

Towards a Sociological Theory of the Mobile Phone

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1. The innovative potential of cell phone technology in an evolutionary perspective

Since its inception billions of years ago, the evolution of life on earth has been shaped by two highly consistent physical constraints:

- 1) *Physical proximity* was always a precondition for organisms to initiate and maintain continuing interactive relations;
- 2) *Stable dwelling places* were necessary for the development of more complex forms of communication and cooperation.

The *first* of these conditions implies that the diversification of living forms and behavior takes place mainly as a differentiation within physical space. In operational terms, this means that tight correlations exist between spatial location and the prevalence of particular ecosystems, species and breeds. On the human level, this is reflected in racial, ethnic-linguistic and many other differences along geographical lines - as well as in the high salience of face-to-face gatherings for the maintenance of social collectivities and institutions and for the satisfaction of (physiological and psychological) individual needs.

The *second* constraint can be easily substantiated by the empirical regularity that more advanced levels of interdependence and organization are only found among organisms that co-exist for longer periods at the same physical locations. Of course, widespread interaction also occurs within moving herds of antelopes, swarms of birds or schools of fish, but they tend to result in rather simple segmentary structures - not to be compared with the elaborated societies realized by stationary bees, ants or primate apes. On the level of human societies, the same regularity can be convincingly demonstrated by comparing nomadic and sedentary populations. Evidently, the increasing stability of settlements made possible by horticulture in the Neolithic period created favourable conditions for the emergence of more complex organizational structures and differentiated occupational roles, and the evolution of sedentary farming patterns in irrigated valleys (Egypt, Mesopotamia, India) was certainly a precondition for the emergence of higher-level civilizations (Lenski/Nolan/Lenski 1995; Coulborn 1959).

In more recent times, the crucial importance of tightly organized factories and densely populated urban areas for the development of industrialized societies has again demonstrated that the achievement of higher levels of societal complexity (and economic production) is still based the physical proximity of many human individuals in very stable locations.

The restraining effects of these two physical factors seem to increase in the course of biological and socio-cultural evolution, because they collide more and more with some other outcomes of this same evolution: the *increase of spatial mobility* on the one hand and the *growing capacities for communication* on the other.

Thus, animals are much more affected than plants, because they can communicate among each other, and because the need to be physically near and stationary clashes with another most valuable capacity for survival and active adaptation: locomotion. In fact, the functional significance of locomotion is much degraded by the fact that

- a) *while moving*, communicative potentials are minimized or even totally suspended,
- b) *as a result of bodily movement*, spatial distances are created which are incompatible with the maintenance of communicative relations.

As a consequence of this serious dilemma, painful compromises have to be made, for example by ensuring that

- whole collectivities move together, so that intragroup communication can be maintained,
- communication has to be limited to the rather rare occasions when populations are densely aggregated at specific locations;
- communication codes have to be standardized and messages simplified in a way to be compatible with conditions of movement and/or wide and variable spatial dispersion.

On the human level, such incompatibilities are amplified insofar as in comparison to animals:

- a) communicative potentials (mainly based on verbal language) are incredibly high;
- b) spatial dispersion has been facilitated by highly generalized capacities for ecological adaptation (so that since the Palaeolithic period, humans have spread out thinly over almost the whole globe);
- c) advanced technical means of transportation amplify locomotion: so that the constraining effects of mobility on communication and interaction are more painfully felt.

Thus, while the increase in population density has certainly facilitated primary interpersonal communications (by furthering spatial proximities), increments in locomotion have again reduced it, because whenever individuals are walking on streets, driving on roads, cruising on ships or flying in planes, they are trapped in public traffic orders characterized by highly restricted and standardized codes of communication. (Goffman 1971).

Evidently, the unavailability of translocal communication has not prevented human beings from establishing interpersonal bonds of solidarity and cooperation between geographically distant local groups (e.g. by exogamy). And more advanced cultures have a manifold of "alocal" social components based on personal membership rather than on territorial factors (e.g. sodalities, tribes, ethnic groupings, feudal elites, professions or religious movements). However, the interaction and internal development of all these translocal aggregations could not be based on the primary medium on which all social life is based: ongoing interpersonal interaction. It had instead to be based on two other foundations: either on the *highly internalized psychological dispositions* of their participants (e.g. subjective faith or feelings of love, belongingness or identification), or on *highly externalized material objects or written documentations* (e.g. emblems of worship or legally binding membership declarations) (see: Geser 1996: chapter 3).

In modern societies individuals are highly accustomed to leading lives characterized by constant painful discrepancies between spatial and social distance. On the one hand, they have to tolerate extreme spatial proximity with masses of totally indifferent others (e.g. in crowded cities, stores and buses); and on the other hand, they have to accept extreme spatial distance to their most significant partners: e. g. the loved ones at home or their most congenial, but distant professional colleagues.

Certainly, the landline phone has eliminated the prerequisite of physical proximity, but on the other hand it has preserved (or even reinforced) the need to stay at specific places. While there are conditions under which individuals on the move are at least able to continue face-to-face interaction (e.g. by sitting in the same train compartment), they have to remain at home or at the office in order to be reached by remote callers.

Thus, the main function of fixed telephones was to reinforce the social integration of stable sedentary settings like cities or bureaucratic organizations: helping them to grow into dimensions far beyond the integrative of potential of primary social interactions:

"Telephone is a key element in the building of corporate empires. Apart from easing the violation of laws and the realisation of exchanges without leaving traces (Aronson, 1977: 32), it permits the physical separation of the offices from the factories, allowing the managers to keep the control of the production. Therefore, the telephone plays a role in the urban concentration of financial and business activities. The telephone helped in the development of larger metropolitan systems with a more diversified and complex structure it is also a central element in the work organisation and communication inside the skyscrapers, the symbols of corporate capitalism that arose at the beginning of the 20th century." (Lasen 2002a: 20;26).

Wireless transmission technologies are certainly at the root of all innovations that make communication compatible with spatial mobility. Remarkably, this portability was first realized for receiving-only devices, while transmission technologies (e.g. radio or TV stations) have remained stationary and under the control of very few elitist actors (especially economic enterprises or governmental regimes).

Seen in this very broad evolutionary perspective, the significance of the mobile phone lies in empowering people to engage in communication, which is at the same time free from the constraints of physical proximity and spatial immobility.¹

¹ The potential to remain in contact while moving is still highly restricted, insofar as traffic conditions demand high attention. The lower phone use in the United States may well be explained by the fact that most Americans move

As it responds to such deeply ingrained and universal social needs, it is no surprise to see the mobile phone expanding worldwide at breath-taking speed. In fact, there are reasons to assume that it would have been equally welcome in all human societies and cultures in the past: that is, under all imaginable specific cultural or socio-economic conditions.

At the same time, however, this emancipation from physical constraints has to be paid for (1) with an almost exclusive limitation to bilateral contacts, and (2) with increased uncertainties about the current subjective states and environmental conditions of the contacted partners.

2. The Expansion of cell phone usage as a multidimensional challenge for sociological theory and research

Since its inception in the late 19th century until recent years, the telephone has received very meagre attention from sociology and the media sciences (Lasen 2002a: 31). In particular, no considerable efforts have been made to gain a synopsis of its multifaceted impacts on various fields of social life, and no integrated theory has evolved concerning the specific functions and consequences of phone communication (vis-à-vis face-to-face interaction, on the one hand, and written communication on the other). This deficit only illustrates the larger tendency to ignore the impact of technologies on the unspectacular aspects of everyday life. Even Erving Goffman, while focusing completely on everyday life, has almost ignored the telephone: portraying the life of modern individuals in an old-fashioned way as a sequence of face-to-face-encounters (Katz/Aakhus 2002:3/10).

Evidently, the cell phone seems to evoke much less intellectual enthusiasm and scientific research endeavours than the World Wide Web. In the theoretical perspective of Manuel Castells (1996), for instance, only the Internet is given the status of a Mega-Innovation that really counts, while mobile communication facilities are almost totally neglected. Such views ignore the basic facts that in comparison with PC's and Net technologies, cell phones are used nowadays by broader strata of the population all over the world, and that for many users, they have stronger impacts on social life², so that most of them are ready to spend much larger sums of money on monthly phone bills than on Internet provider services.

"The advent of inexpensive mass-produced mobile communications in particular, has avoided scholarly attention, perhaps because it seems pedestrian compared to the nebulous depths of cyberspace. Yet the cellular telephone, merely the first wave of an imminent invasion of portable digital communications tools to come, will undoubtedly lead to fundamental transformations in individuals' perceptions of self and the world, and consequently the way they collectively construct that world." (Townsend 2000).

Due to the rapid increase in cell phone technology, the total number of phones worldwide has for the first time surpassed the number of TV-Sets in 2001. (Katz/Aakhus 2002:4).

This diffusion has occurred worldwide, rather independently of different cultural habits, values and norms. Thus, cell phones have become popular even in rather "technophobic contexts like Italy, where computers and other modern technologies have a difficult stand (Fortunati 53), and especially in Scandinavian countries where people traditionally are introverted and silence in talk is highly valued (Puro 2002).

by driving cars, while Europeans (and even more Japanese) tend to use buses and trains for commuting. Especially when riding on trains for longer spans of time, individuals are quite free (and motivated) to use various new technologies for filling out their time: Thus, Lasen observes that "Mobile phone use gives new meanings to dead times and transitional spaces allowing escape from boredom. Texting seems to be one of the main activities of commuters in and around London when waiting on platforms." (Lasen, 2002b: 27/30).

2 In an Irish study where young respondents were asked what kind of technological gadget they would prefer when stranded on an isolated island, 52 voted for the mobile phone and only 18% for the TV. (Hession 2001).

One major impact of the cell phone stems from its capacity to include partly illiterate mass populations in less developed countries in the southern hemisphere, who will never have the means to buy a computer and who hitherto were not even connected to the traditional networks of landline phones (Townsend 2000).

A recent empirical study by the International Telecommunication Union provides striking evidence of how the cell phone has contributed to narrowing the century-old gap in telephone usage between highly developed and less developed countries. It shows that in 2001 about 100 nations (among them many African) had more mobile than landline phones in service and that cell phone technology is far more potent than computer technology in connecting less privileged populations to the sphere of digitalized information. (World Telecommunication Development Report 2002).

Within the sphere of developed countries, the geographical diffusion and evolution of cell phone technology contrasts sharply with the habitual patterns reigning in most other technological branches. Thus, *"Japan is typically a year and a half ahead of Europe in wireless adoption, and Europe is again a year and a half or so ahead of the U.S."* (Harrow 2000).

There is wide agreement that hand-held phone sets can substitute stationary PC's or mobile laptops to a considerable degree, because they are in the course of becoming multimedia devices able to transport voice, text messages, pictures, musical sound, software programs and anything else coded in digital format.³

More than that, these multimedia functionalities are combined with significantly reduced size, weight, energy needs and buying prices, as well as by a much simpler, user-friendlier interface, which makes it possible to be used by younger children, illiterate or handicapped people and other marginal population segments not able to come to terms with MS Office and W2K.

These tendencies toward lower thresholds of access are all the more remarkable when it is considered that, during the first hundred years of its history, the phone was a rather exclusive means of communication, which was not readily accessible to lower classes, women, farmers and younger age groups. In America, as well as in Europe, this restrictive usage was mainly caused by the public or private monopolies, which succeeded in maintaining prohibitively high prices, especially for longer-distance calls (Roos 1993).

In its early stages the cell phone was an even more elitist device, which was mainly used by middle- and higher-class males for instrumental (especially professional) purposes (Roos 1993). As late as 1996 European surveys showed that less than 14% of users reported using their mobile for private, intimate conversation (Fortunati 2002: 51).

But under the combined influence of technological progress on the one hand and economic deregulation on the other, the prices for landline phone calls have dramatically diminished, becoming almost independent of geographical distance, and the cell phone has become one of the most ubiquitous communicative devices. Thus, it is projected that as soon as 2005 the total number of cell phones in use worldwide will be higher than the number of computers or TV sets (Smith 2000).

The history of the telephone vividly illustrates the large role of unintended and completely nonanticipated adoption patterns in the diffusion of modern technologies: The traditional phone as well as the modern cell phone have mainly been designed for business and professional purposes, but in the first case, the largest user segment were rural women using the new technology for gossiping, while today, the industry relies heavily on adolescents exchanging SMS as well as audio messages (Lasen 2001a: 7;24).

Likewise, history shows that communication technologies are typically highly polyvalent tools that can change their major functions completely during time. Thus, the phone was originally primarily used as a broadcasting device, not as a medium of bilateral communication:

³ On the other hand, empirical studies show that email and phone are considered as media with completely different functions. Even intensive email contact does not lead to a reduction of aural communication. One reason is that voice contacts have more capacity to articulate personal emotions - which explains the high relevance of phone contacts with absent family members (Sawhney / Gomez 2000).

"At the end of the 19th century the telephone was a carrier of point-to-point messages to individuals, and a medium of multiple address for public occasions: concerts, theatre, sports, church services and political campaigns. This use as a means of entertainment and broadcasting of news was one of the main uses of the device till the end of the 19th century. The broadcasting of news was both professional and improvised. Telephone companies transmitted weather reports and even informed their subscribers of the entry of the United States into the war against Spain in Cuba in 1898." (Lasen 2002a: 6).

After 1920, telephones have been used almost exclusively for bilateral talking: until these years where the arrival of the WAP and 3G-phone sets again the stage for using the phone as a broadcasting tool: e.g. for a very rapid, wide and cheap distribution of public information. (Lasen 2002a: 6).

As they are used literally by everybody, cell phones create a new aspect in which all human beings are equal, i.e. irrespective of age, gender, cultural background, wealth, income or hierarchical position. For instance, Norwegian studies show that cell phones are equally adopted by both genders and by kids from all social backgrounds, and that penetration of younger age cohorts is nearly complete. (Puro/2002: 20/21).⁴

Thus, the cell phone is a technology with highly generalized integrative functions: By leveling, for instance, differences between boys and girls, cell phones differ from most other technologies (e.g. motorcycles) which tend to accentuate rather than to minimize differences between genders, and by being adopted irrespective of education and family background, the cell phone bridges at least some gaps between different social classes.

Nevertheless, while the *possession* of cell phones may become ubiquitous and homogeneous over all population segments (so that their value as status symbols disappears), cell phones may still accentuate social inequalities insofar as their *factual usage* patterns are tightly correlated with the various purposes of social actions, as well as with different situations, social relationships and social roles.

On the *theoretical* level, this situation calls for the development of highly elaborated analytical concepts and typologies suited for grasping the major differences in usage patterns, as well as the various symbolic meanings attributed to mobile phones, messages and users; on the *methodological* level, it implies the need for survey studies, as well as ethnographic approaches, for assessing such variables empirically in quantitative as well as qualitative ways.^[4]

In a quantitative perspective, the simple concept "amount of cell phone usage" results in a multidimensional construct unfolding on at least three independent axes:

- 1) **Usage intensity:** which refers to *"how often the product is used (usage time) regardless of the different applications for which the product is used."* (Ram/Jung 1990: 68)
- 2) **Usage breadth:** referring to the number of partners to whom calls are directed and from whom calls are received.
- 3) **Usage variety,** measuring the *"different applications for which a product is used or the different situations in which a product is used, regardless of how frequently it is used."* (Ram and Jung 1990, p. 68).

In sharp contrast to PC's, TV-Sets and most other electronic equipment, cell phones lend themselves to "personalization": e.g. by choosing individual colours, ring tones, display images etc. In particular, they support gender-related identity profiles: by giving rise to a technology-centered "hard style usage" typical for males and a female "soft style" adaptation where aesthetic and interactional features are emphasized (Skog 2002: 255ff.).

As the empirical evidence hitherto gathered by systematic quantitative studies is rather limited (and of questionable relevance for the - even short-term - future), theory building at the moment has to rely heavily on the much more numerous studies based on qualitative (mostly ethnographic) methods, and

⁴ Given the very rapid ubiquitous diffusion of cell phones, they have lost almost completely their capacity to be used as "status symbols". To the contrary, highly educated individuals characterized by high self-esteem and controlling large amounts of "cultural capital" tend to make less use of it than members of the working class (Skog 2002: 267ff.).

even more on impressionistic essays which provide plausible hypothesis (often anchored exclusively in suggestive anecdotal illustrations).

Nevertheless, a preliminary synthesis of this amorphous material seems fruitful in order to develop more generalized theoretical argumentations and hypotheses to be tested in future empirical research.

As in the case of other current technologies which rather widen then constrain the range of alternative options, the cell phone also cannot be seen primarily as a factor of causal determination, but rather as tool providing a set of specific functional capacities which may be more, less or not at all exploited under various socio-cultural or psychological conditions.

Thus, theory-building has to focus not primarily on "causal impacts" or "determinate consequences" of cell phone usage, but more generally on its "implications": i.e. its specific functional capacities to facilitate or inhibit various modes of social behavior, interactions and relationships, and to create new environmental conditions under which conventional social systems have to operate.

In the following, a few of these implications on the following levels are addressed:

- 1) on the individual as a self-guided actor,
- 2) on interindividual fields of interaction,
- 3) on face-to-face gatherings,
- 4) on groups and organizations,
- 5) on interorganizational systems and societal institutions.

3. Implications for human individuals

3.1 The immanent functional expansion of phone usages

Many studies show that cell phone usage is subject to functional expansion, because users gradually change habits and learn to apply the new technology for a growing variety of purposes and in a widening range of situations. In their diachronic study of 19 new cell phone users, for instance, Palen/Salzman and Youngs (2001) have found that subjects typically start with rather narrow conceptions of why they need a mobile, but then considerably enlarge the range of uses with evolving time.

Typically, there seem to be broad trends towards expanding usage from mere emergency to routine cases and from specific instrumental to more diffuse expressive communications.

As a primary motive for adopting a cell phone, most individuals refer to instrumental functions: e.g. the possibility of getting reassuring information about the well-being of loved-ones, or the chance to call for help in emergency cases (e.g. street accidents) (Ling/Yttri 1999; Palen/Salzman/Youngs 2001).

In particular, many initial users imagine they will use the phone only in special non-routine situations, not as a ubiquitous instrument in their daily life.

In the course of time, however, typical changes in cell phone usage can be observed:

- 1) More and more, mobiles invade daily routine behavior of all kinds. *"The adoption, in its most basic form, is to solve a specific problem, i.e. security in the case of accidents. In this situation the interaction is directed towards the intimate sphere and perhaps the representatives of institutions such as emergency services. As the use and ownership becomes more routine it goes over to various types of coordination. In this way, the table describes the embedding of the technology in everyday situations. There is the movement from the extraordinary and unexpected to the expected and the mundane. (Ling/Yttri 1999).*
- 2) There is an increase in "grooming calls" which have primarily (or even exclusively) a non-instrumental, socio-emotional function: e.g. showing concern, solidarity and commitment, and

articulating nearness, compassion, sympathy and love (Palen/Salzman/Youngs 2001).⁵
"Short, frequent informative calls may strengthen the formation and maintenance of deep bonds, not because of their content but because of the reassurance they bring and the amount of trust they create or reinforce. In the example quoted above, being able to call her husband and have him tell her where he is brought a sense of security and trust to the woman." (Licoppe/Heurtin 2002: 106)

In a general way, it is very common that users are unable to anticipate their own future usage patterns correctly.

The spread of the landline telephone at the end of the 19th century has followed quite similar patterns. Thus, Fischer found that the initial adoption of landline telephony was mainly justified by instrumental (safety- and business-related) reasons, not by any social uses. However, the telephone was widely used for purposes of sociability as early as 1910 (Fischer 1992). Nevertheless, the positive-integrative nature of many cell phone calls differs sharply from the traditional use of fixed phones, where most calls are still based on the motive that some unsolved problems have to be discussed, an unpredicted change in schedule has to be announced or some crucial, maybe even disastrous, information to be communicated (Goldensohn 2000).

Given the ubiquitous availability of the cell phones for sending and receiving calls, it can be expected that its impact will make phone conversation more similar to offline face-to-face communication, where highly expressive gestures and "grooming talks" are very common: communication not primarily aiming at conveying specific information or inducing recipients to specific actions, but just for the purposes of expressing affection and confirming that the relationships exists and will continue in the future.

"... the mobile clearly enables additional communication that we might not have made before (as does e-mail) - for example, phatic calls where the point is not so much the message but the gesture of getting in touch." (Haddon 2000).

To receive a call may in itself be considered to be a sign that one has not fallen into complete oblivion, regardless of what is actually communicated (Stuedahl 1999; Licoppe/Heurtin 2002: 106).

"Many ring just for contact which suggests that phone calls are a powerful reminder of connectedness. This was reflected in the disappointment people express when they have no messages on their answering machines, as this means no one wanted to talk to them, or wanted to be called back." (Cox/Leonard 1990)

Thus, much cell phone talk is neatly embedded in encompassing communication processes which include face-to-face talk, phone calls, SMS, email and maybe other channels at different points of time.

3.2 Accentuated differences between socially integrated and socially marginal individuals

Under traditional no-tech conditions, the difference between socially integrated and socially isolated individuals is levelled by the fact that even very highly integrated individuals are "lonely" during certain times: e.g. when they are on the move or physically distant from their kin and friends.

Today, mobile phones allow these well-integrated people to display their social contacts even under such conditions of mobility and absence: standing thus out against socially isolated, marginal individuals at all times and places.

In other words, mobile phones amplify pre-existing differences in social participation and integration, rather than attenuating them (Puro 2002: 28).

⁵ The regularity that mobile phone usage spreads to an ever wider range of functions holds especially for women, who normally use the phone sets for all kinds of social purposes, for keeping in touch with kids, friends and family members (Kopomaa. 2000), and for purposes of security and care (Puro 2002).

The reason why so much cell phone activity goes on in public may well stem from the symbolic status display functions associated with the availability and actual usage of this new technology: "status" not in the sense of higher wealth or education, but in terms of intense social integration:

"If you are without a mobile phones it means that no one depends on you for urgent direction, and no one needs to get in touch with you at all times. It means you are not cutting deals, giving orders; in short, not get-ting around all that much." (Bautsch et. al. 2001)

3.3 The emancipation from local settings

Long before the invention of mobile phones, books, radios, TV sets, VCR's, computers and other gadgets opened the way for individuals to free themselves (functionally as well as psychologically) from their immediate social surroundings by empowering them to fulfil many material and psychological needs without relating to any others in their vicinity.

Reading a book, for instance, implies that one is absorbed by thoughts and feelings normally not shared by other individuals currently present in the same room, building or community, thus reducing the capacity to relate to the others by living through common experiences or by finding common topics of discussion (Gergen 2002: 227ff.).

Likewise, people in urban settings can more easily evade any interaction with surrounding strangers. Reading a newspaper, using a walkman with a headset and also engaging in telephone calls are all visible activities which can be used to communicate to bystanders: "I'm not currently available for any approach or talk".

As "symbolic bodyguards" (Lasen 2002b:27), mobile phones also contribute to the strategy of individuals to defend a minimal private space and the right to enjoy "civil inattention"⁶ within areas densely populated with - potentially intruding and irritating - unknown strangers (Haddon 2000; Cooper 2000). As Goffman has remarked, women especially often don't like to show themselves alone in public places, because this may indicate that they are without relationship: a condition which (1) provides a bad impression of their social status and (2) leaves them in an unprotected situation which is often exploited by foreign males. For mitigating these consequences, the cell phone is quite useful, because it can carry the message: I'm physically alone, but not isolate and alone, because I'm still embedded in my social setting. (Plant 2000).

"... in our fieldwork observation studies we found lone females increasingly using the mobile itself as a form of 'protection' from the potentially threatening world around them. Women on their own in cafes and bars and on trains now use their mobiles as 'barrier' signals in the way that they used to hold up a newspaper or magazine to indicate to predatory males or other intruders that they were unavailable. The idea of one's social support network of friends and family being somehow 'in' the mobile phone means that even just touching or holding the phone gives a sense of being protected - and sends a signal to others that one is not alone and vulnerable." (Fox 2001)

Compared with reading newspapers or listening to Walkman music, however, using mobile phones is a rather "offensive" way of disengagement, insofar as one's own conversations are apt to disturb the privacy of others nearby, especially under conditions where these others have no freedom to withdraw (e.g. in restaurants or buses).

Among colloclal interaction partners, answering cell phone calls can signal that they are not significant enough to deserve exclusive attention, or that the meeting is not considered important enough to shield oneself from incoming calls, and that EGO has far more important acquaintances and role duties.

„Several Birmingham entrepreneurs say they use their mobiles as means of deliberately absent-ing themselves from their present environments and so keeping other people at bay: 'If I arrive at a meeting where I don't know anyone, I play for time and composure by doing things with my

⁶ For a discussion of this concept, see Goffman, E. 1963: 83ff.

mobile.' This sends out other messages to the room as well: it says that one is busy and not to be disturbed, and temporarily extends one's personal space." (Plant 2000:62).

On the other hand, switching off the cell phone is a new way to show deference to present partners or to articulate the "dignity of the occasion".⁷

One implication of this is that people may be more prone to tolerate the physical nearness of people with whom they have no (or negative) relationships, because the salience of such strains is reduced by the ever-present opportunity of "virtual emigration".

This function is especially crucial for individuals disposed to cultivating dense networks of social interaction systematically incongruent with their current spatial locations. For instance, adolescents are especially prone to using the phone in all human cultures, because they are in the course of generating ever more extensive networks of acquaintances that transcend the boundaries of the family within which they have been born and raised.

"In contemporary society, the peer group gains significance during adolescence. It is during this period of life that friends are most central to the individual. Previous to this point, one's parents are in focus and later on, one's partner and children gain a central role." (Ling/Yttri 1999).

On a methodological level, it has to be concluded that the cell phone lowers the degree to which any causal relationships between spatial allocation and social relationships can be expected. For instance: to see 3000 scientists participating in a big congress may not tell us anything about the probability and prevalence of mutual interaction among them, because most of them may be absorbed by phone calls most of the time. Or observing five million people migrating to a huge city may not allow any conclusions about the likely emergence of any kind of "urban mentality" and "urban culture", when it is known that most of these new inhabitants remain firmly embedded in their original ethnic setting by daily phone contact with their relatives left behind in rural regions.

3.4 Opportunities for complexity avoidance and regressive social insulation

Despite its technical capacity to make each individual immediately accessible to each other, the land-line phone has nevertheless contributed to strengthen the ties among people already familiar to each other (e. g. in the neighbourhood or community), while its contribution to larger social networking has been rather modest.

Thus, it functioned as a "conservative" device counteracting the effect of mass media to expose individuals to highly distant events, persons and spheres of social life

"... people used the telephone to increase local ties much more than extralocal ones. Phone calling strengthened localities against homogenising cultural forces, such as movies and radio." (Lasen 2002a: 25)

Cell phones can even better be used to shield oneself from wider surroundings by escaping into the narrower realm of highly familiar, predictable and self-controlled social relationships with close kin or friends (Fortunati 2000).

Such tendencies are supported by the fact that in contrast to fixed phone numbers, which are usually publicized in phone books, cell phone numbers are usually only communicated to a narrow circle of self-chosen friends and acquaintances, so that no calls from unpredictable new sources (including insurance agents, telephone survey institutions etc.) have to be feared.

"Where one had spontaneous and random interaction with a broad spectrum of individuals through the day, there are indications that, as Calhoun notes, we seem to be moving into a society where the social net is cast further afield but to a more similar set of individuals." (Ling 2000c).

Thus, mobile phones may support tendencies towards closure rather than tendencies to open up to new acquaintances. This function is highlighted by the empirical regularity that in Finland, owners of

⁷ This is equivalent with saying that the use of cell phones will be strongly governed by institutional and cultural norms, which are still anchored also in modern Western societies. In a survey by SBC Communications, for instance, 98 percent of respondents found it inappropriate to use a mobile phone at a funeral, 86 percent say phones should not be used in a restaurant, and 96 percent are against its use in a theatre (Terrell/Hammel, 1999).

mobile phones are most frequent among members of two or three-person households (Puro 2002: 20), not among singles, and that in Italy, usage is highest among individuals who maintain close contacts with their kin (Fortunati 2002: 56). Such empirical regularities strongly suggests that mobile phones are very often used to strengthen already existing intimate relationships, not to enlarge social interaction to wider circles.

"The possibility of choosing the kind of sociality we wish to express often leads us to create greater distances or anyway of not creating closeness with strangers or partial strangers. The public space is no longer a full itinerary, lived in all its aspects, stimuli and prospects, but is kept in the background of an itinerant "cellular" intimacy. Thus, the possibility of a nomadic intimacy is achieved, but at the same time there is the refusal to discover and directly experience everything that the social space can offer. In this way, the aspects of predictability and uniformity of existence are emphasized." (Fortunati 2000).

As Fox vividly describes, the cell phone can function as a powerful tool for re-establishing the fluid, casual modes of informal communication typical for traditional communal life - thus counteracting the losses of communalistic social integration caused by traditional media as well as the depersonalizations of modern urban life.

"Our survey found that the main advantage of the mobile as a new medium for gossip, for most people, was what we jokingly called the 'Martini benefit' - the ability to gossip anytime, anyplace, anywhere. Landline telephones allowed us to communicate, but it was not the sort of frequent, easy, spontaneous, casual communication that would have characterised the small communities for which we are adapted by evolution, and in which most of us lived in pre-industrial times. Communication by landline telephone involved a certain amount of deliberate effort and planning: we could only talk at specific times and places. We had to wait to get home, hope the other person was at home, overcome tiredness and make a conscious effort to call, often in the presence of noisy children or demanding partners. There was no telephonic equivalent of the regular brief and breezy encounters in a village or small community, where frequent passing ensured that everyone felt connected to their social and support network. Mobile phones are re-creating the more natural, humane communication patterns of pre-industrial times: we are using space-age technology to return to stone-age gossip." (Fox 2001)

Evidently, the cell phone opens a way of perpetuating highly traditional communalistic relationships under modern conditions of high geographic mobility and dispersion.

"... this is for me the essential thing about mobile phones: they enable the type of (virtual) communication and interaction which characterizes premodernity: people who never move far, live in small towns and villages near each other, everybody knows where everybody is etc. But being virtual, this kind of communication is not any more bound to any single locality, as it was in the premodern times." (Roos 2001)

While the intrusion of strangers can be reduced, circles of established friendships can be deepened because a higher density of communication within such circles can be maintained - irrespective of time and place:

"The mobile phone means that for those who have come into our sphere of friendship we are always available. A short message can always be given. Location and activity can always be ascertained." (Ling 2000c).

In other words: the cell phone helps to stay permanently within the closed social field of familiar others: thus reinforcing a unified, coherent individual identity because the same personality traits and behavioral patterns can be acted out within a familiar communal setting:

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'. By the same token, brakes are placed on the concatenating tendency towards self-fragmentation and diffusion. With the cell phone, one's community of intimates more effectively sustains one's identity as a singular and coherent being. One is continuously, if sometimes painfully, reminded of one's place in the flux of social life. Cell phone technology not only favours a kind of parochialism, but also stands as a wedge against the kind of polyvocal participation required in an increasingly multicultural world." (Gergen 2002: 238/239(240)).

The dominance exerted by such communalistic ties is illustrated by the regularity that whenever a phone call occurs, it's the *casual relationship with bystanders* which is momentarily broken in favour of the intruding distant kin or friend. (Gergen 2002: 238).

In fact, call phones may make it easier for individuals to find themselves spatially very near to complete strangers (e.g. in daily in dense urban crowdings), because they provide them with a "virtual exit option" by just contacting their loved ones at home.

In other words: the cell phone gives rise to a new transspatial version of particularistic communalism: thus making the mobility enforced by modern urban living conditions compatible with the maintenance of rather primordial modes of social integration.

Given this affinity to "communalistic" social circles, the cell phone can well engender conflict in the case loyalties to competing circles are evoked, because in contrast to specific and universalistic commitments, diffuse and particularistic loyalties have a tendency toward mutual exclusion: one cannot be a member of different highly absorbing communities at the same time

Traditional space-bound communities have the advantage of being compatible with this exclusion principle because only one communal group is "here" at a specific time. By contrast, cell phones can become to bases of serious role conflicts and conflicting loyalties, whenever loyalties to two or more particularistic social settings exist: because these different social bonds can easily become salient at the same time and place. This is certainly the case for an adolescent who feels ambivalent about the call phone when peer group members and parents use it simultaneously for reinforcing their social controls.

"In the case of teenagers, somewhat ironically, the cellular phone or beeper is an important tool for deepening contact with the peer group, but the freedom it offers in building friendships becomes less attractive when a parent insists on using these devices for monitoring their child's whereabouts. Some teens have been known to turn in their beepers or phones due to the unexpectedly short leash they afforded between parents and themselves." (Bachen 2001)

As users can decide themselves to whom they make their phone numbers known, they possess a new means of controlling the access to their inner circle of "closer friends" and of symbolically expressing closeness or distance to specific acquaintances:

"One young woman described the ways in which she uses her phone to mediate familial power in the arrangement of potential marriage. If she likes the suitor she will give him her mobile number; otherwise, he will be confined to the (more) traditional and familial medium of the fixed-line telephone." (Plant 2000:72).

Given their capacity to retain primary social relationships over distance, the use of cell phones can well go along with regressive psychological tendencies: e.g. with the need to cushion the traumatic experiences in foreign environments by remaining tightly connected to the loved ones at home: Thus, the mobile can function as a "pacifier for adults" which reduces feelings of loneliness and unprotectedness at any place and any time.⁸

Another, similar metaphor conceptualizes the cell phone as an "umbilical cord", making social emancipation processes more gradual and less traumatic by allowing parents and children to retain a permanent channel of communication in times of spatial distance (Palen/Salzman/Youngs 2001).

Thus, when growing children increase their range of independent locomotion and increase their times of absence from home, the cell phone can help to cushion these emancipative processes, thereby making them more gradual and less traumatic by keeping children connected to their parents by a communicative link - however sporadically it may be used.⁹

As a consequence, individuals may well become less prone to develop certain "social competencies": e.g. to react adaptively to unpredictable encounters, to participate in conversations with unforeseen

⁸ See: Maira, Kalman: the president of M & Co (a Manhattan product and graphic design group) in: Louis 1999.

⁹ This is another illustration for the capacity of cell phones to transform dichotomous role switches into more gradual changes ("greying of the social world").

topics, to form a quick impression and judgment about newly met people, or to learn quickly how to behave conformably in new colloclal gatherings and groups.

"In reality, we are in a situation of communicative stalemate, as we continually lose the capacity for social negotiation." (Fortunati 2000).

Given the constant availability of external communication partners (as sources of opinion and advice), individuals may easily unlearn to rely upon their own judgment, memory and reflection: thus regressing to a state of infantile dependency from always the same narrow circle of "significant others" - even in cases where they are 10,000 miles away.

"In Chicago, a group of young intellectuals expressed the concern that such connectivity might even undermine people's self-reliance, making them unable to operate alone, and leaving them dependent on the mobile as a source of assistance and advice. Rarely stranded incommuni-cado, the person with a mobile is less exposed to the vagaries of chance, unlikely to be thrown onto resources of their own, or to encounter adventure, surprise, or the happiest of accidents. Some people interviewed in Tokyo felt that there was now less chance that time would be spent standing and staring at, for example, the cherry blossom, and more excuses to avoid being alone with one's thoughts and one's own inner resource." (Plant 2000: 62).

The same restraining impacts of cell phones on social environments become visible when they are seen as a new technological device for filling unoccupied stretches of time.

"In Japan, many people use their mobiles to while away the time they have so often gained by being early to avoid being late. Older ways of hima tsubushi, killing time, are losing out, and although books, comics and newspapers are still read by many of Tokyo's commuting millions, the space-saving keitai, so perfect for crowded platforms and trains, claims much of their time and attention." (Plant 2000)

Further studies will have to show whether such changes reduce the probability that individuals can be reached by information from the wider world (political news or commercial advertisements), because they are increasingly absorbed by communicating with their nearest friends.

Considering the high potential of cell phones to support rather segregated, self-controlled social networks, it is not astonishing that they can catalyze the emergence of subcultural segregations. Hitherto, such cleavages were mainly visible between age groups: with adults concentrating on voice calls, while young people embraced text mails characterized by group-specific linguistic habits and codes:

"Use differs from the use of adults. The use profile of the young differs from that of adults. Instead of voice functions (calls, voice mail) it is clearly centered around new, text-based messaging (short messages). The adolescents have embraced the possibilities offered by mobile communication in a very versatile way: new cultural meanings have established themselves around the phenomenon and their folklore (prank calls) and special terminology (text message conventions) do not necessarily open up to an outsider. The culture is partly invisible or hidden from adults." (Rautiainen 2000).

Contrary to the fixed phone, which promoted the establishment of highly generalized linguistic forms (e.g. answering formats like "Hallo", "Pronto" etc.), the cell phone may facilitate the emergence of linguistic habits peculiar to particular families or friendship circles.

Considering the (still) rather elevated time-based fees for audio-connections on the one hand and the very low bandwidth of SMS on the other, it is evident that cell phones are not very useful when highly complex, elaborate communication has to be activated. Because the maximum size of text messages is strictly limited, there is an extensive use of homophones, cognates and abbreviations that are understood only within rather small groups consisting of intimate members who have developed a common code during a rather long time of interaction (Ling/Yttri 2002: 162).

This is most dramatically shown in contexts where a rather "restricted code" can be used, as for instance

- 1) among very close partners who share the same "microculture" of symbolic meanings and language uses because they have been acquainted for a long time (e.g. elderly couples);

- 2) among individuals who share the same linguistic subculture (e.g. young people speaking the same peer-group jargon or incumbents of identical professional roles);
- 3) among team members who engage in highly standardized and routinized forms of cooperation or transaction where only a few words are necessary to transmit clear messages and to reach consensus (e.g. about business deals).

"There are two antipodes of mobile telephone communication: the impersonal, short business communication: agreement on a date, place, delivery, a piece of information; and on the other hand the highly personal, intimate conversation with a spouse, relative, friend, lover." (Roos 1993)

The itinerant Somali traders portrayed in Sadie Plant's transcontinental study vividly illustrate the first of these conditions:

"On a wooden ship moored in Dubai's busy creek, a Somali trader dozes in the shade of a tarpaulin sheet. He wakes to the opening bars of Jingle Bells. 'Hallo? Aiwa..la..aiwa..OK.' The deal is done. This trader, Mohammed, exports small electrical goods, including mobile phones, to East Africa. 'It's my livelihood,' he says of the mobile phone. 'No mobile, no business.' It multiplies his opportunities to make contacts and do deals as he moves between cities and ports, and the short, instantaneous messages and calls to which the mobile lends itself are perfectly suited to the small and immediate transactions in which he is engaged." (Plant 2000:74).

Thus, the "conservative" bias of the cell phone is again shown in the regularity that they have a special affinity to highly institutionalized or traditionalized social settings where rather stable and routinized communicative patterns prevail. Paradoxically then, the new mobile technology will be much less useful in informalized and innovative settings, which have to rely on broadband channels (especially face-to-face gatherings) in order to clarify and negotiate meanings (Collins/Neville/ Bielaczyc 2000).

3.5 Role-integrative functions

In two highly different ways, cell phones help individuals to reduce role strains and role fragmentation, typically generated by highly complex social environments and societal conditions.

1. By increasing the capacity to accumulate and coordinate diverse (simultaneous) roles

According to Georg Simmel (1908:305ff), modern societies are characterized by individuals who combine a multitude of different roles, and individualization grows to the degree that each person realizes his own idiosyncratic role set and his specific trajectory of role shifts over time.

Insofar as each role demands one's physical presence at a specific place (workplace, private apartment, church, school etc.), reconciling different roles usually means: sequencing role involvements diachronically and taking the burden of frequent time-consuming locomotion.

By providing the opportunity for flexible role switching without changing location, cell phones facilitate the harmonization of different role duties, because diachronic role change can be substituted by (almost) synchronous roles involvements, and because frictional costs associated with time-consuming locomotional activities can be avoided (Gillard 1996). Thus, women can engage in "remote mothering" at work, or "remote work" at home:

"The cellular phone permits them to exist in their domestic and work worlds simultaneously... women are now working "parallel shifts" rather than what has been described as the "double shift" (Rakow and Navarro, 1993: 153).

Paradoxically, the cell phone could make it easier to perpetuate (rather than to eliminate) traditional forms of labour division between the genders, because the husbands of successful "remote mothers" may feel more legitimated to evade family duties.

The separation between work and personal life as well as between public and private sphere are modern concepts that have constantly expanding since the 18th century, G. Grant and Kiesler have remarked, mobile technologies partially reinstate a premodern state of social life where the boundary between work and personal life was less distinct (Grant/Kiesler 2001: 121),

In contrast to the cinema and other media which force individuals to involve themselves during a certain time span into a single absorbing role, it may therefore not be the *surplus*, but rather the *shortage* of leisure time which predisposes people to use the cellular phone intensively (Gillard 1996).

It is important to note that this capacity to play different roles simultaneously is paradoxically based on certain limitations of cell phone technology. First of all, the neat separation of local and remote role-playing is much facilitated when only the recipient (not the bystanders) can hear the voice of the caller. And secondly, the capacity to perpetuate local offline roles would be seriously hampered if cell phone calls became multimedia events involving visual channels of communication as well:

"The mobile telephone, in many respects, represents the opposite of video telephones. Where videophones require one to be fixed to a specific location, one can roam with a mobile phone. Where one is forced to pay attention to their conversation partner with a video telephone, one is free to carry out parallel activities with a mobile telephone. Where the video telephone conversation is a well-bounded event, the mobile telephone call is less well defined and can intrude while one is on the bus, in a restaurant or in church." (Ling 1997).

Thus, insofar as such role-compatibilization effects are the main rationale for cell phone adoption, it might be concluded that customer demands for broadband phone transmission could be considerably lower than many optimistic telecommunication strategists - who invest large sums in UMTS - are currently assuming.

2. By increasing the capacity to maintain "pervasive roles" (which demand unlimited involvement)

Cell phones can be instrumentalized for preserving diffuse, pervasive roles which demand that the incumbent is available almost all the time, because such encompassing availability can be upheld even at times individuals are highly mobile and involved in other social or private activities.

Thus, mothers can use mobile phones as "umbilical cords" to their children, so that they are in contact with them the whole day even when they are at work or on travel. And traditional family doctors can be available to their patients whenever needed, even if he/she is at a dinner party or some other private location. Similarly, managers can preserve a traditional patriarchal leadership role that demands their availability around the clock. They can thus inhibit processes of organizational differentiation by remaining remain themselves "on duty" all the time instead of delegating responsibility to subordinates.

3.6 The need to control and limit accessibility

From the receivers' point of view, it would be unbearable to expose themselves to all calls at all times. For them, it is crucial that they can maintain certain control over their accessibility

- 1) by deciding when their mobile is turned on and turned off,
- 2) by manipulating volume of voice,
- 3) by restricting the circle of people who possess the phone number,
- 4) by selectively filtering out "welcome" call numbers (so that all other callers hear the "busy sign" even if the mobile is turned on) (Bautsch et. al. 2001).

This last option is made possible by the caller identification function which for instance

"... allows the teen to avoid the communications from their parents when it would be socially awkward to do so. They need not answer the calls of their parents and, if confronted, they simply say that their battery was dead or that they had not heard the device ringing." (Ling / Helmersen 2000).

A useful compromise strategy is provided by the capacity of digital phones to store the numbers of incoming calls: allowing one to leave calls unanswered in the first place in order to respond to them later at a self-chosen time.

Another escape route is to switch to text-based messages (SMS): thus leaving it to receivers whether and when to respond, and especially giving them time to design their response carefully.

In the future, we may well see phones which give users the capacity to signal their varying "coefficient of accessibility" (e.g. on a scale between zero and 100), so that callers can verify first to what degree a recipient is currently disposed to answer it (or even to get involved in a lengthier talk):

"Phones should be designed to give the caller subtle feedback on one's accessibility, not unlike how an office door left wide open, ajar or shut tight sends a clear message!" (Goldensohn 2000).

3.7 The simultaneous increase of individual empowerment, personal responsibility and social controls

Many recently emerging technologies are "empowering" in the sense that they increase the range of alternative actions available to individuals or social groups. But in all cases, such gains in freedom and autonomy go along with countervailing increases in social responsibility and social control, because individuals face more social pressures to make active use of these new options, and more demands for legitimizing and justifying what they do or omit.

Thus, one significant downside of cell phones is that they expose individuals to additional attributions of personal responsibility, because they reduce the availability of excuses of the sort: *"I surely wanted to call you, but I was not able to because I didn't find a public phone"*.

"Once upon a time, being aboard an airplane excused an executive from having to interact with colleagues. No more, for the fax and phone now follow even at six miles high; nor are the seashore and mountaintop immune to their reach." (Katz/Aakhus 2002: 2).

In a study of Finnish teens, it was found that answers to short text messages are usually expected within 15 to 30 minutes; later reactions have to be sent with an excuse (Kasesniemi / Rautiainen 2002: 186.). In fact, *"one higher order consequence of wireless communication is that it makes us more responsible, for both our own actions and those of people for whom we have assumed responsibility. In effect, we become more subject to social control"* (Katz 1999: 17).

Thus, the freedoms gained by being able to connect to anybody from anywhere at any time is at least partially counteracted by the increasing duties to answer incoming calls and to "keep in touch" with kin and friends who expect to be contacted. Weekends, vacations as well as sick leaves are no longer time periods completely free from occupational contacts and duties, because it is assumed that one is still reachable (at home, or even in the hospital or on the Maldives) (Bachen 2001). Thus, *"The benefits of being plugged in may be only truly fulfilling when one can be free to 'unplug' oneself from the many devices that locate each of us any time, any place."* (Bachen 2001).

As a consequence, highly traditional asymmetries of social power and control may again be accentuated: e.g. the authority parents exercise over their children, or the vulnerability of women vis-à-vis the dominance of males. In a Finnish study, for example, it has been found that males are more prone to evade social control by switching the mobile phone off at certain hours, while women leave it on even at night (Puro 2002: 23). This highlights important differences still reigning between the genders: women being more expected to be reachable all the times (e.g. by their kids in cases of sudden need). Similarly, women show a higher tendency to phone in order to give their location (Fortunati 2002: 51).

"This could stem from many factors, such as the need of men and children to know where the woman is at any moment, and the woman's compliance in making themselves easily reachable by men, and especially by children." (Fortunati 2002: 51).

3.8 The lost advantages of temporary non-connection

Typical social relationships unfold in alternating phases of manifest interactions and latency where the separated partners may simply memorize past interactions, imagine what they may be currently doing and thinking, and preparing themselves for future encounters. Such interruptions may be extremely necessary when time for reflection or time for cooling out emotions is crucial, so that over-spontaneous reactions (with possibly irreversible consequences) can be avoided.

Human existence is certainly enriched by feelings of longing or homesickness, by experiences of anxious insecurity about what others may be doing, by sadness when a loved one leaves and joy when he/she finally comes back.

Cell phones tend to level out such emotional oscillations: e.g., by making farewells less dramatic because we can always "keep in touch", and by dissipating the thrill and bliss connected with seeing

each other again, because the void created by long absence has been filled with emails, cell phone calls, SMS and various other translocal communications.

"... the use of the mobile has made us lose the positive aspects of lost time. There also exists a time of physiological disconnection that has, up to now, regulated the communicative flow inside social relations. These moments of non-connection were very precious, because they structured the web of relations inside the rhythm of presence/absence. At the same time, these moments could also fill up with reflection, possible adventures, observing events, reducing the uniformity of our existence, and so on. The possibility of perpetual contact that the mobile offers risks shaping time into a container that is potentially always open, on the model of connecting times guaranteed by the world of information, which tend to be 24 hours out of 24." (Fortunati 2000).

Like all additional communication media, cell phones complicate the social world of individuals by creating many new decision dilemmas associated with "availability management": e.g. by pondering at what time to turn their phone on or off, and whether an incoming call shall be answered immediately, kept on or off, or sent to the voicemail system (Licoppe/Heurtin 2002: 102).

"Mobile phones create new dilemmas for users: when should they leave the phone on or off and to whom should they give their number? Do they really want their boss or relatives to be able to reach them anywhere, anytime?" (Bautsch et. al. 2001)

In the future, "leisure time" may well become synonymous with the scarce moments where one is legitimately "incommunicado": so that no such constant micromanagement problems have to be solved.

4. Implications on the level of interpersonal interaction

4.1 The enlargement of peripheral relationships and weak social ties

As a result of their empirical studies undertaken in the late eighties, the Australian researchers Cox and Leonard have come to the conclusion that instead of just functioning as a (rather imperfect) substitute for face-to-face relationships, the telephone factually enlarges the social networks of individuals by adding communication that otherwise would not occur.

For instance, the phone helps to keep in contact with rather distant (or even disliked) relatives one would not like to see, or to secondary acquaintances who would never be visited or invited (Cox/Leonard 1990).

Thus, the cell phone can help to enlarge the most peripheral layers of social relationships: the realm of "weak ties" which are activated only under highly specific circumstances (e.g. when searching for a job or an apartment). (Ling 2000c; Granovetter 1973).

To use David Riesman's famous terminology, this capacity makes cell phones especially useful for "other-directed" persons who *"live in a world of multiple connections and relationships which may also be rather looser and more transient than the fewer, stronger bonds maintained by more tradition-directed or inner-directed individuals."* (Plant 2000:70).

The phone also facilitates contacts during time when individuals don't feel disposed to present themselves visually (e.g. on Sunday mornings when f2f partners would notice their hangover and their disordered hair).

Such possibilities to engage in "minimal contact" while keeping distance are based on the low bandwidth of telephone communication: on the low quality of audio transmission on the one hand and the complete lack of visual transmission on the other. Again, we thus reach the conclusion that broadband telephone connections (made possible by UMTS) may be less embraced than optimistic investors are expecting, because they would eliminate exactly these functionalities to reduce the need for personal disclosure.

4.2 The reinforcement and "empowerment" of primary interaction systems

In contrast to mass media contacts, which typically originate outside the boundaries of primary social relationships, most phone contacts originate within preceding face-to-face interactions.

In fact, the phone can be seen as a technology that empowers such microsocial systems by allowing primary bonds to be continued during periods of spatial separation. (Gergen 2002: 237).

This same complementarity is also seen in the use of SMS as "trailers" for gossip: by announcing a topic that is later more expanded during a personal encounter (Fox 2001).

"... we found that mobile gossip is often enhanced by the use of the text message as a sort of 'trailer', alerting friends to the fact that one is in possession of an interesting item of gossip, but without revealing the details, which are saved for a phone call or meeting. " (Fox 2001).

While (usually infrequent, but lengthy) calls by fixed phones are often functioning as a full substitute for face-to-face meetings (Licoppe/Heurtin 2002: 106), the mobile phone is more used for frequent shorter talks connecting people who also meet each other physically on a regular basis. Such contacts are not meant to make gatherings unnecessary, but to support and complement them in various ways.

Typically, such calls can be reduced to the barest essentials because the partners know each other so intimately that they can use very shorthand ways of communication: especially by eliminating all ritualistic components such as "how are you" and the like.

"Unlike fully self-contained phone calls, mobile calls are part of a conversation pattern that continues beyond the interruptions between calls. It is therefore necessary to renew salutations and formal conversation openings". (Licoppe/Heurtin 2002: 106)

In other words: the mobile phone has the effect of "deritualizing" oral communication in the same way as Email deritualizes written communication (by eliminating courtesies as they are still used in conventional letters).

While the phone as an audio device privileges the expressive support of bilateral relationships, text-based messages can also at least also support social chains: by transmitting the same message from A to B, from B to C etc- or from A to B, C, D, E at the same time.

But apart from that, chain messages can also spill over to accidental bystanders: e.g. by allowing them to read the received messages (cross-reading): thus giving insight into an aspect of his or her private life (Kasesniemi/Rautiainen 2002: 181f.).

Correlatively, written messages are often designed by two or even more individuals despite the fact that there is always only one sender for pure technical reasons.

In addition, text messages can be stored *ad libitum*: thus adding to a growing stock of "culture" shared between a couple or sometimes also larger groupings.

4.3 SMS as a channel for low-threshold, non-intrusive contact initiation

It is easy to grasp why Short Message Services (SMS) are more closely associated with the mobile phone than with the fixed phone because mobile phone calls are often received in highly absorbing situations where immediate reactions are not possible: e.g. when driving a car or during talks with surrounding people. Thus the asynchronous mode is highly valued because it provides the opportunity of delaying the reception and the answering to a more appropriate time (Ling/Yttri 2002: 165). Of course, this same non-intrusiveness makes it easier for the new technology to enter all kinds of institutions despite dense social controls (e.g. schools or even prisons).

Consequently, there is a very low threshold for sending such messages, like merely trying out whether recipients take notice of them, answer them or even "escalate" the relationship by calling back orally (Ling/Yttri 1999).

"Almost all of our focus-group participants said that they found text messages an ideal way to keep in touch with friends and family when they did not have the time, energy, inclination or budget for a 'proper' phone conversation or visit. A male participant commented: "Texts are useful to stay in touch with people you don't see or can't have a conversation with - or even if you

don't have enough information to have a conversation, you can send a text as it avoids awkward silences." Fox 2001).

More than that: it is relatively certain that the SMS will be received by the individual to which is sent, without somebody else taking notice. This privacy contrasts with oral calls, which can drop into completely unpredictable environments where unwelcome third parties may be present. Moreover, it contrasts with all other forms of writing (e.g. letters), which can easily be intercepted by intermediaries (Ling/Yttri 1999).

Another attractive feature of SMS is that the costs of message exchanges is shared by the two senders, while phone call costs have to be paid exclusively by the caller, regardless of how much the receiver contributes to the conversation. Thus, SMS allows for an equilibrated "economic exchange" which is highly preferred by partners not (yet) involved in an informal social relationship. By contrast, phone calls produce more "social exchanges" which are typical for already established relationships where exchange disequilibria are intentionally produced for reinforcing mutual interdependence (Blau 1964: 88ff.).

Finally, the need for extreme shortness makes it legitimate to use conventionalized forms of writing: so that even shy people (or people from cultures which prohibit very subjective expressions) feel free to communicate because they do not have to expose themselves in a highly personalized way (Fox 2001).¹⁰

"Texting has become particularly popular with individuals and in cultures which tend to be reserved with other people: in both Bangkok and Tokyo, teenage boys and girls value texting as a means to communicate without having to voice feelings and thoughts. The demands of brevity can also encourage text messagers and emailers to be candid, frank, informal, even cheeky: ice can be broken, intentions declared and invitations offered, all without the risk of embarrassment." (Plant 2000:56).

In particular, senders feel free to concentrate fully on the core message without fussing about ritualistic conventions:

"The 160-character limit for a text message was also seen as a plus because short abrupt messages are perfectly acceptable, whereas in a phone conversation preliminary how are you? Exchanges are often required." (Eldridge/Grinter 2001).

As a consequence, SMS is highly functional for widening the social sphere by an ever-changing multitude of very peripheral relationships, mostly based on single accidental contacts, which may be a potential resource pool that can be tapped in the future. In some cases, it may also substitute closer relationships by providing an ever accessible reservoir of superficial contacts, which demand very little psychological effort and involvement.

"For some people, the effortless contacts and fleeting noncommittal messages made possible by the mobile are ways of avoiding more immediate and forthcoming kinds of interaction. One Japanese service allows users to court 'virtual girlfriends' by mobile phone, and many teenagers have dozens, sometimes hundreds of meru tomo, 'email friends', who may never meet and only ever know each other through the keitai. Many of these friendships involve constructed personalities and sometimes complex webs of multiple personas and duplicitous affairs. For some teenagers, such virtual friends can act as substitutes for actual friends, just as video games can replace their real lives. One Japanese student expressed concerns that younger keitai users are becoming 'less capable' of direct, social communications" (Plant 2000:57).

4.4 The deregulation of agendas and social roles

Continuous campfire sites established up to 500,000 years ago¹¹ testify to the skills of emerging hominids to reach agreement about convening at the same place at a specific hour (or day). Such capacities for planning are not known in subhuman species, because animals typically lack the conventional

¹⁰ Given the restricted size of messages as well as the tedious typing, there is a premium of writing in English because words and sentences are be shorter than in most other languages (e.g. Finnish or French) (Kasesniemi / Rautiainen 2002: 184.)

¹¹ See for instance: Mustafayev 1996.

symbols for communicating about the future, as well as the concept of objective time (Kummer 1971:passim).

Today, people typically manage written agendas where they note future dates, so that they know in advance when they have duties, when they have to travel and to what places, and when they are "really free". Thus, planning is very crucial for organizing personal life as well as for managing collective forms of behavior: e.g. for preparing a meeting known to take place within two hours from now, or for cooking a meal by knowing that exactly seven guests will knock at my door at about 7 p.m.

On the other hand, planning can be cumbersome because I have to submit rigidly to predetermined dates even if I have fixed them myself; and disappointments are inevitable when definite dates are missed because of traffic jams or other unpredictable events.

Under conventional technological conditions, preplanning was inevitable because people had no means of communicating at later points in time. Especially when participants were already on the move, no opportunities existed for changing appointments.

From this perspective, it is evident that cell phones reduce the need for temporal pre-planning, insofar as rearrangements can be made at any moment, even very shortly before the agreed time. Thus, a new, more fluid culture of informal social interaction can emerge which is less based on ex-ante agreements, but more on current ad hoc coordination which allows people to adapt to unpredictable short-term changes in circumstances, opportunities, or subjective preferences and moods,

"With the use of mobile communication systems, one need not take an agreement to meet at a specific time and place as immutable. Rather, those meeting have the ability to adjust the agreement as the need arises. In addition, mobile communication systems allow for the redirection of transportation to meet the needs of social groups." (Ling/Yttri 1999).

When fully used within a social collectivity, the cell phone effects a transformation of social systems from the "solid" state of rigid scheduling to a "liquid" state of permanently ongoing processes of dynamic coordination and renegotiations.

"The most important change that occurs in observations of subjects who completely adapt to the new lifestyle opportunities of mobile phones, however, is that time becomes a commodity that is bought, sold, and traded over the phone. The old schedule of minutes, hours, days, and weeks becomes shattered into a constant stream of negotiations, reconfigurations, and rescheduling. One can be interrupted or interrupt friends and colleagues at any time. Individuals live in this phonespace they can never let it go, because it is their primary link to the temporally, spatially fragmented network of friends and colleagues they have constructed for themselves." (Townsend 2000).

Such social settings are "real-time systems" where everything happening is conditioned by *current* situations, while the impact of the past (effected through rules and schedules) and of the future (impinging in the form of planning activities) decline. (Townsend 2000). In Sadie Plant's worldwide qualitative study, for instance,

"...some people said they often found themselves caught in what seemed to be eternal states of preparation, arrangement and rearrangement, with nights out characterized by endless deferrals and reshufflings of meetings and events which might never occur." (Plant 2000:64).

Thus, hosts occupied with pre-cooking party meals are well advised to focus on food which can be prepared (or enlarged in quantity) very quickly because they don't know exactly how many people will arrive or at what time. And many boring parties will face mass emigration of frustrated participants who have meanwhile checked by phone where something more exciting is going on.

Consequently, it may be more demanding to stabilize colloquial social gatherings, because other evasive options are available to all participants in case of dissatisfaction.

Townsend may be right in arguing that the new "freedom from punctuality" is felt by many individuals to be a major gain in empowerment, which quickly becomes so habitual that it's almost unthinkable to return to the status quo ante:

"Once one becomes accustomed to the flexibility of scheduling, the freedom from punctuality permitted by constant ability to update other parties as to your status, it is nearly inconceivable to go back." (Townsend 2000).

The more fluid, spontaneous lifestyle made possible by mobile phoning is particularly akin to countries like South Korea where it has always been custom to call together "after-work parties" on very short

notice - instead of organizing neatly planned, prescheduled parties like in the United States (Kim 2002: 70).

In such contexts, the new technology makes social life highly volatile and unpredictable because gatherings are highly affected by short-term redispositions.

"While driving to a place where friends are waiting, one gets a call from someone at another location and immediately changes direction, calling in an excuse to the innocent friends. After a nice round of beer with these other guys, he may feel sorry for his jilted friends and call them again to make up with another round of drinks late at night. The city is all too well connected by invisible networks of two-way radios and mobile phones." (Kim 2002: 70/71).

The very high penetration rate of the mobile in Italy seems to be associated with its support for a spontaneous, disorganized lifestyle that has always reigned among most of the country's population:

"It is a particular feature of the Italian sociality that one must neither be nor appear programmed, Regimented living and precise organizationally planned activities are abhorrent. Rather one must be and appear to be engaged in spontaneous activities with a posture of openness to being deflected onto another trajectory. This inherent sense of ...flexibility, which can also appear to outsiders as disorganization and incoherence, leads the mobile to be seen as the ideal instrument for rapidly adjusting the organizational fabric of daily living." (Fortunati 2002: 55).

4.5 The evolutionary rise of "nomadic intimacy" and "nomadic social participation"

Compared to people walking the streets or riding on public buses who are physically unprotected from intrusions of others, automobile drivers enjoy a kind of "ambulant privacy" by carrying with them a closed moving box which allows them to listen to personalized music or engage in private conversations with close family members riding in the same car.

The cell phone can be seen as a device that amplifies this trend, by empowering moving individuals to connect to any distant partners at any point in time, regardless of location and speed.

Thus, one of the major social functions of cell phones is to provide a "nomadic intimacy" (Fortunati 2000) by making it possible for people on the move to remain embedded in their personal social networks.

First of all, more communicative contacts between moving and non-moving individuals can be established. In the era of fixed phones, moving people could use public phones to connect with stationary individuals, but they themselves could not be contacted. Consequently, moving people were very isolated from new incoming information, so that they could not participate in social actions that demanded very rapid communication (e.g. vertical communication between stable organizational centers and moving peripheral employees). By using cell phones and other devices of mobile translocal communications, there is a greater degree of freedom for combining stationary and moving cooperation units without losses in transmission speed and reaction time.

Secondly, higher communicative connectivity among various moving actors can be achieved.

"It was not until the rise of mobile telephony that transportation and communication were again linked together. Previous to this one who was in transit was also incommunicado. Now mobile telephony allows for nearly continuous and ubiquitous communication under transport. This barrier has fallen and those who are in motion or away from a known "fixed" terminal, are also available telephonically. (Ling/Yttri 1999).

Thus, rigid time scheduling can be substituted by processes of "gradual approaches": so that time and place of gatherings are fixed only just before they occur.

"A third variation is the progressively exact arrangement of a meeting. Two parties might, for example, generally agree to meet somewhere at an approximate time. As the two are in transit they might call each other to confirm the timing and the location. Finally, if the two can not locate each other at the agreed upon place at the agreed upon time we can have a third round of calls for the final location of each other. Thus mobile communication allows for the structuring and rationalization of interaction, particularly in the face of distributed participants." (Ling/Yttri 1999).

It is also possible to keep the composition of meeting participants open to change: e.g. by phoning around to additional individuals who may be ready to participate because they happen to be in the region.

On a most general level, it can be argued that the cell phone eliminates at least some of the advantages of sedentary life styles, which are responsible for the constant decline of nomadism since the rise of higher human civilization.

In fact, modern mobile technologies may facilitate the emergence of new segments of "high tech nomads" (e.g. venture capitalists, global traders, business consultants, itinerant journalists etc.) who feel sufficiently integrated into society without possessing fixed addresses and any stationary resources. (Garreau 2000). On the other hand, many reasons for nomadic activities evaporate, because "since they can communicate from anywhere, why do they bother moving around at all?" (Garreau 2000).

Similarly, cell phones can reduce the marginality of many traditional ethnic groupings (like Bedouins, gypsies etc.) characterized by constant movement through geographical space.

5. Implications for face-to-face gatherings

5.1 The unpredictable, uneasy intrusion of distant others

The usage of the telephone as a communication medium is generally hampered by the fact that phone calls tend to hit receivers at unpredictable moments, forcing them to redirect their attention to the caller even in unfavourable circumstances: e.g. when unexpected (and unwelcome) third parties are present, or when they are occupied by other rather absorbing activities.

Thus, phone communication generally strains the capacity of individuals to switch roles and to redirect attention very rapidly at any unforeseen moment: a well-known source of irritating psychological stress.

The cell phone accentuates these contingencies because in comparison with the fixed phone at home, calls can hit receivers in a much broader range of different mental states, social circumstances and environmental conditions (for instance while being exposed to eavesdropping in a cafeteria or while driving a car).

For several reasons, then, cell phone calls have a highly negative, destabilizing influence on ongoing face-to-face interactions:

First, the calls typically occur at unpredictable times, so that they cannot be anticipated and integrated into the local discourse.

Secondly, deeply anchored norms and habits usually demand that calls are answered at the moment they come in, so that local interactions are disrupted even at highly critical moments.

"Many people feel irritated and disconcerted by this new electronic soundtrack. All ringing phones are disruptive, even arresting. As Marshall McLuhan observed in "Understanding Media", an incoming call provokes a sense of expectation, even urgency, which is why they usually feel compelled to answer a ringing phone, even when they know the call is not for them. Like a calling bird, a ringing phone demands a response. Public uses of the mobile spread this tension to all those within earshot, while leaving them powerless to intervene: only the person to whom the call is made is in." (Plant 2000:30)

As a consequence, even the mere presence of a cell phone in a colloal group can produce irritation, because "just the knowledge that a call might intervene tends to divert attention from those present at the time." (Plant 2000:30).

Third, when an individual is answering a call, he or she gets involved in a bilateral communication process completely segregated from the local interaction field for purely technical reasons, because other bystanders cannot see who is calling and cannot hear the caller speaking. Therefore, all possible reactions to incoming calls are likely to disrupt the ongoing social interactions.

- 1) *Flight*: the most drastic response is leaving the place of colloal interaction for a corner or another room where the phone talk cannot be overheard.

- 2) *Suspension*: while remaining in the same physical location, the recipient suspends current activities or interactions for an undefined time; this leaves bystanders helplessly waiting, and evaporates ongoing discussions, so that the thread of talk can often not be easily taken up again when collocal interaction is resumed.
- 3) *Persistence*: keeping current activities ongoing. This is only possible when local activities do not require much involvement, certainly not when they consist of verbal communication. (Plant 2000:16).

In all cases, a situation of normlessness and insecurity is created, which tends to increase when the conversation endures and its total length cannot be anticipated.

Reinforcing these technical conditions, there is another deep-seated habit to focus attention completely on the communication with the caller (e.g. because calling time costs precious money and therefore has precedence). Thus, answering a phone call means disengaging oneself psychologically from the face-to-face discourse at least on the level of verbal communication.

"... in the case of the mobile, we make our flesh and blood interlocutor helpless while we talk into the mobile and give the person at the other end more importance than the person in front of us." (Fortunati 2000).

While Erving Goffman could still maintain that the major allegiances of human beings 'belong to collocal gatherings and encounters', electronic communication tends to shift this center of social life to the level of translocal communications.

"The ambiguous dimension of presence/absence in space also means the restructuring of the sense of belonging to a place, one of the four classic poles of the sense of belonging (apart from belonging to the family, one's country, and one's race). It is actually transformed into the sense of belonging to one's communicative network. Those emotional elements that are lost in the relation with space are transferred to a social level, that is loyalty, the sense of identification, familiarity, stability, security, and so on. However our partial mode of adhering to a single place is translated at the same time into a sense of potential belonging to a host of different places." (Fortunati 2000)

5.2 Simultaneous role playing on two very different "front stages"

While people at home are often in a relaxed "backstage" situation which allows them to give absolute priority to the incoming call, recipients of cell phone calls are often hit at moments when they are engaged in front stage performances: obliging them to take part in two highly demanding (and usually conflictive) front stage activities at once. (Goffman 1971; Ling/Yttri 1999).

"When mobile phone users are on the phone, they are simultaneously in two spaces: the space they physically occupy, and the virtual space of the conversation (the conversational space). When a phone call comes in (or perhaps more pretentiously, when a call is placed out), the user decides, consciously or otherwise, what face takes precedence: the face that is consonant with one's physical environment, or that of the conversational space? The greater the conflict between the behavioral requirements of the two spaces, the more conscious, explicit, and difficult this decision might be." (Palen/Salzman/Youngs 2001).

The mere fact of showing different faces to the present and the absent interaction partners

"brings to the fore that faces are publicly assumed, which then gives rise to the feeling that the new face and perhaps even the old face are false." (Palen/Salzman/Youngs 2001).

In other words, the simultaneous, visible acting out of different roles makes it easier to recognize that individuals actually play *roles* (instead of just displaying their personality). Consequently, bystanders will be more prone to attribute individual behavior to factors of external influence, while the attribution to stable personality traits becomes more difficult because such attributions have to be consistent with all the divergent forms of behavior observed.

Therefore, individuals become more absorbed by the highly difficult task of managing role conflicts and discrepant strategies of self-presentation at the same time.

"While the face-to-face restaurant talk may be, for example, cozy, intimate and integrative, the talk on the mobile phone may be of power relations, fast deals and office politics. The stage

management can become quite complex. Like a cubist painting, the speaker on the mobile phone is seen from two perspectives.” (Ling 1997)

Very often, therefore, phone users experience situations of normlessness, insofar as there are no standing rules prescribing how such contradictions can be reconciliated:

“There can be something comical about the mobile user attempting the difficult task of managing a call whose purpose and emotional registers are at odds with those around them: the conversation with a lover on a train, or with an irate boss in a bar. Certain conversations can induce emotional and bodily responses, which may be quite incompatible with their perceptions of their physical location. Their participants often look as though they don’t quite know what to do with themselves, how to reconfigure the tones of voice and postures which would normally accompany such conversations. The mobile requires its users to manage the intersection of the real present and the conversational present in a manner that is mindful of both.” (Plant 2000: 26)

Thus, a very broad spectrum of factors co-determines how receivers react to a specific call, how elaborated or intimate their verbal utterances are, what kind of topics they try to evade etc.- and callers may quickly feel uneasy, disappointed or helpless because they lack knowledge about these influential conditions.

The impact of the colloclal field on phone calls is dramatically seen in cases of „stage phoning“, where callers use phone communication to make a specific impression on the bystanders: e.g. the impression that they are acquainted with important personalities, that they are urgently needed for help or advice, or that they are in a position to make big business contracts, to give important orders or to make far-reaching final decisions. Such impression management behavior reaches its culmination when fake talks are simulated (Plant 2000).

The reverse strategy consists in focusing exclusively on the phone call, so that the local audience is temporarily left suspended in an uneasy “backstage position”. Typically, this decision has to be paid for with uneasy moments of anomie after finishing the call, when the interactions with the original bystander(s) have to be resumed (Ling 1997).

In fact, the cell phone has generated the new role of the “hanging bystander” who has to engage in a “waiting strategy” during the call and to think about whether and how he/she will continue the original interaction when it has ended. (Ling 1997).

As Lasen has observed in his ethnographic three-city study, role conflicts arising between the two frontstages (phone call and face-to-face meeting) are handled differently in various countries:

“In London and Paris users tend to separate the phone conversation from face-to-face interaction, whereas in Madrid users tend to integrate them, allowing third parties to take part in the conversation and making collective use of the mobile phone. Londoners and Parisians are more likely to treat a phone call as an interruption, for instance when being with other people, than users in Madrid.” (Lasen 2002b: 10).

5.3 The increasing segregation of verbal and visual gesturing

Cell phone calls contrast with ongoing face-to-face interactions because role performances have to be exclusively based on verbal communication.

This usually implies that conversation has to be rather loud and highly articulated, so that the remote recipient can understand it clearly. In addition, the complete absence of visual cues (and the poverty of paralinguistic expressions) implies that practically all communication (including metacommunicative transmissions designed to create context and to define the relationship between the speakers) has to be based on linguistic articulations.

“In face to face conversation quite nuanced body language has several functions. Through our use of nods, glances, small sounds and other gestures we indicate attention, the desire to speak, the desire to retain the floor and indicate pauses. We also use these devices to impart meaning and emphasis. All of these gestures are changed in a normal telephone conversation. Visual gestures are replaced by intonation and linguistic structure in “grounding” the conversation (Instead of relying on body language to control turn taking, pauses, emphasis, etc., these are done with what one might call verbal gestures. We use tones such as “uh” replace the lack of eye-contact that controls turn taking, phrases such as “ah ha” replace nodding and other signals of continued attention on the part of the listener, etc” (Ling 1997).

As a consequence, cell phone speakers often have no other choice than to engage in highly elaborated forms of verbal behavior: thus increasing the risk that involuntary eavesdroppers become uneasy about overhearing what they are not supposed to hear. In order to reduce such irritations, it is to be expected that partners intensify communication on the nonverbal level (e.g. by engaging in more "facework" and amplifying the frequency and lengths of mutual gazes).

Such compensative nonverbal communication can have two signalling functions, communicating to the bystanders:

- 1) that they are still considered important, even when attention has currently been shifted to the remote partner on the phone,
- 2) that they should please remain on the spot, because I want to continue to interact with them as soon as I have ended the call.

Risks of "interactional overheating" are associated with the fact that interactions by phone are based completely on verbal exchange. In face to face gatherings, conversation can easily be intermittent because the mere togetherness in the same location assures that the relationship is seen as continuing even when there are long periods of silence. In some cultures (e.g. in Finland or Norway), people have developed such non-talking habits: e.g. guided by the premise that, whoever talks, should have some real information to convey (Puro 2002: 24ff.). In the case of telephone calls, however, talk has to flow continuously from beginning to end, because any interruption leads to high insecurity whether the other one is still "on the line" (or still willing to continue the contact at all). In the Finnish case, for instance, this results in very brief mobile phone talks: focussing exclusively on "real information" (especially about time and place of future meetings).

6. Consequences for the meso-level of groups, organizations and markets

6.1 Decentralization and bilateralization of intrasystemic communication

As fixed telephones belong to specific locations rather than to specific individuals, they support rather depersonalized and collectivized communication structures, as found mainly in bureaucratic organizations as well as in many less formalized settings (e.g. dormitories or traditional family households).

Formal organizations in particular have become highly sophisticated in using landline phone systems for designing communication channels in accordance with their formal structure.

For instance, traditional police communication is characterized by radial communication flows: itinerant policemen phoning in to a central radio dispatcher who then automatically has an overview over what is going on. Nowadays when all peripheral policemen can contact each other directly by cell phone, they can easily circumvent this centralized relay station: substituting it by direct horizontal communication and coordination.

On the one hand, such short-circuiting is functional for abridging unproductive red tape and for accelerating the speed of reaction, but, on the other hand, it can challenge the structures and processes of formal organization in three ways:

- Communication channels are no longer authoritatively predefined. Instead, they are chosen by the subordinate members themselves, so that management has no overview about who contacts whom, who is cooperating with whom.
- Less information about peripheral events, activities and developments flows into the organizational center, so that superiors have less knowledge that would enable them to react and to intervene.
- All these covert horizontal exchanges are potential breeding grounds for autonomous subgroups and informal organization as well as for various kinds of deviant behavior, because the participants can easily agree to circumvent certain prescribed rulings. (Manning 1996.)

"The specific effects of the mobile telephone are that it allows back channel communications between officers, between officers and other agencies and also between officers and various

private individuals. Thus, it provides a back channel through which they can agree upon various irregular covert activities. This means that the mobile telephone can change the specific routines associated with police work. Where one relied on a central dispatcher to communicate messages to other agencies and organizations, the police officer is able to do this by himself. In some cases this may lead to more efficient work. On the other hand, there is a reduction in the pool of general knowledge provided by the traditional radio communication. This may mean that the information, and perhaps the activities of the agency are more disjointed. (Ling 2000b)

Similar changes occur in households where the singular fixed phone has become a supportive element of a collectivized communication structure with the function of mediating between incoming phone calls and individual recipients.

Thus, the ethnographic study of Sawhney and Gomez about the communicative interaction pattern of recent immigrants to the U.S. has shown that wives acted as real "information hubs" by maintaining two-way relationships to all other family members:

"The husbands in both families keep in touch with their wives throughout the day, both for routine home-related tasks, but also to inquire about the children (living near or away). In fact, the wife also acts as a link to their friends in the local community in their case. Hence she maintains an important communication role in the family. From closer examination of all interviews, we have subsequently discovered that the wives also maintain ties with their husband's families in India, via a cousin there (through email) who now serves the role of a distant hub in the social network." (Sawhney / Gomez 2000).

By contrast, a common aspect of Email, SMS and cell phone calls is that they all promote segregated bilateral relationships, because mutual two-way communications cannot usually be watched by third parties.

In many cases, this has a "democratizing" effect on local social systems, because even younger children and employees at a lower hierarchical level now have their own personal phone connection, while in the era of fixed phones they were invisible co-users of a telephone set maintained and controlled by the respective "head" (e.g. the father of a family or the owner of a firm).

"The other democratising aspect of the mobile phone is that it counteracts the disappearance of household members who "hide" behind the personal data of the person who signed the fixed telephone subscription. Now other members of the family have access to their own number and the possibility of managing their own communicative networks." (Fortunati 2000).

As a consequence, the family as a social system is weakened on a normative as well as on a cognitive level.

First, the *normative influence* of the family on personal communications declines. In the past, personal bilateral communications have often been heavily influenced by the presence of other family members during these communications. Today, such influences are less likely to occur.

Secondly, there is a decline in mutual *cognitive transparency*, because each member cultivates his/her own interaction patterns unobservable by anybody else.

"The Japanese keitai certainly allows many school children and teenagers to lead lives that are totally opaque to their parents. The mobile has, for example, encouraged the popularity of the enjo kosai, or 'paid date'. Telephone clubs had long been popular ways for students and schoolgirls, as well as professional women and housewives, to make contact with potentially lucrative lovers. But the privacy, anonymity, and mobility of the keitai have made this kind of contact even easier: it can be used to post or read the equivalent of personal small ads - through some devices, even images as well - on countless sites; to exchange messages with the 'email friends' one makes; and to make arrangements to meet." (Plant 2000:58).

At this point, it seems rewarding to reflect about the "latent functions" of "unsuccessful calls" which don't reach the targeted person. Fixed phone calls produce high numbers of unintended recipients because any member living in the same household, workplace or institution can answer the call.

These unintended recipients may be a nuisance to callers who want to deliver their message directly to a specific person - especially when this message is highly confidential, or when others should not even know that the contact has taken place.

In many other circumstances, however, unplanned recipients have positive effects:

- a) They are accepted as “secondary partners” with whom an unplanned talk unfolds *“An interesting difference between the two formats is that when family members answer the phone on behalf of other members, they often strike up their own conversation with the calling party. This happened once in every three calls of this type. It was particularly common in Lesley’s interactions with friends of her children calling in. She uses the opportunity of taking a ‘missed connection’ to Gordon or Kath to consolidate her relationship with them!” (Frohlich/Chilton/Drew 1997).*
- b) They can be used as go-betweens who will deliver the message to the targeted individual.
- c) They are relevant third people who can provide useful additional information and advice. (For instance: “How is mother really doing, please, father, tell me the truth...”).
- d) They can enlarge the bilateral phone call into a multilateral conversation: thus transferring it from a private talk to a community conversation.

By eliminating the “risk” of unintended answerers, the cell phone also eliminates these unintended functions of unplanned third-party recipients.

Again, it is evident how cell phones tend to reduce interpersonal communication to the range of pre-planned, well-intended interactions: thus also reducing the chances of involving “third parties” which may be useful for integrating bilateral communications into more extended, multilateral relationships and groups.

In conclusion, the following hypotheses can be made:

- 1) With the diffusion of cell phone, private email accounts and other forms of personalized ICT’s, the mutual knowledge about each other’s communication networks declines. Specifically, we may find that each family member has many acquaintances and ongoing interactions unknown to the other family members.
- 2) To the degree that family members themselves communicate by new media, their relationships become more bilateral and individualized. For instance, a mother has more leeway to disclose highly divergent thoughts and opinions to her husband, her son and her daughter on the phone, while in the past, she communicated one single version to all together (e.g. assembled around the dinner table).
- 3) Cell phones reduce the degree to which experiences and social contacts are shared among family members. Instead, intra-group information sharing takes place only if the members are ready to convey such private information voluntarily to their kin.

In Georg Simmel’s terms, the family is increasingly strained by “crossing circles” (“Kreuzung sozialer Kreise”): so that it has to preserve its cohesion against powerful forces of centrifugal fragmentation stemming from the highly divergent communication spheres of its different members (Simmel 1908: 305ff).

Given these strong bilateralizing impacts, the conclusion seems unavoidable that mobile phones cannot be potent instruments for the quick build-up of large-scale collectivities and collective actions - except under highly specific circumstances, when many group members assume the role of active propagators.

Such conditions hold, for instance, in “pyramidal structures” in which every recipient acts as a multiplier:

“The mobile telephone, like the traditional telephone, is a point-to-point technology and thus requires a pyramid structure in order to spread information quickly, i.e. one person calling three and each of the three calling three more etc.” (Ling 2000b).

Only when such broad, active participation is ensured, can a snowball effect take place, which leads to a rapidly growing base of activated members or sympathizers.

In addition, oral communication demands that messages are extremely simple, so that they don’t get distorted in this process of multi-stage diffusion.

With text-based messages like SMS, distortions are minimized because they can be reproduced and distributed in identical form. Thus, the chances of quick and extensive collective activation accrues to groups with a high absolute number of activists functioning as transmission relays in such network systems.

Whenever this precondition is fulfilled, informal factions of any kind and size can successfully challenge centralized communication channels, thus lowering the capacity of overall formal organizations to reach or maintain internal consensus and centralized leadership (Ling 2000b).

6.2 Shrinking spheres of individual responsibility and individual decisions

Within organizations, much need for the delegation of responsibility and for taking individual decisions arises from lack of communication. For instance, when a service worker sent to a customer (or a social worker sent to a client) meets an unexpected or new kind of problem situation, he has to decide on the spot how to proceed: thus also carrying the responsibility for possible failures. Similarly, paramedics called to an emergency patient have to take measures on the spot, without consultation with a doctor.

In many cases, such delegation of autonomy leads to strains and deficits of performance because these peripheral agents have rather low qualifications. This problem is vividly illustrated in the case of policemen who have to exercise very high discretion when confronted with cases of group violence, civil disobedience or public unrest, despite the fact that they occupy very inferior hierarchical positions.

For many organizations, this usually means that their ambulant members have to be equipped with detailed instructions and specific rules, so that they know exactly what to do in most (probable and even less probable) circumstances. For instance, life insurance companies have to fix rigid conditions for contracts, so that their agents are not able to adapt the conditions to each specific customer.

The cell phone can ease such discrepancies between low formal and high factual discretion by providing the inferior employees with a means to contact their superiors as well as colleagues or specialized experts, in order to get information and advice, but, especially, to legitimize their decision by reaching consensus and mobilize support.

This may be particularly functional for novices who are not yet so experienced. Even beginners with rather low knowledge can be sent to do peripheral service tasks because whenever an unfamiliar problem arises, they can contact more experienced collaborators who tell them what to do.

Such "just-in-time"-consultations can substitute traditional forms of supervision and instruction that usually rely on preplanned meetings and instructional courses

Tor (18 son): [I have a mobile telephone] for my job because there is always something that you need to know. You can do things twice but it is often one way that is better than another. So if you call to one of these bigwigs you can find out how it should be done. Then instead of them coming around once a week to talk with us it is ok to call a number and you get a clear idea." (Ling/Yttri 1999).

6.3 Shifts from supraindividual and intraindividual to interindividual determinants of social action

When individuals are interacting, they are likely to be heavily influenced by the specific conditions of the microsocial setting: e.g. by the idiosyncratic subjective moods and preferences of their particular partners, and by the situational conditions they are currently experiencing.

When individuals are alone, their actions are more likely to be conditioned by subjective psychological factors on the one hand and supraindividual (or cultural) factors on the other: e.g. by internalized norms and values they share with many others of their collectivity (e.g. within their peer culture or their ethnic grouping).

In fact, temporary suspension of interaction may be necessary for such cultural patterns to be acted out without "disturbance" from the presence of "significant others" who may easily exert various impacts of "social facilitation": e.g. by "seducing" EGO to perform nonhabitual or even delinquent actions (e.g. Zajonc 1965; Simmel/Hoppe/Milton 1968; Cressey 1960).

By increasing the amount of time and by enlarging the range of situations where individuals interact with others rather than act on their own, cell phones are likely to heighten the impact of particular current conditions on individual action (= "other-direction"), while reducing the salience of more firmly established patterns like cultural traditions and internalized norms ("inner-direction"). For instance, children may be less prone to develop an autonomous personality (guided by internalized conscience)

when they are constantly communicating with monitoring parents.¹² Similarly, we may well see that cell phone communication promotes “social facilitation” to a similar degree that face-to-face interaction does: thus increasing the probability that two or more individuals agree to do something not compatible with superordinate normative rules.

In formal organizations, for instance, the anarchic ubiquity of cell phone contacts makes it likely that employees reach agreement on practices that are not covered by formal standards and not welcomed by (uninformed) supervisors. And communities hitherto tightly integrated by consensual traditions may find themselves suddenly fragmented into subgroups, which develop their own (mutually opaque) “microcultures”.

Following the terminology of Barry Wellman, it could be stated that the cell phone

- 1) weakens “communities”: i.e. rather neatly circumscribed supraindividual collectivities (in groups) which are shared identically by many members and which have a causal impact on their individual thinking and behavior;
- 2) strengthens “networks”: i.e. decentralized social fields constructed by each individual according to his or her personal capacities and needs, and constantly reshaped by interindividual interactions and negotiations. (Wellman/1999/2001).

Despite the basic bilaterality of its communication channels, the mobile phone can eventually act as a medium for collectivization, at least in situations where many receivers are ready to forward the message, to one or few other persons, so that they spread in a tree-like fashion.

This has happened in the protest actions against president Estrada in the Philippines, where the mobile phone net was successfully used first by agitators to propagate hostile slogans and jokes, and afterwards by protest leaders to redirect the demonstrating crowds (Katz/Aakhus 2002: 2/3).

6.4 Higher interactional integration of “translocal elites” and “place-independent communities”

Since very early stages, human societies have always possessed many population segments which have not been bound to specific territorial locations: e.g. moving collectivities like herdsman, migrant merchants and artisans, hobos or itinerant students and monks, or stationary, but translocally distributed aggregates like feudal families or professional groups (Wellman 2001).

In modern societies, the last category especially has grown to unprecedented dimensions. Physicians, lawyers, scientists, architects, nurses and journalists are cultivating occupational solidarities, knowledge bases, ethical standards, linguistic conventions and behavioral standards which extend over wide geographical regions: thus cross-cutting local organizations like enterprises, universities or hospitals where the individual professional members are typically employed.

The whole spectrum of new translocational communication media helps to strengthen such communities by facilitating the communication among members, irrespective of their current location and movements. As a consequence, they can improve their capacities to maintain homogeneous patterns of knowledge and norms and to diffuse new patterns very swiftly. Furthermore, all members have better opportunities to influence and consult each other, not only on the sphere of general professional principles, but on the much more tactical and technical levels of everyday occupational practice.

Given that the new media facilitate all kind of translocal communication, it is to be expected that they are disproportionately used by those social strata which have always been disposed to cultivate widespread contacts over wider geographical areas. For instance, national politicians may make more use of them than local politicians mainly involved in intracommunal face-to-face interactions; and locally minded high school teachers may see less need for usage than cosmopolitan academic scientists who have always been involved in scientific communities spreading over the whole globe.

The professions in general will be highly disposed to use digital media because they find them useful for reinforcing the interaction between their widespread members and the autonomy of their group-

¹² Dr. Abramowitz in: Goldensohn, 2000.

specific values, norms and practices vis-à-vis local employers. As such translocal orientations are highly correlated with occupational prestige, it is no surprise to find that incumbents of reputational occupations and professions show higher usage intensities - even when covariating factors like education and income are controlled (Davied et al 1999).

6.5 Speeding up and intensifying system-environment interactions

Many institutions like police, fire departments, ambulances etc. are designed to become externally activated in emergencies that can happen anywhere, anytime and anyhow.

Thus, their functionality depends critically on factors they cannot control: e.g. that there are external informants who call the service without delay and who provide the precise information necessary for deploying adequate resources.

The cell phone can be extremely useful for interconnecting emergency agencies with their environment, by increasing the likelihood that somebody watching an emergency event has a phone and is disposed to make a call.

In particular, cell phones can shorten considerably the time span for the arrival of institutional helpers like ambulances, fire workers or policemen: so that they have better chances for effective intervention: e.g. keepina the heart attack patient from dying, preventing the fire from spreading or intercepting flying burglars. Of course, such notifications are especially crucial in sparsely populated countries like Finland, Norway or Australia, where observers of street accidents, criminal acts or fires have a good the to be the first and only ones calling for intervention. Australian studies in particular have showed that considerable percentages of all cell phone users have already made such calls. (Chapman/Schofield 1998).

Under these conditions, there is ample room for "cellular samaritans": volunteers creating unpaid public services by regularly notifying radio or TV stations about traffic congestions, weather hazards or other developments of widespread interest:

"Cellular phones have also allowed many people to become "cellular samaritans" -- civic minded citizens who phone radio stations to report traffic hazards and congestion, imminent storms, long queues and so on. In aggregate, these selfless, often anonymous acts presumably benefit countless thousands, if not millions of people Mobile phones may well be making a major contribution to social capital by providing a means for people to become more active citizens by engaging in small acts of social responsibility and interpersonal concern." (Chapman/Schofield 1998).

This of course presupposes that emergency services are (a) activated very quickly and (b) are often contacted by different callers, so that they are able to gather more precise information and ensure that they are not the victims of mere hoaxes.

Of course, the more cell phones become ubiquitous, the more important it is that certain "civic duties" are instilled in all citizens alike: e.g. the duty to know the emergency numbers by heart, to take time for such calls even when in a hurry, and to provide well-elaborated information based on precise empirical observation (or on the testimony of other informants). Evidently, such civic duties are especially relevant in sparsely populated rural areas, where it is to be expected that I may be the only bystander able to call for help. This may at least partially explain the very high use of the cell phone in the Nordic countries (Finland, Norway, Sweden) with their extensive system of herding, fishing and agriculture.

In more crowdy areas like metropolitan suburbs, however, cell phone are likely to affect emergency institutions negatively insofar as they cause information overflows:

"With a mobile phone, a driver can immediately call for emergency help or the 911 service (a safety function), this initially expedites the emergency service. Now emergency services are being inundated with multiple calls for the same emergency, slowing down response time and preventing other emergency calls from coming in. " (Bautsch et. al. 2001).

6.6 Facilitation of exchange processes and increase in the transactional efficiency within social systems

All increases in communication capacities facilitate the efficient usage of all kinds of resources.

For instance, firms don't have to buy and store rarely-used raw materials or technologies (which may become obsolescent without being used) when they have the opportunity of procuring them "just-in-time" from other corporations in case of urgent need; two or three individuals are better able to share a single car when they can coordinate its usage by phone; and housewives can easily call their husbands to stop on their way home to buy some items in the store, so that unnecessary journeys can be spared.

The cell phone is especially functional for making short-term just-in-time adaptations to unpredictable changes in needs. Thus, each phone user is empowered to make more efficient use of his or her social resources. Under conventional conditions, individuals have usually to be satisfied with the support of bystanders for fulfilling their current needs (e.g. asking them for information or counselling). Mobile phone users instead are prone to "choose the person who most closely satisfies their preferences at any given moment." (Kopomaa 2000: 124).

For analogous reasons, the "metabolism rate" of markets, cities and other decentralized social systems will be elevated:

"The mobile phone then might lead to a dramatic increase in the size of the city, not necessarily in a physical sense, but in terms of activity and productivity. No massive new physical infrastructure will emerge; rather it is the intensification of urban activity - the speeding up of urban metabolism. (Townsend 2000)

By increasing the rate of decentralized interactions (between a multitude of different actors), the cell phone makes it even more improbable that any centralized agencies still have the capacity to preplan, steer and control collective actions - despite the undeniable fact that capacities for centralized data gathering are also increased.

For urban planning, what it all might mean is that the city will change far faster than the ability to understand it from a centralized perspective, let alone formulate plans and policies that will have the desired outcomes." (Townsend 2000)

As mobile phone systems are tightly knit cellular structures based on a fine distribution of local antennas, the geographic location of every cell phone user can be rather precisely assessed at any moment, except at periods when his phone set is shut down. For the same reason, it is also easy for local broadcasters to reach all users located within a specified area, and for all users present in a specific territory to gather relevant local information (e.g. about best product buys in a city).

Currently, such functionalities are just beginning to be exploited by emerging "location-based services" which allow us to call the closest taxi-driver, to identify the address of the nearest pub or liquor store, or to verify the momentaneous whereabouts of one's closest friends.

Of course, such capacities can be better exploited by text-based SMS messages than by audio-calls, because SMS makes it possible to send identical messages simultaneously to a potentially unlimited number of receivers.

In the future, this feature is very likely to be exploited for the purpose of influencing local and regional populations: e.g. by distributing information about sales outlets for cheap umbrellas in regions where it is currently raining, or in inviting all people in a city to participate in a specific public demonstration.

Locally oriented political campaigns may become more vigorous because parties use cell phone systems to target electoral propaganda to the populations of precincts or counties; local churches may inform neighbourhoods about their services; and regional drugstores, hospitals, schools or welfare institutions may inform their relevant public (e.g. about new services, prices, changes in opening hours etc.).

Thus, SMS may become a major tool for creating or reinforcing social integration on a territorial basis: e.g. providing information about or reinforcing solidarity with local or regional institutions.

Similarly, large festivals with different simultaneous stage productions can be organized in a more flexible fashion because visitors can be notified very rapidly when new performances are going to start in specific places (Nilsson et. al. 2001)

For highly mobile individuals unacquainted with the environment in which they are currently located, such SMS services are especially useful for finding out where the next Pizzeria, dentist, police station, or flower shop is located. For them, the cell phone is another "urban navigational tool" substituting or complementing street maps, city guides, public information offices etc.) (Townsend 2000).

By lowering the costs of acquiring information even in highly complex urban environments, individuals are better able to make efficient use of everything a big city has to offer, so that the attractiveness and competitiveness of big cities (and the sprawling agglomerations surrounding them) may be considerably increased. By such chains of causality, the cell phone may well contribute to a vigorous increase in urban concentration (Townsend 2000).

7. Implications on the macro-level of interorganizational systems and societal institutions

7.1 The deregulation of intersystemic boundary controls and the shift from location-based to person-based social systems

By building factories, churches, opera houses, schools or psychiatric institutions and by organizing congresses or meetings, social systems with rather stable and neatly defined boundaries are created with boundaries that are anchored in space: i.e. the most objective and invariant dimension available in the physical world.

Especially under traditional conditions where primary no-tech communications prevail, such anchoring has the double function of:

- a) providing accessibility for the participants of the social system,
- b) setting clearly marked boundaries between the system and its environment.

On the **acoustical** level, for instance, this implies the existence of a scheme of causal interpretations, which allows all manifestations of noise to be attributed to endogenous sources within the system. A case in point is the classical theater, where the multitude of different noises does not diminish but instead augment, the degree to which it is a unitary, integrated whole:

"Theaters have always dealt with noise, such as the coughing of sick people and the crumpling of candy wrappers. But these disturbances have been endogenous: they arise from the actions of people who are located within the physical space of the theater, and who are subject to the moral order of the place. Theater performances have historically been resistant to exogenous disruptions, and the theater building is designed to make such disruptions unlikely." (Agre 2001).

On the **visual** level, the unity of the social system is supported by its physical architecture that defines a specific mapping of places and activities:

"The theater assigns every activity to a place: dressing in dressing rooms, performing on the stage, watching from the seats, buying tickets in the lobby, and so on. The architecture itself does not guarantee that everyone will behave themselves according to their assigned position in the theater's social order, but it does provide structural resources and constraints for the socialization process. Everyone plays their part in this institutional drama, and so the play can get performed." (Agre 2001)

According to Foucault (1984), this linkage between architecture and social institutions is a primary basis of social power, because by constructing buildings and designing physical technologies, societal elites have powerful media at hand for implementing their (class-specific) values and norms.

Usually, the power to define and maintain system boundaries accrues to the elites who found and manage these organizations and arrangements: e.g. by controlling gates so that only members have access to the buildings or gatherings, or so that employees do not leave their workplace at any self-chosen time.

In the course of societal evolution, such processes of "authoritative segregation" have been crucial because, by insulating social systems from their general social environment, the preconditions have

been created for subjecting them to processes of systematic (e.g. technological and organizational) development and specialization.

Thus, modern economic systems are heavily based on industrial organizations which have separated work processes from their traditional embedment in family households or other (e.g. religious) institutional settings; and modern medicine would be unthinkable without the hospital where patients are spatially concentrated for systematic diagnosis and treatment.

Conventional theories of modernization usually give much weight to such achievements of interinstitutional segregation: like the physical segregation of workplace and family households as well as the separation between private and public spheres.¹³

While designed for talking at a distance, landline phones have paradoxically also facilitated dense aggregations of people in space, for example by supporting the communication within large-size firms:

"... it is inconceivable to imagine a high-rise building without the telephone - the elevators could not support the number of messages travelling by courier from floor to floor every second, every minute, and every hour of the workday." (Townsend 2000).

Similarly, the fixed phone had a stabilizing impact on families, because households, not individual members, were the units between which it created communicative connections. Thus, it still fundamentally belongs to the historical era of "place-to-place networks". As people had to go somewhere to meet someone, they also had to phone somewhere in order to communicate with a specific person (Wellman 2001).

By articulating differences in location, fixed landline phones have even contributed to more pronounced segregation between different social spheres. For example, the widespread traditional habit of juxtaposing private numbers and office numbers (e.g. on personal cards) has certainly reinforced the structural segregation between work and family: e.g. by facilitating the establishment of different normative expectations about when (and for what purposes) the one or the other of these phone lines should be used. (Laurier 2000).

Evidently, fixed phones are adapted to a society primarily structured in terms of stable location-based social systems: like households, offices, and firms. They are most functional when the purpose is to reach such locational units, irrespective of the people who are present there at the moment. When a specific, but momentarily absent, individual is sought, the premise is that any other person answering the incoming call is not only acquainted with the targeted person, but will reliably inform him or her about the call or even transmit a message.

This premise is certainly fulfilled in the case of stable families inhabiting the same apartment or among employees of the same firm.¹⁴ However, the use of place-specific communication technologies is rather dysfunctional when the individuals inhabiting the same place have quite loose connections or no relationships at all (e.g. in the case of student dormitories where phones are located on each floor, or in hospital rooms where several patients are sharing the same phone). In such cases, cell phones are more useful, because they help to reach specific individuals directly, thus circumventing any need for intermediary messengers located at the same place.

"... mobile phones afford a fundamental liberation from place, and they soon will be joined by wireless computers and personalized software. Their use shifts community ties from linking people-in-places to linking people wherever they are. Because the connection is to the person and not to the place, it shifts the dynamics of connectivity from places--typically households or worksites--to individuals." Wellman 2001).

This functionality is particularly crucial in the case of divorced parents: providing the absent father with the potential of reaching his kids directly, without interference from the divorced mother:

"It has been found in earlier work that communications between non-resident parents and their children can be meaningful for both the child and the parent. In some instances, it has been reported that the non-resident parent has purchased a mobile telephone for their child. Some-

¹³ Among many other examples, consult Parsons/Smelser 1956.

¹⁴ As a consequence, traditional white collars working permanently in the same offices at the same desks show a rather low need for mobile communication (Palen/Salzman/Youngs 2001).

times the children can be quite young. In cases where the adults are not able to agree on the rules of contact this creates a parallel communications channel that is, to some degree, outside the purview of the resident parent. At the same time, the mobile telephone allows the parents to communicate and coordinate with their child without needing to go through the filtering of the ex-partner. (Ling/Helmersen 2000).

An analogous emancipative effect is found in the case of prostitutes for whom cell phones open the way for individual arrangements with their customers: thus promoting their independence from any hierarchical controls and organized exploitation (Plant 2000:59).

Seen in a more generalized perspective, various electronic means of communication have the capacity to undermine such segregation by increasing the permeability between hitherto strictly separated contexts of social life.

At many workplaces, for instance, PC users are free to switch between private and professional computer usage back and forth at any moment of time; and work may extend into private life when office calls are received during evenings, weekends or vacation.

Under such new circumstances, centralized institutional control of system boundaries is more difficult to maintain, because it is no longer achieved as a simple correlate of physical walls or spatial distances, but has to be actively upheld by constant controlling procedures (e.g. by preventing employees from using PC's and mobile phones for private purposes).

It is empirically easy to see many circumstances under which such centralized control is inexistent (or ineffective), so that control shifts downwards to the level of individual users. Especially professionals like doctors or lawyers, managers, social welfare workers etc. are quite free to decide at which time periods they are open to calls from their clients or collaborators. And scientists at a congress or workshop nowadays have the choice as to whether they give priority to conference presentations or to engaging in more fruitful long distance calls.

The integration of informal private gatherings is similarly becoming precarious because it depends on the behavior of each participant as to whether intrusions from outside communications occur. For instance, when three friends come together for dinner, each of them has to decide whether the hours spent together will remain undisturbed from any incoming calls.

Finally, the cell phone can subvert traditional rules which demand that certain individuals should be spatially separated during specific periods in order to inhibit communicative contact and social relationships (e.g. when brides and bridegrooms are not allowed to see each other before marriage in certain traditional (e.g. Islamic) settings, when monks isolate themselves in monasteries in order to facilitate a segregated life style characterized by prayer, chastity and contemplation; or when prison inmates or psychiatric patients are locked up in closed institutions so that they cannot do any harm.

Cell phones undermine the basic notion that physical and communicative isolation are tightly correlated, so that measures on the "hardware" level of physical allocation and transportation are no longer sufficient to produce parallel effects in the loftier "software" sphere of interpersonal communication. For instance, while the traditional practice of keeping couples separated before marriage may still prevent the girls from becoming pregnant, it may no longer be effective to inhibit deeper intimacy based on private interpersonal communication.

In her intercultural ethnographic study commissioned by Motorola, Sadie Plant has for instance found that

"... unable to meet her fiancé face-to-face, a young woman in Dubai described the ease with which the mobile allowed her to talk to him, sometimes while watching him across a busy street. A British Asian woman described the many times she has spoken to her boyfriend under the cover of darkness, her bedclothes, and loud music." (Plant 2000:56).

The loss of centralized control is particularly manifest in the fact that organizers of meetings have diminishing power to decide about the size and composition of participants, because everybody can easily call others to join the gathering.

"Charlotte (15): Last week I was at a party at my best friend's house and suddenly there were people that I had never seen before and it was like 'Hi,' How did they find out about this? But that was surely the mobile telephone because somebody heard about it and they called somebody they halfway knew and when they came, I had never seen them you know." (Ling/Yttri 1999).

Thus, while the hosts who organize the gatherings may control the initial composition (by sending personal invitations), they lose afterwards control over the composition of the group. This is critical in the case of many street demonstrations where the organizers face the risk that these will degenerate into violent riots because uninvited additional groupings mobilized by cell phones "take the lead" (Geser 2001; CSIS 2000).

In a very general way, cell phones introduce an element of entropy into all social groups and institutions anchored in places or territories, because they permeate them with communicative relationships, which transcend system boundaries in highly heterogeneous and unpredictable ways. Thus, the cell phone *"can connect a theater-goer to anyone at all: an employer, a reporter, a dental office administrator, or a fellow club member, among many others"* (Agre 2001).

In theoretical terms, this means that the conventional unity of the locational systems is eroding under the intrusion of many uncoordinated "person-based systems". These are mostly bilateral microsocial relationships, which produce "chaos" mainly because they occur independently of each other and are opaque insofar as they cannot be observed (or even controlled) by any centralized agency. Thus, *"the mapping between activities and places will dissolve, and everyplace will be for everything all the time."* (Agre 2001).

Homes, churches or school buildings will of course continue to symbolize the unity of families, parishes or schools as organizations and institutions, but they may become "empty shells" without much determinative influence on what is "really going on" on the level of social communication and cooperation.

As a consequence, the highly salient question arises: how can the stability of social institutions be guaranteed when it can no longer be anchored on the secure basis of immovable physical structures? It seems evident that hardware factors have to be substituted by much softer media which allow for more fluid definitions and re-definitions of social resources, status distinctions, cooperation practices and normative structures:

"Perhaps the ancient role of architecture in producing social distinctions will be transferred to ubiquitous electronic technologies of surveillance and control, or perhaps the dynamism of the connected society will effectively make it impossible to impose artificial social distinctions in practice." (Agre 2001).

It is reasonable to assume that these developments will have an increasing impact on future architectural designs. First of all, architecture will become freed from many institutional constraints, so that buildings can be designed to satisfy non-institutional (e.g. aesthetic or psychological) values and needs. *Secondly*, rooms will have to be designed to meet the needs of cell phone users (e.g. by creating many small niches where individuals can phone undisturbed). *Third*, architects will have to provide for individual activities related to other roles and institutions (e.g. for work activities in private apartments). In short: *"Physical places and things will become more plastic, and thus more capable of playing roles in a wide variety of institutionally organized activities."* (Agre 2001). And *fourth*, buildings as well as settlements and whole urban structures will increasingly be designed to fulfill those "residual functions" which still demand spatial proximity and technically unmediated primary communication.

"As a result, world cities such as New York increasingly consist of financial people, together with those support services, such as restaurants and cultural activities, that still require physical proximity." (Agre 2001).

To summarize, the mobile phone empowers individuals to decide on their own about the modalities of segregation or permeability between different institutional settings, social systems, inter-individual relationships and individual roles. As a consequence, such boundaries are likely to become much more fluid, modifiable and unpredictable than in the past and, especially, much more a matter of intentional decisions, which risk being controversial (and therefore have to be justified and legitimated) among the different individual actors.

Analytically, the borders between institutional spheres (e.g. work and home) are likely to change in three ways by becoming (1) *more permeable*, insofar as components of one sphere can more easily enter the other, (2) *more flexible* to the degree that the extension of different spheres can be varied according to current situations and needs; and (3) *more interpenetrating (or "blending")*, insofar as role activities may expand and belong to different domains at the same time (Geisler et. al. 2001).

Of course, it might be hypothesized that such an "anomic" state of individualism is a transitory phenomenon, characteristic of these first stages of "cell phone society" in which transindividual (or institutional) norms about phone usage have not yet been established. But we might as well assume that

such "normlessness" is likely to perpetuate in the future because each individual is eager to preserve autonomy in managing his or her own idiosyncratic set of roles.

Evidently, equal access to cell phone usage is highly incompatible with relatively closed and centrally controlled social structures, which limit the privilege of unimpeded outside communication to a few elite members or even one single individual. In traditional families and heterosexual partnerships, for example, it is traditionally the prerogative of the males to maintain such external connections, while the females are more oriented toward system-internal tasks. In accordance with such deeply-anchored role patterns, studies of mixed pairs (e.g. sitting in a restaurant) have shown that cell phone use is most frequently restricted to males (Plant 2000: 21).

7.2 The "colonization" of public space and institutional settings by private communication

The aforementioned deregulation of system boundaries is most vividly manifested in the new uneasy relationship between private, semi-private and public spaces, which is caused by the hardly controllable intrusiveness of mobile phone ringing and conversation.

Conventional communication media (mass media as well as the fixed phone) primarily had the capacity of empowering public agencies to intrude into private spheres. *"No longer a sanctuary where the family was relatively shielded from intrusions from the outside world, the home is now a communication hub, infused with messages of diverse and increasingly global origins."* (Bachen, 2001)

Thus, norms had to be implemented in order to protect telephone subscribers from unsolicited (e.g. commercially motivated) calls.

Modern technologies like the internet and especially the cell phone have reversed this tendency: empowering individuals to carry their private messages into public space. As a consequence, the public sphere tends to become a "common living room" (Kopomaa 2000) and there is now the contrary problem of protecting the public from the uncontrolled intrusion of privacies (e.g. by regulating or prohibiting cell phone use in public places) (Fischer 1992).

"... we observe that a major difference between the social milieux of the fledgling days of land-line and mobile telephony is the agency of privacy violation. Privacy violation concerns have shifted from the surrounding publics infringement upon the landline speakers conversational space, to the mobile phone speaker's infringement upon the surrounding public's acoustical space." (Palen/Salzman/Youngs 2001).

Contrary to a long term trend where public space increasingly became a vacuum zone only used for traffic purposes, the cell phone leads again to a more intensive use of public space ("third places") for informal social interaction. Also restaurants, Hotel lobbies, railway stations airports, supermarkets, and many other "polyvalent" places not committed to specific purposes become enriched with communicative behavior - to the disadvantage of offices and other spaces traditionally dedicated to specific social interactions. (Lasen 2002a: 39f.).

In other words: communication is more and more dislocated to "nonplaces" which have no intrinsic relationship to the messages and messengers involved: so that their content is exclusively determined by the participating subjects, so that their content is exclusively determined by the participating subjects, not by their setting in which the interaction takes place. (Augé 1995).

Among other consequences, this implies that verbal messages not only fail to go along with nonverbal gestures, but also to be embedded in any "scenery" or "stage" contributing to their meanings and effects.

Given the lack of any facilitating and supporting environmental framework, making private calls in public presupposes a rather high tolerance

- a) on the side of callers who have to be disposed to discuss private matters in environments where complete strangers can overhear their talk;
- b) on the side of the bystanders who may feel violated in their own demands for autonomy and non-disturbance when they are forced to listen.

The maintenance of privacy falls at least partially on the "involuntary eavesdroppers" who have to abstain from focusing their full attention on what they actually hear.

Using Goffman's terminology (Goffman 1963, 85-86), it could be argued that the cell phone creates the demand for an augmented form of "civil inattention" which is particularly difficult to secure.

The traditional mode of civil inattention is primarily defined in a visual sense: by not staring deliberately at another person. Such visual distancing is highly viable for two reasons:

- it is easy to practice because gazing is a deliberate activity everybody has under his control,
- it is easy to verify because gazes are visible kinds of behavior.

The mobile phone forces bystanders to enlarge the sphere of civil inattention to the audio level: by not listening to bystander's talks.

Evidently, this is more difficult to implement because

- it is not under my control to "keep from listening" as it is to "keep from gazing"
- even very forceful trials of non-listening will not be adequately perceived and rewarded even very forceful trials of non-listening will not be adequately perceived and rewarded by others, because it does not give rise to any manifest outward behavior.

Nevertheless, traditional norms of "sociofugality" provide individuals in public places with enough leeway to engage in undisturbed talks similar to those in one's own apartment:

"A mutual ignorance seems to prevail among people using their mobiles and the other pedestrians. This example of civil inattention allows users to talk freely outdoors. As Maria, a young student from Madrid says "I'm on the street, walking and talking normally as if I were at home". (Lasen 2002b: 20).

The reluctance to engage in highly intimate talk in public is certainly least when talkers can be certain that all bystanders are unacquainted and unrelated, so that there is no risk that anybody listens too carefully or even tells to third people what he has overheard. Thus, we should expect high reluctance in smaller, densely-knit communities where such risks are much higher than in larger, completely anonymous urban settings (Fortunati 2002: 50).

It is no surprise to find that during cell phone calls, individuals reinforce their social distance to others by various visible nonverbal gestures (Murtagh 2001: 85f; Puro 2002: 23):

"While concentrating on the conversation, they avoid eye contact with other pedestrians. Another typical example of body language in the three cities is the characteristic walk of mobile phone users in public places. They stand and then walk slowly in circles or they pace a short distance back and forth. This walk is a kind of compromise between walking and standing still." Lasen 2002b: 22).

Symmetrically, bystanders "look away, avoid eye contact with the phone user and pretend not to listen, even when the user asks them something related to the phone conversation." (Lasen 2002b: 23).

An interesting development is the emergence of circumscribed public places where especially strict norms of "acoustic civil inattention" are in rule:

In Paris and London I have observed that some urban spaces constitute a kind of temporary phone zone. Different people stop there, make a call and resume walking afterwards. In front of big stores' doors (BHV in Paris, John Lewis in London), near underground entrances, like in Oxford Circus and Saint-Germain-des-Près, or on some street corners, one can see this kind of improvised open air wireless phone booth. In these places several persons are phoning, apparently unaware of others doing the same. Conversations in such zones tend to be short. (Lasen 2002b: 19).

Western culture is rather well disposed to cell phone usage, insofar as social norms do not forbid people to display private behavior in public. For instance, couples are not discouraged to kiss each other in public places.

In addition, the rigid norms of civil inattention (especially in Anglo-Saxon countries) may also create a *need* for using the phone: in order to fight the loneliness people feel in modern urban settings when they find themselves in an anonymous crowd. As public life demands to keep distance to others (e.g. by not opening casual talks), even individuals highly eager to gossip remain basically alone: so that the cell phone may be their only channel for contacting others.

"We are constantly on the move, spending much of our time commuting to and from work either among strangers on trains and buses, or alone and isolated in our cars. These factors are particularly problematic for the English, as we tend to be more reserved and socially inhibited than other cultures; we do not talk to strangers, or make friends quickly and easily." (Fox 2001).

Thus, ethnographic observations have shown that *"on the English commuter trains where the observations were undertaken you are more likely to hear phone conversations than face to face conversations."* (Lasen 2002b: 31).

Evidently, the blurring between public and private sphere is not accepted alike in all cultural settings.

Even within Western Europe, there are pronounced differences in public use of cell phones: the French being more reluctant about making private calls in the public than people in England or in Spain (Lasen 2002b: 7): And in Japan, which is Western by many standards, cell phone use in public places is subject to rather rigid restrictions, because norms of mutual non-intrusion demand that a rather low noise level is maintained:

"Perhaps the biggest reason that cell phones engender hostility in Japan is that the culture does not tolerate loud and extraneous noises. Drivers do not honk in anger. Car alarms are silent. People do not shout. Strangers rarely talk; when the city bus driver shuts off his motor, as he does at each red light, there is a funereal silence. So the jangling of a phone is an excruciatingly intrusive offense, even if the ring has been replaced on today's programmable cell phones with, say, the sprightly theme song to the Astro Boy cartoon show." (Struck 2000).

On the other hand, the cell phone fits nicely into the traditions of Southern countries where much of daily living has always proceeded under the open sky. Thus, lengthy cell phone talks are quite common in Paris and Madrid where streets are typically used for idle strolling, while they are rare in London where pedestrians use public spaces only for efficient locomotion (Lasen 2002b: 15).

It may be speculated that high urban density and multiculturalism will promote restrictions of public cell phone usage in the future, because risks are increasing that at least some minorities will feel disturbed.

Thus, in contrast to most other (e.g. industrial) technologies, norms related to the relationship between privacy and public sphere seem to be even more decisive for cell phone use than economic factors

"While rates of economic development have an enormous influence on the extent of mobile use, the popularity of the mobile also seems to be related to some rather more subtle cultural factors. It seems that the mobile is more at home in cultures which foster a relaxed attitude to issues of privacy and personal space, than it is in those which prioritize privacy." (Plant 2000:78)

On a more general level, it might be hypothesized that in the longer run, cell phone use will be subjected to similar tendencies of tightening social controls like many other innovations in public individual behavior (e.g. smoking or the parking of cars). Typically, such new forms of behavior are well tolerated in the beginning because their use is not yet so ubiquitous, because political actions for rule making and rule enforcement are in the initial stages, or because their negative impacts (e.g. "passive smoking") are not yet completely known. As time goes on, however, complaints accumulate and take the more formal character of court suits or legislative procedures, while on an informal level new standards of morality and politeness emerge which make it rather easy to enforce formal rules.

The impact of cell phone use on environments is very much reduced when text-based messages (SMS) instead of audio calls are used. A major advantage of SMS lies in the fact that messages can be sent and received in a highly unobtrusive way, even when bystanders are quite close.

In addition, SMS is compatible with conditions where phone calls are totally impossible: either (a) with high levels of noise or (b) when total silence is to be maintained, so that even "sotto voce" phone con-

versations would be angrily classified as disturbances (e.g. in school classes or during musical performances).

While public places are easily invaded by private communication because no consistent social controls are applied in order to keep privacy out, the same is not true for "semi-public places" like formal organizations or other institutional settings, where centralized and formalized control structures are effective for maintaining specialized roles and forms of social cooperation (Kopomaa 2000).

Cell phones tend to weaken the control of all formal institutions over their members' behavior, because they open the opportunity for all members to reduce or interrupt their formal role involvements by engaging in alternative role behavior and completely private interactions anywhere and anytime: e.g. during office hours, school lessons or military duties and when driving a car or piloting a plane.

Thus, schools come under pressure to allow kids to use cell phones, because their parents are eager to keep in touch at any time whenever needed (Mathews 2001).

While in the past communicative isolation during school hours was easy to maintain because technology made external calls difficult anyway, such isolation now has to be actively produced and legitimated by providing convincing reasons, by exercising authority and by implementing (potentially disputed) measures of social control.

While audio calls may readily be repressed because they can be easily observed, it is much harder to prevent kids from receiving SMS messages during school hours (Ling 2000a). In fact, Norwegian researchers have reached the conclusion that cell phone technology "has become part of the classroom context" (Ling 2000).

Institutions lacking sufficient authority and controls will easily be destabilized by such waves of role diversion and informalization, so that their members can no longer be supposed to be focussing their full attention on formal role duties during the whole time of their physical presence in the institution.

On the other hand, institutions may draw on inputs from members not currently on duty: e.g. by reaching them during evening hours, at weekends or on vacation.

This implies that it will be less and less viable to measure individual work inputs by simply verifying the time of physical presence; rather, companies must ensure that employees don't use working time for private online activities and personal calls.

An interesting study for testing the impact of formality has been made in London and Birmingham, where cell phone behavior in more formal restaurant settings (with tablecloth and table service) and in an informal cafeteria environment (without tablecloth and self-service) was compared. It was shown that in the formal environment, cell phone use is much more inhibited than in the informal settings:

"People are relatively uninhibited about showing mobiles at less formal tables, but it seems that the presence of waiters and waitresses or tablecloths mitigate against such displays. This may be because tablecloths and the other trappings of more formal establishments are associated with a certain, more ritualized social activity - dining out - from which it may be felt that mobile phones and all their actual and potential interruptions should be excluded. The presence of a waiter or waitress also brings more formal tables under a loose form of surveillance, and this may also tend to inhibit the use and display of mobiles in such contexts." (Plant 2000:38)

It is highly interesting to note that such differences in behavior are based exclusively on implicit norms that are neither explicitly stated in terms of written rules, nor discussed or negotiated among the participants of social systems.

Generally, the intrusive effects of cell phone calls are more akin to lower class culture settings (e.g. proletarian restaurants) where it is usually found appropriate to rearrange the allocation of private spaces according to changing circumstances. On the other hand, they collide very much with middle and higher-class settings (e.g. high-level dining rooms) in which territorial spaces are more highly respected and more rigidly fixed (Mars/Nicod 1987; Ling 1997).

8. Some preliminary conclusions

The most general function of cell phones is to lessen the degree to which social relationships and social systems are anchored in space, and they increase the degree to which they are anchored in particular persons.

From the point of view of individual users, the cell phone provides opportunities:

1. to enlarge the number of potential communication partners available at any specific place and moment,
2. to distance oneself from current collocal interaction fields by directing attention to remote partners
3. to expand the peripheral layers of social relationships by cultivating weak ties to partners one is not ready to meet
4. to shield oneself from new and unpredictable contacts by signaling unavailability and by maintaining more frequent interaction with familiar partners (e.g. friends and kin)
5. to maintain contact with any other individuals (or organizations) irrespective of movement and changing spatial locations
6. to combine divergent roles which would otherwise necessitate one's presence at different places at the same time
7. to switch rapidly between highly different (and usually segregated) roles and situational contexts, so that there is more discretion as to how they should be separated or combined
8. to take over "boundary roles" in any social system: e.g. in order to get information about the external environment or to participate in processes of external interaction and adaptation
9. to fill empty waiting periods with vicarious remote interactions
10. to reduce the reliance on one's own inner judgment by asking others for advice
11. to occupy highly diffuse roles which demand involvement at any hour of the day (e.g. care-giving functions etc.); or "standby" roles which demand permanent readiness (e.g. in emergencies)
12. to live more "spontaneously": without strictly scheduled agendas, because meeting hours can easily be rearranged.

From the point of view of *social systems* the cell phone will:

1. decrease the positive impact of spatial proximity on social interaction and integration,
2. increase the functional viability of very small groups and single individuals, because they have increased opportunities to mobilize additional resources from outside actors, or to include additional remote members on an ad hoc basis when needed,
3. ease the penetration of bilateral interpersonal microsystems into multilateral groupings, formalized social collectivities as well as public spheres,
4. increase the capacity of organizations to fully integrate spatially remote and moving subunits and to relate to customers whose location is changing and not known,
5. increase the functional capacity of collectivities and organizations on the move: e.g. military or police units, ambulances, refugee groups etc.,
6. privilege collectivities constituted on the basis of particular members rather than particular places or territories (e.g. families and ethnic groupings rather than cities, parishes or schools),
7. encourage emphasis on highly segregated bilateral relationships - while larger multilateral allegiances are losing ground,
8. facilitate swiftly constituted, ad hoc gatherings with highly variable composition, so that social system structures can be flexibly adapted to rapidly changing situational conditions,
9. facilitate the shift from rigidly programmed bureaucratic organizations to "adhocracies" where timetables and cooperation patterns are constantly reshaped,

10. lessen the need for central "communication hubs" within groups and organizations because each member can directly receive (and send out) his/her own calls,
11. minimize the "spill over" of communications to unintended third parties because messages can be precisely targeted to intended individual receivers,
12. increase intersystemic permeabilities, blendings and interpenetrations, while lowering the capacities to keep such contacts under centralized and regularized control.

Confronting the two lists, it can well be argued that cell phones have a certain "subversive" capacity to shift the weights from dominant to the less powerful individuals and from formal institutions to informal social systems:

- 1) While it has been argued that cell phones will enlarge the sphere of employer authority by allowing him to reach employees at leisure hours, studies show that to the contrary, they have the effect of invading the workplace with privacy (Harper 2001; Taylor/Harper 2001).
- 2) While it was predicted that cell phones work as an instrument for parents to tighten their control over kids, it has been found that they help children to evade parental control (Green 2001; Taylor/Harper 2001)
- 3) Contrary to expectations, females have found to be keener in adopting the new mobile technology: by using it for a wider range of everyday purposes (Ling 2001; Taylor/Harper 2001)

In a very general way, mobile phones undermine traditional mechanisms, which have secured the segregation of social system levels from the level of individual members, as well as the segregation between different social systems. Instead, each individual now is burdened with the task of maintaining a difference between personal behavior and social roles, and with regulating the boundaries between different social relationships, groupings, organizations or institutions.

Therefore, the demand for social control will rise because, in a world where social differentiation can no longer be based on spatial segregation, it has to be increasingly secured by controlling individual behavior.

Such control can be realized in three forms:

1. *intraindividual self-controls* (e.g. in the case of users avoiding or shortening incoming calls in order to concentrate on ongoing collocal interactions),
2. *informal interindividual group controls*: e.g. in the case of collocal partners showing impatience when cell phone calls go on for longer than expected,
3. *formal institutional controls*: e.g. in the form of regulations prohibiting cell phone calls during school or working hours. For instance: the institutional differentiation between school and family is no longer guaranteed by physically segregated school buildings and closed classroom doors, but by actively preventing pupils from receiving and answering mobile phone calls and SMS during the courses.

Will the mobile phone change society?

On the one hand, it will certainly spread explosively because it fulfills so many needs which have remained unfulfilled, not only during the most recent periods of human history, but during the whole time of biological evolution.

On the other hand, its functionality to complement or even substitute traditional no-tech communications will be limited by the basic fact that this same evolution has created deeply anchored needs for basing social interaction on spatial proximity at stable locations (e.g. physiological needs of having sex with "zero-distance" partners, or psychological needs to socialize with others at informal face-to-face gatherings).

Thirdly, it has to be considered that mobile phones are only capable of supporting highly decentralized network-like interactions, especially on the simple level of bilateral communications. Thus, older space-dependent interactions are still essential for supporting multilateral interaction fields, as well as more tightly integrated collectivities like communities and organizations.

Finally, the formulation of determinative causal propositions (or even precise forecasts) is severely hampered by the fact that, in sharp contrast to industrial machinery, cell phones (like Personal Computers, PDA's etc.) belong to the class of empowering technologies which are likely to amplify (instead of to reduce) psychological, social and cultural divergences, because of their capacity to be used for different purposes in any sphere of life.

This versatility has the implication that mere hardware possession is not a very informative indicator, because it doesn't tell us anything about the extent and the ways these instruments are in fact used.

This is certainly different to older media like television, where the number of installed receivers is a good measure of the degree to which this technology has penetrated society and individual life.

By contrast, when technologies like cellular phones become ubiquitous, no certain conclusions referring to the actual changes in human communications patterns can be drawn. Instead, much extensive and sophisticated research is necessary in order to assess how they are actually used, how they affect various kinds of social relationships, and how they become embedded in the evermore complex sphere of all other communication media.

Of course, these indeterminacies increase to the degree that cellular phones assimilate more and more different functions: e.g. the capacity to send alphanumeric messages, to hook up to the WWW or to use the GPS for determining geographical locations.

Another implication is that as individuals have a broader range of behavioral options at hand, the impact of psychological, social and cultural factors on such behavior is likely to be increased (Davied et. al 1999). In other words, while behavior in low-tech environments is predominantly shaped by "hard" physical factors (e.g. apartment walls, loudness of voice, spatial proximities and distances, physical means of transportation), behavior in high-tech settings will be more determined by "soft" factors like subjective preferences and motivations, informal or formalized role expectations, cultural customs and habits or purely functional needs.

Given the almost ubiquitous adoption of cell phones within and across current human societies and cultures, the most important question to ask is whether this universal diffusion is causing worldwide convergences and homogenization.

Most probably, the right answer is rather negative, because by supporting rather traditional and particularistic social settings, cell phones are more likely to accentuate differences rather than communalities between various population segments, social institutions or ethnic cultures.

"A closer look at the details of people's interactions and relationships with mobiles suggests that while they are introducing some common patterns of behavior to very varied regions of the world, there is no homogeneous mobile effect. Indeed, the mobile is remarkable for the diverse range of users and uses it attracts. It is uniquely adaptable, capable of playing many different roles, and able to make itself useful in a wide variety of cultural contexts, social worlds and individual lives. As its use spreads, so it will continue to diversify instabilities as traditional structures of employment, family, community, and cultural life are disrupted. The mobile encourages such movements, and helps to repair the connections they may break." (Plant 2000).

As studies on the level of family and kin networks have shown, the cell phone becomes readily assimilated by almost every collectivity without effecting any significant longer-term change on the level of structures or cultural patterns.

"When first introduced the novelty value may change behavior slightly and for a brief time. Once the novelty has worn off the family resumes their normal activities, their normal ways of behaving with each other and the outside world. The introduction of a new technology into the home doesn't challenge their existing ways of relating to each other. It becomes part of their everyday routines. It doesn't challenge who does the dishes, who takes charge of childcare, and who takes out the rubbish. It doesn't change the relationships members want to have with others. In fact it is more likely to reinforce the family's values and activities." (Wale/Gillard 1994).

Understandably, social and cultural factors have more impact on the interactional and social-institutional uses of the new media, while the psychological variables are important in shaping the more private uses. This regularity is vividly illustrated by the empirical study of Davied et al, which shows that social class factors are much better able to explain the business-related uses of new media than the uses in the realm of entertainment.

Or expressed in a third way: New communication technologies make it easier to translate psycho-sociocultural dispositions directly into overt behavior, by reducing - or even eliminating - many obstacles and distortions which have hitherto contributed to a weakening of these empirical relations.

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