

BOUNDED SOCIABILITY, RELATIONSHIP COSTS AND INTANGIBLE RESOURCES IN COMPLEX DIGITAL NETWORKS

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ABSTRACT

This article addresses the role of trust and other intangible resources and costs in Internet sociability. The model used to analyze the data hypothesizes a dynamic relation between social capital, intangible resources and culture, which helps explain both the positive and negative effects of Internet use on sociability. Sociability in the digitally connected world, with its complexity and its new "costs" of relationships, is bounded. There is a necessary selection, so it is important to understand how this selection is made.

The Internet is neither neutral nor an automatic creator of a frictionless all-symmetrical network society. It makes people change the structural nodes and the organizational relationships of their social networks, while adapting to the dynamics of the new relationship costs and resources. This adaptation seems more evolutionary and culture-driven than just instrumental. These partial results are used to outline the need for a better understanding of sociability dynamics in complex network societies—beyond the simplification proposed by both techno-pessimists and techno-optimists, but also by the first ideas of the Internet as a neutral medium. The model is tested using multivariate regressions and path analyses of Italian national sample data collected in 2001 as part of the World Internet Project.

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This article outlines some dynamics of trust and cooperation on the Internet, particularly in the new collaborative environments such as virtual communities. How can they influence online and offline relationships? How might they affect the stock of social capital and quality of life in society? The idea that Internet virtual communities have great potentialities for fostering civic development should not simply legitimize the hypothesis that the Internet technology itself automatically brings about these changes. This idealistic model of a totally connected network society is influenced by the mistaken belief (a "digital symmetry fallacy," Mandelli 2002) that by providing a communication channel, technology is enough to predict a communication process through that channel. It is the old issue of "communication as transportation" revisited, in light of the new media and network communication debate (Carey 1989).

The Internet has become an important part of people's lives. With its network-based communications, it calls to mind the idea of a new social order, developed thanks to the network and cooperative nature of the new media. A major claim in the literature on digital societies and markets (Hagel and Armstrong 1997; Evans and Wurster 2000) states that the Internet reduces transaction costs in economic and social interactions (especially the costs driven by search activities) and eliminates the trade-off between reach and richness in establishing relationships. It thereby creates a new frictionless society, where every individual can find what he needs (or can meet who he needs) with very limited costs associated to these cognitive searches and symmetric encounters. Rheingold (1993) describes virtual communities as Putnam (1993) portrayed the social places which fostered civic engagement in modern societies. For Rheingold (1993),

Virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace. In this view they are perfect places for enhancing the civic fabric of society. (P. 62)

In business this paradigm is the foundation for the so-called "reverse-marketing" philosophy and for predictions of a community-based business model of the Internet (Hagel and Armstrong 1997). It is based on the assumption that technological network connections will create information symmetries; this will bring information democracy in market relationships (Sawhney and Kotler 1999) and a radical power shift from the firms to the consumers, who will self-organize in communities of consumption (Hagel and Armstrong 1997; Hagel and Singer 1999). In sociology, the same intellectual framework is used for predicting the diffusion of a new community-based social order (Schwartz 1996; Tsagarousianou *et al.* 1998). Since the Internet lowers the barriers of time and space in communication, people will build new communities of interest and new communities of emotions much beyond the limits of their local environment (Rheingold 1993). People's net contacts may come from people who have

different backgrounds or who live far away from us (Etzioni and Etzioni 1997). As Hauben and Hauben (1997, 5) argue, "a grand intellectual and social commune in the spirit of the collective nature present at the origins of human society."

However, the story is not so simple. Besides the problems related to the artificial and increasing blend of the marketing and the social dimensions of virtual communities (Rifkin 2001; Kozinets 2001), reverse markets and frictionless civic society don't seem to be the necessary outcome of the Internet diffusion. Research results from studies in different fields have provided little evidence supporting the hypothesis of the Internet as driver of a symmetrically all-connected network society (as reviewed in Norris 2000, 2000b, 2000c). In Italy, in 2001, only a minority of the Internet population (about 30%) have ever used Internet community environments, and only 11 percent have used them for discussions with other members. Unequal access to technology, but also different motivation and intangible resources, doesn't permit the spread of information and civic society potential that the Internet seemed to promise. Network economics, economies of scale and new transaction costs, though dynamic and cognitive, drive new asymmetries/structures of relationships and gatekeeping (Brynjolfsson *et al.* 2000; Smith *et al.* 1999; Mandelli 1997, 2001; Demattè 2001).

Putnam (2000) argues that virtual forms of social communications cannot substitute for traditional face-to-face social networks in local communities, because virtual relationships are not rich and strong enough for building social trust. Consistent with this, a study on the potential role of the web for building distance-learning communities found that Internet-only relationships were rich but not solid, in contexts of technological uncertainty, and that "computer network interactivity may be necessary but not sufficient in order to build collaborative learning communities" (Mandelli 1995). Virtual ties seem to be weaker because people have easy access to them but also an easy exit. As Galston puts it, "many (most?) of these online communities are composed of transients—people who stop by to gain some information, get or give some moral support, and then go their own way" (Galston 1999: 52, in Norris 2000).

In many western countries there is a concern that citizens are becoming increasingly isolated and societies are becoming fragmented. Putnam (2000) links this to the lowering of trust and socializing activities. Kraut *et al.* (1998) found support for the view that the Internet negatively influences people's offline social relationships. Nie and Erbring (2000) reported that heavy Internet users have cut back on their social ties.

These views of the so-called "techno-pessimists" are not clearly supported by all the evidence collected. Internet users seem to have wider social networks than nonusers (Robinson *et al.* 2000). In a major national survey Cole (2000) found strong evidence that the use of the Internet fosters offline relationships. Also, Kraut *et al.* (2002) reconsidered their original conclusion on the negative

impact of the Internet on sociability, when they didn't find the same effect in a second study on the same subject. Only people with lower social skills and wellness are likely to be affected negatively. The new data suggests that this negative impact doesn't occur when people use the Internet to develop their local and face-to-face relationships and this is easier for people who already are very sociable. This "reinforcement" effect (found also in Norris 2000) is consistent with the theory of "uses and gratifications" in the use of mass media (Katz, Blumler, and Gurevitch 1974)—and with the theory of diffusion of innovation (Rogers 1962), which predicts that people actively engage with media activities when they have "relative advantage" in doing so. In this case, people who take advantage of using virtual communities are "people who need or like to meet people," either because they already know them or because they like making new friends.

In short, research results don't support any simple view of the link between the use of Internet communities and sociability. This should not surprise scholars in the mass communication field, since the search for the "magic simple bullet" in media effects has been unfruitful for several decades. This also confirms the idea that new network media may bring different and opposite effects, due to the contradictory impact of their interactive nature and their economics (Neuman 1991).

Beyond the opposite and radical visions, Uslaner (2000) offers "a third perspective: The Internet neither destroys nor creates social capital. There are both altruists and scoundrels on the Net, just as there are in everyday life."

This "neutral" view of the Internet sociability issue helps to understand why one finds different results for the same problem. However, it may not help explain whether there is any Internet affect—though different in different contexts—on sociability. This study, instead, is based on the idea that Internet is not neutral. Internet affects, as well as media affects, are important, even if one can't find them when looking for simple, one-level and unidirectional links.

BRIDGING AND BONDING WITH VIRTUAL COMMUNITIES

The original debate on virtual communities has recently been updated to include a new classification of the socialization affects of these collaborative environments on the web. Putnam (2000) distinguishes the *bonding* effects from the *bridging* effects of socializing:

Bridging social capital refers to social networks that bring together people of different sorts, and bonding social capital brings together people of a similar sort. This is an important distinction because the externalities of groups that are bridging are likely to be positive, while networks that are bonding (limited within particular social niches) are at greater risk of producing externalities that are negative.

Virtual communities lead more toward bonding sociability, and impede bridging possibilities, because they connect people with the same interests and lifestyles (Stolle 1998; Preece 1999). "The Net may consume trust, rather than produce it," according to Uslaner (2000). In fact the Internet makes people connect more with family members, friends or people with the same interests. In Italy, 46 percent of users said they increased their regular contacts with people with the same economic interests; and 38 percent of them increased their regular contacts with their family and friends.

This idea, that gathering with similar people on the net can drive negative social effects, is also the basis of the so-called balkanization hypothesis. Van Alstyne and Brynjolfsson (1997) suggested that one "examine critically the claim that a global village is the inexorable result of increased connectivity." Their conclusion comes from the analysis of the constraints posed by limits of what is known as "bounded rationality" (Simon 1959), the practical implication of which suggests that

a citizen of cyberspace still has a finite set of "neighbors" with whom he or she can meaningfully interact, but these neighbors can now be chosen based on criteria other than geography. . . . even in a lifetime, few people have significant relationships with more than a few thousand others. As long as human information processing capabilities are bounded, electronic media are unlikely to dramatically change this total. When geography no longer narrows interaction, people are able to select their acquaintances by other criteria such as common interests, status, economic class, academic discipline, or ethnic group. The result can easily be a greater balkanization along dimensions which matter far more than geography (Van Alstyne and Brynjolfsson 1997, 3-4).

Thus, the balkanization hypothesis is motivated by the analysis of the impact of time resources on relationships; one can say it is motivated by bounded sociability, beyond bounded rationality. The Internet can facilitate the isolation of individuals or groups from their geographic neighborhoods because time is limited, and "spending more time online can require one to withdraw from traditional offline social ties." (Van Alstyne and Brynjolfsson 1997, 3-4).

Using data from the Pew survey on virtual communities, Norris (2002) builds on this demarcation between bonding and bridging effects, suggesting these two dimensions are a continuum, with mixed types of socialization effects in the middle: Type A when people socialize with people with the same ideological heritage but different social background, and Type B when people socialize with people with the same social characteristics but a different ideological culture. In this continuum, relationships with friends and political affiliation are bonding relationships, lifestyle communities are mixed Type A relationships, while professional ties are mixed Type B.

Following Horrigan *et al.* (2001), Norris (2002) found evidence that virtual communities have both types of sociability effects. People felt that through virtual communities they widened (by helping them to connect to others with different beliefs or backgrounds) and deepened (by reinforcing and strengthening existing social networks) their social networks.

This is not a surprising outcome, using the lens of the Complex System Theory (Kauffman 1990; Axelrod 1997), and using connectionism and the neural net metaphor for explaining the new structures of relationships on the Internet (Vicari 2001). Competition and cooperation in complex evolutionary networks are both at work. They are not absolute alternative outcomes. Networks, from the organizational standpoint, are different from both hierarchical institutions and from markets. Network relationships are potentially competitive (because each node can dynamically access more diverse sources of content and relationships) and potentially cooperative (because decentralized nodes can self-organize coordination and because network economics can drive institutional coordination and cooperation). The problem is that these two different (parallel and dynamic) organizations of relationships do not drive simply "order for free", as in the frictionless market and society hypothesis. They are influenced by the structure of the mediation network (both the cognitive networks of the individuals and the cognitive networks of the "infomediaries," in Mandelli, 2001).

There are new shortcuts and gatekeepers on the Internet. They are in the minds and culture of people, as the cultural framing affects in traditional mass media agenda-setting research has already shown (McCombs *et al.* 1997; Semetko and Mandelli 1997), and in the structure of the "infomediation" agents (Patterson 2001; Mandelli 1998, 2001). Online content sites, portals and online communities are the new virtual mediators of content and relationships. They offer different—and competing—paths and choices to relationship reach and richness (to bridging and bonding). People can meet people if portals and virtual community organizers make them meet (see the influence of economic rules in this selection, Mandelli 2001), and also if they are cognitively and affectively ready to engage.

Following Neuman *et al.* (1999), the debate should move

beyond the notion of isolated Internet effects, to a broader understanding of how the Internet and new media are changing the current media ecology. Not surprisingly, Marshall McLuhan was the first scholar to enunciate media ecology as a . . . forceful way that people studying media are not just studying machines and how they work, but the interaction between the structure and form of machines and the human sensorium. . . . In other words, the media do not act upon people and institutions in isolation, but as part of a rich fabric of other media and social interactions. Therefore, to truly understand the effects of the Internet, one must study the entire ecology in which the Internet is used.

In other works (Mandelli 2001, 2002), the hierarchies in the "external" cognitive mediation network have been examined (the new media gate-keeping system and the relationship between this system and the individual cognitive system). Here the analysis is on the "individual agent" level of "friction" and relationship costs, in the cooperation of individual network agents with other agents, adopting the vision of the studies on complex social networks (Kollok 1999; Axelrod 1997) for studying the relationships between trust and cooperation (Castelfranchi 1998; Falcone and Castelfranchi 1999). At the origin of this approach there is the idea that an agent in a complex adaptive network has both a "goal and value-driven" activation/selection mechanism and a learning-adaptive activation mechanism (Macy 1998; Castelfranchi 1998).

So one expects to find links between goals and culture with cooperative behavior at the individual level, but also to be unable to explain some social outcomes of network relationships at the individual level of analysis. This is only part of the story.

TRUST DYNAMICS IN COMPLEX NETWORKS

Falcone and Castelfranchi (1999) propose a model of social engagement and cooperation that include different views of goals and values which drive collaboration. They may be instrumental and not instrumental (ethical value-driven). This model describes a circular link (dynamics) between trust (the beliefs—the "state of mind"), cooperative actions (engagement) and social effects (consequences). Trust builds trust and "has a history." Also, trust is not only based on beliefs about people and their willingness/abilities to cooperate in the present and the future (internal trust), but also is based on beliefs about the trustworthiness of the environment and third parties (external trust), a vision also proposed by Kollok (1999) and Axelrod (1997). This dynamic also highlights the importance of the cognitive resources (cognitive energy and time), available at the network agent level. Cognitive resources are finite; their economics influences social decisions. Also Norris (2000) suggests that civic engagement is influenced by the availability of cognitive resources (cognitive abilities and time) and by the perception of self-efficacy in social engagement.

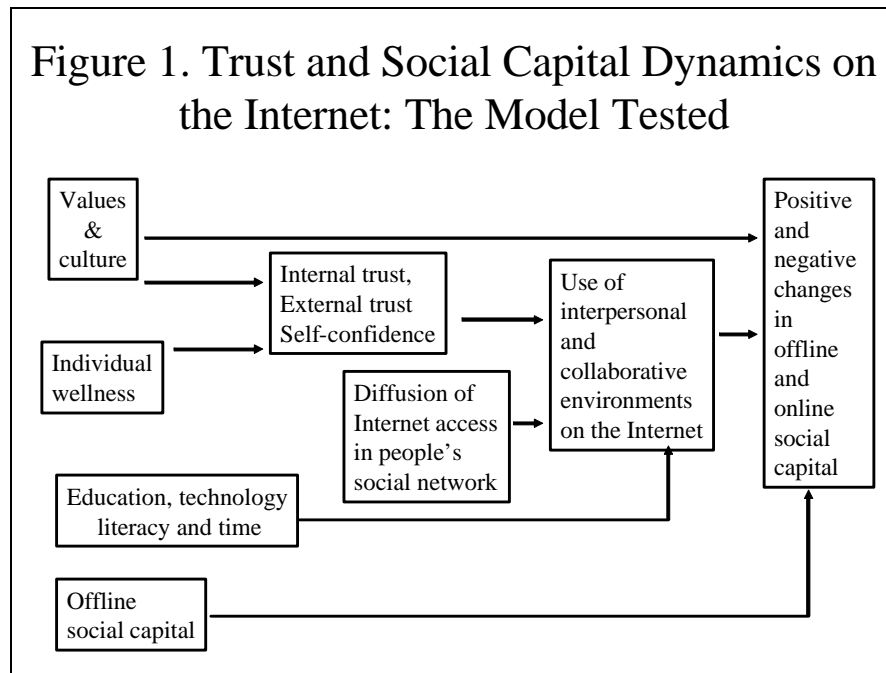
In the approach used in this study, cognitive and social digital networks are parts of the more general cognitive and social networks that individuals are in and can access (Vicari 2001; Mandelli 2001). The Internet cognitive and cultural space cannot be considered separated from the offline experience. If this has been conceptually correct since the beginning of the Internet, it is particularly true when considering the diffusion of ubiquitous technology and cross-channel integrated communications on the net—made available by agent technology, CRM and mobile devices (Mandelli 2001). This is why a main hypothesis of this study claims that there is a complex interplay between offline sociability and online sociability.

Trust and legitimation are mediation factors (selection mechanisms) in relationships. Each mediation requires a cognitive transaction. Each cognitive transaction has cognitive costs (Mandelli 2001). Transaction cost theory (Williamson 1989) states that organizations build structures and hierarchies of relationships when there are costs for searching and trusting external partners—a theory that helps explain the new cognitive hierarchies in digital economic networks, but also helps predict new structures of social digital networks (Mandelli 1998, 2001). In the complexity of networked societies, the new "cognitive logistics" don't eliminate transaction costs and relationship structures. They create the need for new cognitive investments and trade-offs. If transaction costs are not eliminated there still are social trade-offs and decisions to mediate between reach and richness. People retreat from cognitive and social mediation when transaction (cognitive and social mediation) costs are too high compared to the benefits of cognitive, affective and social meaning construction. But people also adapt to new social structures based on what they have learned and experienced. Network societies are dynamically interconnected, decisionally complex and evolutionarily selective. Trust functions as a complexity management tool in cooperation.

So the final model of cooperation on the Internet in Figure 1 describes a complex interplay between different sets of variables, which can produce different and even opposite effects on the quality of individual and public life—depending on goals, beliefs, trust and intangible resources like technology access, knowledge and time.

DATA SOURCES

The data analyzed come from a study conducted at SDA Bocconi in Milan, based on questions developed for the World Internet Project. This study involved a telephone survey of the Italian adult population (over 15 years old), with a random stratified sample of 1006 individuals listed in the telephone directories. They were interviewed in the last two weeks of September 2001 using the core survey questionnaire (about a 20 minute interview). A longer questionnaire (beyond 30 minutes) was submitted to a subset of the general sample ($N = 591$). The questions regarding the use of the Internet were asked only of Internet users, who at the time of the survey were 29 percent of the sample. Italians who are not listed in telephone directories are about 15 percent of the population according to the SWG polls service; they are mainly characterized by lower social status, since being listed in the phone directories is rather common for phone users. This should make analyses based only on Internet users (like the one described in this article) relatively unbiased by sample selection, since the diffusion of Internet connections in those population groups is very low.



Interviews were conducted using CATI technology, by the firm SWG based in Trieste. The final 1006 sample respondents represent about 30 percent of those people who agreed to answer the telephone interview. The final data were then weighted, adjusting the age, gender, education and geographical area quotas to those of the Italian population older than 15 years, according to data released by the national census institute ISTAT.

Internet users were asked if, due to the use of Internet communication, they had increased the number of people with whom they had regular contacts—if they had increased their regular contacts with family and friends and with people with similar interests. They were also asked if they had met new friends online.

Among the sample frequencies

1. Fifty-seven percent of the Internet users disagreed that it is easier to meet people online than offline, whereas 29 percent agreed.
2. Twenty-five percent said they increased the number of people with whom they have regular contacts, due to the use of the Internet.
3. Forty-four percent of users said they increased their regular contacts with family and friends; 55 percent increased their regular contacts with people with the same professional interests; 34 percent increased their regular contacts with people with the same hobbies. Lower percentages of people increased their political and religious contacts through the Internet.

4. Nine percent of the users estimated they had *decreased* their regular religious contacts, 8 percent decreased their political contacts, 5 percent decreased their regular contacts with family and friends.
5. Thirty-five percent of users made friends online, though only 7 percent met them offline afterwards.

A multivariate regression analysis on these final dependent variables tested the influences of demographics, techno-graphics, value priorities, internal and external trust, Internet civic self-confidence, individual perception of alienation, southern local culture and the use of interpersonal online applications (chats, virtual communities and email) on the dependent variables listed above (see Appendix A for the wording of questions and the operationalization of the variables). A time stress variable was also included to test the influence of the time resource on cooperative behavior.

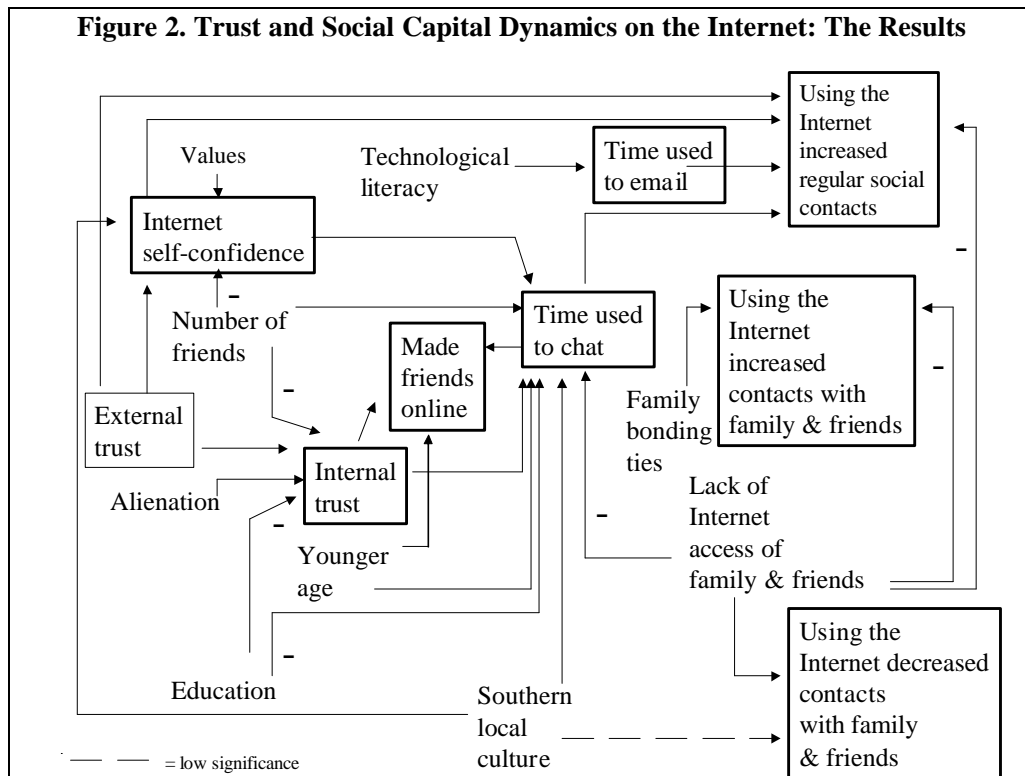
The statistical path analysis considered as intermediate variables the use of collaborative environments online, internal trust, external trust and Internet civic self-confidence. Each scale used in the analysis (see Appendix A) met statistical reliability criteria for alpha coefficients. Only significant beta coefficients in the regressions were considered in order to describe paths between variables in the model and isolate only the most relevant regression results.

The results confirmed the hypotheses, but for the direct influence of time on sociability behavior. Figure 2 represents the synthesis of the regression paths, which describe the most relevant regression relationships found. The beta coefficients are listed in Table 1 in Appendix B.

The use of the interpersonal communication environments of the Internet can drive the creation of new social capital. Using email and group communication, people can foster relationships with family and friends—but also with people they have never met before. There is a link between offline and online social capital. People who have stronger ties with family members and friends are more likely to increase their regular contacts with them after they start using the Internet. But they do it if they can access their significant others through email and other interpersonal communication tools of the web. The digital access divide may drive a social divide.

Using chat rooms and virtual communities, people can make new friends. However, not everybody uses these collaborative applications. The use of these communication formats (and the consequent affect on regular relationships) is mediated by generation and Internet trust. People who think that it is easier to meet other people online than in person are more likely to use the synchronous communication environments of the Internet (chat) and make friends online. Results also confirmed the link between internal and external trust. Trust in the Internet community environments helps create trust in online people.

Even though time stress showed no relationship with sociability outcomes, the data supported the hypothesis that time resources influence



cooperation behavior and sociability phenomena. There was a significant link between the increase in the number of regular contacts with people with the same hobbies, the same religious interests and the same political interests, and the decrease in the number of regular contacts with other social groups (see Table 2 in Appendix B). This "switching bonding" effect seems to capture the adaptation to social changes predicted by the balkanization hypothesis reviewed above. This hypothesis links the risk of increased society fragmentation not to alienation effects of the Internet but, instead to those adaptive and evolutionary selection effects necessary for managing the economics of cognitive and time-based costs of relationships in complex interconnected social networks. Yet, it is not possible to claim that the data confirm the balkanization hypothesis fully, since the marginal social variance of the new relationships compared to the old ones is not known.

The cultural nature of trust formation is also confirmed by other results in the study. Internal trust (the attitude toward making friends online) was predicted by value priorities, through the mediation of external trust (the ideas about the quality of information flows in communities). However, this belief (that it is easier to meet friends online than offline) was also related to lower education, to a smaller friend network and to perception of individual

alienation. This result highlights another dimension of the role of cognitive and social resources in the process. It is as if people moved to the Internet looking for social support and friendship if they had problems with their offline life. Although, the opposite direction of relationship (online trust drives alienation) may hold also, the first interpretation is preferred because of the interplay of the alienation variable with lower cognitive sophistication of individuals in predicting chat use.

Internet self-confidence was also predicted by a smaller friendship network and was also related to solidarity values, external trust and local (southern) culture. The southern local culture seems to be relevant in explaining different important results concerned with Internet sociability. Time dedicated to chatting is predicted by southern residence (also by younger age, lower education, lack of family bonding ties, Internet civic self-confidence and internal trust). It also influences Internet self-confidence and the decrease in the number of regular contacts with family and friends, even though this last relationship is significant only at the 0.10 level. The decrease in regular contacts with family and friends due to the Internet use was also related to lack of Internet connections of family and friends. This is a confirmation of the idea that the first dimension of the digital divide (the differential Internet connectedness of people) predicts the social consequences of Internet use.

These results may also help explain why the initial findings of Kraut *et al.*'s (1998) study on social isolation effects of the Internet didn't hold in their later research. Here there is empirical support for the interpretation that Lee and Zhu (2002) make of these contradictory results: social isolation effects may be transitory and due to the specific characteristics of the initial phases of Internet diffusion. However, instead of being motivated by the so-called initial "Internet-hype," as Lee and Zhu suggest, in Italy it seem driven by the first dimension of the digital divide: the differential technological access to Internet connections in the same social group, that is typical of the first phases of Internet diffusion. It seems more likely that the shift in social relationships occurs when there is a relevant difference, with regard to Internet connection, among members of the same family and the same friendship network. If people can't access their friends and parents through the Internet, they can access other people; they may change their social habits and this can influence negatively their offline social relationships. It is another type of "switching bonding" effect of the Internet, motivated by access constraints, not by intangible resource constraints. If it is so, it should fade away as soon as the adoption of the Internet spreads through society.

CONCLUSIONS

Consistent with the results of this study:

1. The Internet drives both bonding and bridging sociability phenomena; the use of the Internet, and the use of different communication environments on the Internet, may affect social networks and social capital. Using new communication technologies, people change the amount and the nature of relationships with their family and friends, and also with people not belonging to their local communities.
2. The different Internet sociability effects can be explained by considering the interplay between access, social capital, culture, and Internet social trust. The original social network, culture, beliefs and trust influence the way people use the Internet and nurture their relationships (old and new, close and distant, similar and diverse) through the new digital network. This supports the hypotheses that trust is built in a complex dynamic and that offline sociability and online sociability are not alternatives but complementary social outcomes.
3. Internet sociability effects are constrained by technological and intangible resources (even if a direct link between time stress and sociability effects was not found in this study, the so-called switching bonding effect may suggest including time effects in this conclusion). New structures of social relationships in complex networks are adaptively created and changed, shifting dynamically the sources of engagement (and social variance), adjusting to changes in relationship costs and resources (access, cognitive and trust costs)
4. The impact of these social adaptations is not unidirectional. There may be both positive and negative sociability effects (an increase or decrease of regular social relationships), which can be better explained by looking not only at the instrumental level of social cooperation (the reasons why people use collaborative environments on the Internet) but also at the cultural specificity and evolution of individuals and local communities.

Thus, there seems to be a “virtuous circle” driving the creation of cooperation and new social capital in complex social networks—which describes the adaptive interplay among the stock of social, technological and cognitive resources with civic engagement, and which may also explain culturally-influenced Internet social effects.

However, this virtuous circle can become vicious, when there is a gap or an instrumental/economic imbalance of social, technological, and cognitive resources at the individual relationship level. Also this phenomenon is

evolutionary and is not based only on rationalistic expectations, in that values and local culture play a significant role.

Internet users, as all citizens, have access to a new environment for socializing and cooperation. Confirming its mass media social function (Morris and Ogan 1995), the Internet is not neutral: it opens new, plural, parallel and also conflictual social possible designs of individual and system-level life, because it changes the potential "structures" of interpretations of the world and cooperative activities. It changes the "transaction costs" of relationships (the instrumental and noninstrumental costs for social encounters on the complex interconnected network), and it influences the stock of one's social and cognitive resources. The outcome is neither simple nor unidirectional, contrary to what was promised by the information symmetry hypothesis of Internet diffusion.

Continued study of deeper changes in communication patterns and virtual community development can help one better comprehend the dynamics of these impacts on the quality of social life. Ethnographic research is needed (as suggested by Norris 2002), along with research on cognitive and social mediation of complexity in evolutionary social networks. As Maturana (1997) puts it,

It is not information that constitutes the reality that we live. The reality that we live arises instant after instant through the configuration of emotions that we live, and which we conserve with our living instant after instant.

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APPENDIX A

SURVEY QUESTIONS AND OPERATIONALIZATIONS

Southern local culture

Area of residence

1. North west
2. North east
3. Center
4. South
5. Islands

Technological literacy scale:

1. How long have you been using the Internet? (number of years)
2. How often do you use the Internet?
0 = less often
1 = at least once a week
2 = at least once a day
3 = more than once a day
3. In a scale from 1 to 10 evaluate your computer skills

Number of friends

I have many friends. (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree.)

Lack of Internet connection of family members and friends

How many friends and family members can you reach through the email?

1. many
2. only few
3. none

Internet civic self-confidence

Using the Internet people like me have better opportunities for speaking out about public policy issues. (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree).

Chat use

How long (minutes, hours) do you chat in a typical week?

Email use

How long (minutes, hours) do you use the email in a typical week?

Community use

Do you participate to virtual communities? Yes, no

Increase and decrease in regular contacts

- a. Did the use of the Internet increase or decrease your regular contacts with your friends and family members? (Please answer in a scale from 1 to 5, where 1 means highly increased and 5 means highly decreased. The variable was recoded and made dichotomous, as below).
- b. Did the use of the Internet increase or decrease your regular contacts with people who share your hobbies?
- c. Did the use of the Internet increase or decrease your regular contacts with people who share your political interests?
- d. Does the use of the Internet increase or decrease your regular contacts with people who share your religious interests?
- e. Does the use of the Internet increase or decrease your regular contacts with people who share your professional interests?

Internal trust

It is easier to meet people online than in person. (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree).

Internet regular contacts

The Internet has increased the number of people with whom I have regular contacts. (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree).

Made friends online and click & face friends

Did you ever make friends online?

1. yes, and after I met those friends offline
2. yes, but I never met them offline
3. no (*recoded as a dichotomous variable: made friends online*)

External trust (trust in the environment - scale with the following items)

1. On a scale from 1 to 5 could you please evaluate the plurality of the following information media online?
 - virtual communities
2. On a scale from 1 to 5 could you please evaluate the independence of the following information media online?
 - virtual communities
3. On a scale from 1 to 5 could you please evaluate the reliability of the following information media online?
 - virtual communities

Alienation (scale with the following items)

1. My life could be happier than it is now (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree, as below).
2. Most of what I do is boring.
3. I feel I am isolated.

Time stress:

On this list, what would make you happiest? (Choose 3):

1. have fun
2. make more money
3. more time
4. less work
5. be independent
6. less boring work
7. live in a beautiful place
8. be safe (me and my family)
9. feel I am important
10. more happiness and love in my family
11. more friends
12. be able to help other people
13. DK

Family bonding scale:

1. My family agrees with my decisions and style of life. (Please answer in a scale from 1 to 5, where 1 means totally disagree and 5 totally agree., as below)
2. I am satisfied about how long my family pass together.
3. I am satisfied about how my family members help me when I have problems.
4. I am satisfied about how my family members discuss with me our common problems and try to find solutions.
5. I am satisfied about how in my family we manage affect and emotions (positive and negative).

Value priorities

A set of four value priorities, according to the classification of values proposed in social sciences by Inglehart (1973) and already used in research for studying the role of values in media agenda setting processes . The final variables are the recoding of the answers to the following questions:

How important is it for you?:

1. opening your mind and improving your intelligence (value 1 scale, individual freedom)
2. be sure that there is freedom of expression (value 1 scale, individual freedom)
3. protecting the environment (value 2 scale, solidarity)
4. discussing about social and political matters (value 2 scale, solidarity)
5. volunteering and charity (value 2 scale, solidarity)
6. interest for individual health (value 3, safety)
7. importance of making a lot of money (value 4, economic interest)

APPENDIX B
STATISTICAL RESULTS**TABLE 1: MULTIVARIATE REGRESSIONS ON DEPENDENT VARIABLES REGARDING
THE INCREASE IN THE NUMBER OF REGULAR CONTACTS WITH DIFFERENT KINDS OF PEOPLE,
DUE TO THE USE OF THE INTERNET**

Independent Variables	family & friends		people with the same political interests		people with the same religious interests		people with the same hobbies		people with the same professional interests	
	<i>Beta</i>	<i>T test sig.</i>	<i>Beta</i>	<i>T test sig.</i>	<i>Beta</i>	<i>T test sig.</i>	<i>Beta</i>	<i>T test sig.</i>	<i>Beta</i>	<i>T test sig.</i>
Age										
Education								0.14	0.02	
Family income										
Gender female										
Southern local culture								-0.11	0.08	
Alienation										
Time stress										
Chat use							0.15	0.04		
Email use									0.22	0.00
Virtual community use	0.13	0.05								
Decreased family & friend contacts										
Decreased political contacts	0.17	0.01								
Decreased professional contacts										
Decreased hobby contacts					0.16	0.01				
Decreased religious contacts			0.17	0.01			0.16	0.02		

TABLE 2: MULTIVARIATE REGRESSIONS ON FINAL AND INTERMEDIATE DEPENDENT VARIABLES IN A PATH ANALYSIS SCHEME

Independent Variables	Dependent Variables																				
	Increased the number of regular social contacts		Increased the number of regular contacts with friends and family		Decreased the number of regular contacts with friends and family		Made friends online		Chat use		Email use		Virtual community use		Internal trust		External trust		Internet civic self-confidence		
	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	Beta	T test sig.	
Age							-0.26	0.00	-0.11	0.09			-0.18	0.04			-0.17	0.01	-0.10	0.10	
Education									-0.14	0.02					-0.12	0.04					
Family income													-0.11	0.06							
Gender female							-0.09	0.08	0.14	0.02							-0.12	0.06			
Southern local culture					0.11	0.09			0.15	0.01									0.25	0.00	
Number of friends									0.11	0.08					-0.11	0.08			-0.12	0.04	
Family bonding			0.13	0.04									-0.11	0.09							
Value: freedom																					
Value: solidarity	0.10	0.09																		0.18	0.01
Value: safety																					
Value: econom. interest	-0.11	0.06																			
Technological literacy											0.32	0.00									
Lack of Internet connection by friends & family	-0.20	0.05	-0.23	0.00	0.21	0.00			-0.15	0.01											
Alienation															0.19	0.00					
Time stress																					
Self-confidence	0.16	0.00							0.11	0.08					0.17	0.01	0.13	0.03			
External trust														0.17	0.00						
Internal trust	0.13	0.01					0.10	0.05	0.16	0.01			0.22	0.00							
Chat use	0.13	0.05					0.34	0.00													
Email use	0.15	0.02																			
Virtual community use	0.11	0.09	0.15	0.28			0.20	0.00													