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The Social Geometry of Mobile Telephony

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Abstract
Mobile telephone technologies seem to be everywhere having profound effects on the nature of communication. They are being celebrated for the creativity of new mobile languages that have and are being generated and for emancipating communication from fixed points in space. But behind this lies a central paradox – mobile phones are ubiquitous and bodily intimate technologies but, at the same time, the public seems particularly fearful of any spatial proximity to mobile phone masts. Such fears are generally understood in terms of 'risk perception', an irrational consequence of media hype, faulty cognitive processing, or communication failure. This merely psychologises what is a deeply spatial paradox. The routine 'nomadic intimacy' of mobile phone usage establishes place as a mere backdrop to being always 'on-call', too absorbed in the 'busy-ness' of everyday life to notice what is close at hand. In contrast, 'place intimacy' becomes evident when public protest over the unwanted intrusion of phone masts helps refashion familiar places as meaningful, safe and worth protecting. Reaction to the unwanted intrusion of phone masts helps to refashion familiar places as meaningful, safe and worth protecting. In contrast, the routine nomadic intimacy of mobile phones establishes place as an indifferent backdrop to being always 'on-call', too absorbed in the 'busy-ness' of life to notice what is close at hand. In this respect, and contrary to the celebration of mobile telephony as a liberatory technology it may also be deepening the disenchantment with modern life.

The Social Geometry of Mobile Telephony
Mobile Telephony: The Dr Jekyll and Mr Hyde of ICTs?
Mobile telephone technologies are having profound effects on the nature of communication. Yet, critical examination of the widespread impact of mobile communication technology is lagging well behind the social, cultural and spatial innovations already being brought into existence. This new sense of communication in motion has become a forcing house for cultural experimentation. Take text messaging, or short message services to use its technical term. This has been variously discussed a revolutionary new means of expression among teenagers or as a scandalous assault on the 'cul8ral' standards of national languages. Standard English, which aspires to become the *lingua franca* for the age of globalisation, has broken into various localised hybrid languages, what Plant (2002) calls the 'new textperantos for the mobile age'. Such communication creativity was unforeseen by the mobile telephony industry.

Different cultures have found different terms for the handset in mobile telephony, reflecting the fact that this small portable object allows communication with an unseen communicant while moving through open space. Though it called a 'cell phone' in the United States, in Britain it is known as 'the mobile', in France 'le portable', in Finland 'kanny', 'in Germany 'handy', in Thailand 'moto', in Spain 'el movil', in Japan 'ke-tai' (Plant, 2002: 23). Mobile telephony has emerged as an important shaper and emblem of everyday life, in some ways proving more radical than the coming of the Web just a few years earlier. Although Manuel

Castells (2001, p. 234), the leading architect of the idea of the Internet as the medium of a new 'Network Society', makes only a single mention of mobile telephony in his recent 300 page-long study, *The Internet Galaxy* mobile telephony is set to merge with the computing to create new relationships between Castells' 'spaces of flows' and 'nodes' in creating mixed-up 'hybrid spaces'. In some cultures, such as the United States, cell phone use is less extensive than in places like China, Japan and Thailand, perhaps because it represents a violation of personal space and boundaries where elsewhere it extends existing layers of social interaction (Plant and Land, 2003).

Wireless transmission technologies like portable or 'mobile' telephony therefore seem to represent a technological reordering of the geography of communication, consigning the spatial fixity of the television and telephone age to an archaic memory. For some, mobile telephony represents an 'emancipation from physical constraint' (Geser, 2002). As Leopoldina Fortunati (2002a) puts it, 'If the Internet is really creating the conditions for humanity's taking on a planetary consciousness, the mobile creates the conditions for the acquisition of a really widespread cosmic consciousness'. For Townsend (2000) the cellular telephone 'will undoubtedly lead to fundamental transformations in individuals' perceptions of self and the world, and consequently the way they collectively construct that world'. Sadie Plant (2002) further argues that mobile telephony 'has extensive implications' for the nature of communication, identities, social structures and economic activities. Plant (2002) continues, 'the mobile introduces new senses of speed and connectivity to social life, establishing new kinds of relationships between individuals and with the urban crowd. In this respect, the mobile can facilitate the emergence of a new private world, a virtual community which can be pulled together in a matter of moments'. In existential terms, Plant argues that 'the mobile is probably the first piece of digital technology which directly and more or less constantly changes people's intimate experience of their bodies, their senses of their capacities, the possibilities of the everyday, on the street, the material self' (Plant and Land, 2003, p. 63).

Such claims echo those made for the Web a decade ago, deploying the exaggerated code words of technological glamour - new, speed, 'connectivity', community. As part of the more general phenomena of de-territorialization, mobile telephony makes possible a new social geometry of communication. It inverts what Georg Simmel (1997) called 'spatial proximity' and 'social distance' by combining unprecedented mixtures of *spatial distance* with *social proximity*. Yet technologically-mediated remoteness from what is physically close and intimacy with what is spatially distant will not necessarily result in emancipated mobile spaces (Stones, 2001). Mobile telephony may also extend the social controls of parents or bosses across distances or foster a conservative or passive relationship to space as users avoid what is close at hand but unfamiliar and reach instead for the familiar but spatially remote (Katz, 1999; Haddon, 2000). Neither are mobile phones being uncritically absorbed into national and local cultures as sales figures alone might suggest (Fortunati, 2002b, p. 54; Nafus and Tracey, 2002). Different age cohorts express divergent attitudes towards mobile telephony. While teenagers display the most positive attitudes, many under-30 year-olds express outright hostility and older age groups feign indifference (Nafus and Tracey, 2002).

A focus on the technics of mobility, that is on the operation of a portable device while on the move, runs the risk of fetishising the object of the mobile handset as a semi-autonomous cultural symbol or functional gadget. As a fetishised object the mobile phone transforms the meaning of place into a blurred backdrop, an empty void through which communicants indifferently pass. As an indeterminate marker of the passage through space, place becomes a resource for mobile callers to register their increasing or decreasing distance from each other in the interminable enquiry, 'Where are you now?' (Laurier, 2000). Place is less a

space loaded with specific meanings but one reduced to a quantitative means for measuring the stages of a journey. Fortunati (2002a, p. 11) argues that such 'nomadic intimacy' diminishes what might be called the 'place intimacy' of social spaces.

> 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.

Place intimacy need not depend on a fixed, nostalgic 'sense of place', where 'authentic' communities somehow resist the 'inauthentic' transience of mobile geographies, to register the role of mobile technologies in creating an 'absent presence' – the body is here but the mind is engaged somewhere else (Agre, 2001). Spatial consciousness is reconfigured by mobile communications as physical co-presence becomes 'absorbed by a technologically mediated world of elsewhere' (Gergen, 2001, p. 227). A sense of spatial context might yet be restored by sophisticated context recognition devices that technically mediate the 'absent presence' of a stable location for remote human interaction using ultra-mobile computing like mobile phones (Schmidt, et al, 1999). Thus technology is called upon to rectify the condition of displacement that technology itself gave rise to. It thus gives rise to a Jekyll and Hyde attitude to mobile telephony.

One side of this dual character is that mobile telephony remains dependent on the everyday meaning of place intimacy. This can be found in the contentious siting of radio transmitters and receivers for mobile telephony. Behind the youthful facade of the sleek handheld cell phone, creating a new freedom from space, stands a familiar, old-style fixed industrial infrastructure of base stations upon which the functioning of mobile technology depends. At street level the 'space of flows' of mobile communications depends on the 'nodes' of an infrastructure of fixed transmitters and receivers housed in base stations. Base stations process radio waves from mobile phones and provide geographical coverage over areas known as 'cells'. Nation-wide mast networks scar the new mobilescape, which is perhaps why strenuous efforts are made to keep them out of sight.

As fixed nodes in the new nomadic space of flows base stations (or phone masts) have become the source of two key objections: aesthetic-cultural and health risks. Each has become a matter of contention in many localities for quite distinct reasons. Aesthetic-cultural objections to base stations rest on their incongruent relationship to the surrounding landscape. Health risk objections to base stations rest on public fears of radiation and a sceptical attitude towards scientific expertise. This paper examines some of the sources of these two seemingly unrelated objections. It sets out the paradox of base station fears that, when coupled with widespread mobile phone usage, is a function not of some irrational public schizophrenia over technology that some analysts claim but of spatial proximity to technology considered 'alien' to the place intimacy of urban and rural environments. It then provide an alternative mobile geography of base stations, one that focuses on political mobilisation over the contentious siting of phone masts. From a remote social distance scientists, policy agents and operating companies attempt to factor-in geography as a largely neutral variable in base station siting (Cutter, 1999). In contrast the place intimacy of activists, residents and parents endow local space with rational concerns over health and arouse strong feelings over the external imposition of eerie-looking built structures.

Postmodern Towers Of Babel?

In terms of geographical spread the spatial growth of base

station coverage has been a process of dispersal outwards from high-density urban populations to more remote areas along major transport routes such as motorways. Like some latter-day tower of Babel base stations electronically process and relay novel language forms across space. And just like the biblical tower of Babel base stations have become a controversial site of mutually incomprehensible voices. Their proliferation represents a highly visible and contentious feature of both urban and rural landscapes. Phone mast visibility has led to objections from those living within their vicinity on the grounds of 'visual obstruction and intrusion'. Base stations take on a varied appearance but tend to share in common several basic features such as a storage cabinet housing electronic equipment for transmission and reception of radio frequency signals, a mast or a tower, typically 15 metres high, with aerial antennae or dishes attached.

In such forms base stations do not easily blend-in with idealised rural landscapes. In less densely populated areas concerns over base stations tend to revolve around the aesthetic or amenity value of scenic landscape or wilderness. Their appearance as industrial objects works against the landscaping of 'the rural' as scenic countryside and disrupts the tourist idyll and authenticity of the heritage industry's staple of mannered country life. One Scottish folklorist, for example, protests that climbers ascending the summit of Mount Blair in east Perthshire, an area rich in Scottish folklore as well as sumptuous scenery, must confront an 'ungainly structure': 'The word "mast" is a beautiful one with it nautical connotations. Another word altogether should be found for the new chunks of ironmongery that are despoiling the landscape' (Fleming, 2001, p. 554). Even from the limited vantage point of a car travelling along a motorway base stations stand out. Efforts have been made to camouflage base stations using 'stealth designs' so that they effortlessly dissolve into the background from the view of passing motorists, who only see rather strange looking trees from their cars rather than a piece of telecommunications apparatus. Such deception expresses a wish to erase the disenchanted signs of modernity from the cultural construction of rural landscapes, forgetting that an older mobile geography of car-filled motorways already cuts a swathe through them (Smith, 1998).

Perhaps the most intense controversy concerning the siting of base stations has been generated in urban settings by their spatial proximity to 'sensitive' built structures like hospitals, schools and residential estates. Despite the efforts of industry groups like the international body, the Mobile Manufacturers Forum (www.mmfai.org), base stations arouse strong fears of health risks from the emission of radio-frequency radiation. As industrial objects base stations in urban areas may be less susceptible to aesthetic disapproval. They tend in any case to be banished to the top of tall buildings, housed inside built structures such as disused church steeples or fixed to existing street furniture like CCTV cameras or street lighting.

Base stations tend to be clustered in the city centre and fan out from there in concentric circles, a spatial patterning that shadows the concentration of radio connections needed to ensure effective coverage, connecting-up large numbers of callers in more densely populated areas. In rural settings base stations cover up to a 10km radius while in cities the radius of coverage may be less than a few hundred meters. They are also more likely to be located nearer to buildings of public sensitivity than in semi-urban or rural settings. It is impossible to avoid siting base stations in close proximity to residential populations or public amenities. With constantly increasing base station sites, estimated at 100,000 new masts compared to the present 40,000, to support the increased sophistication of the 'third' generation (3G) of mobile phones, public concerns over base stations are not likely to subside but may even increase in the near future (Fox, 2001; Curwen, 2000). Despite phone operators paying huge sums for 3G licenses, £22 billion in the UK and £6.5 billion in France, rising public concern and resistance to base

station sitings is jeopardising the introduction of the 3G network and with it operator profitability (Spurgeon, 2001, p. 275).

Risk And Rationality

If, as is generally the case, public fear of base stations is understood in terms of perceptions of risk then it rests on an apparent paradox. According to the scientific evidence, radiation exposure from base stations could be considerably lower than emissions from using a mobile phone (Stewart, 2000; Blettner and Berg, 2000; Schuz and Mann, 2000; GAO, 2001; Strock, 1998). Base stations generally emit radio waves in an even pattern well below levels set by international guidelines and any concentrated pocket of radiation emission is likely to be at a safe distance from ground level. Mobile phones, in contrast, may have higher emissions of radiated energy, which can have a thermal effect, heating body tissue, or biological effects such as tumours or cell breakdown (Edwards, 2001). Recent scientific research has also found some worrying non-heating effects of microwave radiation, causing nematode worms to become more fertile and grow longer (Graham-Rowe, 2002). Yet despite the apparent lower health risks the public seems to be more anxious about base stations than about using mobile phones. In the words of one US writer, 'Simply put, many people love wireless convenience … but no one loves the towers or antenna arrays that accompany the technology' (Blake Levitt, 1998).

In the UK the most authoritative overview of scientific findings, the UK Independent Expert Group on Mobile Phones (Stewart, 2000, p. 26) speculated on the central 'paradox' of the public's base station fears:

> Given the much lower exposures to radiation from base stations than from handsets, the greater public concern … about the former is paradoxical. It presumably arises because individuals can choose whether or not to use a mobile phone, whereas they have little control over their exposure from base stations.

Thus, contrary to the available scientific evidence, the public seem to underestimate health risks from mobile handsets while frequently overestimating the risks from base stations (HC330, 2000). This is variously attributed to the failure to communicate scientific knowledge effectively to the public (Covello, 1998) or the public's cognitive failure to acquire adequate or accurate knowledge (Hester, 1998). The 'established mental model' of deficient public knowledge and risk perceptions often assumes the public's 'numerous misconceptions and misperceptions, as well as deductions from inaccurate media information' (Szmigielski and Sobiczewska, 2000, p. 264). Others, however, remain sceptical about communication failure and mental deficit models and point to the role of wider political and cultural values shaping conflicting assessments of risk (Taylor, 1999). It is not just the public that appear to have 'defective mental models', that public perceptions fail to correspond to what science tells them about reality, since the scientific community is itself divided on the potential hazards. Many scientists urge a precautionary approach to base station location until more research has been conducted. Some bioelectromagnetic research suggests that the most profound bioreactions occur at the lowest exposure levels (Blake Levitt, 1998). Campaign groups claim to have identified cancer clusters among people living close to masts and some research exists that challenges the dominant 'no hazard' hypothesis (Cherry, 2000). In Germany medical practitioners have initiated the Frieburger Appeal (2002) over their concern about unknown health hazards and the identification of a correlation between sick patients and base station locations.

Current research therefore prioritises professional and expert definitions and calculations of risk over public perceptions (see Kammen and Hassenzahl, 1999; Bennett and Calman, 1999). Studies for the International Commission on Non-Ionizing

Radiation Protection (ICNIRP) and the World Health Organization (Matthes, et al, 1998; Repacholi and Muc, 1999) propose to resolve the incongruity between science and public perceptions by a more efficiently designed process for communicating scientific knowledge appropriate to the existing 'mental models' of lay people. In its recommendations, the Stewart Report established three priorities designed to reassure the public about base station development: *amenity*, to minimise the (visible) environmental impact; *health*, where potential health impacts should form a material planning consideration; and a *precautionary* approach, where planning authorities need to compile a hierarchy of site locations. Only the latter recommendation begins to address the crucial geographical issue of place intimacy, albeit from the social distances of planning authorities.

For the mobile telephony paradox there is, as yet, little empirical data concerning precisely how perceptions are shaped by cultural and geographical factors. The Stewart Report links this paradox to the degree of control and autonomy that individuals feel able to establish over mobile telephony in comparison to the siting of base stations. Many others list similar claims about cognitive failure and reduced personal autonomy. Psychological perceptions of risk generate opposition to technological developments like mobile telephony. In common with many forms of risk analysis the World Health Organisation compiled a list of binary characteristics for low to high perceptions of risk (WHO, 1998; see also Chapman and Wutzke, 1997). The mobile phone/mast paradox can therefore be reduced to a kind of rationality failure on the part of local campaigners and communication failure on the part of operators and planners, with only the latter in a position of knowledgeable authority to correct the faulty representations of the former.

A further way that mobile telephony's Jekyll and Hyde condition might be understood is in terms of material culture, in the symbolic meaning of the mobile phone and mast as physical objects. The mobile handset appears to possess diametrically opposed design characteristics to base stations: the former is elegant, miniaturised, a fashion accessory, portable, bodily intimate, 'soft and compact' (Chuang, et al, 2001), and emblematic of metropolitan sophistication (or vulgarity) while base stations are perceived as large, ungainly industrial protrusions, alien impositions fixed to the landscape, emitting unseen and unknown dangers. In such ways, the very infrastructure that makes mobile telephony possible as a functioning, desirable technical system appears to be rejected by the culture that generated it in the first place.

While a focus on material culture moves away from the psychologisation of protest and communication failure these objects need to be more firmly embedded within the habitus of place intimacy if they are not to become reified. Base station fears are not solely about the ugliness of towers (Blake Levitt, 1998), though their physical characteristics may indeed be a factor. Few, including otherwise authoritative cross-national studies like Katz and Aakhus (2002), make the paradoxical connection that base station fears and ubiquitous mobile phone usage may in fact be closely connected once the issue of people's unquestioned relationship to familiar spaces, place intimacy, is considered. To more adequately account for mobile telephony, an understanding is necessary of the new technologically-mediated spaces of communication, its inverted social geometry of spatial proximity and social distance.

Protest and Phone Masts

Opposition to mobile phone towers has become a routine feature of many countries. In August 1995, a protest opposing a base station adjacent to a kindergarten in the middle-class beachside Sydney suburb of Habord was taken-up sympathetically by the news media and the telecommunications operator Telstra forced to dismantle the structure (Chapman and Wutzke, 1997). In

January 2002, parents in the north-central Spanish city Valladolid won a court judgement to close down a cluster of thirty masts on the roof of a building neighbouring a primary school after four cases of cancer were detected among the 450 pupils (Reuters, 2002). Throughout the United States, where Section 704 of the 1996 Telecommunications Act gives communities limited rights over the general placement, construction, and modification of towers stopping short of an outright ban, respectable as well as poor neighbourhoods have been engaging in civil disobedience to prevent the siting of phone towers. In Wellfleet, Massachusetts, a small New England town on Cape Cod where a church wanted to site several antennas in its steeple, in the very heart of a historic district of centuries-old closely built houses, local resident Richard Chevalier asked, 'What are they going to do, send out the national guard and make us site towers?' (Blake Levitt, 1998). Such is the concern extending even into places like Vermont that industry researchers in the US went on strike for a year demanding that the industry indemnify them for the results of their research. In London local residents used Human Rights legislation to prevent Orange from erecting a new mast on the roof of the Royal Free Hospital. Such examples could be multiplied over and over.

Even from this cursory glance it is apparent that health fears are intimately tied-up with geography. Thus there are important national differences in the 'mobilezation' of base station protest. Differing national juridicial, policy and media contexts contribute to the social construction of risk (Burgess, 2002). In the UK a high level of 'risk consciousness' over issues like the media coverage of BSE coupled with state responsiveness to anti-mast campaigners may have actually increased rather than quelled public anxiety about health risks (Burgess, 2002, p. 178). Following the successful Sydney protests in the mid-1990s health risks remains high in Australian public consciousness and became institutionally embedded in state consultation exercises. A precautionary approach has gone furthest in Italy where the most restrictive precautionary laws in the world have been passed against 'electrosmog'. In contrast, Finland has the highest concentration of mobile phone users and is home to mobile phone corporation Nokia but health concerns are not a public issue. In some other places they have also slipped back down the public agenda. Anti-mast protests flared in Ireland in the mid-1990s through to 1998, when 120 riot police sealed-off a village, Kerrykeel in Donegal, for the erection of a mast, but since then the issue has become depoliticised against a background of rapid national economic development. Protests are not always health-related. In Cyprus anti-mast protesters rioted against the lack of local consultation and high-handness of the British military presence on the island in unilaterally erecting masts (*The Economis*t, 2001). Despite widely publicised lawsuits over brain cancer in the US health concerns have not had the same resonance there as aesthetic issues or local control issues.

Yet national differences in attitudes to base stations cannot simply be put down to how heath risk is 'socially constructed' by media hype and further legitimated by the state's own policy of precaution. Burgess (2002, p. 184), for instance, gives the media a decisive role in constituting public anxieties and recommends that politicians and 'influential individuals' should avoid a 'non-scientific' precautionary approach since accommodation with 'minority fears' over an impossibly hypothetical risk merely encourages public fears and active campaigners. Indeed, campaigners in the UK and elsewhere have successfully blocked base station developments not on the grounds of the available scientific research but on the potential and as yet unproven link to adverse health effects (Spurgeon, 2001). But Burgess's argument that precautionary state responses to media scare stories play an important, perhaps central, role in the social construction of base station fears is self-contradictory and neglects the specifically spatial dynamic of place intimacy.

In fact, in following international guidelines in the UK both government and industry are going to great lengths to exclude health risk fears as a legitimate basis for objecting to proposed mast locations. Rather than inflaming (or constructing) public fears many local governments and health authorities in Scotland were actually taken by complete surprise in 1997 after 'base stations have spread largely unnoticed across Scotland' (Scotland on Sunday, 2 March 1997). Neither are anti-mast protesters gullible 'media dopes' that panic irrationally at the repeated mention of some potential hazard. Consider the near saturation public use of mobile phones, despite media stories and official health warnings. Burgess (2002, p. 186) puts this lack of a public panic over handset radiation down to a 'pragmatic attitude' and is ultimately forced to argue against the force of his earlier analysis that 'Evidently, precautionary state policies do *not* exercise a decisive influence in the social construction of risk' (our emphasis).

What is missing from such accounts is that both health and aesthetic objections to mast sitings address themselves to a specific violation of place intimacy. The use of mobile phones in public places also violates the customary sense of place intimacy but typically occurs in a 'neutral' shared space such as on board a bus, in the supermarket or the pub. The often loudly declaimed 'absent presence' of the caller may be irritating to those physically nearby but is often tolerated since those within earshot may be required to next take a call in front of the same public. Over time the unwanted intrusion of the public mobile phone user will be negotiated culturally and a new set of norms for appropriate conduct will emerge. Some trains, for instance, have introduced Quiet Coaches where any use of mobile phones is forbidden. Inanimate base stations, however, cannot be culturally negotiated in the same way. With the passage of time they may begin to disappear from public perception and enter into the background street furniture of everyday life, just as electricity pylons, television aerials and satellite dishes were once objects of public disquiet but are now hardly noticed. With increasing technological complexity and fierce market competition base station banality may yet be some years away.

Conclusion

The siting of phone masts may continue to generate controversy over the next few years. The third generation of handheld mobile phones will require an overhaul of the communication mast infrastructure. Health fears have not been assuaged and public uncertainty persists over the scientific evidence. Moreover, unless planners find a way to come to terms with place intimacy a hierarchy of planning values based on a faulty psychological or communication model of risk perception will continue to be imposed onto a sceptical, anxious and increasingly vocal public. Public fears over fixed masts are rarely related directly to the nomadic intimacy made possible by more hazardous phone usage. This paper aimed to show something of the repressed side of emerging mobile communications by making the paradoxical responses to mobile telephony explicit. Reaction to the unwanted intrusion of phone masts helps to refashion familiar places as meaningful, safe and worth protecting. In contrast, the routine nomadic intimacy of mobile phones establishes place as an indifferent backdrop to being always 'on-call', too absorbed in the 'busy-ness' of life to notice what is close at hand. In this respect, and contrary to the celebration of mobile telephony as a liberatory technology it may also be deepening the disenchantment with modern life.

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