

Beyond Talk, Beyond Sound: Emotional Expression and the Future of Mobile Connectivity

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Preamble

The chapters in this book are testament to the range of possibilities enabled by current communications technologies. Our own interest in this is reflected in articles and books that we have written that report on the use of various technologies, whether it be SMS (Harper et al., 2005) or fully duplex mobile telephony (Brown et al., 2001). In this chapter, we want to take a different view: a view not on what communication technologies have done and do, but a view on what they *might* do when designed in novel ways. More particularly, in this chapter, we would like to explain why it is that, in the Socio-Digital Systems Group in Microsoft Research in Cambridge, England, we have set up a programme of inquiries into what we are calling *New Communications Genre*. This is a long-term programme where we hope to invent and demonstrate the value of a variety of new ways of communicating, of expressing and being in touch.

Background

Why would we want to do this? After all, aren't there too many communications channels already? Do we want to simply push more technologies on to people who are already confronted with too many? Certainly, if one looks at the history of communication, one can readily understand why the Victorians invented the stamp so as to allow paper mail to flourish; one can understand, too, how paper mail served as an instrument to bring the USA together; but today, why would we want another channel to communicate with? To what end? Why?

One reason why is reflected in the research presented in this book: some channels do different things. Thus, readers of this book will know that the reason why the telephone has not replaced paper mail because it appears that people like to write as well as speak. But if we understand this (and believe it to be true), perhaps we do not know all the reasons why email, which affords written communication rather than spoken, has not replaced paper mail. People may want to talk and to write, but if so, why not use the quickest, cheapest form for each? Email is, on these counts, better than paper mail. Yet, despite this, paper mail persists. And, even if we disregard why paper mail still gets used, one can still be perplexed by that fact that if is text is what people want, then why has email not been replaced by another, more recent medium that would appear to be ‘better than’ email if measures of better are quickness, cheapness and so on? We are thinking here of Instant Messaging (IM). Why hasn’t IM replaced email?

Obviously technology drives change – after all, the paintbrush allowed people to leave their mark on cave walls. Similarly the quill and velum allowed people to start the currency of letter writing. And, if one wants to go on, one could note that the Internet allowed email. And so it could be that what we ought to be doing is develop technologies that best satisfy the variety of human needs for communication – defined thus far as the need to talk and to write. But this seems too simple: it sounds like a case for technology which is merely ‘better’ than what was – is – available before. Perhaps another way of thinking about it might be to ask better in what sense? According to what measure?

In relationship to communication technology the answer is typically thought of as one to do with the problem of *telos*, i.e. separation by physical distance: ‘You are here, in Cambridge, they are there, in Redmond’, as a case in point from our own organisation. It is the problem of ‘near and far’, ‘close and remote’. Accordingly, one could argue communication technology has developed, historically, to reduce this problem, the problem of geography.

This seems persuasive. But is communication always a question of solving physical distance? Chapters in this book have already created an orthogonal dimension: that sometimes one wants to use the written word to cross distance and at other times the spoken word. But is this all? Take the example of paper mail again – a written form of expression if ever there was one. Letters do solve the problem of sending words across distance but that is not always what letters do: summonses and answers may be a question of telos, perhaps, but what about documenting and receiving? Even when one or other of us is with someone, they may choose to document something of mutual interest and may give it to oneself, there and then. But why? For what end? It is not because ‘I am here and they are there’. No, something else is going on.

Take another example: this time from the mobile domain. Here we find a curious parallel with what we noted above about the written and spoken word: we have mobile talk and we have mobile text. Does each offer different ways of solving the telos problem? In part, surely the answer is yes, according to some chapters in this book, but they are sometimes used to do other things too, as we ourselves have argued elsewhere (Taylor & Harper, 2003: 267-296). We have noted that many of the SMS messages teenagers send one another are artfully created, one might say *crafted artefacts*. Teenagers (and sometimes older people, too!) often put a great deal of effort into SMS, certainly more than is simply necessary to create a message. Reflecting this, many of these messages get kept and treasured by the recipients, sometimes even shown to friends. This hardly sounds like merely a way of dealing with telos. Thus we argued that texting can be thought of as a way of sustaining and creating bonds between people, bonds through the giving and receiving of text ‘gifts’. There is, needless to say, a long history of anthropological research about giving and receiving; all our research did was show that giving and receiving is a contemporary practice: with text gifts, people, especially teenagers, build the social fabric of their world.

So how does one move on from this and ask not what communications technologies do, but what, when redesigned, *might* they do? How can one stop focusing on the present and instead focus on the future? Could we design other channels to allow gifting, for example, and let people build their social relations? Could we use email? Or even the traditional letter? In some ways many other channels already support gifting (and much else beside) but, of course, one could always find ways of improving their design. Yet, if we were to turn to other, currently existing channels we would, to some degree, be constrained. As we noted above, it is clear that different channels do afford different things. The perplexing point, though, is that part of the reason for this has to do with matters that are essential to the channel, that are technical issues if you like, and, on the other hand, with issues that are essentially human – to do with what people are endeavouring. Unfortunately, and as this book shows, these essentially human issues cannot always be understood so easily. To make matters worse (though all the more human for that), what people do with technology evolves: thus what was something that designers might have understood, changes into something that they might not understand.

We have seen this evolution of the human and technical in action with SMS: at first the channel was for merely communicating short messages about network traffic, stuff for the maintenance engineers, basically. But soon, text came to be used as a kind of channel that is intimate, for personal, close and private matters. Our research has suggested that this has to do with where it arrives and when it arrives: pushed to the hand immediately after its sending. An email, by way of contrast, is official, long, though doubtless collegial. An email has these properties in part because of its content and in part because of where it arrives and how it is dealt with – an email is typically pulled and triaged, rather than dealt with immediately after its creation. Nor are most emails intimate: after all they arrive in one's desktop in-tray, hardly the place for love notes and tenderness (and Blackberries do not alter this: they only allow users to put their

hand into that in-tray even when they are away from the office) (For a review of the evolution of email see Baron: 2000).

A way forward

In the Socio-Digital Systems group we have been thinking a great deal about this relationship between human endeavour and communication technology. It seems to us that this relationship should not be reduced to the problem of geography. It is clear that different communications channels offer different possibilities and experiences for people: some of these do indeed relate to the problem of distance, but other functions – or affordances if you like – encourage different things. These new doings in turn create new roles for the technology. There is, then, a kind of mutual shaping: people do this and then learn with technology that they can do that; once they learn that, they then alter the technology to do yet more, different things.

If this is so, it seems to us, we might be able to combine new communication technologies with new forms of human endeavour to create ways of expressing, ways of communicating, which are fresh and novel. We have in mind not a view that there is either the personal or the official, the one intimate, the other cold, the one currently supported by SMS and the other by email as just alluded to, but instead a view that these are but two possible dimensions amongst many.

We want to approach this possibility with as much of an open mind as possible, but we also do not want to miss an opportunity. The opportunity we have in mind is leveraging the already existing literature on technologically-mediated human communication, irrespective of the technology in question. It

seems to us that one might be able to discern some insights and lessons from this research that will help guide our efforts to create new genres.

One of these areas of prior research relates to what is called emotional communication – on the ‘who’, the ‘why’ and the ‘what’ of our emotional lives. There is, beyond all this, considerable research on the values, some of which are emotional, that mobile connectivity in particular affords – some of which is reported in this book. We have been exploring this prior knowledge, with a view that doing so will ensure that the directions we take are both well-founded and likely to succeed.

We cannot, at this point, either report on what technology we are planning to assemble (for reasons that are obvious), nor, as yet anyway, can we present findings on the usage of those technologies ‘to the public domain’. We are at the start of our work. But in any event we want, in this chapter, to present a review of the literature on the expression of emotion and emotional value enabled by mobile devices of various sorts, with a hope that so doing might not only indicate how we are planning to use evidence to guide our own design work, but might offer others, too, encouragement, a basis for their own thinking about what the future might hold.

In particular, we want to report that there are four main categories of inquiries into this topic, as follows. The first set attempts to construct conceptual definitions of emotion and how various emotions might be technologically mediated. It is important to understand that these papers do not derive from the social psychology of emotion nor from sociology: they are ‘best efforts’ by the technology industry researchers to approach the problem sensitively (for an overview of the importance of the turn to ‘emotion’ in Human Computer Interaction, HCI, see Cockton et al., 2002; Sengers et al., 2002:87-98; Marcus, 2003:29-34). As we shall see, measures of success for this work are hard to come by, but that it is design-oriented needs to be borne in mind when one tries to learn from them. The second main set of papers that one can delineate in the

literature relate to studies of technologies for particular expression. These encompass everything from expressing ‘I love you’ to more tactile behaviours, the most intimate included. The third group, perhaps the largest in terms of numbers of papers, reports studies that stretch current channels to let them afford more in terms of user experience. One of the reasons for the popularity of such papers is that researchers in the technology design domain would appear to have a preference for the ‘next step’ approach to design, rather than for radical, ‘leap ahead’ methodologies. The fourth set report various technologies intended to be part of the ecologies of devices, each enabling various individual expressions. These ‘building block’ papers detail anything from emotional badges that label wearers as ‘feeling this’ or ‘feeling that’, right the way through to papers that describe wearable clothes that enable sounds to be made, sounds that are an expression of a particular kind of emotion.

Having reviewed these papers we will then attempt to summarise what we take from them and what guidance they offer in terms of our direction for research. We will then allude, as carefully as we can, to some of the technological and user studies research endeavours we are now embarking upon.

Conceptualising emotion for design

Within the general HCI and technology design disciplines there are many papers on what emotion might be, how it might be measured, and how it is communicated. There are also books on this area, Don Norman’s being the most well known (2004; see also Jordan, 2000). These books and papers cover a great deal of ground, and it becomes clear when reading them that emotion and emotional expression, even when approached from the limited set of concerns of technologists and designers, are labels for a very wide range of behaviours and ideas. Emotion is not something confined to two lovers, nor is it simply what one feels

when one is sad or angry. Emotion and emotional expression are relevant to oneself, to the relationships one has, and to the groups of people of which one feels, in whatever way, a part: thus, and as we say above, it really is about the *who*, the *what* and the *why* of it.

This results in the literature being amorphous. To take two extremes: there is Battarbee, for example, who explores what she calls ‘co-experience’: what groups of people feel about each other and as a group. Emotion is one aspect of this, though not hugely important. At the other end of the scale are Mattelmaki and Keinonen (2001), who explore how to design for brawling, the ultimate expression, one would think, of emotion. In-between is Paulos’ *Connexus* (2003), an exploration of what kind of infrastructure would allow the expression of anything and everything just as long as it does not include words. This non-verbal stuff is, apparently, the domain of emotion.

Nevertheless, there is a tendency in the literature, as a whole, to focus on certain aspects or points of view on emotion, and the most important of these foci is on intimacy. Bell et al. (2003), for example, explore what might be an intimate expression, a form of expression that they and many others seem to think is exclusively a question of emotion. In the same vein, Kaye and Goulding (2004) delve into various forms of ‘intimate objects’, objects that enable, somehow and in various ways, the ultimate form of communication: intimate and emotional (or so they would have us believe!). Howard et al. (2005; also Kjeldsko et al. undated) probably offer the most thorough explorations of intimacy and its ‘technological mediations’, partly through the use of experience prototypes or probes and partly through a taxonomy of intimate expressions (see also Buchenau & Suri, 2000).

Technologies for particular expressions

The second group of papers report on technologies for what one might call particular expressions, intimate included. As noted, it is these latter that are the most common, and certainly the area which seems to be the most intensively mined. Kaye et al (undated) report on the *Virtual Intimate Object*, for example, which consists of a click-ometer that users select whenever they have ‘intimate thoughts’ about another. These others have these clicks relayed to them in graphical form. Eagle and Pentland’s *Relationship Barometer* is similar (2003). Then there is the *SenseBed*: this device can relay the emotionally charged virtual presence of another in one’s bed (Goodman & Misilim in Bell et al., 2003). Beds are of course the site of various forms of behaviour, as Goodman and Misilim are at pains to point out. *Digital hugs* is somewhat similar, and, it has to be said, equally beyond what one would imagine is socially acceptable (Di Salvo, undated). There are other technologies reported in the literature which seem designed for even more limited tasks (if one can bear for the moment to reflect on the range of things that might be conveyed in a bed or by a hug). There is for example, the *Gustbowl*, a virtual bowl by the front door that allows people to announce they are home through the dropping of their virtual car keys into it (Hoog et al., 2004). There is, too, the *Love Bomb*, a device that allows people to broadcast their romantic state (Hansson & Skog, 2001).

There are one or two papers that report on technological possibilities that, though limited in these sorts of ways (i.e. are tied to some particular human practice), nevertheless seem more likely to receive widespread acceptance. Vonray et al.’s (undated) *PhotoStory*, for instance, is an attempt to link audio files with images so as to enable photos to convey more of the emotional values associated with them: the key here is of course to let them ‘talk’. This is, needless to say, something that has been extensively researched by printer and camera manufacturers and is best summarised in Frohlich’s *AudioPhotography*, a book published in 2004. Going the other way, towards more generic technologies to

support emotion, one finds perhaps the boldest and certainly the most curious of all technologies in the literature and that is the *emotional wardrobe*, a set of technologies that allow people to express a limited set of meanings through the changing properties of their clothes: these are designed to announce such things as sadness, joy, even lust (Stead et al., 2004).

Stretching channels

Another group of papers report what one might consider to be efforts to ‘stretch’ current channels. By this we mean that they explore how to offer certain added features to technologies that have already proven their basic value. An early example of this stretching can be found in Nelson et al.’s (2001) paper on *Quiet Calls*, the idea here being that one of the options that could be made available to users on mobile devices is to provide a ‘whispering voice message’ that would convey to callers the need to hush more effectively than does the ‘meeting setting’ typically available as an option on a mobile phone. What is interesting, given the age of this paper, is what little influence it has had on mobile design. A similar fate seems to have beset Woodruff and Aoki’s *Push-to-Talk-makes-People-Less-Pushy* paper, where they discover that the ability to have ring-less phone calls enhances the variation of experience provided by mobile telephony. Today, of course, this hardly needs stating, but this paper, published in 2003, is more or less the only academic paper on the user experience of push to talk and, as far as we can tell, is never cited in commercial explorations of the potential of that communications genre (as we label it).

Taking a slightly different tack on stretching, Chag et al. (2002) report a device that allows touch to be shared alongside voice telephony in their *Com-touch*. The argument seems plausible enough, but the paper does not effectively explore how touch may in practice be an augment to certain types of technologically mediated human communication (such as audiotelephony) rather than a

distraction: if truth be known the *Comtouch* devices reported in that paper would seem to offer touch at the price of other faculties, including auditory. Poupyrez et al. (2002), by way of contrast, explore how touch can enable more effective navigation through information, though avoid explorations of how this might enable more effective emotional expression.

In any event, many more papers focus on Instant Messaging (IM), and indeed one could say that if intimacy is the main topic of research on emotion, then IM is the main channel that gets explored in relation to this area. There are many attempts to stretch IM in the literature, such as through embedding IM presence metaphors on to new devices, particularly handhelds (see Tang's *ConNexus*, 2001; also Tang & Begole, 2003). Indeed, stretching the idea of presence seems to be the key concern of most of these papers (see also Fabersjo et al., 2005). Other papers combine presence with the idea of rich media, which can mean anything from peripheral displays (Guzman et al., 2004) or the use of more icons to express types of presence. More icons apparently allow a greater range of expression (as in an icon for 'I am doing this' or an icon for 'I am doing that'). Presence can also be linked to other data sources, such as the media files that are being watched by others in a buddy list (see Zaner et al. in Bell et al., 2003).

The building blocks of expression

If these prior groups of papers have shown some interest in human endeavour, then the next set have little concern with what those endeavours might be and focus instead on defining technological infrastructures that might enable a range of human action. These include the delightfully entitled *Tactons*, by Brewster and Brown (2004), small, possibly wearable devices that offer rather basic func-

tions such as on-off, yes-no – though nothing seems to have come of the idea since that paper (it is only a year or two old, so perhaps it is too early to judge). In a similar vein is the *Bubble Badge*, a wearable device that contains a small screen that can be used to display messages – though quite what the messages might be is unclear (Falk & Bjork, 1999). The *Love bomb* mentioned above comes to mind, though what kind of couple would willingly wear such a device does not bear thinking about. The delightfully eccentric paper on ‘Kensai expression’ reports on the design of clothes with interactive auditory broadcast functions; this enables gangs of ‘users’ to meet in public places and hear each other ‘playing’ their own clothes (Nakatsu et al., 2001). The prospect brought to mind by this infrastructure seems all the more amusing when it is understood that the clothes only broadcast to a predefined set of headphones and so, for most of those passing by, the musicians merely look like odd people shaking and touching themselves.

There are various other papers that explore similar infrastructures but without some of this glorious daftness. Maddam et al. (2004) explore how auditory response rates and head-movement can be measures of or pointers toward a ‘group index’ of such things as interest in a conversational topic. Partridge et al. (2001) meanwhile, do not worry about what users might do with an infrastructure that captures bodily expression, by which they mean capturing electrical signals regardless of what the user intends. Laaasonen et al. (2004), in contrast, insist that automatically generated *location information* is important for users to express themselves and thus report their efforts to build such a system, combining GPRS and mobile phone cell data with a range of probabilistic measures. They conclude their efforts by saying that the value thus provided is not equal to the effort put into the system. They then suggest, rather pessimistically it seems to us, that if users were to broadcast their location themselves, it would probably offer a solution better allied to the effort entailed (as against the effort required to produce an automatic procedure).

Perhaps the most well thought out of these infrastructures, though, relates to a set of technologies which, at first glance, seem irredemiably human. These are the papers that explore the idea of *digital jewelry* (see Cameron et al., 2001; Russell in Bell et al., 2003). When we say better thought out we mean that these papers report on a series of inquiries into the possibility that wearable devices could merge with jewelry. This would result in it being more likely that the computer devices were worn. This much seems obvious, of course: it's a choice between Coco Channel and Bill Gates. But having got thus far, the researchers then recognise that the aesthetic value of the resulting jewellery may be compromised if they embed into it too many user interactive functions, like keyboards, buttons and switches: 'It's all very well saying that you are going to build jewellery, but how does one make it a computer?' one can hear them ask. Consequently Russell and others came up with the idea of building a system that splits the control of the jewellery onto other, server and PC-type devices: the solution they come up with is, if you like, an appliance one, albeit that much of this research does not claim affinity with that credo. In any event the resulting applications have the following character: a message is created on a PC and is sent to a receiving jewel; this will glow. In reverse, when a jewel is pressed, a remote piece of jewellery glows or an icon glows on the PC desktop. Of course, the meanings of these pressings and glowings is wrapped up with already existing systems of meaning and effect – the glowing of a jewel standing as a presence icon for example, designed to lead the user to turn to an IM text client on a nearby PC.

Lessons

Needless to say whether the resulting articles satisfy as jewellery (being beautiful, desirable, a worthy ornament of a loved-one) is of course open to doubt,

though the researchers in question wisely avoid confronting that issue directly: after all their primary audience is the computer industry, not the fashion one. But what their ideas point towards is a new kind of communications channel or at least an extension to the means whereby people communicate with one another. Whether theirs is the route to take or not remains unclear.

Nevertheless, if one were to try and distil from all these papers, the conceptual, the specific, the stretching and the building, then what one can say about the literature as a whole, it seems to us, is that there is a strong conviction that new communications genres are worth devising, though how, what they will be, or what will be attained thereby, is not agreed. As we have seen, this conviction leads researchers in various directions: through stretching what appear to be the successful bits from current channels, such as the presence idea from IM, for example; or through the creation of a wholly new genre, particularly ones close to the body, and thus intimate.

The papers and the research they report also attest to the finding that new forms are constrained not by the technology but by user practice. Thus remote monitoring applications – such as clicking to say ‘I am thinking of you’ – are popular at first, but soon wither: their value turning out to be essentially gimmicky and short-lived. Moreover, it also appears that they wither in part because what is communicated (and to some degree how) is sometimes too literal from the user perspective. As Gaver notes (undated; see also Gaver & Martin, 2000), solutions that succeed, he argues, do so because they are evocative rather than literal. They provoke a reaction; they do not simulate one. Part of the success, he goes on, is through the use of evocative materials. Together this produces genres that succeed because they are expressive rather than constrained, allowing users to evoke ‘this’ meaning rather than that, and thereby allowing users to create richer, more diverse expressions: not simply ‘I love you’ but ‘I love you this way’ and ‘this way’ and ‘this way’.

Furthermore, several of the papers argue that in addition to these requirements, success is more likely if the channel is linked to other, already existing ones; not in the sense of piggy-backing on those other channels, as just suggested, so much as that they have a close affinity with and linkage to those channels. Thus, ‘presence’ (a notion from IM which we assume the reader is familiar with) expressed on a necklace is not sufficient unto itself but is rather a queue to provoke the subjects to turn to another, probably richer channel: thus a glowing jewel is used to say: not only ‘I am thinking of you’, but ‘do you want to chat’ (on IM)?

Given this, then, the form factors, the ways that a new genre needs to evoke rather than simulate, and so on, all this and more begs questions about design, about how to unpack elements of technologies to fit human needs and of how the practical and the emotional need to function together (see Karan, 2004). Design, until very recently, has not been a concern in our own organisation, though it is beginning to have a more central place. Indeed, one of the shifts in practice that has resulted from this review has been the appointment of designers to our research group, Socio-Digital Systems. At the moment we are unable to recount the benefits of this realignment, though we hope to do so at some time in the future.

Be that as it may, the research in the literature, despite its scope, the way it opens up issues and concerns, is still, nevertheless, limited and limited in ways that are quite consequential. For one thing, most of the user studies reported in it suffer from the fact that the users were selected because of their likely receptiveness to the application in question. A tool to express intimacy is given to those who profess such intimacy beforehand; lovers are given tools for loving and so on. There are few if any studies of how a new genre would come into people’s lives, of what would make them buy the ‘thing’ or take it up if given to them; of what, in short, would make the ‘genre’ move beyond a limited application in to something that has a life of its own. If this holds true for what one

might call one-to-one applications (of the ‘I Love You’ sort), the same also holds true for one-to-many applications: what one would call the group expression applications. Nor do any of the papers report on the value a new genre would have when expressed in financial terms. Where would these new genres fit in the overall ecology of ordinary people’s budgets, one wants to ask; useful, thoughtful, yes, but how much, how often, with what demonstrable effect? All this and more is avoided in the literature.

Conclusion

So, what does one take from this review? Can one claim any certitude about what emotion might mean or be enabled? Are there some basic technological infrastructures that we can turn to to build future communications genre? We think ‘No’ on both counts.

Nevertheless we do think one can learn some important lessons. First of all, we read this literature as saying that there is, indeed, a need or a potential role for emotional expression. We take from it also that this expression must not be too simple or specific and should allow users to ‘express’ – i.e. communicate more than one limited thing. Success in doing so needs to be achieved through evoking rather than simulating expression: thus a *Touch-phone* (as a hypothetical illustration) should not replicate touch as it should be a mechanism for conveying various sorts of meanings, touch itself being only part of these meanings (if it is meant at all).

It is in light of this claim that we take it that new genres or technologies for expressions are more likely to succeed if they fit into or link with already existing infrastructures and communications practices: thus if a ‘touch’ is made or done, doing so might be used as an indication that a phone call is desired for instance; or a ‘touch’ could be used to say that a phone call should end, and so on.

Consequently, we think that even though intimacy is sometimes spoken of in the literature as isomorphic with intense feelings and expressly emotional matters, a sense of emotional connection could have, in fact, many forms: a sense of presence does not equate, for example, with a declaration of love; and besides, such individual expressions are part of the assembly that makes up experience.

Beyond this, we also read the literature as saying that any new genre we develop may allow new forms of emotional connection, bringing family members closer to one another in ways that they had not thought of before, or allowing people to express to each other in ways that are more delicate and nuanced than had been possible.

In sum, and without wanting to be too vague, we read the research as saying that we must be open-minded about what our technology might, in fact, let people do. To us, the literature should be read as encouraging: suggesting that certain mistakes should not be made; that there are values, even if they are not measured, and that yes indeed, we should try and explore what is beyond talk, beyond sight, to touch if you will, talk-as-it-will-be-in-the-future.

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