On the other hand, there are only minor differences in the composition of in-person, landline telephone, and mobile phone sub-network. On average, these sub-networks have a larger proportion of kin and a smaller proportion of friends than other sub-networks. The difference in the average geographical distance of alters is maybe the most pronounced distinctness between the three sub-networks: the proportion of alters living at a distance of over 30 minutes by car in mobile phone sub-

network is for nearly four percentage points smaller than in landline sub-network and for more than four percentage points larger than in in-person sub-networks.

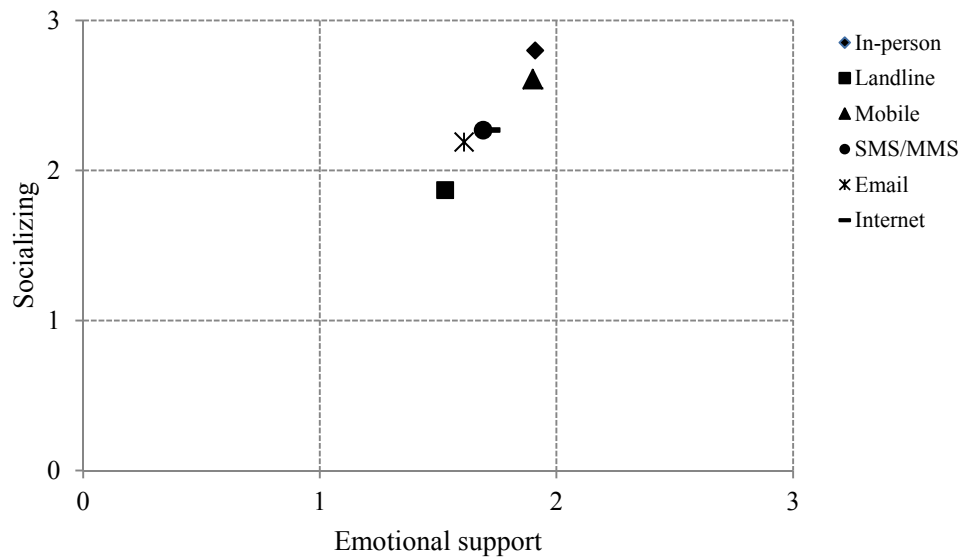
**Table 8.18: The size and composition of media sub-networks – socializing**

	<b>In-person N = 446</b>	<b>Landline N = 206</b>	<b>Mobile N = 380</b>	<b>SMS/MMS N = 197</b>	<b>Email N = 163</b>	<b>Internet N = 136</b>
Network size	2.8	1.87	2.61	2.27	2.19	2.27
% Of alters younger than ego	55.9	58.3	51.6	49.0	53.9	47.9
% Of alters of the same age as ego	12.0	12.0	15.2	21.5	15.2	26.3
% Of alters older than ego	32.1	29.7	33.2	29.5	30.9	25.7
% Male	45.13	37.58	43.89	41.88	42.6	44.5
% Kin	48.5	59.2	49.0	42.0	34.4	27.9
% Coworkers / schoolmates / colleagues	4.7	3.7	4.4	3.8	5.1	3.1
% Neighbors	7.6	8.4	3.4	0.0	2.1	0.0
% Friends	37.9	28.5	42.3	53.7	57.9	68.6
Duration of tie	0.51	0.59	0.51	0.46	0.46	0.46
Geographical distance <sup>a</sup>	11.3	18.1	15.1	18.5	23.8	23.7

Note: The composition of media sub-networks was calculated on those alters with whom the egos stayed in touch through a selected medium at least once a week. <sup>a</sup>Geographical distance indicates the proportion of alters living at a distance of over half an hour by car from the ego.

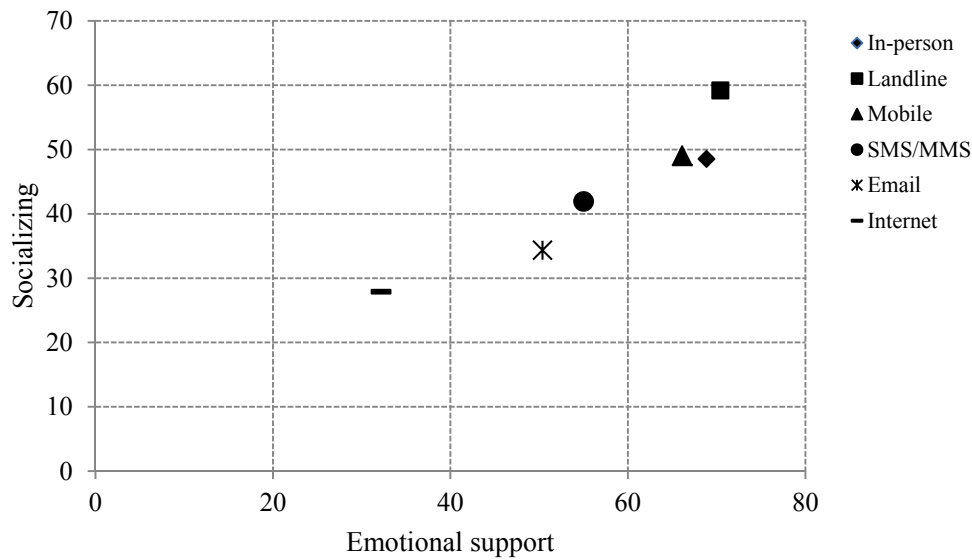
In an analog way, we also looked into the composition of six media sub-networks for socializing networks. When comparing the internet sub-network with other sub-networks in socializing networks, the conclusions are broadly speaking comparable to the ones drawn for emotional support networks (see Table 8.18). The most pronounced difference lies in the role-relation characteristic and geographic distance of ties. On average there are more geographically distant ties in internet sub-networks, which also contain more friends and less kin and neighbors than all other media sub-networks. Again, email sub-networks are similar to texting sub-networks – the only notable difference is that the latter have a mean geographical distance which is nearly 30% larger in comparison with texting sub-networks. Likewise, the measures of network composition do not differ greatly between in-person, landline phone, and mobile phone sub-networks. The only notable difference between these sub-networks appears in that landline sub-networks contain more kin and fewer friends, than do in-person and mobile phone sub-networks (see Table 8.18). In addition, the proportion of neighbors is higher for in-person and landline than mobile phone sub-networks. Similarly to emotional support networks differences related to geographical distance in the structure of socializing networks emerge between the three sub-networks with in-person sub-networks containing more local ties than mobile phone sub-networks, and the latter containing more local ties than landline sub-networks.

**Figure 8.4: The average network size of media sub-networks for emotional support and socializing**



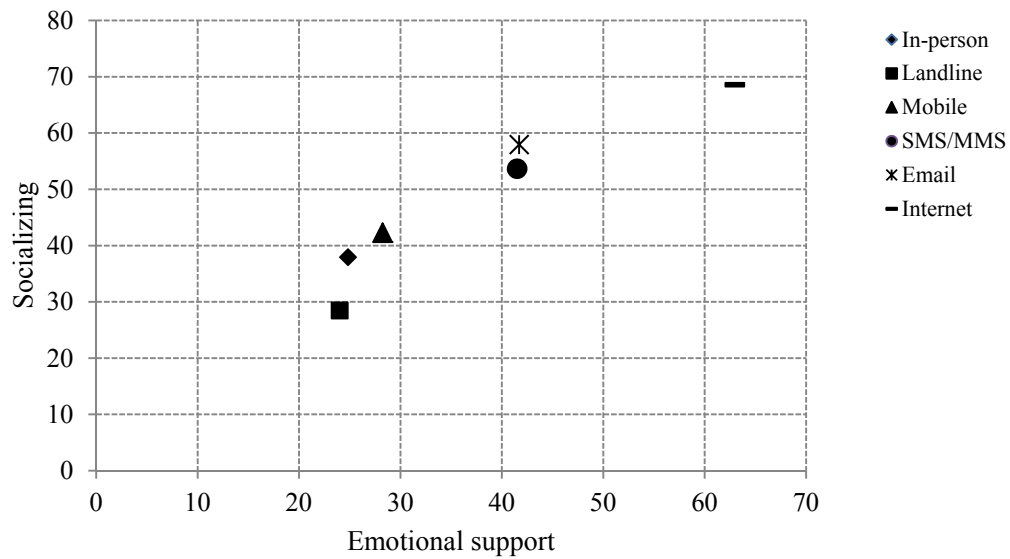
Finally, a common trend was ascertained for emotional support and socializing in terms of sub-network size. The largest network size pertained to in-person sub-network, followed by mobile phone, texting, internet, email, and landline phone sub-networks. As expected in absolute terms, the difference between the largest and the smallest sub-network was larger for socializing networks. As indicated in Figure 8.4 (see also Table 8.17 and Table 8.18), within emotional support networks the average size of in-person sub-network was 1.9, whereas the average size of landline sub-network was 1.5 (21.5% decrease). Instead, within socializing network the average size of in-person sub-network was 2.8, whereas the average size of landline sub-network was 1.9 (33% decrease).

**Figure 8.5: The proportion of kin in media sub-networks for emotional support and socializing**

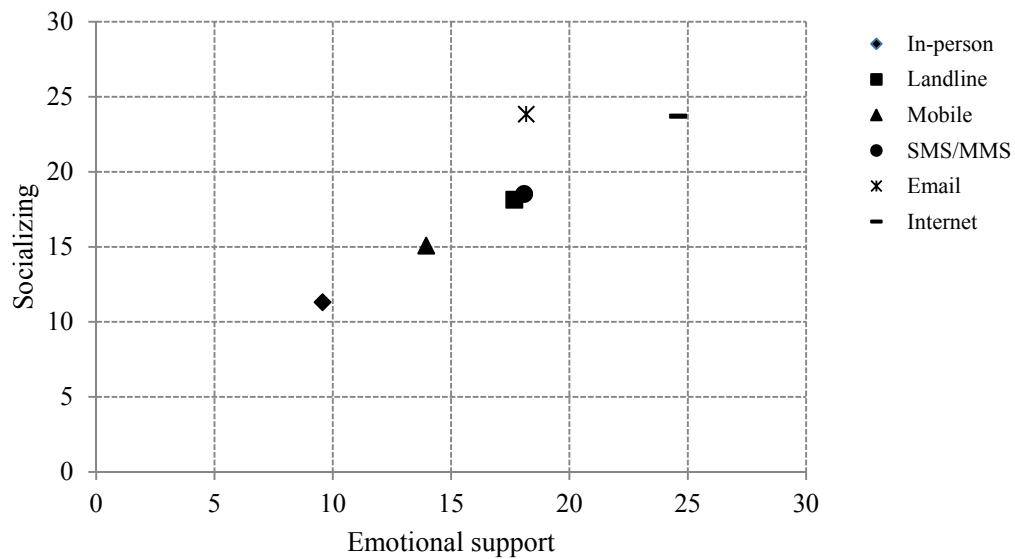


Most probably, the differences may be attributable to variability in use of and social accessibility via communication technologies and ICTs. For instance, younger people who have on average larger networks rarely use the landline telephone for interpersonal communication (Vehovar et al. 2009), while elderly people who live alone and have smaller personal networks generally keep in contact with their alters via the landline telephone (Licoppe 2004). In addition, because of the digital divide (Dolničar 2008) the proportion of internet users in the population decreases with age. Consequently, respondents with a larger proportion of older alters are expected to have on average smaller internet sub-networks than young participants. In sum, it seems that for the most part Hypothesis 5 cannot be rejected since specific sub-networks contain a different structure of social ties, although a more pronounced similarity can be observed between in-person, landline, mobile and SMS/MMS sub-networks on one hand, and email and internet sub-networks on the other hand.

**Figure 8.6: The proportion of friends in media sub-networks for emotional support and socializing**



**Figure 8.7: The proportion of alters living at a distance of over half an hour by car from the ego in media sub-networks for emotional support and socializing**



#### 8.4 CLUSTERS OF EGOS WITH DISTINCTIVE PATTERNS IN COMMUNICATION WITH ALTERS

Since the relationship between ICT use and the structural characteristics of personal networks emphasizes the importance of understanding how communication technologies are combined to form a technological landscape (Boase 2008; Licoppe and Smoreda 2006; Petrič et al.

2011; Petrovčič et al. 2011), we further hypothesized that respondents combine different communication modes in specific ways, clustering together in groups with similar personal communication systems (Boase 2008) that have a distinctive composition of personal networks (Hypothesis 6). For this reason, in below analysis we did not treat the frequency of communication modes within personal networks as single variables but rather took the patterns of communication via all six technologies as independent variables. The comparison of ICT use patterns between different groups will allow us to analyze the coupling of communication modes and personal network structures, determining and contextualizing the role of different technologies in personal networks and the associations between various patterns of social connectivity and structural characteristics of personal networks. In what follows, we shall first draw out the communicative and socio-demographic features of the identified groups, and then examine how these clusters are associated with the structural characteristics of their personal networks.

#### *8.4.1 Communication clusters in emotional support networks*

In order to test the Hypothesis 6 we first had to discover groups of people with similar and distinct patterns regarding their use of various technologies in communication with the members of their emotional support and socializing networks. Hence, a cluster analysis was performed on a sub-sample of 278 (emotional support) and 277 (socializing) respondents using all six communication channels. A standard three-step approach (Ferligoj 1989) was used to determine the number of clusters and individual membership in them. In the first step, the standardized variables that measured frequency of contact via all six media were analyzed by a hierarchical cluster procedure, which begins with Euclidian distances as the similarity measure and uses Ward's method of cluster identification.

After considering a dendrogram<sup>76</sup> that indicates the degree of similarity between different clusters and their theoretical relevance, the four-cluster solution appeared to be the most appropriate for emotional support networks, whereas for socializing networks the three-cluster solution turned out to be optimal. Therefore, in the second step a K-means cluster

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<sup>76</sup> The dendrograms are included in the Appendix A.

analysis was carried out with the input of four groups (emotional support) and three groups (socializing) to optimize the cluster membership and determine the cluster centroids. Finally, the cluster membership of each unit was saved as a categorical variable and then used in further analysis that is presented below.

With reference to emotional support networks the procedure resulted in four distinct clusters, which have a recognizable pattern of communication with the members of their networks. We, accordingly, labeled them: phone-traditionalists, techno-ascetics, emailers, and internet-texters. The names of the clusters were determined arbitrary in order to best represent the structure of their communication practices. In Table 8.19 the characteristics of each of cluster is broken down by the frequency of communication via the six media.

*Phone-traditionalists* are the smallest group containing approximately 16% of the respondent who are in contact with their network member via all six communication channels. What distinguishes the respondents in this group is their frequent use of landline phone, which is combined with in-person encounters with the alters in their networks. In contrast with other clusters, phone-traditionalists also show above-average propensity to be in-touch via the mobile phone. Although the phone-traditionalists use texting, email, and internet communication for keeping up with the members of their emotional support network, they do this rarely – this is especially true for texting and internet communication.

*Techno-ascetics* is the largest group and comprises approximately 31% of the egos who are connected to their alters via six communication channels. In interactional terms, this is the most non-active group among the four clusters. Even though they have all “old” and “new” communication means at their disposal they are reluctant in their use. Compared to all the other groups, the techno-ascetics are the least intense users of all six communication channels, except for in-person communication. They show a consistently below-average frequency of conversation with alters via landline and mobile phone, SMS/MMS, email, and the Internet. Generally, when they talk with their alters, who provide them with emotional support, they do this in a face-to-face setting.

*Emailers* are third largest group of respondents (23.4%) with the most specialized profile of social connectivity among the four groups. In fact, this cluster is characterized by an above-average degree of texting and email communication. They tend to use those communication

modes significantly more often than, for example, the landline phone. What is even more impressing is the fact that they frequently send and receive emails but do rarely use other internet-based services (e.g., instant messenger, chat rooms, private messages on web forums and social network sites) for being in-touch with their supportive ties.

The last and the second largest group are *internet-texters*. This group is made up of roughly 31% of respondents. Similarly as emailers they prefer text-based communication channels to keep in touch with their network members. In fact, they are characterized by an above-average use of email and SMS/MMS. However, what distinguishes the members of this group from emailers and all other clusters is their frequent use of internet-based services such as instant messaging, chat rooms, web forums, and social network sites. In addition, internet-texters also use mobile phone voice calls, although texting is what after internet use characterizes them mostly in relation to other groups.

**Table 8.19: A cluster typology of respondents by communication with alters in emotional support network via six media**

	<b>Phone- traditionalists N = 44</b>	<b>Techno- ascetics N = 86</b>	<b>Emailers N = 65</b>	<b>Internet- texters N = 84</b>	<b>Total N = 278</b>
<b>In-Person</b>	++		-	-	6.85
<b>Landline</b>	+++	---	---	-	2.74
<b>Mobile</b>	++	-	-	+	6.29
<b>SMS/MMS</b>	--	---	++	+++	4.53
<b>Email</b>	-	---	+++	+++	3.29
<b>Internet</b>	---	---	---	+++	2.78
<b>Total (%)</b>	15.8	30.9	23.4	30.2	100

Note: Differences in the average between the cluster centroids and the total averages are marked with + or – in such a way that +++ indicates differences larger than 0.80, ++ indicates differences on the interval 0.61 – 0.80, while + indicates differences on the interval 0.41– 0.60. The system of – is analogous to +, but indicates negative differences.

Multinomial logistic regression analysis was applied in order to identify the socio-demographic characteristics of the above described four groups. Multinomial logistic regression is the extension for the (binary) logistic regression when the categorical dependent variable has more than two categories. In our case there are four clusters that we want to compare between them according to the following social-demographic predictors: age, education, social class (entered in the model as covariates), gender, labor status, having children, and living area (entered in the model as categorical variables). Identification of the



multinomial logistic model requires that the coefficients of the reference category are constrained to zero. In our case we chose internet-texters as the reference category. The coefficient estimates indicate the odds ratios effects of the independent variables on the contrast of one alternative compared to the reference category.

Before presenting the odds ratios effects (last column in Table 8.20) of independent variables on cluster membership, as with any fitted model, the overall fit of the model should be assessed. In multinomial logistic regression the “goodness-of-fit” measures include the loglikelihood measure, the chi-square measure, the significance of the chi-square measure, the Nagelkerke  $R^2$  value, the value of deviance, and the significance of the deviance value (all these measures are reported below Table 8.20). Multinomial logistic regression model that have a good fit generally report significance of the chi-square measure below  $p < .05$ , a high value of Nagelkerke  $R^2$  (the values of Nagelkerke  $R^2$  are bounded from below by 0 and from above by 1), and a significance of deviance measure with a value close to 1. The overall model of significance for the model ( $p < 0.001$ ) and the percentage of the dependent variable correctly predicted (Nagelkerke  $R^2 = 0.392$ ) show a reasonably good fit of the model to the data structure.

Table 8.20 presents the results of multinomial logistic regression analysis. Age is significant for phone-traditionalists, techno-ascetics, and emailers, where its odds ratio (OR) are 1.082, 1.055, 1.058, respectively. The closer the odds ratio is to 1.0, the closer the predictor comes to being independent of the dependent variable. Therefore, we can conclude that age is not a strong predictor related to the odds of being a phone-traditionalist, a techno-ascetic, or an emailer compared to being internet-texter. In other words, one year increase in age increases by 8.2% the odds of being a phone traditionalist (5.5% for being a techno-ascetic, 5.8% for being an emailer) rather than internet-texter, controlling for other variables in the model. This means that internet-texters are composed by younger respondents while the age structure of other three groups is similar (*cf.* Table 12.5 in Appendix C). In contrast with age, the level of education is significant only for the group of phone-traditionalists and emailers. One level increase in education increases by 43.2% the propensity of being a phone traditionalist and by 38.3% the odds for being an emailer rather than an internet-texter. Put it differently, phone traditionalists and emails have a higher education than inter-texters, controlling for other variables in the model. When taking into account social class the results show that it is a

significant predictor for techno-ascetics and emailers. One level increase in social class (e.g., from middle to higher middle) decreases by 48.7% the odds of being a techno-ascetic and for 48% the odds for being an emailer rather than internet-texter. Further, with respect to gender we can say that the odds of being phone-traditionalist and techno-ascetic rather than internet-texter is increased by a factor of 0.41 by being female rather than male. In other words, the percentage of women among phone-traditionalists and techno-ascetics is smaller than among internet-texters. In addition, having children seems to create statistically significant differences between phone-traditionalist and techno-ascetic with respect to internet-texters. The odds of being phone-traditionalist and techno-ascetic rather than internet-texter is increased by a factor of 0.21 and 0.19, respectively, by not having children rather than having children. Put it differently this means, that the probability of having children is bigger for that phone-traditionalists and techno-ascetics than for internet-texters (see also Table 12.5). Concerning the living area where respondents live, the only category which proves to be significant is urban area. The odds of being phone-traditionalist rather than internet-texter is increased by a factor of 0.25 by living in urban area rather than in rural area. The same can be said for techno-ascetics (OR = 0.39). Finally, with respect to the labor status, the odds of being techno-ascetic rather than internet-texter is increased by a factor of 0.25 by being non-active (i.e., retired, housewife, unemployed, schooling age youth) rather than active (i.e., employed, self-employed, farmer).

**Table 8.20: Summary of multinomial logistic regression for socio-demographic variables predicting cluster membership – emotional support**

Clusters		B	SE	p	Exp(B)
Phone-traditionalists	Intercept	-1.880	1.782	0.291	
	Age	0.079	0.029	0.006	<b>1.082</b>
	Education	0.359	0.139	0.010	<b>1.432</b>
	Social class	-0.301	0.416	0.469	0.740
	Gender (female)	-0.899	0.461	0.051	<b>0.407</b>
	Gender (male)	0.000			
	Labor status (non-active)	-0.635	0.576	0.270	0.530
	Labor status (active)	0.000			
	Marital status (married, partnership)	-0.667	0.562	0.236	0.513
	Marital status (single)	0.000			
	Children (no)	-1.582	0.732	0.031	<b>0.206</b>
	Children (yes)	0.000			
	Living area (semi-urban area)	0.061	0.606	0.919	1.063
	Living area (urban area)	-1.352	0.565	0.017	<b>0.259</b>
	Living area (rural area)	0.000			
Techno-ascetics	Intercept	1.342	1.572	0.393	
	Age	0.053	0.026	0.044	<b>1.055</b>
	Education	0.177	0.116	0.127	1.194
	Social class	-0.654	0.358	0.067	<b>0.520</b>
	Gender (female)	-0.911	0.367	0.013	<b>0.402</b>
	Gender (male)	0.000			
	Labor status (non-active)	0.865	0.472	0.067	<b>2.375</b>
	Labor status (active)	0.000			
	Marital status (married, partnership)	-0.518	0.423	0.221	0.596
	Marital status (single)	0.000			
	Children (no)	-1.687	0.642	0.009	<b>0.185</b>
	Children (yes)	0.000			
	Living area (semi-urban area)	-0.554	0.543	0.308	0.575
	Living area (urban area)	-0.948	0.429	0.027	<b>0.387</b>
	Living area (rural area)	0.000			
Emailers	Intercept	-0.511	1.644	0.756	
	Age	0.057	0.027	0.036	<b>1.058</b>
	Education	0.325	0.117	0.006	<b>1.383</b>
	Social class	-0.865	0.370	0.019	<b>0.421</b>
	Gender (female)	-0.128	0.389	0.742	0.880
	Gender (male)	0.000			
	Labor status (non-active)	0.200	0.470	0.671	1.221
	Labor status (active)	0.000			
	Marital status (married, partnership)	-0.254	0.433	0.557	0.775
	Marital status (single)	0.000			
	Children (no)	-0.609	0.640	0.342	0.544
	Children (yes)	0.000			
	Living area (semi-urban area)	0.553	0.519	0.287	1.738
	Living area (urban area)	-0.289	0.443	0.514	0.749
	Living area (rural area)	0.000			

Note: The reference category is Internet-texters. -2 Log likelihood = 609.744; Nagelkerke  $R^2$  = 0.392;  $\chi^2$  = 124.843 (p = 0.000); deviance = 601.213 (p = 0.990)

#### 8.4.1.1 The structural characteristics of emotional support networks of communication clusters

In order to analyze what are the structural characteristics of emotional support networks of different communication clusters we ran a multiple classification analysis with network size, percentage of men, percentage of kin and non-kin, alters' age, tie duration, and geographical distance as dependent variables and cluster membership as independent variable (see Table 8.23). Since the structural characteristics of personal network are also dependent upon various socio-demographic characteristics of respondents, we decided to include in the model also a block of demographic variables: gender, age, education, labor status, marital status, having children, living area, and social class. However, these serve as controls in order to estimate the "pure" effect of cluster membership on dependent variables. Therefore, in what follows, we explain the standardized beta coefficients and the corresponding adjusted predicted means only for the variable cluster membership.

After controlling for the effect of the examined socio-demographic variables, cluster membership was highly significantly associated with all dependent variables (all the betas are significant at  $p < 0.05$ ). As shown in Table 8.23 phone-traditionalists had the smallest emotional support network among the four groups. They also had the smallest percentage of non-kin and men (together with emailers) in their network. Yet, they had the highest percentage of kin. Their alters live in geographical proximity and are on average older than themselves. This also holds for techno-ascetics whose ties live in proximity and are the oldest among the four groups. Yet, techno-ascetics also had the largest networks with the largest share of men among the four groups. They had an above-average percentage of kin and a below-average of non-kin. In addition, they knew their network members for the longest time among the four groups. Conversely, internet-texters knew their alters for the shortest time. They also had the smallest percentage of kin, but the highest percentage of non-kin. Their networks were average size, geographically dispersed (the highest average value among the clusters) and included alters of the same age as ego. Finally, the network structural characteristics of emailers were to some extent similar to the characteristics of internet-texters: geographically dispersed networks of average size with the lowest percentage of male alters. However, in contrast with internet-texters, emailers had a higher proportion of kin than non-kin. In short, the results seem to confirm that telephone and mobile communication are

associated with smaller networks with more long-lasting kin ties that live in a close proximity near the ego. On the other hand, the communication via text based services such as SMS, email, and especially the Internet, seems to correlate with more geographically dispersed networks of average size, which have more non-kin than kin and younger, short-lasting ties.

#### 8.4.2 *Communication clusters in socializing networks*

The same cluster analysis procedure as for emotional support was also applied for the data regarding socializing networks. In this case only three clusters with distinct characteristics were identified. We decided to name them as follows: techno-ascetics, mobile-mailers, and internet-texters (see Table 8.21).

*Techno-ascetics* is the largest group and comprises roughly 30% of the respondents who are in touch with the members of their socializing network via six communication channels. In interactional terms, the characteristics of techno-ascetics in the socializing network are very similar to the techno-ascetics related to the emotional support network: they are the most reluctant group among the three clusters. For keeping in touch with their socializing companions they generally prefer landline phone and in-person communication, while the frequency of communication via mobile phone, SMS/MMS, email, and the Internet appears to be below average. In sum, when techno-ascetics want to talk with their socializing companions, they contact them via telephone or meet them in-person.

*Mobile-mailers* is the second largest group of respondents (32.4%) with a much dispersed portfolio of communication means to be used in situations when they would like to contact the members of their socializing network. In fact, this cluster is characterized by an above-average degree of mobile voice calling, texting, and email communication in comparison to the other two groups. In addition, they also use the landline phone – although less often than the mobile phone, texting, and email. Finally, a resemblance of mobile-mailers with emailers should be noted; in fact, both groups are characterized by a below-average use of internet-based communication services that are not email. This confirms the idea that the Internet is not a single-medium communication platform, thus, its various communication channels should be operationalized and investigated separately.

The third and the largest group is *internet-texters*. It is made out of approximately 35% respondents that were included into cluster analysis. Comparably to mobile-emailers they have a much dispersed portfolio of technological means used for communication with the members of their socializing network. In fact, this cluster is characterized by an above-average degree of texting and email as well as mobile voice call communication. Nevertheless, what makes them singular is their accentuated use of other internet services besides email. In this they are very similar to internet-texters that were identified in the case of emotional support network. What distinguishes them from the latter is the less frequent use of landline phone.

**Table 8.21: A cluster typology of respondents by communication with alters in socializing network via six media**

	<b>Techno-ascetics</b> N = 83	<b>Mobile-emailers</b> N = 90	<b>Internet-texters</b> N = 98	<b>Total</b> N = 271
<b>In-Person</b>				6.31
<b>Landline</b>		+	--	2.37
<b>Mobile</b>	---	++	+	5.76
<b>SMS/MMS</b>	---	++	+++	4.27
<b>Email</b>	---	++	+++	3.39
<b>Internet</b>	---	---	+++	3.05
<b>Total (%)</b>	29.9	32.4	35.3	100

Note: Differences in the average between the cluster centroids and the total averages are marked with + or – in such a way that +++ indicates differences larger than 0.80, ++ indicates differences on the interval 0.61 – 0.80, while + indicates differences on the interval 0.41– 0.60. The system of – is analogous to +, but indicates negative differences.

In order to analyze the socio-demographic profile of three groups a multinomial logistic regression model was set up in an analog way as in the case of emotional support network with internet-texters being again the reference category. The model had a good fit; the value of the significance of the chi-square measure was below  $p < .05$ , the value of Nagelkerke  $R^2$  was relatively high (Nagelkerke  $R^2 = 0.391$ ), and the significance of deviance measure value was very close to 1.

In Table 8.22 the values of OR predictors in the model are shown. Age is a moderate but significant predictor for technology-ascetics and mobile-emailers as the odds ratio (OR) for the variable age are 1.106 and 1.067 respectively at  $p < .05$ . This means, one year increase in age increases by 10.6% the odds of being a techno-ascetic and by 6.7% for being mobile-

emailer rather than internet-texter, controlling for other variables in the model. Put it differently, internet-texters are composed by younger respondents, while the group of techno-ascetics mobile-emailers is composed of older respondents (*cf.* Table 12.6 in Appendix C). In contrast with age, the level of education is significant only for the group of mobile-emailers. One level increase in education increases by 23% the odds of being a mobile emailer rather than an internet-texter. It could be said that mobile-emailers have a higher education than inter-texters, controlling for other variables in the model. Further, with respect to gender we can say that the odds of being a techno-ascetic rather than an internet-texter are increased by a factor of 0.463 by being female rather than male. To restate, the percentage of women among techno-ascetics is smaller than among internet-texters. In addition, having children also seems to create statistically significant differences between techno-ascetics with respect to internet-texters. The odds of being a techno-ascetic rather than an internet-texter are increased by a factor of 0.219 by not having children rather than having children. This means, that techno-ascetics are more likely to have children than internet-texters (see also Table 12.6). Concerning the living area where respondents reside different effects can be observed for the group of techno-ascetics and mobile-emailers. For the former the only category which proves to be significant is urban area, whereas for the latter semi-urban area has a significant effect. In other words, the odds of being techno-ascetic rather than internet-texter is increased by a factor of 0.332 by living in urban area rather than in rural area, whereas the odds of being mobile-emailer rather than internet-texter is increased by a factor of 2.404 by living in semi-urban area rather than in rural area. Put it differently, in comparison with internet-texters, mobile-emailers are more likely to live in semi-urban areas, while techno-ascetics are more likely to live in rural areas.

**Table 8.22: Summary of multinomial logistic regression for socio-demographic variables predicting cluster membership – socializing**

Clusters		B	SE	p	Exp(B)
<b>Techno-ascetics</b>	Intercept	-0.710	1.645	0.666	
	Age	0.101	0.029	0.001	<b>1.106</b>
	Education	0.061	0.117	0.605	1.063
	Social class	-0.467	0.365	0.200	0.627
	Gender (female)	-0.769	0.384	0.045	<b>0.463</b>
	Gender (male)	0.000			
	Labor status (non-active)	0.587	0.479	0.221	1.798
	Labor status (active)	0.000			
	Marital status (married, partnership)	-0.055	0.444	0.902	0.947
	Marital status (single)	0.000			
	Children (no)	-1.518	0.619	0.014	<b>0.219</b>
	Children (yes)	0.000			
	Living area (semi-urban area)	0.209	0.523	0.689	1.233
	Living area (urban area)	-1.103	0.456	0.016	<b>0.332</b>
	Living area (rural area)	0.000			
<b>Mobile-emailers</b>	Intercept	-1.108	1.574	0.481	
	Age	0.065	0.029	0.025	<b>1.067</b>
	Education	0.207	0.103	0.044	<b>1.230</b>
	Social class	-0.519	0.333	0.119	0.595
	Gender (female)	-0.077	0.341	0.821	0.926
	Gender (male)	0.000			
	Labor status (non-active)	0.482	0.435	0.268	1.620
	Labor status (active)	0.000			
	Marital status (married, partnership)	-0.086	0.376	0.819	0.918
	Marital status (single)	0.000			
	Children (no)	-0.793	0.584	0.174	0.452
	Children (yes)	0.000			
	Living area (semi-urban area)	0.877	0.463	0.058	<b>2.404</b>
	Living area (urban area)	-0.161	0.379	0.671	0.851
	Living area (rural area)	0.000			

Note: The reference category is internet-texters. -2 Log likelihood = 459.627; Nagelkerke  $R^2$  = 0.391;  $\chi^2$  = 114.618 (p = 0.000); deviance = 450.177 (p = 0.848)



**Table 8.23: Summary of MCA for socio-demographic variables and cluster membership predicting network size and composition – emotional support**

		Size				Men (%)				Kin (%)				Non-kin (%)			
		Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M
Cluster	Phone-traditionalists	<b>0.24</b>	0.00	1.54	1.59	<b>0.19</b>	0.05	30.03	32.60	<b>0.39</b>	0.00	83.10	85.76	<b>0.39</b>	0.00	16.90	14.24
	Techno- ascetics			2.67	2.83			46.69	46.84			73.12	71.87			26.88	28.13
	Emailers			2.35	2.21			29.46	28.82			56.30	54.24			43.70	45.76
	Internet- texters			2.27	2.19			34.72	33.72			40.46	41.96			59.54	58.04
Gender	Male	0.05	0.44	2.37	2.38	0.01	0.92	36.90	36.71	<b>0.11</b>	0.06	67.52	65.66	0.11	0.06	32.48	34.34
	Female			2.23	2.22			36.06	36.23			55.29	56.93			44.71	43.07
Age	15 - 19	0.23	0.14	2.29	1.79	0.13	0.73	37.51	34.17	<b>0.32</b>	0.01	40.82	40.50	<b>0.32</b>	0.01	59.18	59.50
	20 - 27			2.44	2.20			39.57	42.72			65.06	77.45			34.94	22.55
	28 - 34			2.67	2.69			37.70	38.72			63.41	61.94			36.59	38.06
	35 - 44			2.21	3.02			26.55	29.55			55.03	49.07			44.97	50.93
	45 - 75			1.93	2.08			37.26	33.09			73.56	62.57			26.44	37.43
Education	Elementary school or less	0.14	0.26	2.29	2.54	0.16	0.40	39.89	46.16	0.22	0.13	47.11	77.78	0.22	0.13	52.89	22.22
	Vocation high school			1.92	1.95			30.54	29.12			60.31	51.22			39.69	48.78
	High school			2.52	2.34			39.69	37.37			65.51	62.82			34.49	37.18
	University or higher			2.54	2.51			37.98	37.53			67.27	59.33			32.73	40.67
Labor status	Employed, self-employed,	0.09	0.63	2.16	2.16	0.11	0.39	36.43	39.78	0.08	0.76	65.83	63.61	0.08	0.76	34.17	36.39
	Children, pupil, student			2.41	2.38			37.81	35.03			51.49	57.73			48.51	42.27
	Retired			2.27	2.69			34.00	30.29			76.79	65.60			23.21	34.40
	Other			2.86	2.40			30.05	22.92			61.63	53.12			38.37	46.88
Marital status	Married, non-marital	0.15	0.16	2.12	2.33	0.21	0.19	38.72	43.03	<b>0.24</b>	0.00	70.41	62.39	<b>0.24</b>	0.00	29.59	37.61
	Having a permanent			1.87	1.76			31.54	28.38			68.00	81.84			32.00	18.16
	Single, never married			2.62	2.34			34.25	29.18			49.62	56.23			50.38	43.77
	Single, widowed, separated			2.48	3.13			46.58	56.01			45.60	30.76			54.40	69.24
Children	Yes	<b>0.20</b>	0.07	2.01	1.88	0.10	0.38	36.18	31.89	0.15	0.15	71.25	68.47	0.15	0.15	28.75	31.53
	No			2.50	2.59			36.64	39.63			53.91	55.85			46.09	44.15
Living area	Rural area	0.13	0.12	2.06	2.10	0.08	0.45	37.33	37.08	0.03	0.83	61.84	59.77	0.03	0.83	38.16	40.23
	Semi-urban area			2.23	2.34			27.98	30.35			57.34	61.11			42.66	38.89
	Urban area			2.75	2.62			39.88	38.93			61.76	63.05			38.24	36.95
Social class	Low, lower middle class	0.04	0.82	2.11	2.11	<b>0.16</b>	0.05	44.64	43.21	0.05	0.71	64.91	56.45	0.05	0.71	35.09	43.55
	Middle class			2.32	2.33			32.86	33.22			61.08	62.04			38.92	37.96
	Higher middle. High class			2.33	2.29			49.64	48.80			57.40	59.17			42.60	40.83

Table 8.23: (continued...)

		Age				Tie duration				Geo. Distance			
		Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M
Cluster	Phone-traditionalists	<b>0.53</b>	0.00	1.10	1.30	<b>0.24</b>	0.00	0.54	0.58	<b>0.29</b>	0.00	1.79	1.64
	Techno- ascetics			1.35	1.43			0.59	0.61			1.83	1.87
	Emailers			1.13	1.18			0.56	0.54			2.32	2.27
	Internet- texters			1.06	0.83			0.47	0.45			2.42	2.50
Gender	Male	0.00	0.98	1.21	1.17	0.03	0.63	0.55	0.55	<b>0.16</b>	0.01	1.87	1.93
	Female			1.14	1.17			0.53	0.53			2.33	2.28
Age	15 - 19	<b>0.52</b>	0.00	1.44	1.48	0.16	0.62	0.49	0.46	<b>0.42</b>	0.00	2.35	2.72
	20 - 27			1.33	1.35			0.63	0.58			1.84	1.43
	28 - 34			1.16	1.14			0.52	0.55			2.41	2.30
	35 - 44			1.00	1.06			0.43	0.52			2.26	2.31
	45 - 75			0.89	0.81			0.56	0.56			2.00	2.28
Education	Elementary school or less	0.07	0.70	1.38	1.21	0.09	0.82	0.48	0.50	<b>0.37</b>	0.05	2.18	1.24
	Vocation high school			1.11	1.19			0.51	0.53			2.12	2.35
	High school			1.21	1.12			0.61	0.55			1.97	2.21
	University or higher			1.07	1.18			0.55	0.57			2.20	2.35
Labor status	Employed, self-employed,	0.09	0.32	1.07	1.18	<b>0.26</b>	0.05	0.49	0.48	0.04	0.91	2.10	2.10
	Children, pupil, student			1.38	1.18			0.59	0.62			2.15	2.11
	Retired			0.88	1.18			0.59	0.56			1.95	2.08
	Other			1.15	0.98			0.55	0.46			2.16	2.33
Marital status	Married, non-marital	<b>0.16</b>	0.09	1.01	1.11	<b>0.25</b>	0.00	0.49	0.49	<b>0.26</b>	0.02	1.88	1.80
	Having a permanent			1.20	1.14			0.41	0.46			2.46	2.41
	Single, never married			1.38	1.26			0.63	0.62			2.24	2.38
	Single, widowed, separated			0.99	1.22			0.57	0.54			2.45	2.28
Children	Yes	0.08	0.38	0.97	1.13	0.04	0.71	0.50	0.55	0.04	0.69	1.98	2.06
	No			1.31	1.20			0.57	0.53			2.21	2.16
Living area	Rural area	0.09	0.25	1.16	1.14	<b>0.14</b>	0.05	0.49	0.51	0.12	0.15	2.15	2.24
	Semi-urban area			1.18	1.19			0.62	0.60			2.11	1.99
	Urban area			1.19	1.22			0.58	0.56			2.05	1.98
Social class	Low, lower middle class	<b>0.11</b>	0.09	1.07	1.06	<b>0.16</b>	0.02	0.53	0.51	<b>0.16</b>	0.03	2.43	2.59
	Middle class			1.17	1.17			0.52	0.53			2.08	2.04
	Higher middle. High class			1.27	1.27			0.68	0.65			2.06	2.11

#### 8.4.2.1 The structural characteristics of socializing networks of communication clusters

In order to analyze what are the structural characteristics of socializing networks of different communication clusters we applied the same analytic procedure as in the case of emotional support networks. This means, that seven MCA models were run with network size, percentage of men, percentage of kin and non-kin, alters' age, tie duration, and geographical distance of tie as dependent variables, cluster membership as independent variable, and gender, age, education, labor status, marital status, having children, living area, and social class as control variables. As in the case of the emotional support we below explain the standardized beta coefficients and the corresponding adjusted predicted means only for the variable cluster membership.

After controlling for the effect of the examined socio-demographic variables, cluster membership was highly significantly associated with all dependent variables (all the betas are significant at  $p < 0.05$ ). As shown in Table 8.24 techno-ascetics had the largest socializing networks among the four groups. They also had the lowest percentage of non-kin, but the largest share of men in their network. In addition, what differentiates techno-ascetics from the other groups is the closest geographical proximity of their ties that are on average older than egos. This also holds for mobile-emailers whose ties live in proximity and are the oldest among the four groups. Mobile-emailers' networks included a larger percentage of kin and a lower percentage of non-kin and men than internet-texters. In addition, in their average-size networks they knew their network members for the longest time among the three groups. Conversely, internet-texters knew their alters for the shortest time. They also had the smallest percentage of kin, but the highest percentage of non-kin. Their networks were the smallest, highly geographically dispersed (the highest average value among the clusters) and included alters who were on average younger than egos. To recap, the persons who combined mobile (voice calls and texting) with email communication for keeping in touch with their socializing companions seem on average to have less geographically dispersed networks, which have more long-lasting kin than non-kin ties in comparison with internet-texters. The latter appear to have younger, short-lasting and relatively geographically distant non-kin ties.

#### 8.4.3 *Summary of the results regarding communication clusters*

The focus of this section was on clusters of individuals who share similar personal communication systems (Boase 2008) to stay in touch with the members of their emotional support and socializing networks. Although people use a variety of media to contact their supportive ties, the results of statistical analysis showed that under the conditions of complex media environments groups of individuals can be identified, in which members share a consistent practice of being in touch with the members of their emotional support and socializing networks. As hypothesized, the members of these groups do not only share similar communication patterns and socio-demographic characteristics, but also have a highly distinctive composition of personal networks (this hypothesis was validated by the finding that all MCA's betas measuring the cluster membership effect were highly significant for both emotional support and socializing networks). The results for emotional support networks, for instance, show that people who used landline phones and mobile phones had on average less confidants who were mainly kin, lived in geographical proximity, and have known each other for more time. On other hand, groups of individuals with substantially more pronounced reliance on email and internet-based communication means seem to have more far-flung non-kin ties among their core confidants. Making a concession in the direction of generalization of results, similar conclusions can be drawn with reference to socializing networks. Techno-ascetics and mobile-emailers who do not use the Internet to contact the social companions have significantly less non-kin network members, who have known for longer time. In addition, the members of these networks live in close proximity and are older than techno-ascetics and mobile-emailers. These findings seem to neatly dovetail with the limited prior research findings, which showed that for people with smaller, kin- and locally-based personal networks it is easier to be in contact via in-person, phone, and texting communication (e.g., Hogan 2009; Ishii 2006; Ling 2008; Palackal et al. 2011; Sooryamoorthy et al. 2008), while for larger and far-flung personal networks email and internet-based communication services appear to offer more affordances to individuals (e.g. Boase 2008; Hlebec et al. 2006; Palackal et al. 2011; Sooryamoorthy et al. 2008).

**Table 8.24: Summary of MCA for socio-demographic variables and cluster membership predicting network size and composition – socializing**

		Size				Men (%)				Kin (%)				Non-kin (%)			
		Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M
Cluster	Techno-ascetics	<b>0.25</b>	0.00	4.59	5.02	<b>0.17</b>	0.02	49.68	48.97	<b>0.27</b>	0.00	47.38	47.46	<b>0.27</b>	0.00	52.62	52.54
	Mobile-emailers			4.03	3.83			36.35	38.84			47.21	45.63			52.79	54.37
	Internet-texters			3.76	3.56			53.38	51.63			23.11	24.52			76.89	75.48
Gender	Male	0.06	0.33	3.98	3.95	<b>0.29</b>	0.00	56.95	56.79	0.01	0.87	37.07	39.10	0.01	0.87	62.93	60.90
	Female			4.25	4.27			37.28	37.41			40.13	38.31			59.87	61.69
Age	15 – 19	0.25	0.61	3.35	2.90	0.19	0.14	53.30	51.42	0.06	0.95	33.44	36.53	0.06	0.95	66.56	63.47
	20 – 27			4.44	4.23			48.29	51.65			30.97	38.70			69.03	61.30
	28 – 34			4.61	4.78			37.44	33.68			47.28	43.83			52.72	56.17
	35 – 44			4.00	4.68			39.82	41.19			40.82	37.30			59.18	62.70
	45 – 75			4.04	4.15			49.55	47.85			47.57	37.76			52.43	62.24
Education	Elementary school or less	0.17	0.21	3.30	3.71	0.14	0.27	54.02	51.14	<b>0.21</b>	0.01	34.41	39.20	<b>0.21</b>	0.01	65.59	60.80
	Vocation high school			4.00	3.98			49.47	46.74			29.43	27.43			70.57	72.57
	High school			4.26	3.88			38.61	38.94			38.77	42.95			61.23	57.05
	University or higher			4.72	4.84			45.51	50.73			53.52	48.00			46.48	52.00
Labor status	Employed, self-employed, farmer	<b>0.25</b>	0.08	4.11	3.67	0.19	0.16	47.07	52.88	0.08	0.77	40.58	36.08	0.08	0.77	59.42	63.92
	Children, pupil, student			4.14	4.83			47.05	39.67			32.87	41.38			67.13	58.62
	Retired			4.49	4.30			46.29	49.16			54.11	45.10			45.89	54.90
	Other			3.62	2.88			38.90	38.19			46.43	35.08			53.57	64.92
Marital status	Married, non-marital partnership	0.11	0.35	3.88	3.98	0.13	0.47	46.25	50.66	<b>0.17</b>	0.05	45.89	41.47	<b>0.17</b>	0.05	54.11	58.53
	Having a permanent relationship			3.64	3.59			38.82	38.29			48.53	51.94			51.47	48.06
	Single, never married			4.44	4.37			49.41	44.14			27.90	32.52			72.10	67.48
	Single, widowed, separated			4.84	4.70			43.33	51.61			42.95	31.67			57.05	68.33
Children	Yes	<b>0.18</b>	0.10	3.84	3.52	<b>0.21</b>	0.05	42.65	37.45	0.08	0.48	47.58	42.53	0.08	0.48	52.42	57.47
	No			4.29	4.49			48.91	52.16			33.20	36.31			66.80	63.69
Living area	Rural area	0.05	0.76	3.95	4.04	0.12	0.13	45.69	44.27	0.12	0.16	40.26	41.49	0.12	0.16	59.74	58.51
	Semi-urban area			4.34	4.35			52.54	54.60			43.25	42.44			56.75	57.56
	Urban area			4.24	4.09			44.08	45.02			33.46	32.04			66.54	67.96
Social class	Low, lower middle class	0.12	0.18	3.74	3.56	<b>0.23</b>	0.00	35.19	38.38	0.11	0.23	30.67	25.94	0.11	0.23	69.33	74.06
	Middle class			4.26	4.28			44.80	44.07			39.54	40.27			60.46	59.73
	Higher middle. High class			3.58	3.59			62.72	64.45			39.42	38.68			60.58	61.32

Table 8.24: (continued...)

		Age				Tie duration				Geo. Distance			
		Beta	p	M	Adj. M	Beta	p	M	Adj. M	Beta	p	M	Adj. M
Cluster	Techno-ascetics	<b>0.32</b>	0.00	0.97	1.11	<b>0.27</b>	0.00	0.49	0.51	<b>0.22</b>	0.01	2.20	2.25
	Mobile-emailers			1.16	1.16			0.55	0.55			2.27	2.19
	Internet-texters			1.05	0.92			0.42	0.40			2.59	2.62
Gender	Male	<b>0.13</b>	0.02	1.02	1.01	0.07	0.23	0.50	0.50	<b>0.23</b>	0.00	2.13	2.14
	Female			1.09	1.10			0.47	0.47			2.56	2.55
Age	15 - 19	<b>0.30</b>	0.02	1.27	0.98	0.37	0.11	0.50	0.66	<b>0.33</b>	0.01	2.45	2.44
	20 - 27			1.15	1.20			0.48	0.48			2.26	1.93
	28 - 34			0.98	1.03			0.42	0.36			2.44	2.56
	35 - 44			0.95	1.03			0.49	0.44			2.51	2.71
	45 - 75			0.88	0.96			0.51	0.45			2.26	2.54
Education	Elementary school or less	<b>0.37</b>	0.02	1.28	1.31	<b>0.38</b>	0.01	0.48	0.32	0.25	0.42	2.37	1.91
	Vocation high school			0.94	0.99			0.47	0.50			2.32	2.46
	High school			1.10	0.97			0.46	0.46			2.30	2.38
	University or higher			1.01	1.06			0.53	0.60			2.47	2.55
Labor status	Employed, self-employed, farmer	0.20	0.13	0.97	1.02	0.10	0.52	0.48	0.48	0.15	0.42	2.34	2.27
	Children, pupil, student			1.23	1.14			0.49	0.49			2.44	2.50
	Retired			0.88	1.03			0.56	0.54			2.42	2.41
	Other			0.89	0.92			0.42	0.40			1.94	2.06
Marital status	Married, non-marital partnership	0.11	0.25	0.94	1.05	<b>0.16</b>	0.09	0.48	0.49	0.21	0.16	2.18	2.15
	Having a permanent relationship			1.12	0.98			0.41	0.39			2.64	2.56
	Single, never married			1.18	1.10			0.51	0.51			2.45	2.52
	Single, widowed, separated			0.88	1.02			0.46	0.43			2.46	2.26
Children	Yes	0.14	0.16	0.90	1.00	0.12	0.31	0.47	0.45	0.08	0.48	2.23	2.27
	No			1.16	1.10			0.49	0.51			2.44	2.41
Living area	Rural area	0.06	0.55	1.04	1.04	0.09	0.34	0.48	0.49	0.12	0.16	2.40	2.43
	Semi-urban area			1.09	1.08			0.53	0.51			2.17	2.15
	Urban area			1.07	1.08			0.46	0.45			2.41	2.37
Social class	Low, lower middle class	<b>0.15</b>	0.02	1.02	1.00	0.01	0.97	0.49	0.49	0.08	0.40	2.46	2.54
	Middle class			1.08	1.09			0.48	0.48			2.38	2.36
	Higher middle. High class			0.97	0.95			0.49	0.49			2.20	2.23

## **9 INTERNET USE AND PERSONAL NETWORKS IN SLOVENIA: 2002 – 2009**

Chapter 9 concludes the empirical part of this study. It aims to explore how internet use is associated with the potential size and compositional change of emotional support and socializing networks in Slovenia during the period from 2002 to 2009. More precisely, it shall provide us with an answer on the following three research questions: (1) Did the size and composition of emotional support and socializing networks change during this period? (2) If so, were these potential modifications in the network structure associated with the substantial intensification of internet use, which has characterized the evolution of the technological landscape in Slovenia in the last decade? (3) To what extent were the potential structural changes in emotional support and socializing networks determined by the intracohort (i.e., changes in internet use within the same cohort) and intercohort (i.e., changes in internet use between different cohorts) changes in the Slovenian population. The above research questions relate to the Hypothesis 7a, Hypothesis 7b, Hypothesis 7c, and Hypothesis 7d stated in Section 5.5.

The structure of this chapter follows the above research questions. The first section introduces the basic facts about the internet use growth trend<sup>77</sup> in Slovenia during the last decade. Section 9.2 presents results about the size and compositional change in emotional support and socializing networks. The penultimate section discusses the coupling between internet use and network change, studying the main and interaction effects of the frequency of internet use on the potential structural network changes. The last section deals with the relationship between patterns of change in personal networks and internet use in terms of the intracohort and intercohort changes in the Slovenian population.

Before proceeding, a word of caution on the findings presented in this chapter should be interjected here. First, the results described below are based on the analysis of the data from two cross-sectional surveys. Consequently, we were able only to assess the correlational

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<sup>77</sup> In this chapter we use the word trend in its most basic meaning to designate a progressive change in the level of an observed variable through time.

dimension of the relation between internet use and personal networks without any ambition to draw causal conclusions. Second, even though the findings are derived from two surveys carried out on a representative sample of residents of Slovenia using a comparable measurement technique for eliciting social support networks (see Chapter 6), it should be born in mind that the survey collection of egocentered network data is a complex research process liable to different types of measurement errors (e.g., question order effect, primacy/latency effect, context effect, serial position effect)<sup>78</sup> which are difficult to foresee in the survey implementation stage as well as to identify in the data analysis procedures. This makes the comparison of egocentered network datasets an extremely challenging undertaking. Accordingly, we allow for the possibility, however small, that the changes in the structural characteristics of personal networks illustrated herein may be also a consequence of the methodological differences (i.e., methodological artifacts) between the two surveys (rather than substantial relationships).<sup>79</sup> Lastly, in the following analysis the role of internet use in network change is controlled against a set of socio-demographic covariates (i.e., gender, age, education, labor and marital status). The reason for including this, rather limited, set of factors is that they were the only socio-demographic variables that were administrated to respondents in both questionnaires. Although the inclusion of other covariates would most probably result in somewhat different values of estimates, we argue that it would not significantly change the substantial interpretations of the outcomes. Namely, gender, age, education, labor status, and marital status are considered to be among the most important demographic characteristics that account for the variability in the network structure across different subgroups of individuals (Dremelj et al. 2004; Fischer 1982; Marsden 1987; Wellman et al. 1997).

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<sup>78</sup> For an overview of methodological problems and potential sources of measurement errors in the survey collection of egocentered network data see Hlebec and Kogovšek (2006).

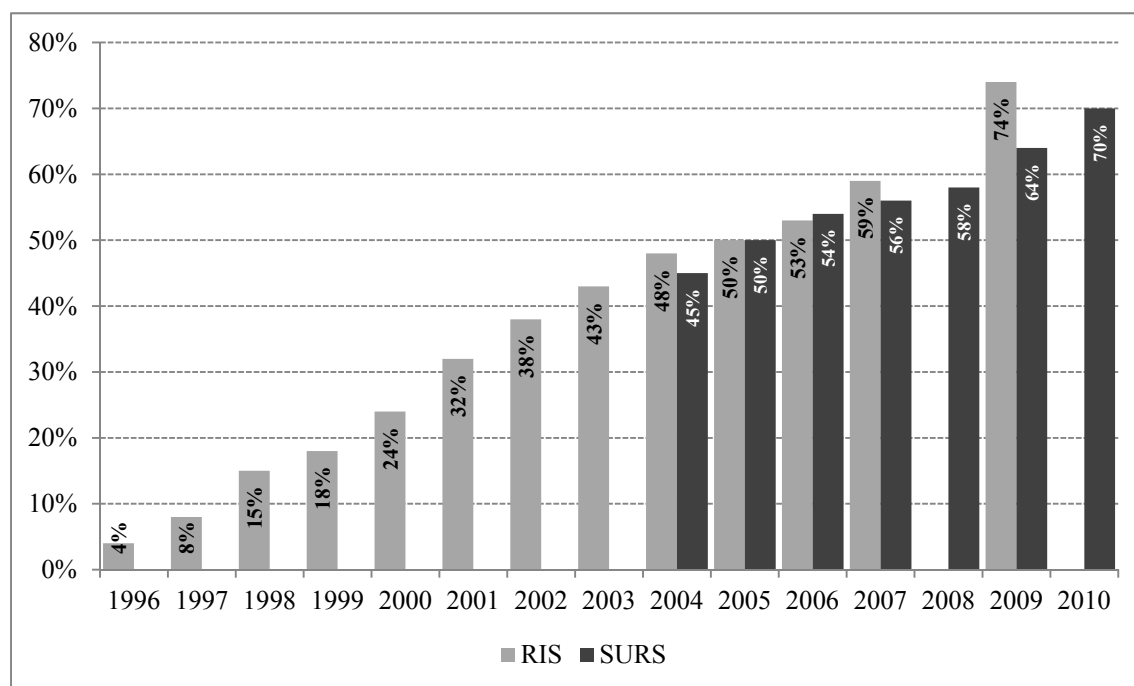
<sup>79</sup> For example, in the CMI 2002 questionnaire the socializing network generator was administered before the emotional support name generator, while in the RIS 2009 survey the question order of network generators was just the opposite. The question order effects related to the position of name generators are discussed in Pustejovsky and Spillane (2009).



## 9.1 INTERNET GROWTH TRENDS IN SLOVENIA

The proliferation of internet access and use has been an important contextual factor that characterized the last decade in Slovenia.<sup>80</sup> According to the information provided by RIS project<sup>81</sup> only one out of four residents of Slovenia aged 10-74 years had used the internet on a regular basis in 2000, while there were 74% regular internet users<sup>82</sup> in the same age group in 2009 (see Figure 9.1). A similar trend can be observed when the SURS (Statistical Office of the Republic of Slovenia) data are consulted: 45% of residents of Slovenia used the Internet on a regular basis in 2004, while this number increased for 25 percentage points to 70% of Slovenian residents aged 10-74 years by 2010.

**Figure 9.1: The growth of regular internet users in the population aged 10-74 in Slovenia between 1996 and 2010**



Source: RIS (2011)

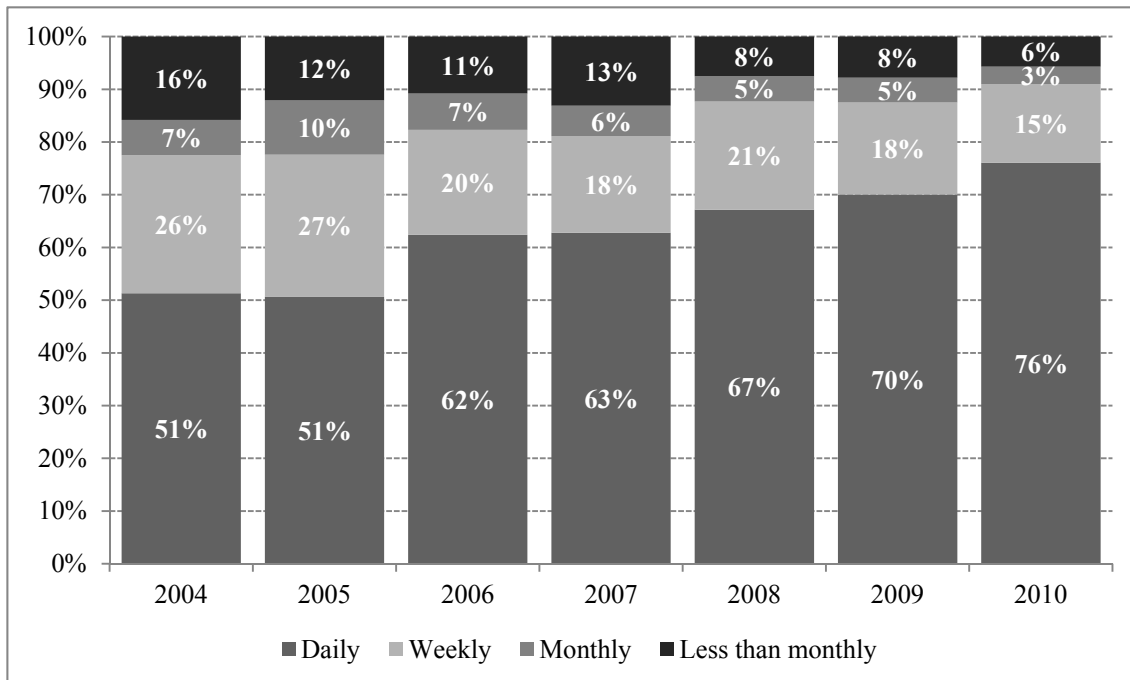
<sup>80</sup> For an insightful discussion about social, political, institutional, and historical factors that have framed and shaped the diffusion process of internet access and internet use in Slovenia see Dolničar (2008), Oblak Črnič (2008), and Vehovar et al. (2009).

<sup>81</sup> The internet growth trends for Slovenia are publicly available on the RIS webpage (<http://www.ris.org>) in the section “Benchmarks/Internet users”.

<sup>82</sup> Individuals who have used the Internet in the last three months.

According to Zhao (2006b) and Kraut et al. (2002) an even more important element for understanding the relation between internet use and social connectivity is to consider the differences in the frequency of internet use. For instance, Zhao (2006b) found that people who spent more time online for social activities and emailing (i.e., heavy internet users) had more social ties than users who spent online less of their time. A somewhat different finding was ascertained by Wang and Wellman (2010) who showed that internet non-users, light, moderate, and heavy users experienced a similar increase in the number of friends between 2002 and 2007, even though heavy internet users had the most online and offline friends. With reference to the frequency of internet use, according to SURS data, the number of daily internet users increased by approximately 40% in period between 2004 and 2010 (see Figure 9.2), while the percentage of internet users who go online monthly or less often felt from 23% to 9% during this period (approximately a 60% decline). In other words, in the last decade we have witnessed not only an impressive expansion of internet users but also a substantial intensification of the frequency of internet use.

**Figure 9.2: Frequency of internet use in the population aged 10-74 in Slovenia between 2004 and 2009**



Source: SURS (2011)

In the analyzed CMI 2002 and RIS 2009 datasets a similar growth in the number of internet users and frequency of use was observed (15.3% vs. 28.4%; see seven years (15.3% vs. 28.4%).

Table 9.1). While in CMI 2002 almost 40% of respondents aged 18-74 years reported to use the Internet, in RIS 2009 this percentage increased to almost 70%. The comparison of the two datasets also revealed a substantial increase in the frequency of internet use: while there had been only 56.3% of internet users who had gone online on a daily basis in 2002, this percentage increased to 83.4% in 2009. Accordingly, the percentage of monthly (5.5%) and weekly (11.1%) decreased in seven years (15.3% vs. 28.4%).

**Table 9.1: Internet use in the CMI 2002 and RIS 2009 survey<sup>83</sup>**

	CMI 2002		RIS 2009 <sup>a</sup>	
	N	%	N	%
All				
Users	1914	39.7	361	69.2
Non-users	2907	60.3	161	30.8
Total	4821	100	522	100
Internet users				
Monthly user	293	15.3	20	5.5
Weekly user	544	28.4	40	11.1
Daily user	1077	56.3	301	83.4
Total	1914	100	361	100

Note: <sup>a</sup>Data refer to the population aged 18-74.

However, the growth of internet use has not been equally distributed across the Slovenian population. The analysis of the socio-demographic characteristics of individuals who do not use the Internet (i.e., internet non-users) indicates that important differences existed during the last decade according to gender, age, and education. Vehovar et al. (2011) suggest that the gender divide is still persistent with a larger and increasing percentage of women among internet non-users (see Figure 9.3). Likewise, the percentage of elders among the non-users has also been increasing over the years, while the percentage of internet non-users under age

<sup>83</sup> The response scale for the question asking the frequency of internet use in the CMI 2002 was somewhat different: 1 – “several times a day”, 2 – “almost every day”, 3 – “several times a week”, 4 – “few times a month”, 5 – “less than once per month.” In this case, the categories “1” and “2” were recoded into “daily user”, category “3” was recoded into “weekly user”, and categories “4” and “5” were recoded into “monthly user.”

30 has been decreasing (see Figure 9.4). The Figure 9.5, further, shows the changing educational composition of internet non-users. There we can see that the education dimension of digital divide has been mostly associated with the group of people who have a high school or lower formal education.

**Figure 9.3: Gender composition of internet non-users between 2001 and 2009**



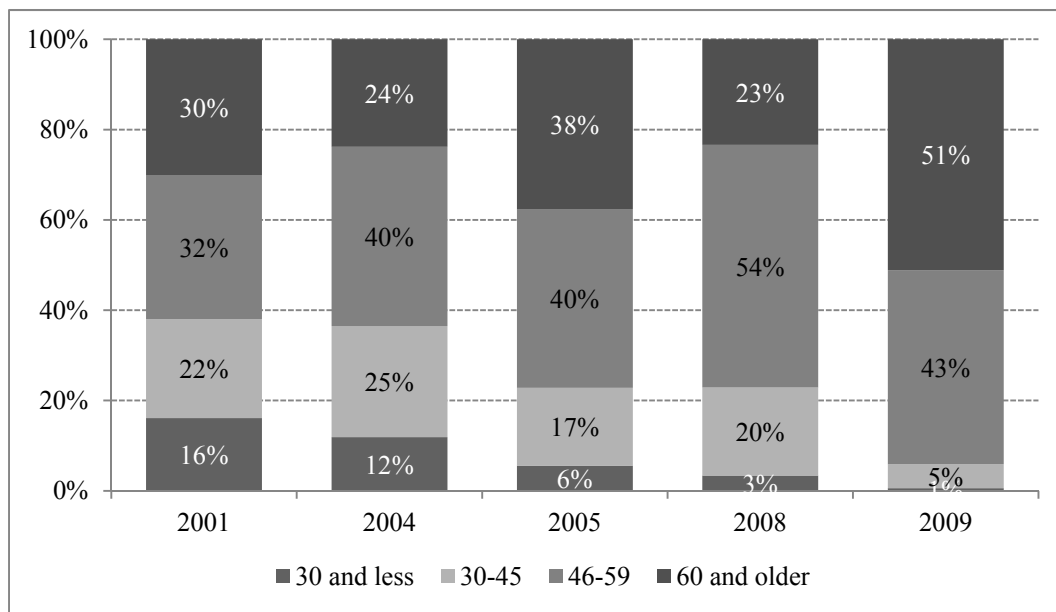
Source: adapted from Vehovar et al. (2011, 60)

According to Vehovar et al. (2011, 62) these trends and the persistence of education and age digital divides might be explained with two underlying mechanisms:<sup>84</sup> (1) generational differences which refer to the changes in the cohort structure of the population – older age cohorts with a smaller proportion of internet users are being replaced by younger generations who have almost completely taken up the Internet; (2) effect of the life cycle transitions – in part the changes in the structure of internet non-users arise from life transitions which are connected with life cycle changes (e.g., retirement, having children, changing job, changing one's residence). In addition, these life transitions might not only determine people ability to access the Internet but also the frequency of internet use. For example, Eurostat's (2011) study based on survey data, which are available for 21 European countries shows that "... Typically, a daily or frequent internet user is a man, has a high educational attainment and/or

<sup>84</sup> For an informed overview of social factors, which are associated with different levels of digital divide (e.g., access, competences, literacy, skills), see Dolničar (2008).

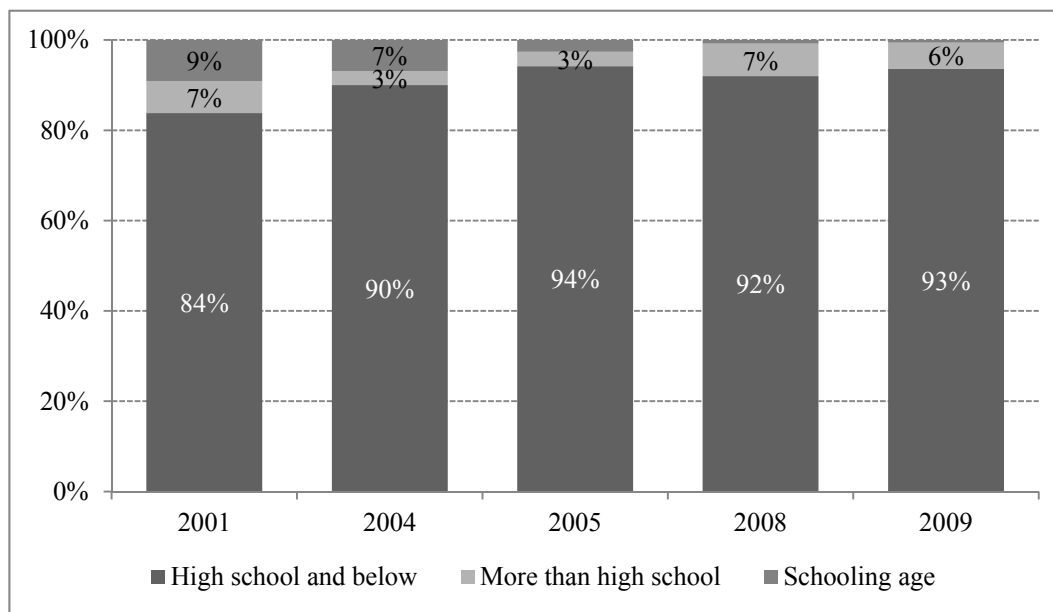
is a student, lives in intermediate or urban areas, lives in a single household with a high income, accesses the internet from home with a broadband connection and additionally accesses the internet with mobile devices. ... Whereas the typical occasional internet user is older, a woman, has a low educational attainment, is economically inactive or unemployed, belongs to a household with more than three members including children and does not have internet at home.”

**Figure 9.4: Age composition of internet non-users between 2001 and 2009**



Source: adapted from Vehovar et al. (2011, 61)

**Figure 9.5: Internet non-use and education between 2001 and 2009**



Source: adapted from Vehovar et al. (2011, 62)

Yet, what is even more noteworthy is that the socio-demographic factors (i.e., gender, age, education, labor and marital status), which correlate with the (frequency) use of the Internet, are also associated with the size and compositional characteristics of personal networks (see Section 7.1). We, thus, explore these associations further in the below sections.

## 9.2 SIZE AND COMPOSITIONAL CHANGES IN PERSONAL NETWORKS

Before proceeding with the analysis of the relation between internet use and change in personal networks, let us briefly outline the main size and compositional changes in personal networks in Slovenia between 2002 and 2009. As already noted, generally social support networks are quite stable social structures in terms of size and composition. The changes in their characteristics most often take place only in times of life transitions and greater changes such as migration, marriage, divorce, retirement, death of a partner, etc. (Hlebec et al. 2010). However, this does not mean that social support is continuously provided by the same networks members. In fact, when analyzing the structural changes in most intimate egocentered network of Torontonians in the 1970s, Wellman et al. (1997) found that size and composition in terms of role-relation remained mostly the same, yet nearly 73% of intimates present in 1968 had been replaced by new persons by 1978 (with more than a quarter of the

intimate networks having a completely new set of intimates). In addition, their results showed that respondents with a higher proportion of strong ties, immediate kin (i.e., parents, partners, siblings, children) in intimate networks, with densely knit networks in which they were in frequent telephone contact with their ties, were associated with a higher persistence of intimate relationships (Wellman et al. 1997). Among life course changes only marriage was associated with significant change in intimate networks, while other changes in family, employment, and residence did not have significant effect on network change.

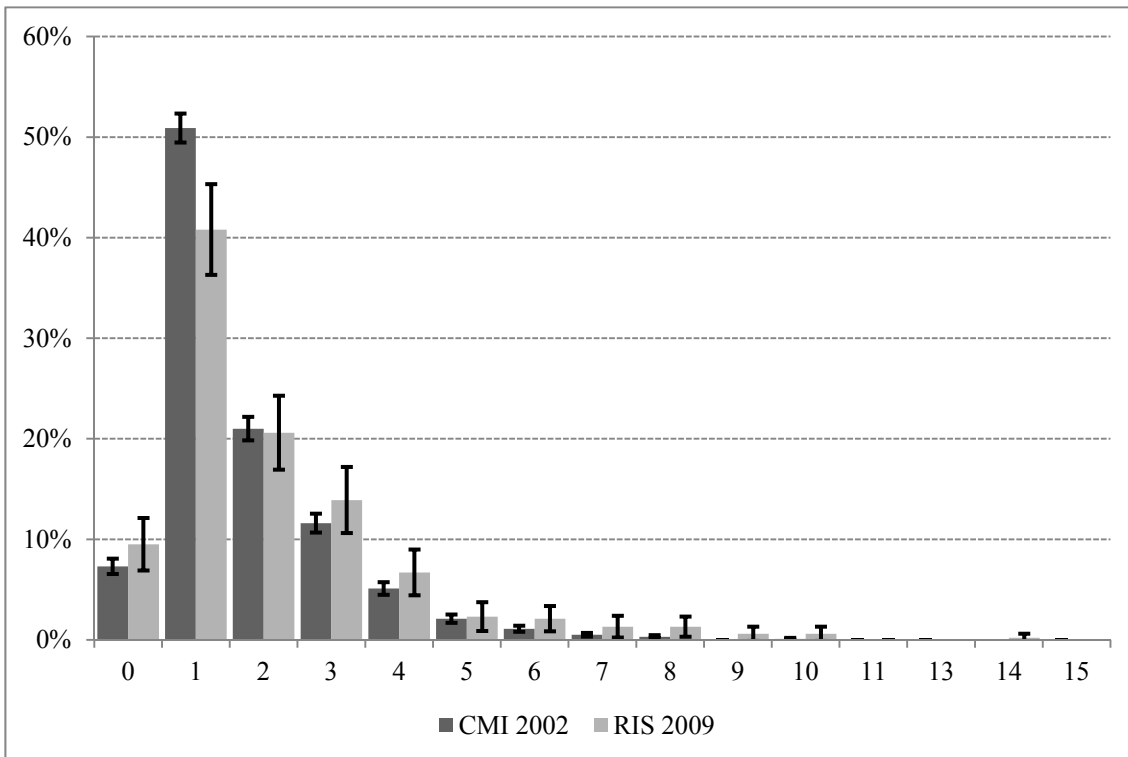
Unfortunately, our data do not allow us to determine the change in the personal network on the respondent level as Wellman and his colleagues did. Yet, what we are able to explore is the network change on the aggregated level of egocentered networks in terms of size and composition. Figure 9.6 and Figure 9.7 indicate the change related to the frequency distribution of the network size of emotional support and socializing network between 2002 and 2009.<sup>85</sup> For instance, we can note how in 2002 a statistically significant lower percentage of respondents (51%) cited only one confidant in comparison with 2009 (41%). Even larger differences can be noted for socializing networks: on one hand, there was a statistically significant larger percentage of respondents who have no one to socialize with or have only one such person in 2009 than in 2002; on the other hand, there was a statistically significant smaller percentage of respondents who cited no one, and a larger percentage of respondents who cited three, four, five, or eight social companions in 2002 in comparison with 2009. These changes in frequency distributions are reflected in the overall increase of the average size of emotional support networks (2002: 1.73 vs. 2009: 2.11) and in an overall decrease of the average the size of socializing networks (2002: 4.32 vs. 2009: 3.79; see column “M” for panel “network size” in Table 9.2). In addition, considering the data from 2002, it seems that social isolation in Slovenia has not changed in the last decade in terms of emotional support; yet it has substantially increased in terms of socializing – from 1% of respondents without socializing companions in 2002 to 8% in 2009.<sup>86</sup>

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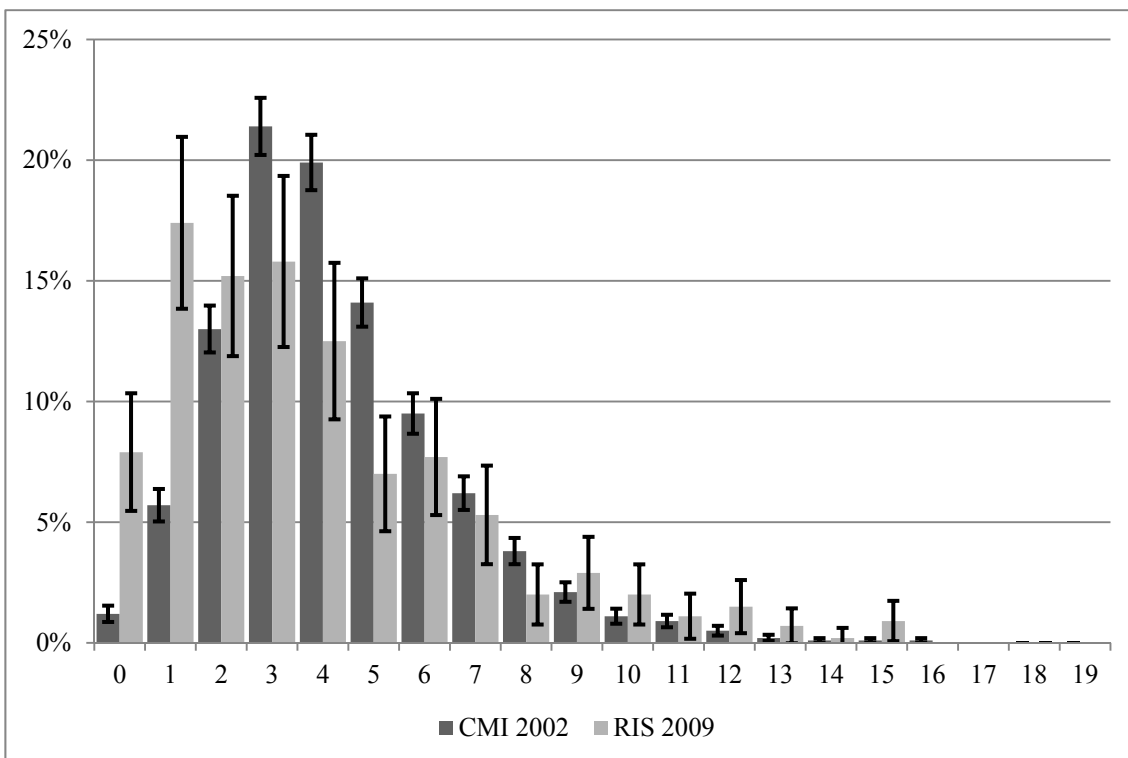
<sup>85</sup> Vertical error bars in the Figure 9.6 and Figure 9.7 indicate the 95% confidence interval for each estimate.

<sup>86</sup> The estimates for RIS 2009 presented in Chapter 9 do not match with the estimated presented in Chapter 7 because in order to make the data comparable with CMI 2002 only respondents aged 18 years or more were included in the analysis.

**Figure 9.6: Changes in the size of emotional support networks in Slovenia between 2002 and 2009**



**Figure 9.7: Changes in the size of socializing networks in Slovenia between 2002 and 2009**





Since the changes in network size could be affected by the change in the socio-demographic characteristics of the respondents in the two samples we controlled for the effects of this covariates. Table 9.2 and Table 9.3 show the results of a series of MCAs for differences in the network size and composition of personal networks between 2002 and 2009 controlled for socio-demographic factors.<sup>87</sup> Due to our primarily interest in whether there is any effect of time on network structure variables measuring the socio-demographic characteristics of respondents (gender, age, education, labor and marital status) were included into MCA mainly as control variables and for reasons of clarity are not presented herein.

**Table 9.2: Summary of MCA for network composition – comparison 2002 and 2009**

	Survey	N	Emotional support				N	Socializing			
			beta	p	M	Adj.M		beta	p	M	Adj.M
Network size	CMI 2002	4183	<b>0.01</b>	0.000	1.73	1.73	4813	<b>0.06</b>	0.000	4.32	4.32
	RIS 2009	476			2.10	2.11	455			3.79	3.79
Social isolation	CMI 2002	4183	0.02	0.115	0.07	0.07	4813	<b>0.15</b>	0.000	0.01	0.01
	RIS 2009	476			0.09	0.09	455			0.08	0.08
% men	CMI 2002	4183	0.01	0.624	36.29	36.33	4813	<b>0.06</b>	0.000	52.65	52.44
	RIS 2009	476			35.76	35.30	455			42.32	44.76
Alter age	CMI 2002	4183	0.02	0.151	1.02	1.02	4813	<b>0.03</b>	0.023	0.97	0.97
	RIS 2009	476			1.02	1.04	455			0.98	0.99
Tie duration	CMI 2002	4183	<b>0.05</b>	0.002	0.50	0.51	4813	<b>0.06</b>	0.000	0.48	0.48
	RIS 2009	476			0.56	0.54	455			0.52	0.52
Geo. distance	CMI 2002	4183	0.01	0.451	1.95	1.95	4813	0.02	0.108	2.31	2.31
	RIS 2009	476			2.00	1.99	455			2.26	2.25

Note: MCA controlled for gender, age, education, labor and marital status.

Broadly speaking, we found that the effect of time on network composition is relatively weak in emotional support networks and moderate to strong in socializing networks. This is not surprising, as we have already mentioned that emotional support networks tend to be more stable over time than socializing networks (Hlebec et al. 2010). Specifically, the results show that emotional support networks have become smaller (confirming the findings based on the analysis of network size frequency distributions), including more long-lasting ties, which is in line with the finding that the percentages of parents and children are considerably higher in

<sup>87</sup> In order to make the comparison of network composition feasible between the CMI 2002 and RIS 2009 datasets, we estimated the network composition on the basis of data on the first five alters named by respondents in CMI 2002 study.

2009 than in 2002. On the other hand, in the last decade socializing networks have become on average smaller and older, including a higher percentage of men and long-lasting ties. These changes are reflected in the changes of composition of socializing networks: the difference between the two years is quite prominent in the case of proportion of partner, neighbor (both lower in 2002 than in 2009), other kin, friends, and other (all higher in 2002 than in 2009). Finally, it should be also mentioned that after controlling for socio-demographic factors the increase in social isolation for socializing remained strong and highly statistically significant.

**Table 9.3: Summary of MCA for network composition – comparison 2002 and 2009**

	Survey	N	Emotional support				N	Socializing			
			beta	p	M	Adj.M		beta	p	M	Adj.M
% partner	CMI 2002	4463	0.01	0.607	34.87	34.79	4756	<b>0.08</b>	0.000	7.94	7.97
	RIS 2009	468			33.00	33.77	456			13.03	12.72
% parents	CMI 2002	4463	<b>0.04</b>	0.010	6.94	6.90	4756	0.06	0.000	3.57	3.53
	RIS 2009	468			9.25	9.65	456			5.73	6.15
% siblings	CMI 2002	4463	0.01	0.611	7.49	7.51	4756	0.01	0.729	8.90	8.89
	RIS 2009	468			8.32	8.10	456			8.52	8.55
% children	CMI 2002	4463	<b>0.04</b>	0.009	6.50	6.69	4756	0.02	0.237	7.70	7.80
	RIS 2009	468			11.33	9.36	456			10.02	8.92
% other kin	CMI 2002	4463	0.02	0.268	4.04	4.09	4756	<b>0.03</b>	0.032	11.60	11.66
	RIS 2009	468			5.55	5.03	456			9.90	9.20
% friend	CMI 2002	4463	0.02	0.088	30.34	30.17	4756	<b>0.04</b>	0.008	44.58	44.42
	RIS 2009	468			24.96	26.73	456			37.48	39.34
% co-worker / schoolmate / colleague	CMI 2002	4463	0.02	0.200	5.25	5.21	4756	0.01	0.603	6.39	6.34
	RIS 2009	468			3.52	3.95	456			5.30	5.85
% association member	CMI 2002	4463	0.01	0.606	0.19	0.19	4756	0.03	0.071	0.46	0.46
	RIS 2009	468			0.31	0.30	456			1.09	1.01
% neighbor	CMI 2002	4463	0.02	0.250	2.86	2.93	4756	<b>0.03</b>	0.018	5.49	5.54
	RIS 2009	468			2.74	2.07	456			8.21	7.65
% other	CMI 2002	4463	0.01	0.566	0.83	0.83	4756	<b>0.04</b>	0.008	1.67	1.67
	RIS 2009	468			0.60	0.62	456			0.60	0.51

Note: MCA controlled for gender, age, education, labor and marital status.

We might conclude that there were changes in the structure of personal networks in Slovenia in the last decade.<sup>88</sup> The changes are more prominent in socializing networks than in emotional support networks. The main difference is that socializing networks became

<sup>88</sup> In the aggregation of the role-relation data for CMI 2002 we considered only the first cited type of relation for each alter. For instance, if an ego reported that a selected alter is his/her friend and his/her work colleague, in the aggregation we defined this alter only as a friend.

smaller, while discussion partners who provide emotional support became more numerous. Nevertheless, in both types of social support networks a common trend toward more intimate, family-oriented networks could be seen, increasing the number of parents and children in emotional support networks and lowering the number of friends and other kin – who seem to be replaced by neighbors and partners – in socializing networks. In addition, in both types of networks respondents have known their alters for a longer time in 2009 than in 2002.

At least for emotional networks our findings seem to bear out the “transition” trends in the compositional change of personal networks in Slovenia, which have been recently put forward by Hlebec et al. (2010). When studying the changes in core discussion networks in Slovenia between 1987 and 2002, they found that core network composition became more intimate: by 2002 respondents reported having significantly less co-workers and neighbors as well as considerably more close kin (i.e., parents, children and siblings) and friends. We investigate in the next section whether and how this change is related to the proliferation of internet use happening in Slovenia between 2002 and 2009.

### 9.3 INTERNET USE AND THE STRUCTURAL CHANGES IN PERSONAL NETWORKS

In order to analyze the relation between the internet use and the size and compositional changes of personal networks and, thereby, to test the Hypothesis 7a, we first recoded the internet users into three subgroups (hereafter referred to as internet groups): daily user (respondents who use the Internet every day or almost every day), weekly user (respondents who use the Internet every week but not every day), and monthly user (respondents who use the Internet every month but not every week or less often). We used independent sample *t* tests to examine differences in personal network size between 2002 and 2009 at the group level. Besides the significant differences in the size of social support networks for the whole sample (see Section 9.1), the results show a highly significant growth of core discussion networks for the group of non-users, while none of the internet groups was associated with a significant change in the size of emotional support networks (see Table 9.4).<sup>89</sup> With reference

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<sup>89</sup> Some caution is needed when interpreting the statistical significance of difference related to the group of weekly and monthly users. These differences are not statistically significant, probably due to an insufficient number of cases, as there are only 19 monthly and 37 weekly internet users in the RIS Survey 2009 sample.

to the socializing networks the findings are similar for non-users (although this time the change is negative, meaning that the number of socializing companions has declined). What is different from the emotional support is the significant difference for daily users, whose socializing networks shrank for approximately 0.5 person in seven years. In other words, the results show that the positive (emotional support) and negative trend (socializing) in network size change did not have the same magnitude across internet groups. However, before drawing final inferences for the confirmation or rejection of the Hypothesis 7a a control for the socio-demographic differences among the internet groups needs to be carried out.

**Table 9.4: Personal network size and internet use – comparison 2002 and 2009**

<b>Emotional support</b>	<b>CMI 2002</b>			<b>RIS 2009</b>		
	<b>N</b>	<b>M</b>	<b>SD</b>	<b>N</b>	<b>M</b>	<b>SD</b>
Non-user	2906	<b>1.61</b>	1.23	150	<b>2.12</b>	2.14
Monthly user	291	1.97	1.39	20	2.04	1.79
Weekly user	543	1.87	1.54	37	2.16	1.78
Daily user	1076	1.89	1.44	270	2.09	1.82
Total	4820	<b>1.73</b>	1.33	476	<b>2.10</b>	1.92
<b>Socializing</b>						
Non-user	2906	<b>4.18</b>	2.37	146	<b>3.42</b>	3.41
Monthly user	291	4.68	2.46	19	4.86	3.01
Weekly user	543	4.58	2.40	33	3.84	3.97
Daily user	1076	<b>4.46</b>	2.14	257	<b>3.91</b>	2.73
Total	4820	<b>4.32</b>	2.34	455	<b>3.79</b>	3.08

Note: Statistically significant differences for paired-samples t-tests at  $p < .01$  are presented in bold.

To control the potential changes between different groups of internet users over time for the socio-demographic characteristics of internet groups, we employed the changing effect model (Firebaugh 1997), which has been already applied for investigation of the role of internet use in the change of network size by Wang and Wellman (2010). The analytic advantage of this technique is that by using hierarchical multiple regression models it does not only enable us to estimate the main effects of independent variables on the dependent variable but also the significance of interaction effects between two independent variables (in our case of internet groups and survey year). In this way we are able to check whether, for instance, the time effect on the size of emotional networks is different among daily and weekly internet users controlled for socio-demographic variables. If so, the beta coefficients of interactions would be statistically significant. If not, we could conclude that no interaction exists between

internet group and survey year, meaning that the potential changes in the network size are consistent across the groups.

We conducted two hierarchical multiple regressions with network size as a dependent variable and two blocks of independent variables. In the first step of the regression model (Model 1), independent variables consisted of dummy coded variables that represented internet groups (i.e., monthly, weekly, daily users), survey year, interactions between internet group and survey year.<sup>90</sup> In the second step (Model 2), a block of socio-demographic variables was entered: gender, labor and marital status were dummy coded, while age and education were entered as covariates. This procedure was applied to emotional support and socializing network data separately.

As shown in Table 9.5 the growth in the emotional support networks occurs among nonusers and users with all levels of internet use – although the effect is most pronounced for daily internet users. The positive value of the year factor indicates a significant growth in the size of emotional support (see also Section 9.1). Moreover, the results of regressions show that a significant negative interaction effect exists between the group of daily internet users and survey year, suggesting that the growth of the number of core confidants between 2002 and 2009 among daily users is significantly smaller than the growth among nonusers. In Model 2 with socio-demographic factors entered in the regression equation, the size and direction of effects of predictors from Model 1 remain by and large the same. In addition, all socio-demographic predictors turned out to be highly significant. This is not a surprising finding and generally confirms the results of prior research on core discussion networks (Burt 1984; Marsden 1987; Van der Poel 1993; Wellman et al. 1997): men, elderly, and married have fewer confidants than females, young, and single, respectively; whilst more educated have more confidants than less educated.

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<sup>90</sup> Due to our focus on the interactions between the three groups of internet users and internet non-users as the reference group we conducted regression analyses only for non-users as reference group in interactions. In theory for every dependent variable we could in addition test two alternative regression models with monthly and weekly internet users as reference groups in interactions.

**Table 9.5: Summary of the changing-effect model for variables predicting the size of emotional support networks in 2002 and 2009**

	Model 1				Model 2			
	B	SE	Beta	p	B	SE	Beta	p
Intercept	1.62	0.03		0.000	1.93	0.09		0.000
Monthly user	0.35	0.09	<b>0.06</b>	0.000	0.25	0.09	<b>0.04</b>	0.004
Weekly user	0.26	0.07	<b>0.06</b>	0.000	0.15	0.07	<b>0.03</b>	0.036
Daily user	0.28	0.05	<b>0.09</b>	0.000	0.19	0.06	<b>0.06</b>	0.001
Year (2009 = 1)	0.51	0.12	<b>0.10</b>	0.000	0.50	0.12	<b>0.10</b>	0.000
Monthly user x survey year	-0.44	0.34	-0.02	0.204	-0.28	0.34	-0.01	0.407
Weekly user x survey year	-0.22	0.27	-0.01	0.412	0.00	0.26	0.00	0.987
Daily user x survey year	-0.31	0.15	<b>-0.05</b>	0.039	-0.30	0.15	<b>-0.05</b>	0.046
Gender (male = 1)					-0.24	0.04	<b>-0.09</b>	0.000
Age					0.00	0.00	<b>-0.04</b>	0.027
Education					0.05	0.02	<b>0.04</b>	0.006
Labor status (active = 1)					-0.12	0.04	<b>-0.04</b>	0.005
Marital status (married = 1)					-0.21	0.04	<b>-0.07</b>	0.000

Note: Adj.  $R^2 = 0.014$  for Model 1;  $\Delta R^2 = 0.02$  for Model 2 ( $p < 0.001$ ).

The results of Model 1 for socializing networks show that the decrease occurs among nonusers and users with all levels of Internet use – with exception of monthly internet users. Moreover, interaction coefficients do not show significant interaction effects – the change in the size of socializing networks between 2002 and 2007 among all internet user groups does not differ significantly from the trend among nonusers (see Table 9.6). However, in Model 2 with socio-demographic factors entered in the regression equation, the interaction effect for monthly internet users becomes marginally significant; suggesting that the decrease in the socializing networks is smaller for this group in comparison with non-users. Further, as in the case of emotional support networks, the effects of socio-demographic predictors (except for marital status) are strong and statistically significant – especially gender, age, and education. As with emotional support network these results are mainly in line with previous studies of social support (e.g., Dremelj et al. 2004): men have smaller networks, age is negatively associated with network size, and more educated have more social companions.

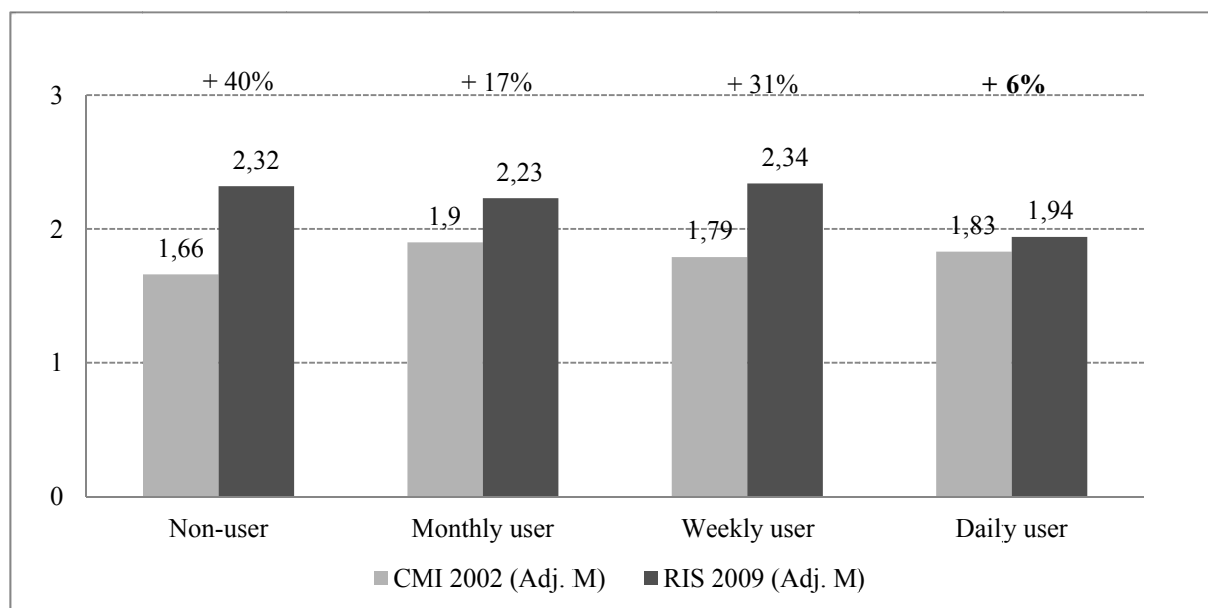
**Table 9.6: Summary of the changing-effect model for variables predicting the size of socializing networks in 2002 and 2009**

	Model 1				Model 2			
	B	SE	Beta	p	B	SE	Beta	p
Intercept	4.18	0.05		0.000	4.39	0.16		0.000
Monthly user	0.50	0.15	<b>0.05</b>	0.001	0.31	0.15	<b>0.03</b>	0.040
Weekly user	0.40	0.11	<b>0.05</b>	0.000	0.20	0.12	<b>0.03</b>	0.098
Daily user	0.28	0.09	<b>0.05</b>	0.001	0.06	0.10	0.01	0.591
Year (2009 = 1)	-0.77	0.20	<b>-0.09</b>	0.000	-0.68	0.21	<b>-0.08</b>	0.001
Monthly user x survey year	0.94	0.60	0.02	0.116	1.03	0.60	<b>0.03</b>	0.085
Weekly user x survey year	0.03	0.48	0.00	0.955	0.25	0.48	0.01	0.606
Daily user x survey year	0.22	0.26	0.02	0.406	0.15	0.26	0.01	0.583
Gender (male = 1)					-0.32	0.07	<b>-0.07</b>	0.000
Age					-0.01	0.00	<b>-0.06</b>	0.000
Education					0.13	0.03	<b>0.07</b>	0.000
Labor status (active = 1)					-0.21	0.08	<b>-0.04</b>	0.006
Marital status (married = 1)					0.08	0.08	0.02	0.290

Note: Adj.  $R^2 = 0.01$  for Model 1;  $\Delta R^2 = 0.01$  for Model 2 ( $p < 0.001$ ).

To make the interaction effects identified with hierarchical regression analyses more intuitively comprehensive, we, further, ran two MCAs with the size of emotional support and socializing networks as dependent variable and internet use group as independent variable for 2002 and 2009. After controlling for socio-demographic variations among groups, Figure 9.8 demonstrates how the growth in the adjusted mean of emotional support networks is the smallest among light users (6%), followed by monthly users (17%), weekly users (31%), and nonusers (40%). In other words, the identified interaction between the frequency of internet use and size of emotional networks suggests that internet use does not lead to smaller networks, even though daily users have experienced the smallest increase in the size of emotional support networks.

**Figure 9.8: Changes in the size of emotional support networks in Slovenia between 2002 and 2009 by frequency of internet use**



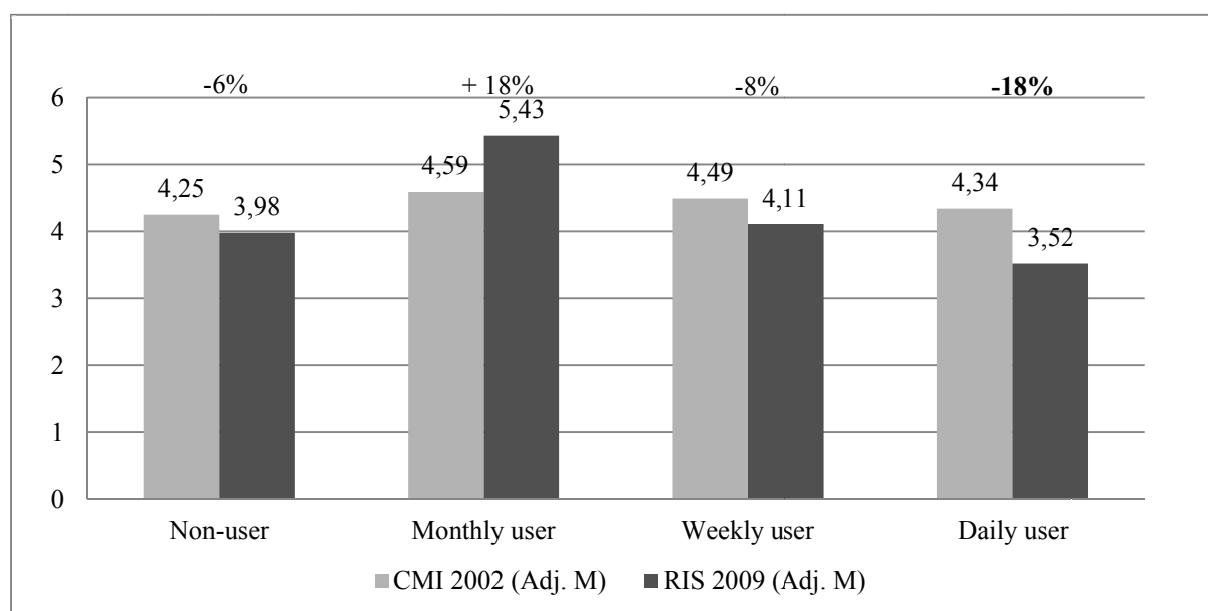
With reference to socializing networks, the changes in percentages between two survey years indicate that monthly internet users are the only group, which has experienced an increase in the size of socializing networks (+18%; Figure 9.9). For all other groups the socializing network became smaller: the largest decrease was found for daily internet users (-18%), then weekly users (-8%), and nonusers (-6%). However, only the group of monthly users is significantly different in size from the nonuser group (see Table 9.6). In sum, while the monthly users seem to be associated with an upward trend in socializing within the seven years, the downward trend in the size of socializing networks for daily and weekly internet users is not faster or slower than for non-users.

To sum up, in Hypothesis 7a we predicted that the frequency of internet use would be positively associated with the potential change in the size of socializing networks, but would have no association with the potential change in size of emotional support networks. The results seem to partly confirm our expectations for emotional support networks, where no significant interaction was found between internet groups and survey year; with the exception of daily users who experienced a smaller increase in the size of emotional support networks than internet non-users. With reference to socializing networks our predictions turned out to be less accurate: apart from monthly users who had a significantly higher increase in the number of social companions over time, other internet groups were not significantly better than internet



non-users; even more, they suffered a smaller decline in socializing than weekly and daily internet users.

**Figure 9.9: Changes in the size of socializing networks in Slovenia between 2002 and 2009 by the frequency of internet use**

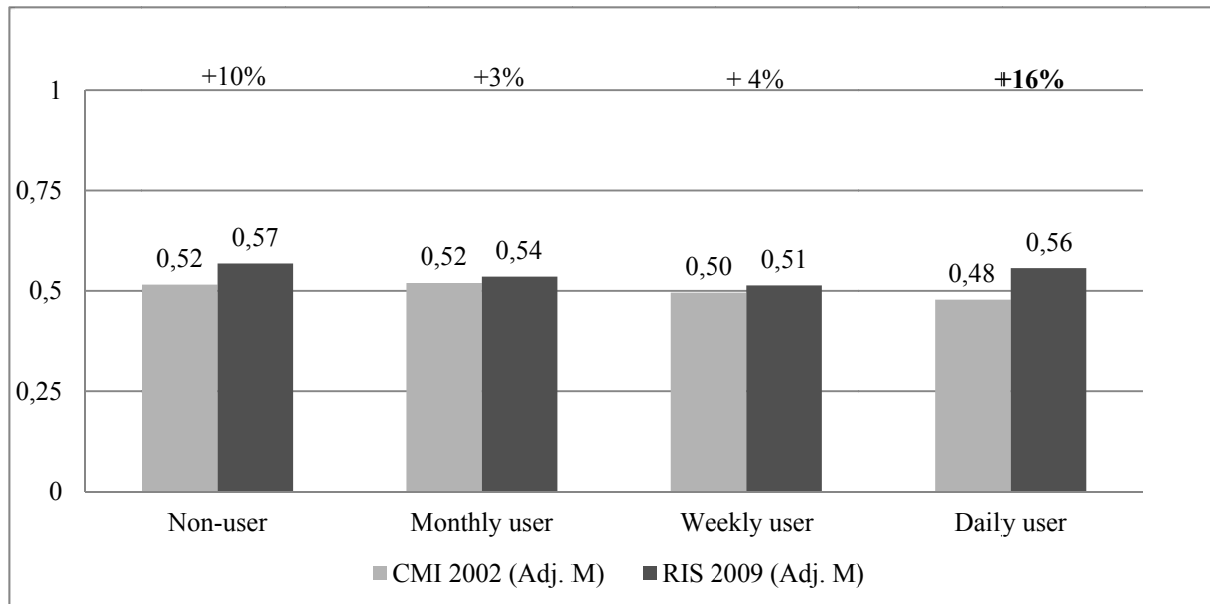


In addition, we ran six hierarchical regression analyses with the network composition indicators (i.e., percentages of kin, average tie duration, average geographical distance) used as the dependent variables. As in the case of network size, for each dependent variable (network composition variables), two separate regression models were estimated: Model 1 including predictors related to internet groups, survey year, and interactions internet groups x survey year, and Model 2 in which all variables from Model 1 were entered plus the socio-demographic factors.

In Table 9.7 results of the regression analyses are presented. In general, it can be seen that the effect of control variables is stronger than the effect of variables entered in Model 1. However, since we are primarily interested in whether there is any effect of internet groups and interactions of them with survey year on network composition, we shall focus only on that estimates. As regards the main effects the results show that in emotional support networks when compared with non-users, on one hand, daily users have fewer kin, whereas, on the other hand, daily and weekly users have less durable and more far-flung ties. The results for socializing support are essentially the same, except for the fact that besides daily

users also weekly users have fewer kin among their socializing companions than internet non-users. With reference to interactions between internet groups and survey year the results indicate only one highly significant ( $p < .001$ ) and one marginally significant ( $.05 \leq p < .1$ ) interaction effect. The former refers to emotional support networks where the increase in the average tie duration among daily internet users tends to be higher than among internet non-users. The latter is related to the average geographical distance of socializing companions: the average geographical distance of ties in the socializing networks seems to decrease more from internet non-users than daily internet users. These two interactions are depicted schematically in Figure 9.10 and in Figure 9.11. The results of MCA for group comparisons in 2002 and 2007 with tie duration in emotional support networks as dependent variable show that internet non-users had a 10% increase, while daily users had a 16% increase. Likewise, the comparison of adjusted means for geographical distance in socializing networks indicates a positive interaction. Internet non-user had a 7% decrease, whilst daily users had a 2% decrease in the same period.

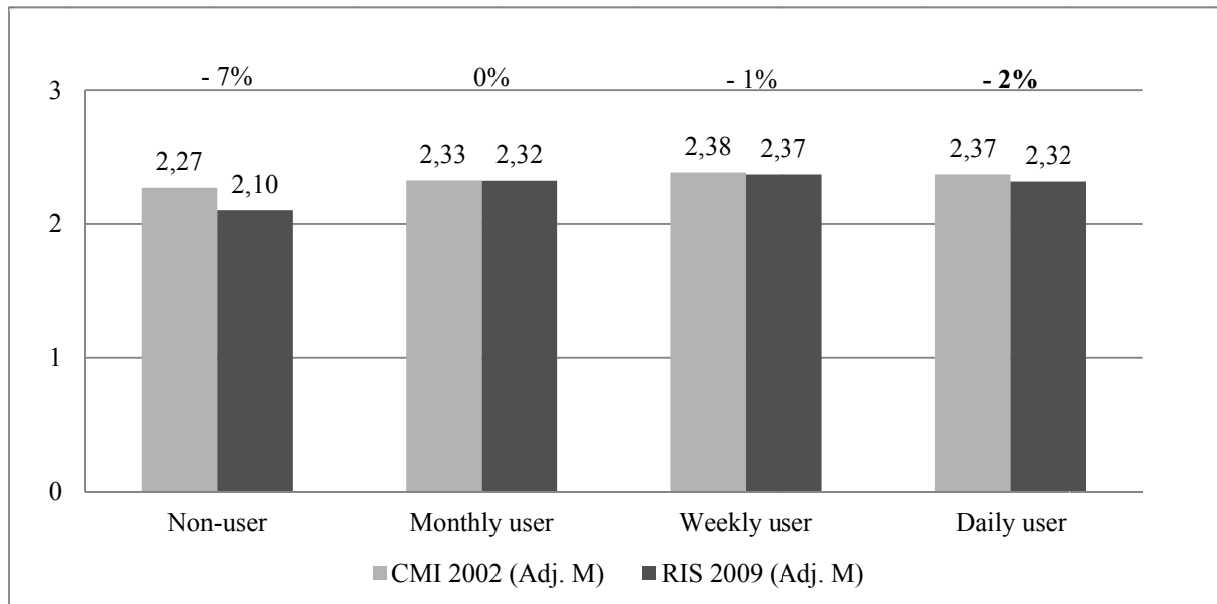
**Figure 9.10: Changes in the tie duration of emotional support networks in Slovenia between 2002 and 2009 by frequency of internet use**



In sum, we could conclude that the change in network composition of personal networks in the last decade among monthly users, weekly users, and daily users does not differ significantly from the trend among non-users. Only two exceptions were ascertained to this conclusion. On one hand, in the past decade internet users seem to have strengthen their

emotional networks more than non-users since the average duration emotional supportive ties has increased more for daily users than for non-users. On the other hand, although the last decade was characterized by a decrease of the geographical distance of socializing networks, the decrease appears to be smaller for daily internet users than non-users. Broadly speaking, the two exceptions speak in favor of the glocalization thesis (Hampton and Wellman 2003; Wellman 2001): more people who use the Internet on a daily level seem to increase the contact with the closest ties and at the same time preserve open access to more geographically remote ties which generally provide specific types social companionship. Ultimately, however, the frequency of internet use, both in emotional and socializing networks, turned out not having a significant relationship upon network structure. Therefore, we found only partial support for the Hypothesis 7b, which posited the frequency of internet use will be positively associated with the potential change in the composition of socializing networks, but will have no association with the potential change in composition of emotional support networks.

**Figure 9.11: Changes in the geographical distance of socializing networks in Slovenia between 2002 and 2009 by frequency of internet use**



**Table 9.7: Summary of hierarchical regression analysis for variables predicting the size of socializing network in 2002 and 2009**

	Kin						Tie duration						Geographical distance					
	Model 1			Model 2			Model 1			Model 2			Model 1			Model 2		
<b>Emotional support</b>	<b>B</b>	<b>Beta</b>	<b>p</b>	<b>B</b>	<b>Beta</b>	<b>p</b>	<b>B</b>	<b>Beta</b>	<b>p</b>	<b>B</b>	<b>Beta</b>	<b>p</b>	<b>B</b>	<b>Beta</b>	<b>p</b>	<b>B</b>	<b>Beta</b>	<b>p</b>
Intercept	64.01		0.000	51.46		0.000	0.53		0.000	0.51		0.000	1.89		0.000	2.04		0.000
Monthly user	-7.74	<b>-0.04</b>	0.000	-1.86	-0.01	0.501	-0.03	<b>-0.03</b>	0.071	0.00	0.00	1.000	0.00	0.00	0.988	-0.07	-0.02	0.202
Weekly user	-9.33	<b>-0.07</b>	0.000	-2.12	-0.02	0.335	-0.06	<b>-0.07</b>	0.000	-0.03	<b>-0.03</b>	0.039	0.19	<b>0.07</b>	0.000	0.09	<b>0.03</b>	0.042
Daily user	-11.39	<b>-0.11</b>	0.000	-5.37	<b>-0.05</b>	0.004	-0.08	<b>-0.15</b>	0.000	-0.04	<b>-0.08</b>	0.000	0.16	<b>0.07</b>	0.000	0.09	<b>0.04</b>	0.018
Year (2009 = 1)	9.15	<b>0.06</b>	0.000	7.95	<b>0.05</b>	0.035	0.04	<b>0.04</b>	0.099	0.00	0.00	0.940	0.00	0.00	0.967	-0.05	-0.02	0.542
Monthly user x survey year	8.69	0.01	0.204	-3.36	0.00	0.772	0.00	0.00	0.999	-0.01	0.00	0.853	0.03	0.00	0.919	0.30	0.02	0.213
Weekly user x survey year	1.35	0.00	0.412	-8.62	-0.02	0.322	0.00	0.00	0.978	0.00	0.00	0.957	-0.03	0.00	0.866	0.20	0.02	0.274
Daily user x survey year	2.41	<b>0.01</b>	0.039	1.62	0.01	0.736	0.07	<b>0.07</b>	0.007	0.10	<b>0.09</b>	0.000	0.00	0.00	0.996	0.08	0.02	0.451
Gender (male = 1)				10.87	<b>0.12</b>	0.000				-0.01	<b>-0.03</b>	0.044				-0.28	<b>-0.15</b>	0.000
Age				0.02	0.01	0.671				0.00	<b>0.10</b>	0.000				0.00	<b>0.06</b>	0.000
Education				-1.98	<b>-0.06</b>	0.000				-0.01	<b>-0.03</b>	0.071				0.05	<b>0.07</b>	0.000
Labor status (active = 1)				-4.64	<b>-0.05</b>	0.001				-0.04	<b>-0.07</b>	0.000				0.01	0.01	0.771
Marital status (married = 1)				22.16	<b>0.24</b>	0.000				-0.01	-0.02	0.205				-0.53	<b>-0.27</b>	0.000
Model 1: adj. R <sup>2</sup> ; model 2: $\delta r^2$		0.014			0.072	0.000		0.021			0.018	0.000		0.006			0.096	0.000
<b>Socializing</b>																		
Intercept	44.14		0.000	33.85		0.000	0.50		0.000	0.47		0.000	2.27		0.000	2.09		0.000
Monthly user	-8.73	<b>-0.05</b>	0.000	-2.91	-0.02	0.227	-0.03	<b>-0.03</b>	0.031	0.00	0.00	0.801	0.06	<b>0.02</b>	0.197	0.04	0.01	0.364
Weekly user	-12.43	<b>-0.10</b>	0.000	-5.06	<b>-0.04</b>	0.008	-0.06	<b>-0.09</b>	0.000	-0.03	<b>-0.05</b>	0.002	0.11	<b>0.05</b>	0.001	0.09	<b>0.04</b>	0.011
Daily user	-11.11	<b>-0.12</b>	0.000	-4.25	<b>-0.05</b>	0.008	-0.06	<b>-0.13</b>	0.000	-0.03	<b>-0.07</b>	0.000	0.10	<b>0.06</b>	0.000	0.06	<b>0.04</b>	0.034
Year (2009 = 1)	12.06	<b>0.08</b>	0.001	7.23	<b>0.05</b>	0.036	0.06	<b>0.08</b>	0.001	0.04	<b>0.06</b>	0.019	-0.17	<b>-0.07</b>	0.007	-0.19	<b>-0.07</b>	0.003
Monthly user x survey year	18.46	<b>0.03</b>	0.063	14.28	0.02	0.142	-0.01	0.00	0.914	-0.02	-0.01	0.713	0.17	0.01	0.348	0.20	0.02	0.247
Weekly user x survey year	1.45	0.00	0.858	-2.20	0.00	0.783	0.06	0.02	0.138	0.05	0.02	0.255	0.15	0.02	0.296	0.19	0.02	0.185
Daily user x survey year	-3.86	-0.02	0.382	-0.84	-0.01	0.847	0.00	0.00	0.913	0.01	0.01	0.616	0.12	0.04	0.150	0.15	<b>0.05</b>	0.055
Gender (male = 1)				-7.70	<b>-0.10</b>	0.000				0.00	-0.01	0.549				-0.03	-0.02	0.192
Age				0.22	<b>0.09</b>	0.000				0.00	<b>0.09</b>	0.000				0.00	<b>0.06</b>	0.000
Education				-1.28	<b>-0.04</b>	0.008				-0.01	<b>-0.05</b>	0.001				0.05	<b>0.09</b>	0.000
Labor status (active = 1)				-1.36	-0.02	0.259				-0.01	-0.01	0.394				-0.02	-0.02	0.302
Marital status (married = 1)				12.15	<b>0.15</b>	0.000				0.02	0.04	0.025				-0.13	<b>-0.09</b>	0.000
Model 1: adj. R <sup>2</sup> ; model 2: $\delta r^2$		0.023			0.041	0.000		0.022			0.01	0.000		0.005			0.014	0.000

#### 9.4 DECOMPOSITION ANALYSIS OF PERSONAL NETWORK SIZE CHANGE

The last section of Chapter 9 deals with the decomposition of the change in personal network size between the intra-cohort (IC) and inter-cohort change in relation to the changes in the internet uptake in Slovenia in the period between 2002 and 2009. We expect that (1) for internet users the potential changes in personal network size are mostly related to changes in internet use within the same cohort, and that (2) the intra-cohort change in the size of socializing networks will be relatively more important for internet users than for internet non-users. In addressing the above hypotheses (Hypothesis 7c and Hypothesis 7d), we followed the recent work of Wang and Wellman (2010). They analyzed the change in the friendship network in the United States through its decomposition into that part resulting from IC and that due to – also known as cohort replacement (CR) – using a linear decomposition method (LDM; see Firebaugh 1997). IC refers to the aggregated individual change within each age cohort, whereas cohort replacement denotes “... the change in the composition of the cohort as a result of population turnover” (Wang and Wellman 2010, 1155). Specifically, in our case a significant IC would mean that the change in the size of personal network is related to the changes within the cohort, and *vice-versa*, a significant value of CR would indicate that the network size changes were related to the fact that in 2009 the cohorts older than 75 (but eligible in 2002), were replaced by younger cohorts who were not eligible in 2002 because they were younger than 18 at that time. Moreover, LDM assumes that intra-cohort change is linear and additive (Firebaugh 1997, 23). LDM is a two-step technique. In the first step it uses the linear regression model to estimate the annual change in the value of the dependent variable within cohorts, while in the second step the slopes in the regression model are used to estimate the contributions of intra-cohort change and cohort replacement to the total or social change (Firebaugh 1997).

The two-step procedure of the LDM can be formally presented in the following way (see Firebaugh 1997, 24-26):

$$\text{Step 1: } Y = b_0 + b_1 \times X_1 + b_2 \times X_2 + e,$$

$$\text{Step 2: } IC = b_1 \times (YR_F - YR_1),$$

$$CR = b_2 \times (C_1 - C_2),$$

$$TC = IC + CR,$$

where  $Y$  is the estimated value of the dependent variable for the respondent,  $b_0$  is the estimated intercept,  $b_1$  is the estimated intra-cohort slope,  $b_2$  is the estimated inter-cohort slope,  $X_1$  is the year of measurement,  $X_2$  is the birth year for the respondent,  $YR_F$  is the time of the final survey,  $YR_1$  is the time of the first survey,  $C_1$  is the average year of birth for the sample in the first survey, while  $C_2$  is the average year birth for the sample in the last survey. The intra-cohort change (IC) is calculated as a product of the estimated inter-cohort slope and the difference between the time of the final survey (in our case: 2009) and the time of the first survey (2002). The cohort replacement (CR) is calculated as a product of the estimated inter-cohort slope and the difference between average years of birth for the sample in the first survey (in our case: 1959) and the average year birth for the sample in the last survey (1963). The total change (TC) is the sum of IC and CR.

In this study we first estimated this regression model on the whole sample and then separately for internet non-users and internet users to see if IC and CR vary across various the groups. The results of the six regression models used in LDM with the respective estimates of IC, CR, and TR are presented in Table 9.8. The results show that overall, for the period from 2002–2009, there is a statistically significant positive TC in emotional support network size, indicating an increase in the average number of core discussant (see Table 9.8). The estimates of IC and CR indicate that the change in the size of emotional support networks is more due to the intra-cohort changes rather than to the cohort replacement. Specifically, IC coefficient is positive, indicating an increase in the average network size within cohorts per year, while the CR coefficient is negative, suggesting a decrease in the average network size across cohorts with younger cohorts having fewer core confidants. Over the entire period of observation individuals who did not use

the Internet experienced more TC in network size than internet users (*cf.* Figure 9.8). Moreover, for the non-users the TC seems to be almost entirely ascribed to the changes within cohort (CR is n.s.), whilst for internet users IC and CR coefficients are significant: from their magnitude it can be deduced that the TC is positively associated the change within cohorts and negatively with cohort replacement: 217% of the change in network size occurred through intra-cohort changes, while -117% through cohort replacement with younger cohorts of internet users having fewer supportive ties. In other words, decomposition analysis reveals that the patterns of change in size of emotional support networks are significantly different for internet users and non-users. On one hand, the total change is considerably lower for internet users, with the replacement of older cohorts of internet users with larger emotional support networks with younger internet users with smaller emotional networks. On the other hand, for the non-users the total change is more consistent and exclusively associated with within-cohort changes.

**Table 9.8: Results of LDM for emotional support and socializing network size across the internet (non)user groups from 2002 and 2009**

Network size	b <sub>1</sub>	Intra-cohort change		b <sub>2</sub>	Cohort replacement		Total change
<b>Overall</b>							
Emotional support	0.050***	0.25	110%	0.007***	-0.02	-10%	0.23
Socializing	-0.081***	-0.41	92%	0.010***	-0.03	8%	-0.44
<b>Non-users</b>							
Emotional support	0.071***	0.36	98%	-0.002	0.01	2%	0.36
Socializing	-0.102***	-0.51	103%	-0.004	0.02	-3%	-0.49
<b>Internet users</b>							
Emotional support	0.022*	0.11	217%	0.017***	-0.06	-117%	0.05
Socializing	-0.084***	-0.42	93%	0.009**	-0.03	7%	-0.45

Note: \*\*\*  $p < .01$ , \*\*  $.01 \leq p < .05$ , \*  $.05 \leq p < .1$

With reference to the size of socializing networks the negative TC can be noted for all three groups (see Table 9.8), meaning that in seven years socializing networks of Slovenians became smaller (this results confirm the findings presented in Section 9.2). Generally speaking, it seems that there are no significant differences across the groups in the size of TC with IC acting as a primary mechanism of TC. For example, overall, the total contribution of aggregated individual change accounts for 92% of the TC, while cohort replacement accounts for 8% of the TC. A similar pattern came out for internet non-users and internet users. For internet non-users,

virtually all (103%) of the change occurred through intra-cohort change (CR = -3%, n.s.), whereas for internet users, 93% of the negative change was attributable to intra-cohort change and 7% was associated with cohort replacement.

To sum up, our expectations are confirmed only in part. On one hand, the findings are consistent with the Hypothesis 7c that for internet users the potential changes in personal network size are mostly related to changes in internet use within the same cohort. Although the use of internet for communication within personal networks is still generational dependent (see Section 8.2), the intra-cohort changes outweigh cohort replacement. On the most general level we may say that it is unlikely that digital sociality is gaining grip because the continual replacement of older cohorts, who have a less enthusiastic attitude toward the Internet and other ICTs, with younger, more intensive adopters of ICTs. Rather, it seems that we are witnessing a structural change in social connectivity, which takes places within the cohorts. On the other hand, the decomposition analysis of total change in personal network size over the period from 2002 to 2009 seems to refute the Hypothesis 7d that the intra-cohort change in size of socializing networks will be relatively more important for internet users than for internet non-users. A common position put forward by new media sociologists (e.g., DiMaggio et al. 2001; Hampton 2003; Kavanaugh et al. 2005; Zhao 2006b) is that the social use of the Internet opens up new ways for forming weak ties and thereby a wider portfolio of social resources. If this were true, then in the decomposition analysis intra-cohort changes for internet users would have been positive and larger than for the non-users. However, this study puts such suggestion under question, since the results show that intra-cohort changes are negative and not different from the respective estimates for non-users. In short, both groups suffer from apparent decline in socializing with no difference in the amount of the intra-cohort decrease.



## 10 CONCLUSION

The aim of this doctoral dissertation has been to get an insight into the role new communication technology plays in personal relating under the circumstances of late modernity. As we have demonstrated this is a complex research problem which has been recently addressed by many studies within different research fields such as sociology, communication sciences, psychology, internet and new media studies to mention only a few. Despite their rich theoretical and empirical contribution (or perhaps precisely because of this), which provides us with valuable perspectives into developments of technologically mediated forms of social connectivity, what seems to lack is a concerted effort to pursue a theoretical framework that would make it possible at least to organize if not actually to understand the socio-technical nature of sociality in the context of broader societal transformations. Existing work on social connectivity and ICTs use up to now has shown little concern for such agenda. It either assumed that technology has some sort of impact on the organization of social relations or suggested that the practices and experiences related to new communication technologies are embedded into a web of social forces.

Hence, we have spent the initial chapters of this dissertation to describing and defining a conceptual framework that would help us to organize the existing knowledge and at the same time provide us with necessary means to assess the idiosyncratic properties of contemporary sociality, which is emerging out of the interactions between the social and technological facet of interpersonal communication in everyday life. We made reference to the STIN approach in an attempt to describe and explain the socio-technical nature of sociality. Its network metaphor allowed us to map out the complex web of connections from which the practices and experiences associated with technologically mediated modes of personal relating emanate. However, this required additional research about the dimensions along which the technology-society relationship can be defined and investigated. This research made clear that social context in which technology is developed, appropriated, and used has to be taken into account when analyzing the use of ICTs in interpersonal communication. Consequently, in accordance with the STIN approach we proposed the notion of digital sociality as a conceptual vehicle that views the

technologically mediated sociality as social reality composed of intensive interactions between the technological landscape, social interactions, social networks, and the social context.

Only after defining the above presented baseline framework, could we concentrated on each of the constitutive facets of digital sociality. The aim of this research was to contribute to the development of a method informed by social informatics for an integrated analysis and assessment of the three facets of digital sociality in relation to accentuated reflexivity and individualization in late modern forms of personal relationship. In addition, we presented an interdisciplinary overview of research that could help us to understand the different aspects of interactions between the three elements of digital sociality: from the emergence of new spatio-temporal domains of communication and related forms of technologically mediated modes of co-presence, through the reorganization of normative frameworks, which on the level of experiences and uses shape the relations between different technologies in interpersonal communication, to the developments that new communication technologies have facilitated on the personal network level. We showed that the interactions between these elements are mutually constitutive, multilayered and multidimensional. For instance, various new forms of social connectivity such as “connected” presence, networked individualism, network sociality, cannot not be adequately (sociologically) analyzed without thinking of them as repertoires of individualized modes of personal relating where an individual can contact their personal network members via many different communication means. If we had passed over that observation we would have overlooked one of the central aspects that differentiate the present form(s) of sociality from their predecessors – in short, the complexity of media environment.

The same holds for the analysis of the related social implications. For example, drawing conclusions about the relation between the ICTs use and social isolation solely on data related to mobile communication would be ill-informed as the mobile phone is only one among many means of communication people nowadays have to connect with family, friends, and colleagues. Although we feel that our analysis synthesized and explained some important points regarding the complexity of interactions, there are other areas in which this could have been done. Therefore, our attempt to reflect the phenomena under study can also be read more as a research agenda than a final and complete overview.

Nevertheless, we feel that at least in three respects this study is a worthwhile contribution to the growing literature on the subject not only in theoretical but also in empirical terms. First, this study suggests that the individualizing character of digital sociality should not be implicitly associated with the dissolution of social integration; at least not in terms of social isolation. Such proposals have been recurrently put forward by the advocates of the postmodernity thesis especially in the context of internet use (as discussed in Chapter 5). Recently, several studies have shown that they do not have a solid empirical foundation. This study confirmed such findings. Neither personal network size nor social isolation (i.e., having no one in the personal support network) turned out to be associated with internet use. This holds for both types of personal network examined in this study (i.e., social circles and social support networks). In the context of internet use the individualizing impetus of digital sociality should be rather understood in terms of increasing differences in the composition of personal networks. In other words, being online and using the internet communication services might not lead to having more/less social ties but rather to connect with specific group of ties. Indeed, the findings of this study are in line with the hypothesized suggestion that the social affordances that come along with the internet-based communication means will have a more pronounced association with composition of socializing networks since they are better at sustaining weak, non-kin, and transient ties than with the strong, stable, and enduring ties that made up the emotional support network.

Second, we found that individuals tend to combine different technologies in pragmatic and complex ways in order to make contact with their network members more feasible. This suggestion needs to be understood along the following lines:

- Patterns of use and the combining of technologies for contacting network members seem to be associated with the structural characteristics of personal networks. For example, the results of this study indicate that smaller and nearby networks are associated with more frequent in-person, mobile voice and SMS/MMS communication, whereas larger and far-flung networks show a propensity to be associated with more frequent landline telephone, email and internet communication. More precisely, when comparing the results across the types of social support we discovered that in contrast with our hypothesis mobile

communication seems to be unrelated to the propinquity of socializing networks, while, as hypothesized, the frequency of internet communication seem to positively correlate with the geographical remoteness of socializing ties. The connection between usage patterns of communication technologies within personal networks seems to be confirmed also by the differences among media sub-networks in terms of networks size and geographical location of social ties. Specifically, it was expected that mobile phone and texting sub-networks will be undersized and locally based, while landline telephone, email and internet communication sub-networks will be larger and far-flung. Our findings tend to support these expectations at least for mobile voice communication and texting in emotional support network as well as for internet communication in general;

- Complex media environment appears to be supported by normative frameworks that promote patterns of media use where replacement is more an exception than a rule. People with access to different communication technologies generally use all of them to contact their personal network members. Specifically, only two of statistically significant correlations between variables measuring the frequency of contact via various media were negative: in emotional support in-person communication was negatively correlated with email, whilst in socializing networks in-person contact was negatively associated with internet communication. In both types of networks the largest number of significant positive associations was found for SMS/MMS, mobile, and in-person communication – especially the latter two have the attributes of the ubiquitous communication mode. In addition, text-based channels (i.e., email, texting, internet contact) cluster together in both networks. In addition, the analysis of the media sub-networks seems to support the complex media thesis: respondents with a larger size of a selected medium sub-network usually also have a larger proportional size of other media sub-networks;
- However, complexity does not only refer to the media use but also to the varying composition of media sub-networks. Put it differently, the results of this study showed a sort of individualized addressability in personal network management, which is structured by the availability of alters via a selected communication technology. For example, this would mean that the alters with whom the ego stays in contact via the mobile phone are not necessary the same persons with whom they stay in touch via the Internet or email. In our study the largest

differences in composition were seen between internet sub-networks and all other types of media sub-networks. The most pronounced difference lies in the role-relation characteristic and geographic distance of ties – with internet sub-networks embracing more friends and alters who live at a distance of over half an hour by car from the ego. The differences in the composition of in-person, landline telephone, and mobile phone sub-network are far less pronounced since all generally contain more kin ties that live in geographically proximity;

- The evidence regarding the relationship between the structure of personal networks and media multiplexity confirmed the hypothesized expectations: in emotional support networks individuals use more communication channels to stay in touch with their network members than in socializing networks. Yet, what might be even more illuminating for the understanding of the networked nature of the interactional mix is that in the two types of networks communication multiplexity is associated with different structural factors. In socializing networks, consisting of weaker and more specialized ties, multiplexity tends to increase with more kin and far-flung ties, whereas network size and average alter age are significant predictors in emotional support network, made up of close, multiplex, family-oriented, and localized ties. Put it differently, the results point to a possible structural distinction between social mechanisms that shape the use of multiple communication means for contacting various types of social ties;
- If the complex patterns of media use are understood as expressions of individual choices and personal preferences, the shared experiences and practices in terms of media choice, which are connected to people's socio-demographic traits and to the compositional characteristics of their personal network, may be seen as the “structural” facet of individualization forces. For instance, in emotional support networks people, who had a propensity to use landline phones and mobile phones, had on average less confidants, who were mainly kin, lived in geographical proximity, and have known each other for more time. Instead, groups that heavily rely on email and internet-based communication seem to have more far-flung and non-kin emotional ties. When looking at socializing networks we may arrive to a similar conclusion. Groups who do not use the Internet to contact their network members have significantly less non-kin and more alters whom have known for a longer time. In addition, the members of these networks live in close proximity and are older than egos.

Lastly, longitudinal data analysis indicated that there were changes in the size and composition of personal networks in Slovenia between 2002 and 2009. Three points are important in this regard: (1) the number of core discussants decreased, whereas the number of socializing companions increased; (2) as expected the magnitude of changes turned out to be larger for socializing networks; (3) both types of social support networks today embrace more intimate, family-oriented, and long-lasting ties than seven years ago. The underlying mechanisms of such developments are undeniably difficult to identify as they relate to a range of social systems in which people participate during their life. At present, capturing the role of ICTs in these developments becomes an increasingly difficult exercise since ICTs are involved in (interpersonal) communication within virtually all domains of social reality. Hence, this study has been only a modest attempt to get an elementary understanding of this matter. It was found that internet use does not play a large part in the described time variations. The change in network composition of personal networks in the last decade was not significantly different among monthly users, weekly users, and daily internet users.

Apart from this general tendency, two small but important exceptions shall be recalled. While internet users seem to have benefited of a smaller increase in number of core confidants when compared to non-users, they appear to have suffered from a smaller increase in the localness of socializing networks. In other words, although we have witnessed an impressive growth in the number of internet users and the frequency of internet use in Slovenia during the last decade, these “contextual” changes seem to have little significance for the changes in terms of personal network size. This is not a surprising revelation given the fact that, as Hlebec et al. (2010) showed, even more profound social changes in Slovenia during the 1990s (the so-called “transition”) have been reflected in and accompanied by small changes in social support providers.

Nevertheless, with the help of linear decomposition models, we were at least able to partition the change in the size of personal networks between intra- and inter-cohort changes. The results revealed that the former were the primary mechanism of network size change. More

interestingly, the decomposition analysis also brought to light some diversity in the patterns of change between internet users and nonusers. In particular, with reference to the size of emotional support networks: for internet users the total change correlated with the replacement of older cohorts of internet users with younger generations of internet users. Conversely, for the non-users the total change in the number of core discussant was only associated with intra-cohort changes. In other words, the smallest increase suffered by internet users in terms of emotional network size seems to derive from the replacement of older cohorts with younger cohorts of internet users. Considering the actual social orientation of contemporary internet communication services development this is a surprising finding. As we do not have other contextual data, anything we say about possible reasons for such trends would be a speculation. However, what this finding in our opinion suggests is that the “social” aspect of internet communication services should be further critically scrutinized. By “critically” we mean that more efforts need to be put into an interdisciplinary research on the social contexts that frame the (social) uses of ICTs for interpersonal communication.

In spite of these rich and insightful findings, we are aware that any conceptual and empirical account of digital sociality is limited by its multilayered and multidimensional nature. The decision to focus on certain aspects and dimensions of the analyzed problem means paying less attention to other research questions and areas which may be equally, or even more, important. In this sense, this study is no exception. There are still other aspects of digital sociality that need further theoretical elaboration and empirical verification. One limitation of this study results from the fact that in social informatics the STIN approach has been generally used to study information technology related phenomena on the organizational level (e.g., work organizations, online communities, electronic journals). This means, that in order to apply it to the scope of everyday life practices and experiences of ICTs use in digital sociality we had to tailor its conceptual model and methodology to a broader analytical framework which encompasses macro-level social structures and processes. In doing so, we were left without a relevant reference point in prior literature, which could help us to critically evaluate our contribution to the ongoing discussion in this field.

Moreover, the research focus of this study involves an everyday life perspective on ICTs use and the reconfiguration of personal relationships in late modernity. However, as Habermas (1984) suggests, the lifeworld is surrounded (Habermas would say “colonized”) by economic and political systems that determine the power relations between social actors. For instance, the new forms of social accessibility, the structural changes of personal networks, and the advancement of reflexivity and individualization in social connectivity can have broader societal developments in areas of gender, labor, identity, and generation relations. As we already mentioned in the theoretical discussion concepts such as personal community, pure relationship, and perpetual contact are not politically and culturally neutral but rather value-laden. They derive from and reflect specific political, economic, and cultural contexts that are important for the evaluation of their implications. With rare exceptions these aspects have been rarely studied thus far. For example, Bulc’s (2007) ethnographic research on service workers in Slovenia showed how employers may take advantage of the always-on accessibility of employees that limit their privacy and personal freedoms. Such practices do not only reconfigure the communicative aspect of their relations but also carry consequences for the structural inequalities between the two groups as well as question the existing public/private division between the sphere of home and work. Such and similar evolvments certainly represent the dark side of digital sociality and more research efforts are welcome to disclose them.

The power dimension of constant communicative availability was also discussed by Ling and Yttri (2006) in the context of family relations and teen emancipation. Their study suggested that mobile phones by modifying the patterns of communication between parents and children have given to the latter a new field where they can demonstrate their search for autonomy and independence. These are also findings and perspectives on social structures and processes associated with the advance of digital sociality which would benefit of further research in the future.

Such research would probably require a qualitative approach with a combination of in-depth interview, time-diary study, focus group, and observation to collect field data about the people’s subjective meaning and understanding of experiences and practices, associated with technological mediated forms of interpersonal communication and the underlying normative and



power frameworks. The quantitative approach, on which the empirical part of this dissertation is based, without doubt provides a valid and reliable insight into the general regularities which connect the composition of personal networks with the use of ICTs for interpersonal communication. However, in order to discern the subjective dimension of these phenomena it should be upgraded with a more complex (mixed-mode) research design that uses qualitative methods to evaluate and describe the people's experience regarding media use.

Qualitative methods could also prove beneficial when attempting to develop a more valid and reliable operationalized definition of notions that are central for the understanding of digital sociality. One such concept is media use. In the empirical part of this dissertation, we defined and measured media use in terms of the frequency of contact via a selected communication technology with network members. This is an important limitation to overcome. In fact, other aspects of media use exist that are equally important for a holistic understanding of the relationship between ICTs and social ties. We have already noted in Chapter 6 that Hogan (2009) identified four socio-temporal structures (i.e., sequence, duration, temporal location, and recurrence) that shape the use of different technologies in interpersonal communication. In addition, Zhao (2006b) and Petrič et al. (2011) noted that the extent to which the use of the Internet and other ICTs structures personal relationships depends as well on other elements such as the reasons why people use a specific technology. Petrič et al. (2011), for instance, showed that there are important differences in the social uses of ICTs; some people use the Internet frequently to manage their private matters, while others make use of it exclusively for work. The same holds for other communication modes. We would probably obtain a multi-dimensional insight which may better explain current findings by adding these dimensions to an empirical inquiry of the digital sociality.

With reference to the limitations of this study a final consideration has to be made about the analysis of longitudinal data presented in Chapter 9. As the analyzed data are based (only) on two cross-sectional surveys, we could determine neither causation nor temporal trends. Causation analysis would have been possible, if we had had panel data (e.g., a two-wave panel survey). To determine the temporal trends we would need access to datasets from more than two time points. Nevertheless, the temporal analysis presented herein produced some interesting

results that may be appealing for further studies with more sophisticated causal and/or longitudinal designs.

Notwithstanding these limitations, we believe that this study adds to the body of literature on the role of ICTs use in social connectivity. Besides the rich empirical evidence, it puts forward a theoretical framework that can help inform future research in this field. In our opinion, social informatics and other emerging scientific disciplines (e.g., new media studies, internet studies, community informatics), which have defined the social reality of information and communication technology as the object of their scientific study, much too often bring their attention only to the interactional dimension of relation between the individual and technological artifacts. What we hope this study has demonstrated is that the social context (which in our case refers to broader societal transformations related to late modernity) is of equal, if not greater importance, to answer key questions in order to archive an appropriate understanding of the social implications arising from such transformations.

Finally, we also hope that the acquired knowledge from this study could be of applied value for the professional and the general public who is interested in the relationship between the use of new technology in interpersonal communication and social support networks. We feel that this dissertation is a well-organized source of insights into how social support is mediated through (new) communication technology according to the people's socio-demographic profile and the composition of their personal networks. Such information might be of some support to experts, analysts, NGOs, and state (or other) decision makers in preparing and implementing strategies and services related to personal and collective empowerment, social inclusion, social protection, social assistance, or social policy in general.

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12 APPENDIX

APPENDIX A: DENDROGRAMS

Figure 12.1: Dendrogram for communication clusters in emotional support networks

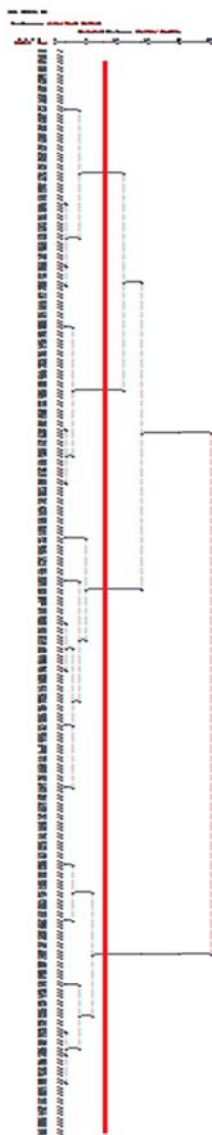


Figure 12.2: Dendrogram for communication clusters in socializing networks



# APPENDIX B: SOCIO-DEMOGRAPHIC DIFFERENCES IN PERSONAL NETWORK COMPOSITION

**Table 12.1: Subgroup differences in role-relation composition of emotional support networks (%)**

	partners	parents	siblings	children	other kin	friend	neighbor
<b>Gender</b>							
Male	<b>39.59</b>	<b>11.20</b>	<b>8.43</b>	5.83	3.25	23.44	<b>3.41</b>
Female	24.57	10.16	7.20	<b>13.99</b>	<b>7.05</b>	<b>30.42</b>	1.68
<b>Age</b>							
15 - 19	14.88	<b>17.15</b>	7.15	0.00	2.61	<b>52.98</b>	0.00
20 - 27	21.50	<b>29.23</b>	<b>12.86</b>	0.00	1.69	<b>32.85</b>	0.00
28 - 34	<b>35.64</b>	<b>19.20</b>	6.14	1.06	2.16	<b>31.26</b>	0.87
35 - 44	<b>39.26</b>	4.38	3.38	6.74	2.67	<b>37.59</b>	0.00
45 - 75	<b>35.57</b>	2.68	7.43	<b>18.87</b>	<b>8.56</b>	16.21	<b>4.84</b>
<b>Education</b>							
Elementary school or less	23.08	8.03	7.29	<b>12.82</b>	<b>8.84</b>	<b>27.86</b>	<b>5.14</b>
Vocation high school	<b>38.23</b>	7.79	6.61	<b>11.17</b>	4.05	26.82	1.98
High school	24.17	<b>21.40</b>	<b>12.01</b>	6.37	1.99	<b>28.46</b>	1.00
University or higher	<b>37.64</b>	10.18	6.71	8.31	5.54	26.08	0.57
<b>Labor status</b>							
Employed, self-employed, farmer	<b>39.85</b>	9.17	6.41	6.24	3.42	<b>27.22</b>	0.97
Children, pupil, student	13.39	<b>24.56</b>	<b>12.00</b>	0.00	2.17	<b>43.72</b>	0.00
Retired	<b>32.89</b>	1.36	6.41	<b>23.78</b>	<b>11.17</b>	16.30	<b>4.89</b>
Other	<b>34.57</b>	<b>11.90</b>	7.24	<b>11.45</b>	2.73	19.77	<b>8.60</b>
<b>Marital status</b>							
Married, non-marital partnership	<b>47.80</b>	4.97	4.36	<b>11.76</b>	4.42	18.93	2.47
Having a permanent relationship	<b>41.36</b>	<b>15.42</b>	7.40	0.00	4.44	<b>27.82</b>	0.00
Single, never married	3.31	<b>24.06</b>	<b>16.33</b>	0.63	4.08	<b>43.40</b>	1.94
Single, widowed, separated	4.79	2.72	5.27	<b>34.28</b>	<b>14.36</b>	<b>32.84</b>	<b>5.52</b>
<b>Children</b>							
Yes	<b>40.28</b>	3.86	5.08	<b>16.62</b>	<b>6.88</b>	19.10	<b>3.69</b>
No	17.17	<b>21.40</b>	<b>12.00</b>	0.26	2.89	<b>40.24</b>	0.52
<b>Living area</b>							
Rural area	<b>35.79</b>	10.04	6.02	<b>10.64</b>	5.36	25.94	2.19
Semi-urban area	29.37	9.78	<b>8.65</b>	8.71	<b>6.12</b>	<b>27.69</b>	<b>4.87</b>
Urban area	24.74	<b>12.34</b>	<b>9.98</b>	<b>10.79</b>	4.83	<b>29.35</b>	1.40
<b>Social class</b>							
Low, lower middle class	<b>37.68</b>	4.84	5.76	<b>20.83</b>	<b>7.33</b>	15.36	<b>3.24</b>
Middle class	30.97	<b>11.30</b>	<b>9.07</b>	6.68	4.99	<b>29.75</b>	2.17
Higher middle, high class	22.22	<b>21.87</b>	3.55	6.13	3.30	<b>36.17</b>	<b>2.98</b>
<b>Total</b>	31.71	10.79	7.76	9.97	5.38	26.97	2.50

Note: Values in bold indicate the subgroups means above the grand mean (although in this case this does not mean that they are statistically significantly different from the grand mean).

**Table 12.2: Subgroup differences in network composition of emotional support networks**

	% male	age	tie duration	distance
<b>Gender</b>				
Male	35.00	<b>1.07</b>	0.55	1.84
Female	<b>38.00</b>	1.03	0.55	<b>2.17</b>
<b>Age</b>				
15 - 19	36.74	<b>1.43</b>	0.50	<b>2.28</b>
20 - 27	<b>40.33</b>	<b>1.33</b>	<b>0.62</b>	1.83
28 - 34	<b>38.12</b>	<b>1.16</b>	0.53	<b>2.40</b>
35 - 44	34.85	0.96	0.46	2.07
45 - 75	35.40	0.87	<b>0.56</b>	1.95
<b>Education</b>				
Elementary school or less	34.07	<b>1.07</b>	0.53	<b>2.04</b>
Vocation high school	35.96	0.97	0.53	1.97
High school	<b>40.81</b>	<b>1.17</b>	<b>0.61</b>	1.97
University or higher	<b>38.23</b>	<b>1.04</b>	<b>0.57</b>	<b>2.15</b>
<b>Labor status</b>				
Employed, self-employed, farmer	<b>37.36</b>	1.02	0.51	<b>2.04</b>
Children, pupil, student	<b>38.17</b>	<b>1.37</b>	<b>0.59</b>	<b>2.11</b>
Retired	34.24	0.84	<b>0.57</b>	1.97
Other	<b>37.49</b>	1.03	<b>0.57</b>	1.87
<b>Marital status</b>				
Married, non-marital partnership	<b>39.69</b>	0.94	0.53	1.80
Having a permanent relationship	32.09	<b>1.19</b>	0.43	<b>2.45</b>
Single, never married	34.65	<b>1.32</b>	<b>0.63</b>	<b>2.33</b>
Single, widowed, separated	28.50	0.83	0.54	<b>2.21</b>
<b>Children</b>				
Yes	35.75	0.90	0.54	1.88
No	<b>38.07</b>	<b>1.29</b>	<b>0.57</b>	<b>2.25</b>
<b>Living area</b>				
Rural area	<b>37.50</b>	1.04	0.53	2.01
Semi-urban area	36.64	<b>1.06</b>	<b>0.60</b>	<b>2.08</b>
Urban area	35.32	<b>1.06</b>	<b>0.56</b>	2.00
<b>Social class</b>				
Low, lower middle class	35.46	0.88	0.55	1.97
Middle class	36.36	<b>1.09</b>	0.53	<b>2.02</b>
Higher middle. High class	<b>44.79</b>	<b>1.19</b>	<b>0.65</b>	2.01
<b>Total</b>	36.97	1.05	0.55	2.01

Note: Values in bold indicate the subgroup means above the grand mean (although in this case this does not mean that they are statistically significantly different from the grand mean).

**Table 12.3: Subgroup differences in role-relation composition of socializing networks (%)**

	partners	parents	siblings	children	other kin	friend	neighbor
<b>Gender</b>							
Male	<b>14.29</b>	<b>5.57</b>	<b>9.21</b>	8.13	7.74	38.48	<b>7.65</b>
Female	10.88	5.37	7.61	<b>9.87</b>	<b>11.92</b>	<b>42.46</b>	<b>6.96</b>
<b>Age</b>							
15 – 19	9.99	6.84	9.68	0.00	6.50	<b>63.71</b>	0.00
20 – 27	8.87	<b>11.11</b>	6.98	0.29	3.61	<b>62.74</b>	0.00
28 – 34	<b>14.95</b>	<b>10.83</b>	6.85	<b>9.50</b>	5.97	<b>47.18</b>	0.92
35 - 44	11.43	4.05	<b>13.58</b>	9.02	8.69	<b>41.15</b>	<b>7.09</b>
45 - 75	<b>14.24</b>	2.29	7.13	<b>14.65</b>	<b>14.58</b>	25.09	<b>13.19</b>
<b>Education</b>							
Elementary school or less	<b>13.65</b>	2.71	6.34	8.18	<b>15.73</b>	32.86	<b>13.50</b>
Vocation high school	10.37	3.16	<b>10.39</b>	<b>11.04</b>	7.40	<b>42.44</b>	<b>8.36</b>
High school	<b>13.05</b>	<b>11.65</b>	7.02	5.90	3.55	<b>51.34</b>	1.46
University or higher	<b>14.13</b>	<b>8.56</b>	<b>8.66</b>	<b>9.69</b>	<b>12.76</b>	38.80	0.58
<b>Labor status</b>							
Employed, self-employed, farmer	<b>12.81</b>	4.87	<b>10.61</b>	9.03	7.28	<b>42.46</b>	4.31
Children, pupil, student	7.57	<b>11.56</b>	<b>9.04</b>	0.00	4.54	<b>62.28</b>	0.00
Retired	<b>14.11</b>	0.95	6.36	<b>16.64</b>	<b>17.01</b>	22.34	<b>15.34</b>
Other	<b>19.13</b>	6.09	2.13	<b>9.69</b>	<b>15.07</b>	31.99	<b>14.98</b>
<b>Marital status</b>							
Married, non-marital partnership	<b>18.01</b>	3.85	<b>8.98</b>	<b>10.83</b>	9.77	31.81	<b>9.58</b>
Having a permanent relationship	<b>26.61</b>	4.71	5.75	0.22	<b>12.01</b>	<b>45.99</b>	0.00
Single, never married	1.92	<b>10.46</b>	<b>9.64</b>	0.22	5.18	<b>62.16</b>	2.55
Single, widowed, separated	0.00	1.65	3.46	<b>29.46</b>	<b>22.88</b>	26.71	<b>12.68</b>
<b>Children</b>							
Yes	<b>14.29</b>	2.68	8.27	<b>15.11</b>	<b>13.02</b>	28.65	<b>11.34</b>
No	9.63	<b>9.65</b>	8.43	0.00	5.51	<b>58.71</b>	1.17
<b>Living area</b>							
Rural area	11.58	5.37	<b>9.86</b>	9.02	9.55	37.00	<b>9.64</b>
Semi-urban area	<b>13.86</b>	5.82	6.39	9.14	<b>11.70</b>	<b>40.61</b>	6.19
Urban area	<b>12.97</b>	5.40	7.05	9.19	9.71	<b>46.65</b>	4.02
<b>Social class</b>							
Low, lower middle class	12.06	3.21	<b>11.08</b>	<b>11.30</b>	<b>13.30</b>	25.28	<b>12.66</b>
Middle class	12.49	6.20	8.28	8.42	10.25	<b>43.41</b>	5.19
Higher middle. High class	<b>14.74</b>	6.23	3.98	<b>10.00</b>	2.77	<b>53.25</b>	4.97
<b>Total</b>	12.62	5.54	8.46	9.22	10.17	40.40	6.81

Note: Values in bold indicate the subgroup means above the grand mean (although in this case this does not mean that they are statistically significantly different from the grand mean).

**Table 12.4: Subgroup differences in network composition of socializing network**

	% male	age	tie duration	distance
<b>Gender</b>				
Male	<b>52.96</b>	0.96	<b>0.53</b>	2.15
Female	37.05	<b>1.01</b>	0.50	<b>2.38</b>
<b>Age</b>				
15 - 19	<b>51.28</b>	<b>1.24</b>	0.50	<b>2.39</b>
20 - 27	<b>47.82</b>	<b>1.15</b>	0.48	2.28
28 - 34	37.97	<b>1.00</b>	0.43	<b>2.43</b>
35 - 44	40.68	<b>0.99</b>	0.52	<b>2.41</b>
45 - 75	43.39	0.85	<b>0.54</b>	2.19
<b>Education</b>				
Elementary school or less	<b>47.32</b>	<b>1.01</b>	0.51	2.15
Vocation high school	43.96	0.93	<b>0.53</b>	<b>2.30</b>
High school	37.89	<b>1.07</b>	0.47	<b>2.29</b>
University or higher	<b>46.23</b>	<b>0.99</b>	<b>0.53</b>	<b>2.44</b>
<b>Labor status</b>				
Employed, self-employed, farmer	<b>48.50</b>	0.94	0.52	<b>2.33</b>
Children, pupil, student	<b>46.17</b>	<b>1.22</b>	0.49	<b>2.42</b>
Retired	38.27	0.85	<b>0.54</b>	2.16
Other	39.37	<b>0.99</b>	0.47	2.04
<b>Marital status</b>				
Married, non-marital partnership	44.72	0.91	<b>0.53</b>	2.17
Having a permanent relationship	38.94	<b>1.12</b>	0.42	<b>2.61</b>
Single, never married	<b>48.49</b>	<b>1.15</b>	<b>0.52</b>	<b>2.42</b>
Single, widowed, separated	35.48	0.82	0.48	2.28
<b>Children</b>				
Yes	41.89	0.87	<b>0.53</b>	2.19
No	<b>47.86</b>	<b>1.15</b>	0.49	<b>2.42</b>
<b>Living area</b>				
Rural area	<b>44.83</b>	0.96	0.51	<b>2.30</b>
Semi-urban area	<b>44.90</b>	<b>1.00</b>	<b>0.55</b>	2.22
Urban area	43.12	<b>1.00</b>	0.49	<b>2.29</b>
<b>Social class</b>				
Low, lower middle class	37.43	0.90	<b>0.55</b>	<b>2.37</b>
Middle class	<b>45.13</b>	<b>1.01</b>	0.51	2.27
Higher middle. High class	<b>56.65</b>	0.95	0.49	2.19
<b>Total</b>	44.60	0.98	0.52	2.28

Note: Values in bold indicate the subgroups means above the grand mean (although in this case this does not mean that they are statistically significantly different from the grand mean).

APPENDIX C: SOCIO-DEMOGRAPHIC PROFILES OF COMMUNICATION CLUSTERS

**Table 12.5: The socio-demographic profile of communication clusters (emotional support)**

		Phone traditionalists	Techno ascetics	Emailers	Internet texters	Total
<b>Gender</b>	Female	47.7	43.0	63.1	57.8	52.9
	Male	52.3	57.0	36.9	42.2	47.1
<b>Age</b>	15-19	0.0	15.3	6.1	39.8	18.0
	20-27	6.8	29.4	33.3	37.3	29.1
	28-34	20.5	16.5	18.2	10.8	15.8
	35-44	34.1	5.9	19.7	9.6	14.7
	45-75	38.6	32.9	22.7	2.4	22.3
<b>Education</b>	Elementary or less	0.0	18.6	7.7	37.3	18.7
	Vocational college	45.5	39.5	20.0	22.9	30.9
	High school	13.6	22.1	36.9	25.3	25.2
	University or higher	40.9	19.8	35.4	14.5	25.2
<b>Labor status</b>	Non-active	20.5	53.5	43.1	70.2	50.9
	Active	79.5	46.5	56.9	29.8	49.1
<b>Marital status</b>	Married, partnership	69.8	60.0	58.5	45.2	56.7
	Single	30.2	40.0	41.5	54.8	43.3
<b>Children</b>	No	29.5	47.7	59.1	88.1	59.6
	Yes	70.5	52.3	40.9	11.9	40.4
<b>Living area</b>	Semi-urban area	22.7	10.6	23.1	16.7	17.3
	Urban area	22.7	24.7	38.5	34.5	30.6
	Rural area	54.5	64.7	38.5	48.8	52.2
<b>Social class</b>	Low, lower middle	6.8	17.4	18.5	1.2	11.2
	Middle	75.0	70.9	72.3	81.5	75.0
	Higher middle, high	18.2	11.6	9.2	17.3	13.8



**Table 12.6: The socio-demographic profile of communication clusters (socializing)**

		<b>Techno ascetics</b>	<b>Mobile emailers</b>	<b>Internet texters</b>	<b>Total</b>
<b>Gender</b>	Female	43.4	61.1	53.1	52.8
	Male	56.6	38.9	46.9	47.2
<b>Age</b>	15-19	8.4	13.2	33.7	19.1
	20-27	13.3	28.6	49.0	31.3
	28-34	16.9	18.7	9.2	14.7
	35-44	18.1	23.1	6.1	15.4
	45-75	43.4	16.5	2.0	19.5
<b>Education</b>	Elementary or less	11.9	12.2	30.6	18.8
	Vocational college	46.4	20.0	26.5	30.5
	High school	14.3	33.3	29.6	26.1
	University or higher	27.4	34.4	13.3	24.6
<b>Labor status</b>	Non-active	39.8	47.3	69.4	52.9
	Active	60.2	52.7	30.6	47.1
<b>Marital status</b>	Married, partnership	69.0	54.9	41.2	54.4
	Single	31.0	45.1	58.8	45.6
<b>Children</b>	No	32.1	61.1	88.8	62.1
	Yes	67.9	38.9	11.2	37.9
<b>Living area</b>	Semi-urban area	19.3	24.7	13.3	18.9
	Urban area	20.5	37.1	35.7	31.5
	Rural area	60.2	38.2	51.0	49.6
<b>Social class</b>	Low, lower middle	14.3	12.2	3.1	9.6
	Middle	72.6	73.3	81.4	76.0
	Higher middle, high	13.1	14.4	15.5	14.4

## 13 INDEX OF NAMES

### A

Akrich, M., 78  
Albrecht, T. L., 180  
Alwin, D. F., 253  
Andrews, F. M., 205, 247  
Antonucci, T. C., 177, 233, 235, 258  
Arnold, M., 150

### B

Bakardjieva, M., 79  
Bargh, J. A., 224  
Bauman, Z., 108, 127, 128, 129, 149, 194, 196  
Bausinger, H., 43, 134, 138, 162, 163, 292  
Baym, N. K., 40, 43, 44, 46, 47, 51, 55, 103, 163, 164, 195, 202, 204  
Beck, U., 47, 54, 106, 108, 112, 115, 116, 120, 121, 122, 125, 132, 152, 190  
Beck-Gernsheim E., 47, 55, 106, 115, 116, 120, 132, 190  
Beer, D., 103  
Berger, P. L., 101, 134, 144, 145, 146, 171  
Berker, T., 69  
Berners-Lee, T., 39, 40  
Biemer, P. P., 227  
Bijker, W. E., 75, 76, 77, 80  
Bimber, B., 65  
Birnie, S. A., 204  
Blumler, J. G., 56, 165  
Boase, J., 146, 147, 162, 207, 211, 223, 238, 261, 264, 267, 296, 301, 316  
Boissevain, J., 177  
Boneva, B., 204  
boyd, d. m., 160, 195, 202  
Bryant, A. J., 43  
Brynin, M., 60, 61, 62, 63, 107  
Brynjolfsson, E., 87  
Bulc, G., 352  
Burt, R. S., 180, 207, 235, 236, 237, 239, 333

### C

Calhoun, C., 131  
Callon, M., 77, 78  
Campbell, S. W., 151, 152, 234  
Castells, M., 40, 49, 56, 72, 105, 107, 108, 113, 115, 132, 133, 152, 173, 174, 181, 190, 191  
Cavanagh, A., 60, 66, 67, 75, 78, 79, 91  
Chambers, D., 117, 127, 137  
Chua, V., 49, 188, 193  
Cobb, S., 180  
Cohen, J., 180, 235, 268  
Cohen, S., 180, 235, 268  
Cowles, D., 161  
Crawford, K., 42  
Cummings, J. N., 166

### D

Daft, R. L., 95, 130, 164  
De Leeuw, E. D., 227  
Delanty, G., 189, 194, 195  
DeSanctis, G., 85  
DiMaggio, P., 344  
Dimmick, J., 139, 166  
Dolničar, V., 300, 321, 324  
Donner, J., 42, 47, 49, 135, 137, 154, 156, 168  
Dremelj, P., 224, 245, 247, 257, 258, 296, 320, 334  
Durkheim, E., 109  
Dutton, W. H., 211, 212, 224

### E

Ellison, N. B., 195, 202  
Etzioni, A., 129, 196

### F

Faust, K., 175, 179  
Ferligoj, A., 58, 226, 236, 237, 238, 240, 241, 302  
Filipović, M., 108, 118  
Firebaugh, G., 58, 332, 341

Fischer, C. S., 46, 54, 60, 63, 64, 65, 67, 68, 72, 73, 88,  
148, 236, 247, 257, 258, 320  
Flaherty, L. M., 166  
Flanagin, A., 167  
Fortunati, L., 43, 47, 48, 50, 55, 56, 60, 61, 69, 70, 73, 80,  
81, 82, 83, 84, 95, 118, 135, 138, 139, 151, 152, 154,  
155, 161, 169, 171  
Franzen, A., 203, 204  
Friedkin, N. E., 179  
Fulk, J., 164

## G

Galaskiewicz, J., 176, 177  
Gebhardt, J., 43, 60, 135, 162, 164, 169, 170, 292  
Geels, F., 82  
Gergen, K., 48, 148, 149, 150, 154  
Gibson, J. J., 65  
Giddens, A., 47, 50, 54, 85, 106, 107, 108, 109, 110, 111,  
112, 114, 115, 119, 120, 121, 122, 125, 131, 132, 134,  
135, 138, 139, 140, 141, 150, 152, 156, 172, 190, 193  
Goffman, E., 141, 142, 143, 154  
Goggin, G., 41  
Granovetter, M., 178, 179, 234  
Grapentine, T. H., 227  
Green, N., 150

## H

Habermas, J., 352  
Habuchi, I., 104, 107, 150  
Hampton, K., 49, 173, 197, 200, 206, 207, 208, 211, 238,  
252, 254, 261, 339, 344  
Harper, R., 46  
Harvey, D., 108, 132  
Haythornthwaite, C., 145, 146, 147, 179, 188, 204, 222  
Heaphy, B., 47, 55, 108, 109, 111, 117, 119, 121, 122, 127,  
129, 196  
Henry, J., 186  
Hinson Langford, C. P., 180  
Hlebec, V., 180, 204, 205, 206, 233, 234, 235, 237, 238,  
240, 241, 243, 245, 247, 251, 260, 267, 296, 316, 320,  
326, 329, 331

Höflich, J. R., 43, 135, 162, 169, 170, 292  
Hogan, B. J., 45, 147, 173, 237, 264, 316, 353  
Horrigan, J. B., 203  
Hosmer, D. W., 253  
House, J. S., 180  
Howard, P. N., 196, 209  
Hox, J. J., 227  
Hughes, T. P., 80, 82, 83  
Hynes, D., 69, 70

## I

Innis, H. A., 67  
Ishii, K., 166, 215, 267, 316  
Ito, M., 47, 50, 57, 103, 137, 154, 156, 159, 160, 193

## J

Jamieson, L., 122, 123, 125  
Jenkins, H., 44, 114  
Jones, S., 195

## K

Kahn, R. L., 177, 233  
Kalton, G., 229  
Katz, J. E., 48, 51, 56, 137, 165, 202, 203  
Kavanaugh, A. L., 224, 344  
Kavčič, M., 247  
Kennedy, T. L., 264, 267  
Kiesler, S., 63  
Kim, H., 214, 216  
Kline, R., 76  
Kling, R., 46, 54, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96,  
97, 98, 99, 104, 105, 106, 107  
Kogovšek, T., 180, 205, 234, 235, 236, 240, 243, 245, 247,  
257, 258, 320  
Kraut, R., 51, 60, 61, 62, 63, 107, 130, 197, 198, 204, 322

## L

Lamb, R., 87, 93, 94, 98, 99  
LaRose, R., 198, 205  
Lasch, C., 128, 194  
Lash, S., 47, 108, 132, 133, 135  
Latour, B., 77, 79, 80

Lengel, R. H., 95, 130, 164

Lenhart, A., 42, 202

Licoppe, C., 43, 48, 50, 56, 100, 101, 102, 103, 104, 105,  
134, 135, 137, 156, 158, 159, 160, 161, 170, 171, 172,  
173, 222, 238, 300, 301

Ling, R. S., 41, 42, 47, 48, 49, 51, 56, 61, 104, 135, 137,  
150, 154, 156, 157, 168, 172, 193, 217, 316, 352

Lozar Manfreda, K., 235, 236

Luckmann, T., 101, 144, 145, 146, 171

Lytard, J-F., 108

## M

Maffesoli, M., 101

Mandelli, A., 204

Marin, A., 175

Marsden, P. V., 224, 234, 236, 245, 247, 258, 320, 333

Marwick, A. E., 160

Mascheroni, G., 49, 105, 106, 173, 174, 192

Matsuda, M., 49, 56, 104, 105, 106, 107, 150, 158, 161,  
174, 193, 238, 267, 296

McLuhan, M., 67, 148

McPherson, M., 51, 204, 207, 236, 245, 254

Meyer, E., 84, 87, 91, 92, 93, 96, 99

Meyrowitz, J., 66, 148, 192

Miyata, K., 49, 161, 215, 224

Morley, D., 70

## N

Nadoh, J., 234

Neustadt, A., 203, 204

Nie, N. H., 199, 200

Niederer, S., 83, 84

Norris, P., 203

Novak, M., 205, 235, 236

## O

Oblak Črnič, T., 70, 196, 321

Okabe, D., 103, 159, 160

Onnela, J. P., 150, 179

Oostveen, A-M., 64, 74, 75, 77, 78, 81, 84

Orlikowski, W. J., 54, 84, 85, 86

## P

Pahl, R., 50, 120, 123, 124, 125, 126, 127, 129, 194

Pajnik, M., 192

Palackal, A., 217, 316

Papacharissi, Z., 202

Parsons, T., 80

Perse, E. M., 165, 169

Pescosolido, B. A., 49, 50, 174, 181, 182, 183, 184, 185,  
193

Petrič, G., 43, 72, 139, 147, 150, 161, 167, 212, 223, 292,  
301, 353

Petrovčič, A., 43, 212, 213, 239, 302

Pinch, T. J., 75, 76, 77

Pinkett, R., 201

Plant, S., 152, 155

Pool, I. de Sola, 61, 148

Porter, D., 196

Preece, J., 40

Putnam, R. D., 43, 51, 128, 130, 131, 197

## R

Rheingold, H., 39, 51, 151, 192, 195, 196

Rice, R. E., 195, 200, 203, 209, 224

Robbin, A., 94

Rosenbaum, H., 92, 95

Rubin, B. A., 49, 50, 174, 181, 182, 183, 184, 185, 193

Ruggiero, T. E., 165

## S

Salecl, R., 112, 116, 194

Sarrica, M., 81, 82, 83, 84

Scacchi, W., 86, 87, 88, 89, 90, 91, 92, 93

Schroeder, R., 43, 103

Sennett, R., 112, 117, 118, 127

Short, J., 159, 163

Silverstone, R., 69, 70

Simmel, G., 109, 174, 182

Slater, P. E., 128, 194

Slevin, J., 113, 114, 196

Smith, M. R., 65

Smoreda, Z., 43, 50, 100, 101, 102, 103, 106, 135, 158,  
159, 160, 161, 170, 171, 172, 301  
Sooryamoorthy, R., 43, 102, 150, 216, 267, 296, 316  
Spencer, L., 50, 120, 123, 124, 125, 126, 127, 129, 194  
Sproull, L., 63  
Stalder, F., 152, 176, 181  
Standage, T., 148  
Steinfeld, C., 195  
Subrahmanyam, K., 195

## T

Tanis, M., 180, 204  
Taylor, A. S., 42  
Thompson, J. B., 50, 100, 101, 113  
Thurlow, C., 164  
Tilden, V. P., 180  
Tomlinson, J., 112, 114  
Tönnies, F., 126, 188, 194  
Turtle, S., 60, 104, 130, 149, 151, 154, 195, 196

## U

Ule, M., 115  
Urry, J., 132, 159, 168, 172

## V

Van der Poel, M. G. M., 333  
Van Sonderen, E., 177, 232  
Vaux, A., 180

Vehovar, V., 42, 43, 146, 147, 211, 212, 229, 238, 300,  
321, 323, 324, 325  
Vincent, J., 42, 155

## W

Wang, H., 209, 210, 211, 224, 261, 322, 332, 341  
Wasserman, S., 175, 176, 177, 179  
Webber, M. M., 189  
Weber, M., 109  
Webster, F., 63, 107, 164, 181  
Weinberger, D., 155  
Weisskirch, R. S., 100  
Wellman, B., 40, 49, 50, 56, 104, 105, 106, 122, 145, 146,  
147, 173, 174, 175, 182, 186, 187, 188, 190, 193, 197,  
200, 203, 204, 206, 209, 210, 211, 221, 222, 224, 238,  
257, 261, 264, 267, 320, 322, 326, 332, 333, 339, 341  
Westmyer, S. A., 166  
Willson, M. A., 49, 115, 131, 134, 137, 147, 181  
Wittel, A., 49, 50, 56, 105, 106, 173, 174, 189, 191  
Wyatt, S., 63, 64, 65  
Wynn, E., 202

## Y

Yttri, B., 48, 56, 61, 135, 137, 154, 157, 172, 352

## Z

Zhao, S., 47, 48, 60, 103, 135, 138, 141, 142, 143, 144,  
145, 146, 147, 161, 162, 171, 173, 202, 203, 212, 238,  
252, 261, 267, 322, 344, 353

## 14 GENERAL INDEX

### A

Actor network theory, 77, 78, 79, 83, 90, 175  
affordances  
    social, 47, 66, 91, 98, 138, 139, 175, 260, 347  
    technical, 131, 165, 168, 169  
    technological, 41, 42, 70, 135, 151  
American Association of Public Opinion Research, 227  
anonymity, 51, 146, 196  
appropriation, 52, 63, 65, 66, 69, 70, 73, 76, 78, 82, 84, 85,  
    86, 88, 91, 92, 93, 95, 105, 114, 133, 172, 201  
Asia, 217  
autonomy, 50, 51, 57, 116, 134, 139, 194, 352

### B

Bebo, 40  
blog, 42, 141, 146, 208, 211, 252  
body-to-body communication, 56, 171  
bounded friendship mode, 123  
Britain, 123, 203

### C

capitalism, 100, 109, 112, 117  
Center for Methodology and Informatics, 226, 240, 241,  
    246, 320, 322, 323, 327, 329, 330, 332  
CERN, 39  
change  
    intercohort, 319  
    intracohort, 210, 224  
    social, 60, 63, 64, 341, 350  
    technological, 39, 60, 63, 66, 67, 72, 74  
chat, 42, 45, 159, 160, 181, 211, 238, 263, 304  
child, 72, 100, 104, 121, 171, 178, 211, 214, 248, 249, 257,  
    258, 259, 269, 271, 273, 274, 275, 278, 279, 281, 282,  
    283, 284, 289, 291, 293, 304, 306, 308, 311, 315, 324,  
    326, 329, 330, 331, 352  
co-location, 48, 49, 141, 142, 143, 145, 147, 171  
communication

channel, 42, 46, 57, 139, 161, 166, 169, 213, 221, 222,  
    223, 237, 242, 244, 261, 262, 263, 264, 265, 266,  
    267, 268, 269, 280, 292, 293, 302, 303, 304, 309,  
    349  
Computer-mediated, 39, 51, 130, 131, 163, 165, 195,  
    196, 203  
frequency, 167, 203, 213, 243, 262, 264, 265, 266, 268,  
    269, 270, 271, 272, 273, 274, 275, 276, 277, 280,  
    288, 290, 291, 302, 303, 309  
goal, 165, 166  
internet, 104, 105, 209, 213, 222, 224, 239, 240, 254,  
    261, 264, 265, 266, 270, 271, 272, 274, 275, 278,  
    279, 280, 281, 282, 285, 288, 289, 291, 292, 296,  
    303, 347, 348, 351  
interpersonal, 39, 43, 44, 48, 52, 53, 55, 56, 58, 72, 102,  
    105, 107, 135, 137, 138, 139, 143, 149, 163, 164,  
    165, 166, 167, 169, 171, 175, 203, 213, 214, 217,  
    237, 238, 300, 345, 346, 351, 352, 353, 354  
mobile, 44, 218, 271, 276, 288  
mode, 67, 135, 146, 147, 206, 238, 242, 264, 266, 274,  
    279, 285, 296, 302, 304, 348, 353  
personal, 47, 52, 56, 100, 103, 133, 134, 135, 137, 138,  
    139, 146, 151, 152, 153, 156, 161, 162, 190, 223,  
    238, 302, 316  
quality of, 98, 164  
technologically mediated, 127, 131, 195  
community  
    local, 51, 115, 122, 179, 184  
    online, 40, 130, 192, 195, 196, 202, 204, 211, 218, 231,  
        351  
    personal, 49, 50, 56, 123, 125, 174, 181, 182, 186, 188,  
        190, 191, 193, 194, 238, 352  
    virtual, 192, 195  
complex media environment, 138, 161, 162, 219, 223, 261,  
    316  
computing resources, 88, 89, 90  
computing system, 87, 90, 91

connectedness, 47, 110, 130, 192, 194

connectivity

always-on, 48

personal, 44, 47, 54, 56, 105, 190, 223

social, 44, 45, 46, 48, 49, 52, 56, 57, 99, 101, 102, 105,  
106, 121, 123, 125, 129, 131, 132, 135, 137, 138,  
139, 147, 152, 153, 158, 160, 161, 168, 171, 174,  
175, 181, 182, 189, 190, 193, 195, 199, 202, 203,  
218, 221, 224, 239, 262, 264, 267, 302, 303, 322,  
344, 345, 346, 352, 354

consumer, 89

convergence, 44, 52, 91, 107, 112, 114, 152, 192, 217

culture, 44

conversation

critical, 51

frequency of, 303

informal, 128

in-person, 104, 165, 166

internet, 278

landline phone, 279

mobile, 169

quality of, 158

conversational

dynamics, 48, 137

expressions, 160

mode, 158, 159, 223

practices, 160

quality, 160

co-presence, 48, 56, 103, 110, 135, 140, 141, 142, 143, 147,  
152, 154, 159, 168, 171, 192, 346

social, 48

core discussant, 208, 254, 257, 264, 342, 350, 351

culture, 94, 95, 109, 152

convergence, 44

domestic, 69

global media, 44

local, 114

participatory, 196

popular, 44, 72

public, 117

cyberspace, 51, 197, 202

## D

determinism

social, 72, 81

technological, 64, 65, 68, 71, 74, 75, 81

deterritorialization, 114

detraditionalization, 111, 127

digital divide, 300, 323, 324

disembedding, 47, 55, 110, 112, 119, 129, 131

do-it-yourself biography, 116

domestication, 69, 70, 114

## E

email, 39, 40, 55, 105, 114, 142, 146, 153, 156, 161, 170,  
195, 201, 204, 205, 207, 208, 209, 214, 215, 216, 217,  
221, 222, 223, 228, 231, 238, 239, 240, 263, 264, 265,  
266, 267, 269, 270, 271, 272, 273, 274, 275, 276, 278,  
279, 280, 281, 282, 283, 284, 285, 288, 289, 290, 291,  
292, 293, 296, 297, 298, 299, 300, 303, 304, 305, 309,  
310, 315, 316, 347, 348, 349

ensemble view of technology, 84, 86

Europe, 109, 217

European Union, 40

Eurostat, 40, 324

everyday life, 39, 41, 42, 44, 52, 56, 66, 71, 72, 73, 92, 98,  
101, 104, 111, 114, 116, 129, 130, 138, 142, 143, 144,  
145, 147, 150, 152, 154, 156, 157, 161, 164, 172, 191,  
192, 202, 213, 252, 345, 351, 352

evolving friendship mode, 123

## F

Facebook, 40, 45, 160, 161, 195, 202, 208, 231, 237

face-to-face communication, 48, 51, 68, 140, 145, 147, 152,  
159, 160, 171, 175, 199, 200, 206, 211, 214, 215, 216,  
236, 239, 265, 281, 303

Faculty of Social Sciences, 41, 226, 240

family, 42, 43, 44, 45, 61, 63, 101, 115, 119, 122, 123, 124,  
125, 128, 139, 146, 158, 172, 174, 178, 181, 183, 186,  
191, 193, 197, 198, 199, 201, 202, 205, 208, 209, 214,  
215, 216, 217, 326, 331, 346, 349, 350, 352

fragmentation, 114, 127, 132, 172, 179, 186  
 friend, 42, 45, 61, 123, 124, 125, 128, 134, 146, 149, 160,  
 166, 170, 177, 178, 179, 181, 193, 197, 198, 199, 201,  
 202, 204, 205, 206, 207, 209, 210, 214, 215, 216, 217,  
 237, 244, 257, 258, 260, 296, 297, 298, 301, 322, 330,  
 331, 346, 349  
 friendship, 119, 120, 123, 124, 125, 135, 166, 201, 209,  
 210, 211, 215, 234, 243, 257, 341

## G

game  
   multiplayer, 211  
   online, 211  
 General Social Survey, 207, 236, 245  
 Global System for Mobile communications (GSM), 39, 42  
 globalization, 47, 55, 112, 113, 114, 132, 195  
 glocalization, 189, 206, 208, 209, 216, 218, 220, 223, 238,  
 296, 339

## I

identity  
   communal, 152  
   human, 118  
   personal, 47, 50, 115, 157, 183, 196  
   self-, 50, 118  
   social, 104, 115, 185, 196  
 impact analysis, 64  
 India, 216  
 individual addressability, 47, 49, 55, 156, 219  
 individualization, 47, 52, 54, 55, 105, 106, 112, 115, 116,  
 118, 119, 127, 129, 130, 131, 132, 134, 135, 136, 137,  
 168, 174, 183, 190, 191, 194, 195, 217, 346, 349, 352  
 information and communication technology, 39, 40, 41, 42,  
 43, 52, 54, 58, 61, 62, 72, 73, 84, 86, 87, 92, 93, 95, 97,  
 98, 99, 101, 103, 104, 105, 107, 113, 114, 127, 130,  
 131, 135, 137, 138, 144, 145, 146, 152, 165, 167, 174,  
 181, 193, 195, 201, 203, 208, 209, 212, 213, 214, 216,  
 217, 218, 219, 226, 229, 231, 232, 233, 238, 262, 265,  
 300, 301, 344, 345, 346, 350, 351, 352, 353, 354  
 Instant messaging, 42, 43, 45, 105, 146, 153, 167, 204, 208,  
 214, 238, 263, 304

institution, 40, 47, 49, 50, 54, 76, 78, 109, 110, 111, 112,  
 115, 119, 120, 126, 129, 132, 133, 134, 137, 139, 164,  
 175, 176, 183, 186, 187, 191  
 interaction  
   mediated, 214  
   mediated interaction, 214  
   social, 40, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 66, 68,  
   92, 98, 99, 101, 102, 104, 106, 110, 114, 120, 127,  
   128, 129, 130, 131, 135, 137, 138, 139, 140, 141,  
   142, 143, 144, 145, 146, 147, 148, 149, 153, 156,  
   161, 162, 163, 171, 173, 174, 185, 189, 194, 195,  
   197, 201, 217, 218, 221, 346

interactional mix, 146, 147, 212, 217, 349

interactive service, 238, 239

interactivity, 91, 165

Internet, 39, 40, 41, 42, 51, 53, 55, 58, 61, 72, 92, 103, 113,  
 114, 130, 133, 138, 143, 144, 145, 146, 148, 165, 166,  
 167, 190, 192, 193, 196, 197, 198, 199, 200, 202, 203,  
 204, 205, 206, 207, 208, 209, 211, 212, 213, 220, 221,  
 223, 224, 226, 231, 238, 239, 242, 251, 252, 253, 254,  
 259, 260, 263, 264, 265, 266, 269, 270, 271, 272, 273,  
 274, 275, 276, 277, 279, 280, 281, 282, 283, 284, 286,  
 287, 288, 289, 290, 291, 292, 293, 296, 297, 298, 303,  
 304, 307, 309, 310, 313, 314, 316, 317, 318, 321, 323,  
 324, 325, 331, 334, 338, 339, 343, 344, 348, 349, 353

## J

Japan, 215

## K

Kerala, 216, 217

kin, 119, 124, 149, 178, 208, 213, 257, 258, 259, 260, 262,  
 293, 294, 295, 296, 297, 298, 300, 308, 313, 315, 316,  
 317, 326, 331, 337, 349

Korea, 214, 216

## L

landline phone, 42, 43, 45, 55, 61, 72, 142, 146, 148, 155,  
 156, 158, 161, 165, 166, 167, 170, 189, 190, 208, 209,  
 212, 213, 215, 222, 226, 231, 238, 239, 240, 263, 264,  
 265, 269, 270, 271, 274, 275, 279, 280, 282, 285, 288,



291, 292, 293, 297, 298, 299, 300, 303, 304, 309, 310,  
316, 347, 349  
leisure, 43, 63, 101, 123  
lifeworld, 101, 115, 144, 145, 146, 147, 150, 162, 352  
LinkedIn, 45, 202

## M

Massachusetts Institute of Technology, 40, 201, 202  
measurement  
    error, 320  
    instrument, 219, 226, 231, 232, 233  
    technique, 320  
    tool, 204, 232  
media  
    choice, 162, 163, 165, 167, 169, 172, 221, 349  
    consumption, 44  
    ecology, 46, 47, 56, 222  
    globalizing, 114  
    images, 168  
    mass, 114, 132, 162, 163, 165  
    new, 39, 44, 46, 49, 57, 84, 95, 99, 100, 114, 136, 153,  
        172, 175, 191, 192, 195, 217, 221, 252, 344, 345,  
        354  
    social, 40, 41, 42, 55, 208, 252  
Media richness theory, 95, 130  
methodology, 57, 97, 98, 99, 106, 204, 226, 351  
mobile carrier, 41, 42  
mobile phone, 39, 40, 41, 43, 44, 45, 51, 55, 60, 61, 100,  
    103, 104, 105, 114, 132, 133, 134, 142, 146, 147, 148,  
    149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159,  
    161, 166, 167, 169, 175, 179, 190, 192, 193, 207, 208,  
    212, 213, 214, 215, 216, 217, 222, 231, 237, 238, 239,  
    240, 243, 264, 265, 266, 269, 270, 271, 274, 275, 276,  
    278, 279, 282, 283, 284, 285, 288, 289, 291, 293, 297,  
    298, 299, 303, 304, 309, 316, 346, 348, 349, 352  
mobile phone voice calls, 42, 167, 214, 304  
model  
    ANT, 83, 90  
    conceptual, 64, 73, 351  
    discrete-entity, 87, 88, 89

domestication, 70  
formal, 123  
linear decomposition, 58, 341, 342, 343, 350  
regression, 269, 270, 276, 282, 284, 290, 293, 294, 305,  
    333, 337, 341, 342  
research, 100  
SCOT, 80, 84, 91  
spoke, 49  
Standard (tool), 97  
STIN, 46, 54, 92, 93, 95, 96, 98, 99, 106  
structural model of technology, 85  
theoretical, 85  
web, 86, 87, 89, 90, 92  
modernity, 47, 53, 55, 60, 61, 99, 106, 107, 108, 109, 110,  
    112, 115, 117, 118, 121, 127, 129, 132, 133, 136, 137,  
    140, 173, 174, 181, 182, 195  
late, 44, 46, 47, 49, 50, 51, 52, 53, 54, 56, 58, 98, 106,  
    108, 112, 114, 115, 118, 119, 120, 121, 122, 125,  
    126, 127, 129, 131, 135, 137, 138, 139, 156, 174,  
    193, 195, 345, 352, 354  
liquid, 108, 129, 194  
second, 47, 108, 132  
modernization, 39, 49, 60, 107, 112, 117, 132, 140, 187,  
    188, 197  
MOO, 195  
moral economy, 69, 70  
MUD, 39, 141, 195  
multimedia message, 41, 213, 222, 238, 239, 240, 263, 264,  
    265, 266, 270, 273, 276, 277, 280, 281, 283, 284, 286,  
    287, 290, 291, 292, 293, 297, 298, 300, 303, 304, 309,  
    310, 347, 348  
multimodal connectedness, 43, 103  
Multiple classification analysis, 247, 249, 250, 256, 259,  
    260, 308, 313, 315, 316, 317, 329, 330, 335, 338

## N

name generator, 53, 207, 214, 233, 235, 237, 240, 243, 245,  
    320  
name interpreter, 233, 236, 237, 239, 240, 243

neighbor, 128, 134, 178, 181, 200, 204, 205, 206, 237, 257,  
258, 260, 296, 298, 330, 331

#### network

composition, 223, 257, 258, 259, 297, 298, 329, 330,  
337, 338, 350

core, 207, 208, 217, 252, 331

egocentered, 175, 177, 180, 194, 215, 232, 235, 243,  
265, 320, 326

formation, 49, 183

personal, 41, 45, 49, 52, 53, 54, 56, 57, 58, 98, 102, 105,  
120, 123, 124, 130, 139, 150, 151, 155, 158, 170,  
173, 175, 177, 180, 181, 182, 186, 187, 188, 190,  
193, 195, 197, 202, 203, 207, 208, 213, 214, 215,  
216, 217, 218, 219, 220, 221, 222, 223, 224, 225,  
226, 228, 232, 233, 234, 237, 240, 242, 243, 245,  
247, 251, 252, 257, 259, 261, 262, 267, 268, 269,  
280, 281, 291, 293, 294, 295, 300, 301, 308, 316,  
319, 320, 326, 329, 330, 331, 338, 341, 344, 346,  
347, 348, 349, 350, 352, 353, 354

size, 205, 207, 208, 210, 219, 223, 224, 245, 246, 247,  
248, 249, 250, 251, 252, 254, 257, 264, 269, 270,  
271, 273, 275, 276, 278, 282, 283, 285, 288, 289,  
290, 293, 294, 295, 299, 308, 313, 315, 317, 326,  
329, 331, 332, 333, 334, 337, 341, 342, 343, 344,  
349, 350

social, 40, 41, 43, 45, 51, 52, 53, 55, 56, 99, 101, 102,  
104, 105, 106, 141, 146, 156, 160, 174, 175, 176,  
177, 179, 181, 182, 184, 192, 195, 200, 201, 203,  
204, 205, 206, 208, 209, 211, 212, 213, 217, 218,  
221, 224, 232, 238, 243, 252, 263, 269, 293, 304,  
346

structure, 53, 102, 179, 181, 182, 184, 185, 190, 192,  
220, 302, 319, 320, 329, 339

theory, 49, 75, 77, 100, 133, 182

networked individualism, 49, 56, 105, 133, 174, 181, 190,  
191, 219, 346

non-kin, 119, 208, 213, 260, 262, 308, 315, 316, 347, 349

norm, 43, 72, 77, 162, 169

#### normative

framework, 48, 49, 85, 139, 160, 201, 217, 346, 348

image, 169, 170, 171, 217

role, 56

## O

organization, 40, 45, 46, 47, 48, 54, 56, 60, 61, 63, 65, 67,  
76, 78, 81, 82, 83, 85, 86, 87, 88, 89, 90, 91, 92, 97,  
100, 101, 102, 103, 106, 107, 108, 109, 110, 111, 112,  
113, 115, 116, 119, 121, 123, 125, 126, 128, 137, 140,  
144, 150, 152, 154, 156, 164, 173, 174, 175, 176, 179,  
181, 182, 184, 186, 187, 188, 190, 193, 196, 238, 345,  
351

other kin, 142, 257, 258, 296, 330, 331

Oxford Internet Survey, 40, 212

## P

parents, 100, 104, 149, 157, 170, 178, 204, 237, 257, 258,  
296, 326, 329, 330, 331, 352

partner, 149, 157, 177, 178, 214, 215, 229, 237, 244, 257,  
258, 259, 296, 326, 330, 331

perpetual contact, 48, 51, 56, 352

personal communication system, 146, 223, 238, 302, 316

personal computer, 70, 87, 215

personal relating, 52, 101, 122, 168, 174, 193, 345, 346

Pew Internet Research and American Life Project, 40, 42,  
202, 207, 209

phone call, 214

postmodernism, 108

postmodernity, 108, 347

#### presence

absent, 48, 148, 149, 150, 151, 192

producer, 44, 73, 85, 89

#### proximity

corporeal, 143, 168

electronic, 141

geographical, 206, 218, 243, 267, 308, 315, 316, 349

physical, 141, 143, 145, 189

spatiotemporal, 142

virtual, 168, 192

## Q

questionnaire, 53, 198, 227, 228, 231, 232, 233, 235, 236, 237, 238, 240, 320

## R

radical doubt, 111

reality

subjective, 56

virtual, 39, 51

reconfiguration, 55, 57, 80, 82, 98, 105, 117, 127, 138, 145, 152, 192, 203, 217, 218, 242, 352

reflexivity, 47, 54, 55, 105, 106, 111, 112, 116, 118, 119, 121, 122, 126, 129, 131, 132, 134, 135, 136, 137, 195, 346, 352

regression

analysis, 252, 268, 269, 333, 337

hierarchical, 273, 277, 286, 287, 295, 335, 337, 340

linear, 247, 253, 341

logistic, 211, 252, 253, 254, 304, 305, 307, 310, 312

multiple, 268, 269, 270, 271, 272, 274, 275, 278, 279, 281, 282, 283, 284, 285, 288, 289, 293, 294, 332, 333

relationship

personal, 40, 42, 43, 44, 45, 46, 48, 50, 51, 53, 54, 55, 57, 61, 66, 67, 98, 104, 105, 106, 107, 108, 111, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127, 129, 130, 131, 133, 134, 135, 138, 139, 146, 150, 152, 154, 156, 158, 161, 165, 168, 170, 172, 173, 174, 175, 180, 181, 185, 189, 191, 192, 204, 217, 218, 220, 222, 346, 352, 353

pure, 47, 50, 55, 119, 120, 121, 122, 126, 127, 156, 172, 352

reliability, 232, 234, 236

Research on Internet in Slovenia, 211, 212, 213, 226, 230, 231, 240, 320, 321, 322, 323, 327, 329, 330, 331, 332

role-relation, 177, 209, 219, 257, 298, 326, 330, 349

ruptured friendship mode, 124

## S

self-disclosure, 120, 179

self-identity, 50, 118

serial friendship mode, 123

short text message, 41, 42, 45, 55, 105, 151, 156, 157, 159, 161, 166, 167, 208, 212, 213, 214, 215, 218, 222, 223, 238, 239, 240, 263, 264, 265, 266, 267, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 297, 298, 299, 300, 303, 304, 309, 310, 315, 316, 347, 348

siblings, 170, 178, 204, 237, 257, 258, 296, 326, 330, 331

skype, 238

Slovenia, 41, 52, 57, 58, 167, 205, 211, 212, 214, 220, 226, 227, 229, 231, 236, 238, 240, 242, 245, 319, 320, 321, 322, 326, 327, 328, 330, 331, 336, 337, 338, 339, 341, 350, 352

sociability, 50, 101, 103, 151, 166, 190, 193, 195

social

action, 55, 79, 102, 110, 111, 112, 122, 134

agency, 86, 94, 110, 112, 113

aspect, 91, 95, 127, 145, 195, 203

bonding capital, 128

bridging capital, 129, 130, 184, 197

capital, 128, 130, 197, 201, 204

circle, 50, 51, 58, 72, 120, 150, 158, 162, 170, 178, 179, 182, 183, 184, 198, 203, 204, 218, 220, 242, 246, 247, 248, 250, 256, 347

cohesion, 109, 129, 130, 155, 179, 190, 197, 204

constructivism, 46, 64, 72, 73, 74, 75, 84, 93

cue, 130, 131, 163, 164

form, 49, 51, 62, 67, 92, 98, 99, 108, 109, 112, 115, 125, 126, 127, 131, 157, 191, 193, 223

informatics, 59, 87, 93, 96, 97, 107, 133, 346, 351, 354

integration, 46, 50, 51, 52, 53, 57, 68, 108, 121, 127, 129, 131, 134, 151, 154, 186, 196, 219, 220, 347

isolation, 53, 58, 197, 218, 219, 220, 242, 251, 252, 253, 254, 327, 330, 346, 347

network site, 40, 42, 45, 55, 105, 146, 156, 192, 195, 203, 211, 212, 238, 263, 304

presence, 46, 48, 56, 61, 137, 142, 152, 163, 164, 165, 167

progress, 60, 65  
 reality, 44, 45, 46, 49, 51, 52, 60, 62, 63, 64, 65, 66, 68,  
     72, 81, 87, 93, 98, 100, 101, 108, 109, 110, 112, 113,  
     114, 116, 118, 131, 132, 135, 138, 145, 147, 149,  
     162, 172, 267, 346, 350, 354  
 use, 46, 69, 71, 72, 78, 98, 151, 160, 167, 168, 192, 212,  
     224, 252, 344, 353  
 Social construction of technology, 75, 76, 77, 80, 83, 90  
 Social shaping of technology, 69, 71  
 sociality  
     digital, 49, 50, 52, 54, 56, 58, 86, 98, 99, 100, 101, 103,  
         105, 106, 133, 137, 160, 175, 191, 193, 215, 217,  
         218, 219, 221, 344, 345, 346, 347, 351, 352, 353  
     mediated, 49, 105, 108, 346  
     mobile, 49, 105, 174, 192  
     network, 49, 174, 189, 191, 219, 346  
     selective, 49, 57, 105, 150, 174, 193  
 society  
     capitalist, 113  
     civic, 193, 197  
     contemporary, 39, 60, 71, 93, 98, 103, 107, 108, 121,  
         122, 124, 126, 141, 174, 181, 196, 202  
     industrial, 109, 122  
     network, 101, 108, 113, 152, 182  
     preindustrial, 108  
     premodern, 109  
     risk, 47, 108, 122  
     traditional, 109, 110, 111, 124, 194  
 socio-economic status, 258  
 sociogram, 233  
 sociology, 50, 67, 100, 129, 186, 194, 345  
 Socio-technical interaction network, 46, 54, 91, 92, 93, 95,  
     96, 97, 98, 99, 105, 106, 133, 175, 221, 345, 351  
     approach, 46, 54, 92, 93, 105, 133, 175, 345, 351  
 software, 41, 83, 104, 160, 228  
 solidarity, 109, 150, 183, 186, 187, 188, 189, 190, 194, 196,  
     217  
 sphere  
     intimate, 118, 120, 121, 129  
     private, 101, 117, 118, 123, 127, 128, 129, 197  
     public, 69, 70  
     social, 43, 54, 63, 161, 179  
     work, 44, 125  
 status  
     labor, 212, 248, 269, 272, 273, 282, 293, 304, 306, 308,  
         315, 320  
     marital, 194, 205, 211, 243, 253, 254, 258, 259, 269,  
         271, 273, 282, 289, 293, 294, 308, 315, 320, 325,  
         329, 330, 333, 334  
     social, 74  
 status update, 41, 160  
 structuration, 54, 67, 72, 85, 111, 189  
 structure  
     social, 43, 45, 49, 54, 55, 65, 68, 71, 73, 77, 83, 85, 95,  
         98, 100, 106, 107, 109, 110, 111, 113, 115, 116, 119,  
         121, 122, 126, 133, 173, 174, 180, 183, 184, 194,  
         196, 202, 251, 326, 351, 352  
     spoke, 174, 182, 184, 185  
 substantivist approach, 66  
 suffusion, 123, 124, 125  
 support  
     emotional, 45, 58, 124, 180, 212, 213, 220, 221, 222,  
         225, 235, 236, 240, 242, 243, 245, 246, 247, 248,  
         249, 253, 254, 257, 258, 259, 260, 262, 263, 264,  
         265, 266, 267, 268, 269, 270, 273, 274, 276, 279,  
         280, 281, 282, 283, 284, 285, 286, 291, 293, 295,  
         296, 297, 298, 299, 300, 301, 302, 303, 304, 307,  
         308, 309, 310, 313, 315, 316, 319, 320, 326, 328,  
         329, 330, 331, 333, 334, 335, 336, 337, 338, 339,  
         342, 343, 347, 348, 349, 351  
     material, 190  
     social, 52, 53, 123, 124, 175, 178, 180, 183, 185, 187,  
         194, 200, 204, 205, 206, 213, 218, 220, 223, 233,  
         235, 236, 240, 245, 246, 251, 252, 257, 291, 296,  
         320, 326, 331, 334, 347, 350, 354  
     socializing, 40, 42, 58, 128, 167, 180, 197, 198, 199,  
         201, 209, 213, 221, 222, 224, 225, 235, 239, 242,  
         243, 245, 246, 247, 248, 249, 254, 257, 258, 259,  
         260, 262, 263, 264, 265, 266, 267, 268, 269, 274,  
         275, 276, 277, 278, 279, 280, 281, 282, 287, 288,

289, 290, 291, 293, 294, 295, 296, 298, 299, 300,  
301, 302, 309, 310, 312, 315, 316, 317, 319, 320,  
326, 328, 329, 330, 332, 333, 334, 335, 336, 337,  
339, 340, 341, 343, 344, 347, 348, 349, 350

#### survey

back-check, 227

CATI, 52, 226, 227, 234

cross-sectional, 226, 242, 319, 353

nation-wide, 41, 214

quality-control, 227, 228

telephone, 205, 210, 226, 227, 229, 236, 237, 240

web, 205, 231

sustainability, 93, 94, 97

symptomatic approach, 46, 64, 68, 69, 71, 88

systems theory, 75, 80, 81, 83

### T

technological landscape, 53, 99, 101, 103, 106, 160, 173,  
218, 220, 301, 319, 346

#### technology

computing, 89

internet, 137, 196, 199

new communication, 43, 44, 45, 46, 47, 48, 50, 51, 52,  
53, 54, 57, 59, 61, 63, 99, 101, 115, 131, 135, 136,  
138, 139, 147, 153, 169, 175, 181, 192, 213, 219,  
220, 345, 346

teenager, 40, 100, 154, 157, 199, 352

tethered self, 104

#### tie

duration, 57, 205, 213, 218, 219, 243, 244, 257, 258,  
259, 260, 265, 269, 270, 271, 272, 273, 275, 278,  
282, 283, 284, 288, 289, 290, 293, 308, 315, 337,  
338

emotional, 214, 274, 349

social, 43, 44, 46, 47, 49, 50, 52, 53, 54, 55, 57, 101,  
105, 127, 129, 130, 137, 139, 146, 147, 150, 159,  
170, 175, 178, 184, 186, 187, 191, 192, 193, 201,  
204, 207, 208, 211, 216, 220, 221, 222, 223, 238,  
257, 261, 300, 322, 347, 348, 349, 353

strength, 102, 178, 179, 204, 218, 219, 234, 295

strong, 129, 178, 179, 197, 198, 204, 216, 218, 223,  
236, 296, 326

weak, 53, 120, 178, 179, 185, 191, 204, 206, 215, 219,  
220, 221, 222, 224, 233, 296, 344

time-space distancing, 110, 129, 131, 141

tradition, 46, 56, 75, 80, 115, 129, 165

Twitter, 40, 41, 42, 43, 45, 160

### U

ubiquitous connectivity, 51, 104, 138

United Kingdom, 40

United States, 40, 41, 44, 128, 197, 203, 207, 217, 341

### V

Valicon, 226, 232

validity, 111, 165, 232, 234, 236, 268

virtual world, 203, 211

### W

web forum, 141, 142, 146, 192, 211, 238, 263, 304

web page, 175, 231

website, 208

#### well-being

personal, 185, 199

psychological, 197, 198

World Wide Web, 39, 40

### Y

youth, 154, 158, 193, 214, 217, 230, 241, 248, 306

## **15 NOVE KOMUNIKACIJSKE TEHNOLOGIJE IN PREOBLIKOVANJE DRUŽBENOSTI V POZNI MODERNI (RAZŠIRJENI POVZETEK)**

Osrednji namen doktorske disertacije je analizirati vlogo novih komunikacijskih tehnologij v medosebnih odnosih v pozni moderni. Disertacija obsega dva glavna dela. V prvem delu avtor razvije in predstavi konceptualne in teoretske pristope, ki so se v družboslovnem raziskovanju osredotočali na razumevanje pomena novih komunikacijskih tehnologij za medosebno komuniciranje znotraj osebnih omrežij. V okviru predstavitve teh teoretskih polj, ki sega vse od kritične refleksije paradigmatiskih pristopov k razumevanju razmerij med tehnologijo in družbo pa do poglobljenega pregleda izsledkov empiričnih študij, ki so v preteklosti z različnih zornih kotov in epistemoloških izhodišč pristopile k proučevanju elektronsko posredovanih oblik družbenosti, avtor najprej umesti svoje raziskovalno izhodišče, ki sodobno oziroma digitalno družbenost pojmuje kot družbeno-tehnični fenomen, ki ga je moč celovito razumevati le skozi analizo procesov in razmerij, ki se v okoliščinah pozne moderne vzpostavljajo med tremi vidiki družbene realnosti, in sicer tehnološkim okoljem, družbeno interakcijo in socialnimi omrežji. Skozi pregled teoretskih tematizacij naštetih vidikov, predvsem pa z osvetljevanjem aspektov interakcije med naštetimi vidiki, skuša disertacija izpostaviti ključne strukturne vidike, ki so z vstopom novih komunikacijskih tehnologij v sfero vsakdanjega življenja zaznamovali razvoj in potencialne spremembe medosebnih odnosov in komuniciranja v kontekstu pozne moderne. Na osnovi teoretske razprave so v disertaciji razvite raziskovalne hipoteze, ki jih avtor preverja v drugem, empiričnem delu disertacije. Slednji vključuje predstavitev rezultatov analiz podatkov o uporabi novih komunikacijskih tehnologij znotraj osebnih omrežjih, zbranih z računalniško podprtim telefonskim anketiranjem na reprezentativnem vzorcu prebivalcev Republike Slovenije. V nadaljevanju sledi podrobnejši povzetek obeh delov disertacije.

V uvodnem delu prvega dela disertacije avtor ponudi poglobljeno kritično refleksijo obstoječih teorij in pristopov, ki obravnavajo razmerje med družbo in tehnologijo. Izhajajoč iz pregleda nekaterih torišč razprav o pomenu novih komunikacijskih tehnologij za medosebno komuniciranje in medosebne odnose namreč ugotavlja, da je za razumevanje družbenih in kulturnih praks ter izkustev, povezanih z uporabo novih komunikacijskih tehnologij v

medosebnem komuniciranju, pravzaprav potrebno najprej razumeti širši kontekst strukturnih povezav med tehnologijo in družbo. Avtor poskuša v disertaciji na osnovi Fischerjeve trirazsežnostne tipologije paradigmatskih pristopov k razumevanju razmerja med tehnologijo in družbo pokazati, da tehno- in družbenodeterministični pristopi ne omogočajo zadovoljivo zaobjeti povezave med družbenostjo in komunikacijskimi tehnologijami, saj razmerje med njima v družbeni realnosti pojmujejo znotraj kavzalnih okvirov, s čimer pristajajo na poenostavljeno iskanje »vzrokov« in »posledic« v družbeni oziroma tehnološki sferi. Pri razvoju konceptualnih izhodišč za preučevanje preoblikovanja družbenosti se zato disertacija opre na t. i. strukturacijski pristop, ki v svojem bistvu opusti kavzalnost in poudarja vzajemnost, na kateri sloni razvoj družbenih struktur in odnosov, ki vključujejo tehnologijo. V tem okviru disertacija izpostavi epistemološka in ontološka izhodišča družboslovnoinformatičnega pristopa k razumevanju tehnološko posredovane družbene realnosti, pri čemer se posebej opre na pojem družbeno-tehničnih informacijskih omrežij (angl. socio-technical interaction networks), ki po Klingu označuje osrednje spoznavno načelo in metodološki pristop družboslovne informatike. Omenjeni pojem namreč avtorju ne omogoči samo identifikacije treh ključnih družbenih polj, ki sestavljajo sodobno družbenost (tj. tehnološko okolje, družbene interakcije, socialna omrežja), temveč s pomočjo prispevka omrežij tudi izčrpno artikulacijo razmerij med temi polji.

Na tem mestu disertacija ugotavlja, da pojem družbeno-tehničnih informacijskih omrežij v ospredje postavlja še en vidik družbene realnosti, ki je bil znotraj determinističnih modelov docela spregledan, in sicer pomen družbenega konteksta. Slednji naj bi eksplicitno in/ali implicitno sooblikoval institucionalne mehanizme, vzvode in oblike, znotraj katerih prihaja do dinamično vzajemne artikulacije razmerij med tehnologijo in družbo, ki se navzven kažejo v izkustvih in praksah uporabe novih komunikacijskih tehnologij. S pristopom družbeno-tehničnih informacijskih omrežij je v disertaciji tako postavljen raziskovalni okvir, ki avtorju omogoča karseda celovito zaobjeti proces preoblikovanja družbenosti v povezavi z novimi komunikacijskimi tehnologijami. Obenem mu ta pristop tudi omogoča, da pokaže na vsebinska in metodološka področja, na katerih bi bilo mogoče obstoječe teoretske okvire in pristope za proučevanje tehnološko posredovanih oblik družbenosti v povezavi s pojmom pozne moderne nadgraditi in dopolniti.

Prav s tem problemom se avtor spoprime v nadaljevanju prvega dela disertacije, kjer poskuša razgrniti tiste mehanizme preoblikovanja osebnih odnosov v pozni moderni, ki na strukturni ravni sovpadajo z odnosnimi oblikami tehnološko posredovanega komuniciranja. Sklicujoč se na Giddensovo interpretacijo pozne moderne, avtor izpostavi posebno dinamiko družbenega razvoja, ki se prek spreminjanja časovnih in prostorskih okvirov delovanja posameznikov, delokalizacije družbenih interakcij in prežemanja tradicionalnih družbenih struktur z institucionalizirano (samo)refleksivnostjo odraža tudi skozi individualizacijo na ravni medosebnih odnosov. S študijo Giddensovega pojma čistih odnosov in Pahl in Spencerjevega prikaza »prelitja« družinskih in prijateljskih vlog disertacija razkriva, da izrazna moč (samo)refleksivnosti, na kateri naj bi se vzpostavil individualizacijski moment preoblikovanja poznomoderne družbenosti, temelji predvsem na izraziti intenzifikaciji interakcij med posamezniki, ki je nujno potrebna, če želijo slednji ohranjati zadostno mero vzajemnega zaupanja v medosebnih odnosih. Prav s tega vidika avtor izpostavi ključno povezavo med elektronsko posredovanim komuniciranjem in odnosno dinamiko pozne moderne: nove komunikacijske tehnologije posameznikom omogočajo skoraj (časovno in prostorsko) nenehen dostop do njihovega osebnega omrežja, obenem pa jim omogočajo, da z njihovo pomočjo individualno naslavlajo izbrane člane omrežja. Na tem mestu disertacija ugotavlja, da se v tem delovanju pravzaprav nakazujejo splošne značilnosti individualizacije: poleg večjega nadzora in avtonomije nad interakcijami namreč posameznik prevzema tudi določena sistemska tveganja, ki so vezana na skrb za stalno povezljivost, ohranjaje stika z osebnimi vezmi ter vzdrževanja zaupanja in vzajemnosti v medosebnih odnosih. Posledično se avtor v nadaljevanju disertacije osredotoči na problem družbenih interakcij ter z njimi povezanih sprememb v odnosu do tehnološko posredovanih oblik medosebnega komuniciranja.

Glavna teza tega dela disertacije je, da nove komunikacijske tehnologije vstopajo v proces preoblikovanja družbenih interakcij na treh ravneh družbene realnosti: (1) pri nastajanju novih družbenih okolij oziroma prostorsko-časovnih con vsakdanjega življenja; (2) pri oblikovanju novih komunikacijskih praks, ki temeljijo na novih oblikah koordinacije in vseprisotne povezanosti; (3) pri reorganizaciji normativnih struktur, ki določajo razmerje med različnimi načini (tehnološko posredovanega) medosebnega komuniciranja. Pri artikulaciji in argumentaciji



omenjene teze avtor črpa znanje predvsem iz socioloških, komunikoloških in družboslovnoinformatičnih razprav o vlogi internetnega in mobilnega komuniciranja v medosebnih odnosih. V prvem delu argumenta se avtor opre na Zhaovo fenomenološko analizo časovno-prostorskih struktur komuniciranja in delovanja, ki jih je omogočil razvoj računalniško posredovanega komuniciranja. Z vzpostavitvijo t. i. »zdaj in nekje« cone vsakdanjega življenja Zhao namreč pokaže, na kakšen način nastajajoče oblike elektronsko posredovanega komuniciranja ne predstavljajo le novega komunikacijskega kanala, temveč tvorijo novo izkustveno polje, skozi katerega posamezniki doživljajo in uokvirjajo medosebne odnose. Avtorjeva teza je, da so te spremembe najbolj vidne na ravni posameznikovega dojetja (so)prisotnosti v medosebnih odnosih, ki ni več vezana (zgolj) na kolokacijo (angl. co-location) v fizičnem prostoru, marveč na občutek prisotnosti, ki izhaja iz intenzivne izmenjave sporočil med posamezniki, razpršenimi v geografskem prostoru. Ključno pri tem seveda je, da so nove komunikacijske tehnologije (npr. mobilni telefon) v bistvu osebne komunikacijske tehnologije, ki omogočajo neposreden osebni stik med komunikatorji, s čimer jih posredno tudi opolnomočijo v smislu nadzora nad interakcijami in komuniciranjem. V tem oziru singularnosti novih oblik družbenosti ni moč razkriti le v odnosu do računalniško posredovanega komuniciranja, ampak tudi v smislu vpetosti posameznikov in družbenih interakcij v to, kar Petrič in drugi razumejo pod sintagmo »kompleksnega medijskega okolja«. Danes družbene interakcije niso (več) vezane na zgolj eno komunikacijsko tehnologijo (npr. neposredovani osebni stik), temveč so vpete v tehnološko okolje, ki ga sestavljajo različne tehnologije. Teza, ki jo v tem delu disertacije avtor zagovarja, je, da sodobne družbenosti ni mogoče celovito sociološko osmisлити, če ne upoštevamo kompleksnosti tehnološkega okolja, v katerem se je znašel poznomoderni subjekt. Prisotnost več tehnologij posledično vzpostavlja vprašanje odnosa med temi tehnologijami, ki v ospredje zopet postavljajo individualizacijske in refleksivne vzorce delovanja posameznikov. Hkrati odpirajo vprašanje normativnih struktur in kulturnih oblik, ki določajo vzorce družbenih rab komunikacijskih tehnologij v medosebnem komuniciranju v različnih kontekstih vsakdanjega življenja. Sklicujoč se na Fortunatijevo, disertacija poudarja, da so premiki v družbenih mehanizmi, ki določajo razmerja med posameznimi oblikami komuniciranja znotraj normativnih struktur, navzven najbolj jasno vidni na primeru spremenjene vloge neposredovanega osebnega komuniciranja. Če je slednje nekoč veljajo za edini – in s tem

privzeti – način medosebnega komuniciranja, je danes njegova »samoumevnost« marsikdaj postavljena pod vprašaj. V določenih okoliščinah namreč postaja skrbno in vnaprej načrtovana obligacija, ki ji vpleteni pripisujejo poseben odnosni pomen. Ob tem avtor v doktorski disertaciji izpostavi tezo, da je značilnosti odnosnih oblik, v katere so vpete komunikacijske tehnologije, mogoče prepoznati na ravni strukturnih lastnosti osebnih omrežij.

V zadnjem delu teoretske razprave se zato disertacija z interdisciplinarnim pristopom loteva analize ključnih torišč strukturnega preoblikovanja osebnih omrežij v pozni moderni. Izhajajoč iz argumentov, ki jih razvijejo Pescosolido in Rubin ter Wellman, predstavi različne vidike in ravni preoblikovanja osebnih omrežij ter njihovega položaja znotraj družbenih struktur in institucij (npr. družine, skupnosti, soseske), ki pričajo o njihovi centralnosti v sodobnih (tehnološko posredovanih) oblikah družbenosti. Še posebej pa se disertacija ukvarja z iskanjem in predstavitvijo načelnih povezav med vedno večjo strukturno raznolikostjo osebnih omrežij v smislu prostorske in časovne razpršenosti, ki jo omogočajo nove tehnologije. S kritično interpretacijo Wellmanovih pojmov osebne skupnosti in omrežnega individualizma ter pregledom obstoječih empiričnih študij na tem področju disertacija pokaže, da je glavnino teh sprememb moč povezati s prodorom novih komunikacijskih tehnologij v vsakdanje življenje. Na osnovi te analize sta v disertaciji izpostavljeni dve tezi. Po eni strani avtor predstavi argumentacijo, ki nakazuje, da v času tehnološko posredovanih odnosov ni mogoče govoriti samo o eni obliki t. i. digitalne družbenosti, temveč je teh oblik več in so med seboj prepletene (npr. selektivna družbenost, mobilna družbenost, omrežna družbenost). Po drugi strani pa pokaže, da problematizacija tehnološko posredovane družbenosti ne more biti enostavno izenačena z vprašanjem odnosa med »virtualnim« in »realnim« družbenim okoljem in iz njega izhajajočo pretnjo razgradnje družbene kohezije; prav uporabniki novih komunikacijskih tehnologij s svojimi družbenimi rabami v vsakdanjem življenju brišejo razlike med »virtualnimi« in »realnimi« okolji komuniciranja in delovanja do te mere, da njihovo izkustvo »družbenosti« temelji na prepletenosti obeh (komunikacijskih) prostorov. V tem pogledu disertacija razume tezo o preoblikovanju predvsem v smislu specifičnih vlog novih tehnologij v komuniciranju znotraj obstoječih osebnih omrežij (in ne v smislu spreminjanja sestave in velikosti osebnih omrežij). Povedano drugače, nove komunikacijske tehnologije vstopajo v proces preoblikovanja

družbenosti predvsem skozi vzpostavljanje novih vzorcev komuniciranja znotraj osebnih omrežij; bistveno bolj omejeno vlogo pa imajo pri strukturnem preoblikovanju osebnih omrežij v smislu njihove velikosti in sestave.

Namen teoretske razprave je tudi oblikovanje raziskovalnih hipotez, ki omogočajo empirično preverjanje teoretskih predlogov. S tem ciljem avtor v disertaciji na osnovi teoretske razprave in pregleda obstoječih empiričnih raziskav razvije več eksplikativnih in specifičnih hipotez, ki se v širšem smislu navezujejo na sledeča raziskovalna vprašanja: (1) Kakšne so strukturne značilnosti osebnih omrežij v Sloveniji in kako so slednje povezane s sociodemografskimi značilnostmi posameznikov in z njihovo uporabo komunikacijskih tehnologij? (2) Kako so strukturne značilnosti osebnih omrežij in uporaba interneta povezane z družbeno integracijo z vidika socialne izolacije? (3) Kako posamezniki uporabljajo različne komunikacijske tehnologije, da ohranjajo stik s člani osebnih omrežij? Ali v tem pogledu obstajajo razlike v načinu uporabe komunikacijskih tehnologij glede na tip socialne opore in jakost osebnih vezi? (4) Ali je v zadnjem desetletju prišlo do sprememb v strukturi osebnih omrežij ter ali so morebitne spremembe povezane z rastjo deleža uporabnikov interneta in pogostosti uporabe interneta, ki je zaznamovala razvoj novih komunikacijskih tehnologij v Sloveniji v zadnjih desetih letih?

Omenjena raziskovalna vprašanja so bila tudi osnova operacionalizacije teoretskih pojmov, ki ustrezajo različnim tipom osebnih omrežij in vezi ter načinom uporabe novih komunikacijskih tehnologij. Pri razvoju operacionalnih definicij merjenih pojmov avtor izhaja iz pristopa analize egocentričnih omrežij socialne opore. Z namenom zaobjeti čim širši razpon močnih in šibkih osebnih vezi je bilo v disertaciji uporabljenih pet generatorjev in 12 interpreterjev imen, s katerimi so bile zbrane informacije o velikosti in sestavi osebnih omrežij ter o pogostosti uporabe šestih komunikacijskih tehnologij (osebno komuniciranje, stacionarni telefon, mobilni telefon, SMS/MMS, elektronska pošta, medosebno komuniciranje prek interneta) znotraj taistih omrežij. Na empiričnem nivoju so se s pomočjo računalniško podprtega telefonskega anketiranja (CATI) na reprezentativnem vzorcu zbrali podatki o strukturi in velikosti omrežij več kot 1200 prebivalcev Republike Slovenije v starosti od 10 do 74 let.

Rezultati analiz so pokazali, da pogostost uporabe interneta ni povezana niti z velikostjo omrežij socialne opore niti s številom šibkih in močnih osebnih vezi. Ugotovitev velja tako za omrežja emocionalne opore kot tudi omrežja druženja. Obenem rezultati nakazujejo, da uporaba interneta tudi ni povezana s socialno izolacijo oziroma z dejstvom, da anketiranci nimajo nikogar, ki bi jim nudil emocionalno oporo ali druženje. Po drugi strani pa empirični podatki potrjujejo hipotezo, da je uporaba internetnih komunikacijskih tehnologij izraziteje povezana s strukturnimi lastnostmi omrežij druženja kot pa omrežij emocionalne opore; prve namreč vključujejo več šibkih, spremenljivih in oddaljenih vezi, s katerimi lahko posameznik hitreje navezuje stik prek internetnih komunikacijskih servisov. V splošnem rezultati tudi govorijo v prid hipotezi, da je za manjša in geografsko manj razpršena omrežja značilno pogostejše osebno komuniciranje ter komuniciranje prek mobilnega telefona in SMS/MMS sporočil, medtem ko so v večjih in bolj oddaljenih omrežjih posamezniki pogostejše v stiku prek stacionarnega telefona, elektronske pošte in drugih internetnih komunikacijskih servisov.

Disertacija potrjuje ugotovitve predhodnih raziskav, da posamezniki pri navezovanju in ohranjanju stikov s člani svojih osebnih omrežij na pragmatičen in docela kompleksen način združujejo različne »nove« in »stare« komunikacijske tehnologije, pri čemer ni opaziti tendence, da bi določene tehnologije »izpodrivale« ali »nadomeščale« druge. Nasprotno, empirični izsledki v splošnem govorijo v prid tezi, da znotraj kompleksnega medijskega okolja vsaka tehnologija prek posameznikove uporabe najde posebno mesto oziroma »nišo« v dinamiki navezovanja in ohranjanja medosebnih odnosov, ki je povezana tako s sociodemografskimi lastnostmi posameznikov kot s sestavo njihovih osebnih omrežij. Rahel odmik od tega načelnega spoznanja je mogoče zaznati le pri odnosu med pogostostjo osebnega stika in komuniciranja prek elektronske pošte (emocionalna opora) ter med osebnim stikom in komuniciranjem prek drugih internetnih servisov (druženje). V omenjenih primerih pogostejši osebni stik zmanjšuje pogostost komuniciranja prek elektronske pošte in interneta. Nasploh pa velja, da sta osebni stik in mobilno komuniciranje »privzeta« načina vzdrževanja medosebnih odnosov tako znotraj omrežij emocionalne opore kot omrežij druženja.

Disertacija potrjuje hipotezo o razlikah v velikosti omrežij in geografski oddaljenosti vezi znotraj osebnih omrežij, s katerimi so posamezniki v stiku prek različnih komunikacijskih tehnologij (t.

i. komunikacijskih podomrežij). Natančneje, rezultati kažejo, da so omrežja socialne opore, v katerih posamezniki ohranjajo stik s svojimi vezmi s pomočjo mobilnega telefona (emocionalna opora) in kratkih besedilnih sporočil (oba tipa socialne opore), manjša in se nahajajo na lokalno omejenem območju, medtem ko so internetna podomrežja (oba tipa socialne opore) večja in vključujejo geografsko bolj oddaljene vezi. Z analizo komunikacijskih podomrežij avtor pokaže tudi, da med proporcionalno velikostjo različnih podomrežij znotraj omrežij socialne opore obstaja pozitivna korelacija. Ugotovitev je skladna z že omenjeno tezo o kompleksnih medijskih okoljih, ki pravi, da izbrana komunikacijska tehnologija ne izpodriva drugih komunikacijskih tehnologij, temveč prek normativnih kontekstov, ki določajo vzorce njenih družbenih rab, pridobi posebno vlogo pri navezovanju stikov s člani osebnih omrežij. Vsekakor pa nakazana multipleksnost uporabe tehnologij pri ohranjanju stikov z osebnimi vezmi še ne pomeni, da imajo na primer člani osebnih omrežij, s katerimi je posameznik v stiku prek mobilnega telefona, enake lastnosti kot osebe, s katerimi komunicira prek interneta ali elektronske pošte. Nasprotno, disertacija potrjuje domnevo, da obstajajo pomembne razlike v sestavi komunikacijskih podomrežij. Sodeč po rezultatih analize so slednje največje glede na tip odnosa (npr. partner, starši, otroci, prijatelji) in geografsko oddaljenost vezi. V tem oziru avtor ugotavlja, da je najizrazitejša razlika prisotna med internetnimi in ostalimi podomrežji. Prva vključujejo več prijateljskih in oddaljenih vezi, medtem ko so ostala praviloma sestavljena iz sorodstvenih vezi, ki živijo v geografski bližini.

V disertaciji je testirana tudi teorija medijske multipleksnosti (angl. Theory of media multiplexity), ki sta jo razvila Wellman in Haythornthwaitova in ki pravi, da so močne osebne vezi praviloma vpete v kompleksnejše vzorce uporabe komunikacijskih tehnologij. Empirični podatki potrjujejo omenjeno domnevo, saj rezultati analiz kažejo, da v omrežjih emocionalne opore – ki vključujejo več močnih osebnih vezi – posamezniki uporabljajo več načinov komuniciranja kot v omrežjih druženja. Pri tem je morda z vidika razumevanja odnosa med strukturo omrežij in družbenimi rabami komunikacijskih tehnologij še pomembnejša ugotovitev, da je vzorec uporabe tehnologij povezan z različnimi strukturnimi lastnostmi obeh omrežij. V omrežjih druženja, ki jih sestavljajo povečini šibke in specializirane vezi, se multipleksnost povečuje z naraščanjem deleža sorodstvenih in oddaljenih vezi, medtem ko se multipleksnost v

omrežjih emocionalne opore povečuje z naraščanjem števila članov omrežja in njihove starosti. Povedano drugače, rezultati nakazujejo na zelo verjetne strukturne razlike v družbenih mehanizmi, ki sooblikujejo uporabo komunikacijskih tehnologij pri ohranjanju stikov z različnimi vrstami osebnih vezi.

Čeprav posamezniki v kompleksnem medijskem okolju izoblikujejo individualizirane vzorce uporabe izbranih tehnologij za komuniciranje znotraj osebnih omrežij, podatki kažejo, da obstajajo skupine ljudi, ki jih družijo določene preference, izkustva in prakse v smislu družbenih rab komunikacijskih tehnologij. Omenjene skupine so povezane s sociodemografskimi lastnostmi posameznikov in s strukturnimi značilnostmi njihovih osebnih omrežij. Skupina posameznikov, ki v omrežjih emocionalne opore na primer pogosto uporablja stacionarni in mobilni telefon, ima v povprečju manjša in lokalna omrežja, ki so večinoma sestavljena iz sorodstvenih vezi. Nasprotno pa imajo posamezniki v skupini, ki pogosteje uporablja elektronsko pošto in druge oblike internetnega komuniciranja, v svojih omrežjih v povprečju več geografsko oddaljenih in nesorodstvenih vezi. Analiza omrežij druženja daje povečini podobne zaključke. Posamezniki v skupini, ki redko ali sploh nikoli ne uporablja internetnih tehnologij za komuniciranje z omrežji druženja, imajo v povprečju bistveno večji delež starejših, lokalnih in sorodstvenih vezi, s katerimi se osebno poznajo že dlje časa.

S pomočjo analize sekundarnih anketnih podatkov, zbranih v okviru raziskave o omrežjih socialne opore prebivalstva Slovenije, avtor disertacije tudi potrdi prisotnost sprememb v velikosti in sestavi omrežij emocionalne opore in druženja med letoma 2002 in 2009. V skladu s pričakovanji so analize razkrile, da je obseg sprememb večji v omrežjih druženja, čeprav je tudi v omrežjih emocionalne opore prisoten strukturni premik k bolj intimnim, družinskim, lokalnim in dolgotrajnim osebnim vezem. Na splošno velja, da pogostost uporabe interneta nima posebne vloge pri navedenih spremembah, saj so zaznani trendi zelo podobni tako med neuporabniki, mesečnimi in tedenskimi uporabniki kot tudi med dnevnimi uporabniki interneta. Ob tem velja opozoriti na dve manjši, a vendar pomembni izjemi. Rezultati kažejo, da so bili uporabniki interneta v primerjavi z neuporabniki tekom omenjenega obdobja deležni manjšega povečanja velikosti emocionalnega omrežja. Obenem pa so bila njihova omrežja druženja manj izpostavljena trendu lokalizacije oziroma zmanjševanja geografske oddaljenosti osebnih vezi.

Nadalje, analiza znotraj- in medkohortnih sprememb je pokazala, da predvsem prve predstavljajo osrednji mehanizem pri spreminjanju velikosti osebnih omrežij. Kljub temu disertacija z metodo dekompozicijske analize, ki temelji na linearni regresiji, izpostavi nekaj značilnih razlik v vzorcih sprememb med uporabniki in neuporabniki interneta. Še posebej to velja za omrežja emocionalne opore, kjer je povečevanje velikosti omrežij med uporabniki interneta povezano zlasti z zamenjavo starejših kohort z mlajšimi generacijami uporabnikov interneta, medtem ko je pri neuporabnikih interneta naraščanje velikosti vezano izključno na spremembe znotraj kohort.

Na osnovi zgoraj predstavljenih rezultatov analiz empiričnih podatkov o procesu preoblikovanja družbenosti v pozni moderni, ki temelji na poudarjeni individualizaciji in (samo)refleksivnosti posameznikov v ohranjanju stikov z njihovimi osebnimi omrežji, avtor disertacije zaključí, da nove komunikacijske tehnologije na zelo zapleten način vstopajo v procese medosebnega komuniciranja in družbenih interakcij znotraj osebnih omrežij. Dinamika in struktura njihovih družbenih rab je povezana predvsem s sestavo osebnih omrežij in manj izraziteje z njihovo velikostjo, pri čemer pomembne razlike nastajajo tudi glede na jakost osebnih vezi oziroma vrsto socialne opore. Omenjenih razlik ni mogoče celovito razumeti, če v analizo ne vključimo vseh tehnologij, ki jih imajo posamezniki na razpolago, ko komunicirajo s člani osebnih omrežij. Disertacija tudi pokaže, da je vloga komunikacijskih tehnologij – natančneje interneta – pri spreminjanju velikosti in sestave osebnih omrežij omejena.

Opirajoč se na izhodišča v teoretskem delu, avtor sklene disertacijo z mislijo, da se skozi uporabo novih komunikacijskih tehnologij v medosebnem komuniciranju znotraj osebnih omrežij izkazujejo pomembni vidiki (samo)refleksivnosti in individualizacije, ki kot rečeno določata širši ustroj družbenosti v pozni moderni. Dostop do družbenih vezi in članov osebnih omrežij temelji na specifičnih vzorcih komunikacijskih praks, ki v odvisnosti od prostorsko-časovnih okoliščin in družbenih kontekstov pogojujejo in povezujejo različne tehnologije. Ob tem velja izpostaviti dva vsebinska poudarka, ki sta posebej pomembna za razumevanje omenjenega zaključka in siceršnjega doprinosa disertacije k znanstvenim spoznanjem družboslovne informatike. Po eni strani procesa individualizacije, vezanega na uporabo komunikacijskih tehnologij v medosebnem komuniciranju, ni mogoče razumeti (zgolj) z vidika povečanja ali zmanjšanja družbene integracije. Rezultati tukajšnje raziskave namreč opozarjajo,

da je vključenost novih tehnologij v komunikacijske procese znotraj osebnih omrežij povezana bolj – in predvsem – s spremenjenimi načini dostopa do družbenih vezi kot pa z njihovo prisotnostjo ali odsotnostjo. Povedano drugače, izsledki govorijo v prid tezi o preoblikovanju družbenosti, ki je bila izpostavljena v teoretskem delu doktorske disertacije. Po drugi strani pa prisotnost specifičnih vzorcev komuniciranja vsekakor še ne pomeni, da v teh komunikacijskih praksah in izkustvih ni mogoče odkriti širših družbenih regularnosti. Nasprotno, disertacija pravzaprav potrdi veljavnost osrednjega družboslovnoinformatičnega načela o pomenu umeščenosti tehnologije v družbeni kontekst, s tem ko pokaže, da so različne strukture družbenih rab tehnologij v osebnih omrežjih vpete v strukturne lastnosti teh omrežij in ljudi, ki ta omrežja sestavljajo. Za razumevanje nians in posebnosti, ki opredeljujejo razlike med različnimi uporabami novih komunikacijskih tehnologij, je zato upoštevanje družbenega konteksta pravzaprav pogoj za veljavno raziskovanje družbenosti v okoliščinah pozne moderne, ki jo zaznamuje edinstvena dinamika razvoja osebne komunikacijske tehnologije.