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Text, Context and Hypertext

Three Conditions of Language, Three Conditions of Mind

Argument: The technologies that support or manage language also affect the mind, of necessity, simply because language is a system for the articulation of the mind, a kind of Operating System writ large. Language thus entertains a close and intimate relationship with our inmost sensibility and also with both the content and the structure of our minds as we show in this paper. For example, oral societies, having little verbal memory support have been more or less obliged to live in a world in which the body has to do the job of remembering and they have to keep re-enacting the past. Two major technologies have modified our earlier relationships with language, literacy and electricity. Literacy by detaching text from context also detached the reader and liberated individual minds from the collective one of the tribe. Electricity brings all the senses back into language, but, at the same time, it externalizes the minds of the readers on screen, and makes public, once more, the contents and traumas of the private literate mind.

With the help of Jean-Pierre Changeux's theory of mental objects, we will attempt to tease out some features of the hypertextual mind by drawing comparisons between mental and digital objects. The next technological—logical—step in IT development after wirelessness has run its course is "mind-machine-direct-connect," where the main real time interface is the human mind. With the ever stronger convergence between orality (real-time), literacy (data-bases and all archives) and electricity (all things digital), we can expect a giant enlargement of mind.

There are indeed three main stages of language as we know it, oral, literate and electronic. The principal interface between self and world in the oral society is the physical body. The whole body talks, the whole body remembers, the whole body of everybody takes part in the body politic. Oral society is the society of context, not of text, for obvious reasons. People are always in context, they live in a kind of extended present, but they refer to events that occurred in the past. They revere their ancestors who showed them the operating rules of their principal reference, God(s), the ur-context. These societies are "religious" almost by necessity, not by choice. Their survival depends on shared experience. That is the context. To keep that context alive, they ritualize it and re-enact it, which is a way for a collective to remember. They don't study the past, they simply make it present. It is a society that is perceptually dominant in the sense that its members rely on their senses (sensory) rather than on pure sense (meaning) to make sense of reality. Even its memory is anchored in sensory modalities, statues, monuments, songs, story-telling, play-acting.

Literate societies use a tool to store language. This tool helps people to turn context into text, to detach text from context, hence to detach themselves from it. The more faithful and simple the tool, the easier it is to detach the text from the context and to replace it in other contexts (the origin of fiction, of course, but also

that of most technologies). The printed material is the dominant interface of the literate society. What's worth writing/printing/reading is not all language, only carefully crafted selections of language, so what is printed takes its position in a certain order of priority, at whatever level, in whatever genres, and whatever categories. Books and papers propose to people in general the contents of "reality" filtered through the modality of text. To a reader in alphabetic cultures, language first appears as an abstract string of easily recognizable signs, then as a mental construction, a kind of "assisted memory." Quite the opposite of the oral societies, the societies of text don't worry about losing the past, they just archive it. So their bias is to the future. It's always bound to be better than the past, what with all these wonderful technologies that keep pouring out. They are not very religious and they don't always need each other to thrive. They are all more or less "self-made people."

Electricity, from the time of the telegraph, whipped language into shape, made it ubiquitous, instant and now, digital. By translating all experience, including sensory ones, into the same very simplified substance, digitization allows them back into the technologies of linguistic exchange. That is what is meant by multi- or hyper-media (vision, hearing), virtual reality (kinesthesia) and interactive systems (touch). What Walter Ong named "secondary orality" is in fact the result of the electrification of language. Whether we are watching television or surfing the web, we are seeing multisensorial transpositions of language, with a high emphasis on iconicity. The mind of hypertext is dominated by icons, logos, links. Its main interface is the screen. Hypertext doesn't just imply "a text that is linked to other texts," it really encompasses all the world of electronic communication in permanent information and storage processing. At the same time it brings out the minds of the users on to the screens, interconnects them and accelerates them on networks. Anybody on line is de facto part of a world wide hypertext.

The key issue is that of the shape of the mind of hypertext. It is similar to that of context, but NOT absolutely collective, since it operates in real time (and also asynchronously over time) with and by specific addresses. It is also like the mind of text, but it is inverted, outwardly oriented to the screen instead of inwardly to the private psyche. The mind of hypertext shares into the minds of text and of context. It has a bit of both and more. It is connective. That means that while the collective memory is made more or less available in databases and on line, the entry of each one of us is privileged, our navigation unique and our experience shared only to the degree that we allow it. Indeed you might say that oral mind is also shared. Yes, but it is the only kind available, the private mind being subsumed into common speaking and thinking. It is quite likely that the intolerance found in many fundamentalist groups is constitutional rather than by rational intent. Electric mind is truly post-literate in the sense that it can afford to know about itself and about the literate mind, it can combine the private and the collective into a single entity, connective, without threatening either. The collective, the private and the connective favour different kinds of thinking processes without ever completely eradicating the other. The dominant form of thinking in oral societies is speaking. If the word "thinking" is too ambiguous, replace it with "deliberation." It is the deliberation of the court, the palaver, the theatre, the rhetorical joust, the public debate, the political harangue, the sermon, the oracle, the witch doctor's formula. We have always assumed that thinking was a silent, internalized and privatized operation of the mind in isolation, but perhaps we are

wrong. Oral societies think aloud and they think together. Francisco Varela's principles apply very well to the thinking process in oral cultures:

- Speaking is an embodiment of language and thought
- The common understanding (the mind) emerges from the speech
- Oral situations imply inter-subjectivity, that is the real time co-presence of speaking subjects
- Orality is characterized by its permanent condition of circulation. Words find no resting place, they are kept in permanent circulation (hence requiring much repetition and formulaic expression).

Literate people speak silently in their heads and call that thinking, while electric societies paradoxically "write orally." This is a kind of treatment of language where it appears simultaneously in context and is archived at the same time. In a literate mind access to memory is private and discreet, but it is an access to the subject's memory only, not to anybody else's. Access to the text may be commonly available but the transformation of text into thought and images is entirely privatized (which is the reason why, contrary to popular and academic opinion, newspapers are not "mass" media). Thinking or deliberation in hypertextual conditions is to access everybody else's memories and to share directly in real time into the knowledge capital of the human condition. Needless to say such a statement has to be nuanced by the recognition that political and economic conditions alter this ideal state.

However, hypertextual cognition is not limited to the single individual accessing the collective memory in a connective way. It is also shared cognition. The contents of our screens are available simultaneously to many people at once, synchronously, or over time, diachronously. The contents of screens and databases may not be as flexible or nuanced and complex as those of our private minds, but they are often more reliable, not only by repeating faithfully what they originally represented, but also by enriching themselves with new links and new additions and adducing new partners in thought.

What we share on screen is the technological equivalent of what French neurobiologist Jean-Pierre Changeux calls "mental objects" (MO). MOs are synaptic configurations of neuronal activity that represent or evoke images and ideas or sounds and sensations that the subject experiencing them recognizes as significant either in isolation or in connection with other images, ideas and sensations. The principal criteria for Changeux is the degree to which a mental object will address sensory receptors, or structurally embedded responses in those parts of the brain that are responsible for integrating data into meaning. Based on the level of sensory content that different situations of thinking evoke, Changeux suggests that there are three principal kinds of "neuronal graphs", i.e. configurations of synaptic connections:

Percepts: these are images that depend more on direct real-time contact of the subjects with the ambient reality in front of or around them; they have a high sensory content, hence they address areas of the brain where such data is processed as opposed to ...

Concepts: these are configurations of synaptic connections that refer preferably to patterns, models and other abstract figures that are easy to mix and match and to interconnect among themselves. They are processed in different parts and different combinations of collaborations among parts of the brain than, for example ...

Icons (or "images of memory"): these are made of a mix of perceptual and conceptual synaptic references and provide us with recall and memory items. Typically, because the sensory content is evoked and not experienced and supported by sustained external stimulation, it tends to be weaker (except, perhaps, in people endowed with a vivid imagination or expert readers of poetry and novels).
When applied to media studies and to the understanding of how technologies affect our minds, it is interesting to note that orality clearly favours perceptual relationships, while literacy encourages a dominance of conceptual references. The minds of the society of readers are dominated by concepts. By comparison with the oral society, the literate one is all dried up, very desensorialized and abstract. Artists' roles in such societies consist in keeping the sensory life alive and interested (popular and high-brow music, media, literature, etc.). Electricity, on the other hand favours iconic relationships. Everything we see on a screen is a kind of "mental object," an icon, an image of memory, but externalized. When screens support the display of digitally constructed objects, one cannot help but notice the great similarities between mental objects and digital objects (DO).
Among the points DOs have in common with MOs:

- They depend on connections
- They are recreated on demand, "just-in-time", so to speak
- They are reasonably reliable (DOs perhaps more so than MOs)
- They are vulnerable to systemic attacks and destruction (mental breakdowns, viruses)
- They are part of a greater—reasonably homogenous—whole
- They rely on very low intensity electrical (organic and electronic) energy
- They are made of varying doses of perceptual, iconic and conceptual content (wireframes and polygons are typical equivalents to imaging concepts, while rendering does the job of sensory memory)
- They are scalable and susceptible to shortcuts and generalizations
- They are meant to be networked

We could go on like this for a while, and, given more thought, we probably should. The value, however, of listing these points of comparison is not in being exhaustive but suggestive of the many complexities of mind that are emulated by IT. Of course DOs also add the hugely expanded potential of both being provided by other than the mind of the user and by being amenable to co-production in real-time by several participants. In effect, technological trends show the relentless drive towards faster and larger connections as well as more pertinent (hypertinent as I call them) connections. The rapid improvement of search engines from the early days of Yahoo! to the present time of gurunet and google shows cognitive progress in leaps and bounds. We can expect not too long from now something I call MMDC or Mind-Machine-Direct-Connect, when by simply thinking about something in front of a screen, it will be possible not only to summon it from the depths of the world databases, but also to modify it and share it by thought alone. At some point, it will seem that, except from their electronic or organic source, there isn't much operative difference between DOs and MOs. At that point, we will need very disciplined thought not to get into a world we don't want to, because there will be less and less resistance of matter to the power of thought amplified, extended, simulated and executed by electricity.
We can be quite sure that the kind of society we are entering into will be different from

that of text and context. I suppose we can expect a general improvement in collaborative strategies. Soon people will find out that putting minds in series instead of parallel, you get better, faster and more pertinent results. Academe may finally get it one day and multiply the intelligences and the hearts of their students instead of simply adding them up as they still do today. The other thing is that the software and the interfaces that are still to be built for developing connected communities are beautiful. They will attract speculative programming as an art form. The communities of hypertext will develop quasi biological software technology, well beyond what we call biotech today, software that will be so intimately interwoven into our daily life and our sensory modes, that we will quasi "wear the environment as our skin" as McLuhan might have liked to say and as Steve Mann actually demonstrates in his work on wearable computers. Health will grow still larger in the general economy, but it will extend to ecology, and perhaps even to replace much of the military. This will also encourage ever greater decentralization, of course, as long as the present trends continue in worldwide distribution of wireless technologies at lower and lower costs.

Indeed, a political consequence of connectivity will be a gradual shift of power from force to power from intelligence. And power of action too. In a properly connected community practicing MMDC in real time, with hypertinent and quasi automated access to the most relevant databases, people can really make things happen. What we want to know now is: What are the priorities—and responsibilities—of thought and feeling in a condition where they can almost be realized at will?

One of the oldest surviving and in fact thriving cultures has lived—and continues to live—a technology for over 50,000 years in conditions of hardship and scarcity that can hardly be compared to any other. The aboriginals of Australia "dream reality", they don't just suffer it or make it. Dreaming reality is an entirely hypertextual activity. Likewise, the ancient Chinese book of wisdom, the *Yijing,* invites its users to throw coins or dice to relate their queries to oracular statements that are like your daily horoscope but perhaps more profoundly rational in their quasi mathematical coherence. Anybody fooling around with the daily horoscope practices hypertextual thinking without knowing it. What you do when you try to relate to the simplistic predictions addressed to you and to everybody born that day or that month is to link the text you see in front of you to the huge personal database you contain in your memory. Just as we have been practicing contextual and textual cognitive strategies seemingly forever, we have been capable of making hypertextual links both privately and socially since the beginning of time. The interesting new factor introduced by the hugely expanded powers of language multiplied by electricity is that the most urgent task presented to artists, scientists and politicians in a world permanently on the brink of social and ecological disaster is also the most ancient: dreaming a world we want to live in.