Multimodality and Technology

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There is a close historical association between multimodality and technology, in two senses. Firstly, technologies have enabled a significant expansion of the range of media by which humans communicate, especially in terms of recording, replaying and transmitting across time and space (that is, mediating) multimodal discourse. This has in turn greatly increased the human capacity for multimodal communication and thus socio-cultural development: for example, the printing press contributed to the evolution of science (Eisenstein 1979) as well as art, through the capacity for individual (rather than societal, institutional) expression (Lotman 1991); and digital technology has led to a significant expansion of the repertoires of human cultural exchange (e.g. scientific, artistic, political, economic etc), rapidly altering social organisations globally as a result (for example, in terms of the speed of global information exchange). In the second sense, technologies have enabled researchers to study much more closely and effectively multimodal texts, again in particular because of the capacity to record, replay and analyse multimodal discourse, but also in terms

of technical means for analysis (e.g. instrumental, computational) which extend the human

sensory capacities for perception: cf for example Praat (2010) and ELAN (2006) softwares.

Technology can be viewed as the application of scientific knowledge in the creation

of tools: the physical embodiment of abstract scientific knowledge. The discipline of

engineering, for example, is specifically concerned with the development of tools to solve

particular problems, based on scientific, mathematical and other forms of knowledge,

including linguistic knowledge. However the term - derived from the Greek technología

(τεχνολογία): téchnē (τέχνη), 'craft', 'art' and -logía (-λογία), systemic study – can refer

variously to tools themselves, the study of tools, and the abstract scientific bodies of

knowledge which are applied in the development and use of tools. Li-Hua (2009) gives a

discussion, which begins with the observation that "the attempt to define technology seems

quite challenging", depending upon viewpoints from various positions; and this may reflect

the importance and ubiquity of technology within contemporary societies.

Multimodality, for linguists and semioticians, refers to the integration of two or more

semiotic resources (including language) in the communication of meaning. Semiotic

resources (e.g. language, image, gesture, architecture and music) are 'system[s] of meanings

that constitute 'the 'reality' of the culture' (Halliday 1978, p. 123). The objects of multimodal

studies include: the systems and structures of semiotic resources; the inter-semiotic processes

through which semiotic choices integrate to create meaning in multimodal texts (e.g.

documents, videos, websites, 3D objects and daily interactions and events); the multimodal

artefacts and events themselves which constitute instances of discourse; and the media

through which semiosis takes place (e.g. stone, wood, fabric, paper, paint and ink, heliograph

and photograph, phonograph cylinder, magnetic tape and microphone, and digital computer

software and hardware). The term multimodality however has other specific uses: for

example, for computer scientists and engineers multimodality refers to forms of input and

output devices whereby humans interact with computers through sensory modalities (visual,

aural and somatic).

Within the human sciences, multimodality thus implicates both abstract and physical

phenomena in its study: the semiotic (e.g. abstract systems and structures of semiotic

resources and inter-semiotic processes through which semiotic choices combine to create

meaning; as well as the actual multimodal artefacts and events); and the physical media

through which semiosis takes place. From this perspective, technologies are implicated in the

study of multimodality both as semiotic (multimodal) artefacts in their own right and as

media which impact on multimodal semiosis (as the means of multimodal communication).

In technology, as in signs in general, we see both the material and the abstract drawn into a

significant relation, because both semiosis and 'technics' are dependent on a fundamental

materiality (cf Innis 2009). These two inter-related aspects of technology − technology as

multimodal semiotic phenomenon and technology as physical means of semiotic mediation −

are now discussed, before the impact of technology on multimodal semiosis (i.e. media as

'semiotic technology') and on the study of multimodality are reviewed.

Since Descartes and the separation of science- and humanities-based knowledge,

studies of the physical (material) and abstract (semiotic) planes have been separated, with

technology and culture likewise being treated as separate domains of study and practice; the

former as an application of science, the latter the preserve of the arts and humanities

disciplines. This separation has led to a general perception of technology as physical rather than cultural (semiotic) artefact. Van Leeuwen (in press) discusses the cultural separation of the semiotic and the physical in the distinction between modes and media of communication: for example, between the composition of a musical work (as abstraction, semiotic mode) and its performance (as materiality, expressive medium). Yet, he observes, while the medium has typically, and traditionally been seen as "a physical condition of communication that provides specific affordances and imposes specific restraints" (its function to provide a faithful reproduction of higher-level meanings), it is in fact "also intricately connected to the ways we use language and other modes of expression, and to the ways genres of discourse and technological media evolve alongside of, and in connection to, each other".

The technologies that enable and mediate human cultural exchange (that is, multimodal communication) can thus be seen as the embodiment of cultural knowledge in general, as part and product of that culture (e.g. Foucault 1977). Technologies, that is, are semiotic, cultural resources, shaped by and shaping socio-cultural practice: our tools are part of the meanings we create as semiotic beings, part of our cultural repertoire, as much as the ideas and abstract systems and structures we create in language and other semiotic resources. Technology can thus be studied as (multimodal) semiotic phenomenon, as suggested by Innis (2009) and others within the semiotics tradition, including Andersen et al (1993) who present early studies of computational technologies, including the semiotics of programming languages, interface design etc, from the perspectives afforded by semiotics. Anthropologists and archaeologists have of course long studied implements and other cultural artefacts as multimodal bearers of meaning: that is, as semiotic artefacts. In fact, from the social semiotic perspective spoken (as much as written) language can be seen as a very early, perhaps

definitive human 'technology': a tool for adaptive engagement with our changing (material, social, semiotic) environment, with the body (vocal tract, arms, hands, face, etc) as medium.

Lotman (1991) discusses the profound influences of technological development on and as a part of wider human culture, and the relations with society. Citing written language as an example of a profoundly influential technology, Lotman (1991, pp. 782-83) observes: "There is a repeated pattern to the immediate consequences of a technological change: having acquired new powerful means, society first attempts to use them for old ends, increasing its possibilities only quantitatively": to take the example of writing, in expanding the capacities for large-scale building projects, and "expanding the volume of social memory" primarily through bureaucratic record-keeping. However, there was "[a]nother, more profound consequence of the advent of writing technology, drastically changing the very matrix of culture" (Lotman 1991, p. 783): the expression of individual and personal creativity which resulted from the ability of individuals to record independently of established authorities and institutions. Lotman (1991, p. 784) goes on to point out that a "somewhat similar process followed the invention of printing and the whole scientific and technological shift of the Renaissance" (cf also Eisenstein 1979).

These observations also apply to more contemporary developments. The capacity to record sound and moving image has greatly increased the power to mediate, and thus record and replay multimodal discourses of social life that were formerly transient and ephemeral. The televised Kennedy-Nixon election debates of 1960 showed the social power of such mediation, as did the UK elections of 2010. The advent of contemporary interactive digital technologies such as the internet and mobile communication devices are having similarly

profound consequences, particularly via the media storehouse that is the internet and its

capacity to record and disseminate human discourse across a wide range of multimodal

forms. The consequences of such developments for science and human cultural development

in general are still unfolding; but historical perspectives point to the possibility of

fundamental changes as a result.

For example, the current generation is undoubtedly the most literate generation in

history - in spite of prescriptive concerns by educators about the immense variation in written

orthographies and discourse styles now developing worldwide through SMS and other e-chat

media - in the specific sense that a vast proportion of the world's population now use writing,

via mobile phone and internet chat, on a daily and habitual basis, a large proportion of whom

would formerly have written only little, and in general only while in the classroom (that is,

within restricted social contexts). Literacy – the use of writing to communicate - is now no

longer the privileged preserve of the well-educated; while writing is now used for a large

variety of types of discourse (spontaneous, dialogic, informal etc).

However, mediation through written and other forms of communication brings its

own constraints as well as new affordances; and the social consequences of mediating (and

recording) such interactions through the constraints of writing are yet to fully emerge.

Halliday (1985) makes the point that the invention of writing appeared as a result of the

demands of new social functions, those associated with the move from nomadic, hunter-

gatherer to settled agricultural social organization and associated needs for record-keeping.

As a result, writing doesn't include intonation, crucial to the sort of interactions and

negotiations characteristic of the spontaneous dialogues (Halliday 1985) found in electronic

chat. Traditional technologies such as writing are clearly changing as a result, as they become

incorporated, remediated and recontextualised within the new media, the most dramatic being

the written language as used for spontaneous, real-time dialogic interaction (cf the use of

emoticons, inter-semiotic integration with image and sound, etc). The consequences for the

written language, if not for culture as a whole, may prove as dramatic as the invention of the

printing press did for Renaissance culture.

The idea that the development and use of semiotic technology is motivated by and

motivates the evolution of culture (as adaptation to social needs) is a basic to social semiotic

theory. Van Leeuwen (in press) discusses the ways in which new technologies have expanded

the semiotic potential of cultures in direct relation to more general social needs. Rejecting the

notion of technological determinism, van Leeuwen cites the example of radio broadcasting, a

phenomenon which came about not with the invention of radio itself – which Marconi had

projected as having limited mainly pragmatic purposes, as a medium for ship-to-shore

communication and the like – but much later as a result of new social geographies and

demands, in particular the development of new city 'garden suburbs'. Comparison of the

dates of the invention and later widespread use of the internet also neatly illustrates the

symbiotic relations of technology and socio-cultural development.

The ongoing development and utilization of recording media for everyday multimodal

discourse in general (as in sound recording, film, mobile phone and internet technologies)

may in fact be said to have their origins in the cultural need for the capacity to mediate more

than just that which is found in textbooks and novels. Writing, as language, has been and

continues to be so important for human social life; but mediating the full range of human

communication types enables for multimodal discourse events the same transcendence of

time and space as writing has done for a very restricted range of social discourses for

thousands of years. Yet there is a sense in which the verisimiltude of state-of-the-art media

(including the latest sensation, at the time of writing, 3D cinema) obscures the fact of these

being 'virtual' rather than actual. Just as writing is an impoverished record of speech and of

everyday multimodal discourse, what we experience in cinemas, through sound recording and

on the internet, are but representations of events rather than the events themselves; while the

intended interpersonal flourishes of email and SMS dialogue may not communicate, as many

are discovering, the same subtleties of expression as are common in face-to-face multimodal

discourse, with often dire social consequences. Meanwhile, it is possible to imagine now a

world where the instantaneous transmission of even mundane multimodal discursive

interaction can be effected via a diversity of media and yet still remain 'on the record'

potentially, in effect, in perpetuity; while such records may easily be taken out of their

original discourse contexts, again with often negative social consequences. We are yet to

fully realize the implications of the limitations and affordances of contemporary media; while

the very rate of increase in sophistication and power renders us complacent in doing so: we

remain 'bedazzled' by our technologies.

The same close relations of general culture and technology can be found between the

development of technology and its use within academia (for research and teaching).

However, here the relationship has clearly been a strongly causative one, with technological

development driving the development of studies of multimodal discourse. For example, until

the invention of sound recording, the study of linguistics was in effect the study of written

language, a constraint that meant that most grammars were orientated towards the language

found in writing, not that of the wide range of spoken discourses found across the landscape of everyday human social life. The invention of early recording technologies first led to the study of speech within phonetics and phonology in the early twentieth century; but it was the wide availability of tape recording technology that ushered in the widespread study of naturally occurring spoken discourse in the 1960s, revolutionising linguistic theory and description.

The availability of film and then video recording has likewise undoubtedly been a key factor in the rise in scholarly interest in multimodal forms of communication, particularly dynamic audiovisual forms of discourse. Multimodal annotation software (e.g. Rohlfing 2006) has provided similarly useful tools for accessing and annotating audiovisual text; and it is perhaps not surprising that with these technologies, a distinct field of multimodal studies has emerged and flourished in recent decades, dealing with an increasing range of media types, including hypermedia such as websites, with their complex array and integration of different semiotic resources, texts and subtexts, as well as with a variety of discourse types, including the mundane and the spontaneous.

However, such technologies can never be autonomous agents in the study of semiosis but rather are tools in the hands of discourse analysts (whatever their disciplinary persuasion). As Halliday and Greaves (2008, p. 19) observe, "modern computer-based techniques of analysis and representation…provide a much richer and more elaborate treasury of information than was available a generation or even a decade ago…[t]hey do not replace the human investigator; they do make the human investigator's work more complex — but also more thorough and more revealing". Today, computational technologies,

particularly interactive digital media but also automated techniques of analysis, continue to offer an increasing sophisticated set of tools for accessing, analyzing, sharing and otherwise processing multimodal data. They are particularly appropriate and perhaps essential for the analysis of those data created by computational media, and for the emergent complexity and detail that results from their application. The challenge for applied multimodal studies is to adapt and utilize such resources for the work of multimodal analysis.

The gulf that exists between oral and literate cultures is just one example of the intimate and profound relations between technology and multimodal culture. A similar gulf has been created in the past two hundred years between the cultures of successive generations by the ever-increasing range and sophistication of media technologies. To say we move in a new world, the digital information age, is already a cliché. Our challenge appears to be the navigation through and adaptation to not so much an actual, material environment but the virtual semiotic, informational environment – an environment of our own making, incorporating the discourses of many millions of multiliterate social agents; and yet an evolved rather than designed environment. Understanding the relations of technological culture and multimodal culture in general is crucial. Such an understanding must ultimately depend upon knowledge of the relations of the material and the abstract planes, and of the links and discontinuities between the cultures of the present and the past as carried through innumerable recorded and unrecorded acts of multimodal communication.

Cross References

SEE ALSO: Multimodal Text Analysis; Multimodality and Software

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