Communications Technology and Personal Identity Formation

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Time schedule:
Discussion: 1 - 10 May 2000
Summing-up: 11 - 12 May 2000

Pre-discussion paper

Divide history into three segments: pre-literacy tribal, modern and post-literacy societies. The movement between segments is characterized by transitions that our sensibilities undergo as technological advances are made and as the tools are incorporated into everyday life. The printing press divided the pre-literacy and modern; the computer divides the modern and the post-literacy.

In the move from pre-literate to modern society there were few technological advances and the speed of mechanical devices was slow as well. The sensory shift occurred between an emphasis on the ear in the oral society to the visual in the modern literate society. The few changes and slow movement insured that individual and societal reactions to innovation were delayed and absorbed over a considerable amount of time. People were able to develop new competencies as changes in organizations stabilized.

This is not the case in the move from modern to post-literate society. Electric tools instantaneously extend our capabilities in a “global embrace”. Action and reaction times occur simultaneously and there are many more tools available.

This panel opens the discussion on the social and individual effects due to computers as communications technology. Do we have a cultural lag with our tools? The speed and sheer choice prohibits people from gaining competency with their tools, to ever catch up to an advancing technology. As our world becomes smaller through global networks, it seems no longer possible to adopt the highly specialized and detached dispassionate modern attitudes, no longer possible to just report the technical facts and remain neutral to their consequences. Let’s open the discussion with these questions:

Do you ever notice sensory changes in how you perceive the world? Subtle changes that you would attribute to having used computers? What effects do communication technologies have on your own sensibilities? What effects do communication technologies have on your social structure? Do you think virtual reality and wearable computers may impact our senses more than computers? If not, why not? If so, will it be important? Are there permanent effects on my sensory capabilities from using communication technologies? If so, how will these effect who I think I am? What would the changes be? How would I be able to tell differences? What might be the impact on society?

Some websites are provided below. For example, David Chandler provides a broad-brush description of the heuristic tool of aural-visual dichotomy that is informative. Two sides of the debate on the affective nature of communications tools are at the website on Katherine Hayles book, How We Became Posthuman; and, Eleanor Wynn's argument that there is little effect. Douglas Kellner's website provides a wealth of information on a variety of topics listing of critical theorists as they can relate to education. MIT's wearable computer website is a state of the art illustration of the future of computers.

Katherine Hayles has written a book on becoming posthuman:
Review/summary of Katherine Hayles book, How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics
http://www.ctheory.com/r49.html
David Chandler's work provides a context for understanding the heuristic dichotomy of Aural vs Visual societies:
http://www.aber.ac.uk/media/Documents/litoral/litoral.html

David Chandler's work provides some background on technological determinism and social structure:
http://www.aber.ac.uk/~dgc/tdet01.html

Eleanor Wynn argues against the idea that computers affect cultural or personal change:
Hyperbole over Cyberspace: Self-presentation & Social Boundaries in Internet Home Pages and Discourse
http://www.slis.indiana.edu/TIS/articles/hyperbole.html

Douglas Kellner's excellent class website on Education, Technology and Society. Many links to sites with information and articles on technology, education, critical theory and society.
http://www.gseis.ucla.edu/courses/ed253a/253WEBa.htm

MIT's wearable computer website

Post-Discussion Paper

Introduction

Several provocative themes from the discussion on communications technology and personal identity emerged that can be summarized under three main topics and six subtopics. These topics begin at a high level of abstraction moving from theoretical perspectives, to viewpoints on technology per se, and move toward concrete subjective perspectives.

First, three perspectives on theoretical shifts are presented. Contributors commented on what may or may not need to take place on theoretical grounds as precursor/simultaneously to social/technological/cultural change. Second, contributors' ideas on the nature of technology as ecological are presented. The third topic most directly addresses the nature and role of personal identity, ways of theorizing about identity, the role of education/literacy to identity and more subjective states including personal reflections, comments on sensory input and human/computer interface.

The main topics and subtopics include:
Theory, change and personal identity
1. paradigm shifts in about change and personal identity
2. theorizing systems thinking and theorizing technology in society
3. the relationship between evolutionary and cultural change
Technology
4. technology is ecological
Subjective perspectives
5. aspects of literacy
6. narrative and personal identity

Theory, change and personal identity

1. Paradigm shifts and theory on change were discussed

Overall, these posts were focused on big picture ideas of how best to theoretically frame the questions and how best to characterize the changes that may or may not occur. Many contributors discussed paradigm shifts as occurring and others questioned the validity of such changes. There was not unanimous agreement on the theoretical state of affairs or consensus of opinion within the two perspectives. In general, both sides made many references to philosophers, mathematicians, scientists, writers involved in systems type thinking. A more specific implication regarding education was a call to bring the humanities back into education as some type of counterbalance to unknown social forces arising from a rapidly advancing technology. The posts grappled with big picture scenarios to frame the questions on communications technology and personal identity.
Barry Kort: It occurs to me that we are at the crossroads of a different kind of extinction. There is a flaw in our culture that worries me. It worries me because it's like the flaw in mathematics before Goedel revealed it. Whitehead and Russell believed that all mathematical truths were derivable within the system, as long as one rigorously followed the rules. Goedel disabused us of that notion. During my career, I've studied rule-based systems, and found them wanting. I've also studied model-based systems and found them far richer. We live in a rule-based culture. I fear we are coming to the end of the line with that model. It's time to evolve from a rule-based system to a model-based one. I fear we won't make any progress until we make that paradigm shift.

A challenge to defend that a paradigm shift may be occurring:
Norma Benesdra: I would simply like to ask Barry Kort for one or two examples of model-based systems and why he thinks they are evolutionary superior to rule-based systems.

A recognition that some type of change is occurring and an attempt to categorize it:
Muhammad Betz: Konrad Lorenz, Nobel Laureate, has stated, "Everything we know about the material world in which we live derives from our phylogenetically evolved mechanisms for acquiring information..." My first take on the current discussion relates to the evolutionary view in general, and specifically, to the relationship between homo sapiens and the computer, and as Lorenz has stated, this is an interactive, reciprocating relationship. The question: Does this phenomenon indicate an evolutionary event? No, not yet. Evolution does not occur within one generation.

A further comment on how differently to categorize change, drawing out what features of change we need to be aware of, e.g. the social construction of theory making.
Tom Abeles: It is only in the Darwinian construct of evolution that change occurs through generations. Evolutionary change can occur within generations through Lamarckian transfer- probably the route for the next round of human evolution in a knowledge age- so we may not have the luxury of time if we have any say in the path.

The discussion features were about change, how rapidly change occurs and response/reaction to change. There was concern that our theories could not keep pace with the changes occurring.

Tom Abeles: The question one must ask is when have we reached the limit of our current theories what do we do. The scientists of the past provided foundations on which we build. Much is sound and much needs to be discarded or revamped. After all a Ph.D. means a philosopher and not a historian or technician. Research pushes the frontiers and does not hold the past as absolute truth. After all, the job of the scientist is to go beyond the past- not just add another decimal point to the past. And how do we do this- with imagination and synthesis of new ideas. After all scientists were burned at the stake for countering accepted dogma from the anointed.

Gene Schmidt: Are we controlled by the ghosts of the past; are we, as the post modernist, cultural studies folk might say, controlled by dead white, European males”? The boundaries between "science" and the rest of what makes us human have never been less certain.

Some contributors contend that we are in the middle of a paradigm shift, others state that there are multiple compatible paradigms and others question that a shift is occurring at all. Whether or not this shift occurs, the discussion still focused on how best we can come to understand the world, our place in it under rapidly changing technological conditions. There are a number of ways to theorize change. The multiple perspectives noted above can be understood in the framework of Thomas Kuhn. Kuhn offered one way to understand how change happened in science in his seminal book, The Structure of Scientific Revolution.

Kuhn described how a scientific revolution took place within the community of traditional science. A normative picture of scientific growth was as a cumulative venture progressing on a predictive route on the shoulders of the giants who came before. A traditional science claimed to be universal, equally applicable to all situations and persons. One of the conceptual behaviors developed within a paradigm is a criterion for choosing problems that while the paradigm is taken for granted these problems are assumed to have solutions. Generally, these problems are the only ones that are or can be recognized by the practitioners. This is so because these problems are reducible to the underlying assumptions; therefore, these become the only real problems recognizable. Other "problems" are dismissed if not reducible to the form of the paradigm. Such cases appear as anomalies against the backdrop of the taken-for-granted paradigm. Anomalies stand out from the backdrop because of their contrast to a perspective that perceives the backdrop as a coherent set of presumptions about how the world works.
A new paradigm emerges because of its ability to explain the anomalies. The new paradigm incorporates some of the old vocabulary and apparatus but both are used in novel ways. The novel manner of approaching problems leads to a different set of standards and definitions used as criteria for evaluating problems. In this way the nature of what constitutes a problem is redefined. That is, the traditional way of calling something a problem, conceptualizing something as a problem and what constitutes a solution to the problem are called into question. The whole conceptual backdrop of assumptions must shift, rearrange, and refocus in order to create a coherent set of presumptions that now sustain the new paradigm. Kuhn concludes that this shifting amounts to incommensurability between the two paradigms. The competing paradigms practice their research in different “worlds” insofar as the “worlds” are made up of different coherent sets of conceptions for understanding. If the new paradigm were to collapse onto the definitions, standards and practices of the old tradition, then one could claim that there was no sustainability since the conceptual shift was insufficient to sustain the transformation to the new paradigm.

2. Theorizing technology and personal identity

There are other ways to theorize about technology than Kuhn's perspective on change. Two other theories about technology and society are instrumentalism and critical theory. Contributors displayed a full range of commentary reflecting both of these theoretical perspectives and not all comments reflected a complete characterization of either theory.

Instrumental views of technology are characterized by essentialism, ahistoricism and social abstraction. The common sense idea is that technologies are tools available to serve the purposes of users and that the person is in control of the tools and not the other way around. Tools do not have evaluative content. This means that the use of tools is relatively indifferent toward the ends of their use, toward politics and ideology; universally applicable in different societies; and, the universality implies that the same set of standards can be used anywhere. Given the instrumental view of technology, the only rational stance toward technology is an unreserved commitment to its use. There would be characteristic notions of personal identity consistent with beliefs of instrumentalism.

Some posts were aligned with the feature of instrumentalism that a tool is relatively inert. A measure of doubt about the long-term impact of communications tools registered in some posts. The two posts below did not exhibit the full range of the instrumental viewpoint, e.g. an unreserved commitment to its use.

Muhammad Betz calls for caution in speculating on the relationship between communications technology and personal identity because things have not settled down into equilibrium and exhibited stability. He doubts that things like communications technology artifacts have effects on the character of persons because they are in flux. Muhammad Betz: From the anthropological perspective, we, as homo sapiens, are influenced by the tools that we use. Our behavior away from our tools will probably show some of the learned characteristics we have acquired from the time spent with our tools. I still wonder what the long term effects of information technology can have on our character, psychological and physical, when the artifacts of technology are in flux.

Another instrumental feature was also expressed, i.e. the effects of technology are understood as external benefits to humans. In this case, one-to-one correspondences of replaced human value with a prosthetics have little inherent or affective capability over and above human capability.

Alan Cooper: If we are talking number crunching or rapid production of works of dexterity, humans can benefit. However, technology, as we now see it, can only compensate for delimited human powers. I don't predict technology implants that will allow humans to become superhuman.

A critical theory of technology is different from an instrumental view in two important ways. First, a critical theory is historical, contextual, value-laden and concrete. A critical theory of technology claims that changes in technology are more than just mechanical improvements to our tools that make our lives more efficient. Technology is deeply embedded in all human interactions, social, work-related, creation of goods and services and culture. Society and technology are in constant flux and, therefore, can never be understood as fixed entities or unique across time and space. Technology is, thus, conceptualized as something socially constructed and imbued with societal biases and interests. Second, a critical theory of technology “follows the dialectical logic of both/and rather than either/or in theorizing new technologies.” It does not set up a false dichotomy between one-sided technophilic or technophobic approaches. There would be characteristic notions of personal identity consistent with beliefs of critical theory.
Several posts did recognize the intimate relationship between human society and technology. Muhammad Betz: As Postman says, "technology doesn't just add something, it changes everything." . . . Still, the effect of new technology does change the way we think about things (what we learn).

However, few posts exhibited a critical stance toward technology, i.e. described biases or politics behind use. In fact, the following post exhibits both critical theory recognition of embeddedness and a type of instrumental determinism that is beyond critique because critique would be futile. Tom Abeles: We are our technology whether in metaphor, metonym or direct coupled. We can not set the technology apart as a disembodied instrument- we have yet to realize that final step of a direct merger. The Borg may be right when they say "We will assimilate you, resistance is futile"

On the other hand, a later post invokes a more social critical stance. Tom Abeles: Who we are and will be biologically and culturally may be forever changed- maybe the university of the future will be a biochemistry laboratory- or an electrophysiology studio--speculative fiction- I think not since it is within the realm of possibilities today- a moral issue it is, IT (information technology), particularly education technology, to paraphrase Eisenhauer's remarks about the military, may be too important to leave to the engineering and computer science departments.

Some speculative/descriptive comments on the state of affairs did not fall into one theory orientation or another. Such a description could be construed as utopian optimism, uncritical reflection of instrumental determinism, or as an assessment to be critiqued later. The following is one such example. Tom Abeles: When does the human race become so dependent on intelligence of bits and bytes that we can't afford to turn the system off? Biomedical implants are here. There is absolutely no reason that a person, from birth could not be implanted with intelligence in the same way we get immunizations today. When would we count that as an evolutionary step. We are not far from a direct human computer interface-hard wire, and not just keyboard and optical coupling. Speculative fiction or extrapolist science?

3. Relationship between evolutionary and cultural change

Many contributors wanted to characterize the types of changes occurring or observed. This portion of the discussion centered on the nature of change in evolutionary or cultural terms. Evolutionary and cultural change in relationship to time were discussed in many ways that for heuristic purposes can be placed on a continuum scale. The two ends of a continuum of change are evolution at one end and culture at the other. In between is a complex relationship between speed of change and the substance of what gets changed. On both ends, contributors argued for and against including technological change as indicative of either evolutionary or cultural change. And on both ends, contributors could invoke the notion of theories as social constructs. For example, two contributors arguing for evolutionary change may disagree with each other on whether technological change is considered evolutionary.

The role of speed of change and the issue of "obsolescence" or extinction was raised at multiple levels: species, cultural, personal self. The nexus point in this discussion centered on the role of time and speed of change. The speed of our communications technologies may be implicated in the potential changes to species, culture and personal identity. The discussion comments below are framed against the heuristic continuum.

Two viewpoints on the evolutionary end of the continuum are discussed below. Betz argues from a traditional evolutionary viewpoint characterized by slow change and, thus, does not include technological change in his viewpoint. Abeles argues for a modified evolutionary viewpoint that includes rapid change and, thus, does include technological change as evolutionary.

For Betz, the concern was that the substance of evolutionary change, e.g. phenotype change, is ultimately not affected by rapid technology changes. Muhammad Betz: Lorenz's view is that the genome can pass on change, in the biological sense, when it is "instructed" to do so by the impressions it receives while interacting in its environment. In that respect, the genetic content is changed in the parent generation, but the phenotypic representation of that change can only be evidenced in the next, or later, generations.

Further, personal changes observed are neither necessary nor sufficient to reflect underlying evolutionary changes.
Muhammad Betz: I find myself thinking more like a computer, and I have noticed a change in my sensory perception, i.e., to by more virtual, particularly after extended time at the computer station. We humans predictable will grow more like computers and computers will become more human. The question: Does this phenomenon indicate an evolutionary event? No, not yet. Evolution does not occur within one generation. With the rapid rate of progress in terms of technological progress, there is no sound way to predict where the relationship between humans and computers (or computers' "relatives" and "progeny") will lead.

On the same end of the continuum is the idea that our theories are socially constructed, that they do not stand as monolithic explanations. At any one time competing theories are leveraged against each other to better explain phenomena. By expanding a theory's vocabulary, one can expand the domain of what are considered real problems to work on. By expanding the notion of change over time to include rapid change, one can argue to include technological change as evolutionary. Abeles argues this point showing both that theories are modifiable because of technological advances and that theories are social constructs at some level.

Here theories are modifiable because of technological advances. Tom Abeles: The issue is not one of doubting evolution. It is how the evolution occurs and on what time scale. Biological evolution, at one time, was intergenerational- one generation passed "knowledge" in the form of genes to the next. . . .Now I am not quite sure what gene therapy means today or in the future where we can insert genes which can change a species, cure a disease and maybe even change what a present generation will bear as a result of a pregnancy. This, of course, is what the bruhaha is about with genetically modified agricultural commodities. Natural selection was left to some sort of divine intervention called "God or Nature" to determine the mix and resultant outcome. And now we have elevated humans to the same status to not only determine what will arise from combinations, but also to determine what combines and even change the game, in vitro during gestation.

Here theories are modifiable because on some level they are socially constructed. Tom Abeles: It is only in the Darwinian construct of evolution that change occurs through generations. Evolutionary change can occur within generations through Lamarckian transfer- probably the route for the next round of human evolution in a knowledge age- so we may not have the luxury of time if we have any say in the path.

On the other extreme, one can argue that such technological changes are cultural, not evolutionary. Abeles had referred to intelligence implants as the next evolutionary phase and this was based on an expanded notion of the role of time. One contributor disagreed with Abeles arguing that such technological change was cultural in nature, not evolutionary.

John Spiers: Hmmmm, would this be an evolutionary advance...or would it be a cultural advance, on par with making 8th graders familiar with Hamlet? Are immunizations evolutionary, or cultural... Japanese are "more immune" to heart disease because they culturally prefer more fish in the diet...or did the Japanese evolve as fish-preferrers? As an amateur with advance study in Japan, for me it would be a tough call...I'd call it cultural. we will soon enough be able to replicate 40 years of fish diet with an immunization to heart disease... evolution is a tricky theory... and culture is leading with our best.

Several posts present intermediate viewpoints showing relationships between the two extremes. The following comment gives a historical perspective on changing views and the role of social influences on biological change. Arun Tripathi: "Historians will have to face the fact that natural selection determined the evolution of cultures in the same manner as it did that of species." Lorenz has also proposed that human fighting and warfare had genetic origins in the kind of behavior observed in lower animals when defending a territory. The theory gained popularity but evoked sharp criticism by authorities in many fields, esp..Sociobiology. Sociobiology is a developing scientific field that investigates the biological bases of the social behavior of animals. Sociobiology seeks to extend the concept of natural selection to social systems and social behavior of animals, including humans. Later, because of the efforts of some prominent sociobiologists to extend such analysis to the complex behavior of humans.

Technology

4. Technology as ecological

That technology is ecological was discussed in two ways. It was discussed from the perspective of a computer acquiring more human-like characteristics. Normally, technology as ecological is viewed as technology
changing the environment. In this case, technology is ecological was reversed, e.g. it was the human impact on the development of a computer's "personal identity" since computers increasingly have more human-like capabilities. Second, ecological aspects were discussed from the Neil Postman point of view that our technologies change the environment.

Barry Kort outlined computer capability development over the last 50 years describing how computer functionality has increasingly mirrored human capabilities. By framing his comments from the point of view of the machine-acquired-functionality, he ascribed to computers some sort of independence from humans.

Barry Kort: It took about 20 years for machines to acquire a respectable level of word-processing skills. Today, machines may not be writing the great American novel, but they are good at basic language skills. To date, computers have been downright autistic, blithely unaware of the affect emotional state of the user. But that's about to change. The next big push is Affective Computing -- building machines that pay attention to the emotional state of the user and make intelligent adjustments.

It is useful to keep in mind that it is humans who still currently program computers to carry out the functionality they have and that machines do not inherently "acquire" these skills independently. That a computer may be able to register emotional states of humans that interact with it, is not the same thing as ascribing that emotional state to the computer. However, Kort's description and questions foreshadow discussions about legal status of machines, ethics and (Quasi-)human rights, and emotions attributed to computers-yet-to-come. That machines will reach this quasi-human state seems both presumed and pre-determined as natural fallout of technological advancements.

The circumstances of boundary conditions between computer and human were further explored. Speculation has it that computers will govern the extent to which we may become more machine-like. Being merely human may work against us if computers are in a position to decide who can evolve this way.

Tom Abeles: Donna Harraway has suggested that we are already cyborgs though not in the sense of Star Trek's Borg. Ray Kurzweil in his Age of Spiritual Machines and Bill Joy, in the recent issue of Wired Magazine have also suggested that this is the evolutionary path, if computers deem that we humans as biological organisms have a survival quotient high enough.

Second, the changed environment due to communications technology can be viewed both externally and internally, i.e. what happens outside and inside of the body. Most communications tools impact our external environment, e.g. writing, typewriter, postal system, and telegraph. The advent of electricity allowed high-speed communications with split second reaction time, inhibitions that usually stop everything from happening at one time are removed. Internally, our communications technology can affect changes in sensibility or psychologically in a way that has not been experienced before in the history of humankind. Contributors addressed these different environmental changes with varying opinions.

Bob Leamnson: Neil Postman's observation is that technology is ecological. As Postman says, "it doesn't just add something, it changes everything." Still, the effect of new technology does change the way we think about things (what we learn)

One contributor paints a broad picture of external technologies that enhance "humanity" and with each example he brings the technology/human interface closer and closer to the internal state.

Alan Cooper: Technology allows us to fly, to manipulate huge and heavy objects in space and in the ocean depths, to perform surgery on the nucleus of a cell, to write by placing individual atoms, to see planets orbiting distant stars, and to quickly access a vast amount of information. These powers are all beyond *my* "unaided human physiology". So I do consider them "superhuman". And the interfaces with which some of us access our tools are already of striking immediacy - consider for example the VR glove and helmet used by the remote mind of a robotic microsurgeon. So on the issue of (humans being) "hard wired" we are effectively already there!

Others report varying internal effects and opinions on what these effects mean.

Muhammad Betz: I find myself thinking more like a computer, and I have noticed a change in my sensory perception, i.e., to by more virtual, particularly after extended time at the computer station.

Muhammad Betz: I personally have not seen technology interfacing directly with humans except to assist disabled or disadvantaged people... This brings me to a hypothesis: technology cannot supersede human capability as described by pioneers. Technology, as we now see it, can only compensate for delimited human powers. I don't predict technology implants that will allow humans to become superhuman.
Alan Cooper: The role of memorization is being dramatically reduced. Yes, largely as a result of a social trend towards intellectual laziness perhaps, but also as a result of genuinely decreased need. Using the web left me with an alarming sense of competence and erudition. Once I got used to it, it was actually quite pleasant. And with our brains plugged in to the net, we really were "superminds".

The internal effect of communications technology addressed technology being implanted within the human body, Betz's and others' comments. It also addressed the effect that interacting with communications technology, e.g. through the internet, had on the perceptions and psychological state of a human user, Cooper's comment.

Personal Identity

5. Aspects of Literacy

Most contributors who commented on the subtopic of literacy and communications technology acknowledged a relationship between communications technology and literacy either positive or negative. The nature of literacy was explored in three ways that again make use of a dichotomous heuristic. First, a debate over the use of Ong's research on orality and literacy helps to inform the analysis on using a dichotomous heuristic. Second, definitions of literacy were explored. The main difference in opinions arose when trying to pinpoint the definition of literacy and how best to characterize the relation, i.e. technology as exogenous or endogenous to literacy. The two ends of the spectrum focused on what the term "literacy" means in relation to communications technology. On one end there were those who understood literacy in the traditional sense of reading and writing and treated technology as exogenous to literacy. On the other end were those who expanded the notion of literacy to include both technological literacy and social awareness of technology and treated technology as endogenous to literacy. Third, historical perspectives are provided both for literacy in general and for computer literacy.

Several contributors debated the merits of Walter Ong's research on orality and literacy. Ong's work showing a difference in thinking between oral-based and literacy-based cultures. Ong's work draws a distinction between orality and literacy largely based on the introduction of communications technologies, albeit primitive as they were in the beginning. Introducing Ong's research into the heuristic does not automatically put someone on one side of the spectrum or the other. Endorsing Ong's work even challenges the notion that such a heuristic provides meaningful information, to even draw distinctions in the definition of literacy in the first place. For example, if Ong argues that there is little difference between scribal, print and electronic forms of literacy, then drawing out the heuristic distinction as done does not significantly add information to understanding differences in communication types. The differences would be differences in degree not differences in type. On the other side of the ledger, one may argue in using Ong that traditional notions of literacy should be expanded to include electronic and multi-media forms of literacy because they are still at bottom the same kind of literacy which is a different type from orality.

Aran Tripathi: Yes, the book of 'Walter J. Ong', "Orality and Literacy: The Technologizing of the Word" is an interesting one...in the book. Walter Ong argues that the major shift in human thinking lies between orality and literacy (a much more significant shift than those between scribal, print, and electronic forms of literacy). He argues that, as senses, hearing and speaking are performative, belonging to the moment in which they occur. Seeing, on the other hand, is much less time bound. Thus, while the speaking of a word can never be repeated, but only imitated, the writing of a word becomes a relatively permanent thing, readable over and over again, with any charge to the written word itself. In this difference between sound and sight, Ong finds the key to the wide-ranging differences between orality and literacy.

On the other hand, it's not clear that refuting Ong's work is necessarily an argument against using the heuristic. It still could be argued that useful information could be gained from learning about the continuum of one type of communication, literacy, in its varying degrees by using the heuristic tool. Some argued against Ong's research.

Charles Nelson: I don't know the exact sources but Cole & Scribner's work (with the Vai in Liberia, I believe) refuted Ong's claim fairly well that there was any major shift in human thinking due to literacy.

Bob Leamnson: Walter J. Ong titled his well-known book "Orality and Literacy" to emphasize that they are (were, before postmodernism) not the same. Oral literacy was, and should have remained, an oxymoron.

The second aspect to this subtopic was on the definition of literacy. Several contributors debated the connection between communications technology and literacy. On one end of the spectrum literacy means reading and writing, contributors saw a negative impact on literacy due to communications technology. For example, I draw
on Leamnson's posts. First, he makes a connection to reduced literacy, i.e. reduced ability to construct meaningful sentences that reflect one's mental state. Second, he expresses his definition of literacy in terms of reading and writing only.

Bob Leamnson: How computer/internet technology is going to change the culture is mostly (but not completely) in the realm of speculation. Of particular interest will be findings about how computer use itself affects the literacy that was introduced by reading and writing. [My personal, non-scientific, observation is that my students are terrifically adept at "finding" or "accessing" information, but not all that many of them actually read what they have found, and of those who do, not many of them understand what they have read.] The ability to construct coherent sentences that reveal one's mental state is learned through reading and not by studying grammar. The effect of long-term intensive computer use on language facility is probably something we'll learn eventually.

When pressed to explore the idea of an expanded meaning of literacy, e.g. "access literacy" to use a term from his experience, he rejected this move.

Bob Leamnson: In response to my expressed worry that increased reliance on hypertext might erode what we have always thought of as literacy, (the idea of "access literacy" was proposed). . . The core meaning of literacy (should) not change. It still means the ability to read and write cogently in whatever symbol system is used. "Access literacy" clearly means something else, something like a talent or skill. Howard Gardner messed up the language and did no one any favors by "inventing" new intelligences. Nothing at all was gained by calling them intelligences except muddying up a word that we were already having problems with. Let's please not further debase the English language by creating a plethora of "literacies."

This perspective is characterized by a traditional understanding of literacy, by a perception of students that lack a competency in traditional literacy, and by an explicit connection of both these to computer use. It seems the explicit connection to technology, one possible cause of reduced literacy, is treated as exogenous to what literacy means and its competency.

Comments representing the viewpoint that technology is endogenous to changing notions of literacy have been mentioned before, e.g. Postman view that technology changes everything. The following quote links together both technological literacy and social awareness of technology, thus, treated technology as endogenous to changes is literacy. The implication is that the process of what is knowledge and how to gain knowledge is changing.

Tom Abeles: We need to really deal less with the technology and how to use it and more with the changing ecosystem of education and what that means for academics in the near term cultural evolutionary scheme. As virtual communities grow, we are seeing less and less need for content experts in the classroom and more a need for process experts to help students grasp what they need.

Two historical perspectives on literacy may be useful when thinking about the arguments presented so far. These are the history of the meaning of literacy and the history of computer literacy.

Most people when they think of literacy think that to be literate means to read and write. This was not always the case, i.e. there is a history to the meaning of literacy. Before the printing press was invented oral traditions emphasized the sense of hearing. How children were educated and how they were trained for work was different in part because of oral traditions. Oral communication meant that people had to stand close to one another and listen. A person became more knowledgeable by listening, memorizing what was heard and reciting. Recitation was done in a group. Oral literacy meant to listen, recite and emphasized auditory sense. The invention of the printing press changed how knowledge was passed on from one generation to another. Books were available for someone's hands to hold. A person had to see the words on the pages and understand how to decipher the symbols in sequential order, linear organization of information. In the early history of schooling, children were not necessarily taught to both read and write, e.g. usually the child could read but not write. Recitation carried over from the oral tradition and children were not taught to read silently to themselves. Early book learning literacy emphasized reading, recitation in a group and visual sense. Gradually, the ideas of silent reading to oneself, holding a book in your hands, and writing become the norm of book literacy. Today we usually think that literacy means reading and writing.

Notions of computer literacy have also changed as a result of technological developments, the changing role of computers in global societies, and the social role of the learners. In general, computer literacy has referred to four developmental goals: proficiency in using computers and applications; understanding of the variety of computer applications and the social implications; elimination of phobias; deeper understanding of computer capabilities. Emphasis on these topics changed over time. For example, earlier notions emphasized hardware
considerations and downplayed the social impact of computers on technology. Two reasons for this emphasis were that early computers where mainframe computers that usually only scientists were trained on and had access to and they were not comfortable teaching social science. The advent of personal computers altered disciplinary access to computers. For example, by the late 1980's it computer literacy meant learning to program and to use software applications. Low-cost, easy access and availability of software led to the current push to include computer literacy courses in the K-12 curriculum. Most recently, computer literacy seems to be developing in two ways: multiple-media literacies, and developing a social consciousness and critical awareness of the power of computer and communications technology in society. Multiple media literacies pay attention to the increased use of mass media and the new multi-sensory aspects to communications technology, e.g. visual images, virtual reality. One might argue that we live in a 20-second sound bite state of literacy, with diminishing attention spans. What role does traditional reading/writing literacy play when we are bombarded with images, graphics, sensory, non-linear information with little accompanying text?

6. Narrative and Personal Identity

Seemingly innocuous quotes paraphrased from Wittgenstein and Eco lead into a fruitful discussion into the explanatory power of narrative storytelling to understand human behavior. Aspects of personal identity formation may best be captured by the role of the narrative story. To the extent that we can theorize about personal identity as narrative, there remains an open question: what are the stories we tell ourselves about communications technology and how do these stories inform our sense of personal identity. I draw on Marya Schechtman's work to explore this idea and the discussion to illustrate it.

A number of contributors picked up on the initial question asking for clarification on Eco's and Wittgenstein's quote about silence.

Arun Tripathi: Umberto Eco says "The things that cannot be theoretically expressed, one must tell a story about". It sounds like he is playing off the final words of Wittgenstein's Tractatus, what cannot be spoken about must be passed over in silence.

One response was to outline a formula for storytelling. Presumably this formula could capture human behavior found in tragic and comedic situations.

Barry Kort: In other words, our deepest felt emotions leave us speechless, and must be communicated nonverbally (in music, art, and drama). So, what about drama? What about storymaking? I've been thinking a lot lately about the storymaking and storytelling. I recently worked up my first primitive theory of storymaking. This theory comes from an insight I gleaned from Rene Girard, who recently published an eye opening theory on competition, conflict, and violence.

Girard, in turn, gleaned his theory from an analysis of compelling stories in the great literature (particularly Dostoevsky). Here is how I model storymaking...For each character in the drama, assign them three related characteristics:

1. A deep-seated fear. Call it Fear of X.
2. An associated constellation of emotions, Y, which are acted out when Fear of X is aroused.
3. An associated desire, need, or obsession, Z, that the character seeks as a protection against their Fear of X, or as relief from their emotional state, Y. By selecting for each character an interesting triple, \{ X : Y : Z \}, one sets into motion a drama as each character pursues their idiosyncratic (and conflicting) desires, Z. To run the drama to tragedy, it suffices that the characters relentlessly pursue their competing desires, Z, until they collide catastrophically. To run the drama to comedy, the characters must discover and reveal the hidden variables, \{ X : Y : Z \} which drive them. It has been argued that Shakespeare and Molliere were the first dramatists who could craft synthetic stories that obeyed this model. Before their time, one had to turn to history and scripture to find compelling dramas that obeyed the model.

A number of posts referred to Wittgenstein and Eco's similarly stated sentiment about silence and what cannot be said. Kort connects this in an important way to what can be said in the face of emotion, namely, storytelling, and its explanatory power for human behavior or how it may shape personal identity. The "technique" of how best to capture what it means to be human is thrown into high relief as a dichotomy between intellect and emotion, theorizing and storytelling. The boundary between these two techniques may begin to blur.

John Laurie: Which further expresses the dichotomy of 'understanding': the intellectual appreciation of a finely structured and apt theory against the plunge into the ocean of sensation within story. Which is to be more believed? Of course the illusionistic narrative has a structure as fine as any theory, but well hidden, filling the infinite space of Wittgenstein's 'silence' with cathartic emotional comprehension.
Marya Schechtman's book, The Constitution of Selves, is a philosophical treatment on the topic of personal identity. She writes that most modern personal identity theorists conflate two significant different questions, that she calls the reidentification question and the characterization question. The former is the question of what makes a person at time, t₁, the same person as a person at time, t₂. The latter is the question of which beliefs, values, desires and other psychological features make someone the person that he or she is. The reidentification question thus concerns the logical relation of identity, whereas the characterization question concerns identity in the sense of what is generally called, an "identity crisis".

The point of bringing Schechtman's work into the discussion: to push the discussion of personal identity forward it may be necessary to separate the two questions and deal with each in its own terms. Her response, in line with Kort, is that the characterization question is what she calls the "narrative self-constitution view". This is a philosophical and psychological argument that states we are either self-creating or that the lives of people are narrative in form. We're not just what we eat, but we are the stories we tell ourselves, the stories we tell ourselves about the world and how we fit into it. A person's characterization identity is constituted by the content of his self-narrative, and the traits, actions, and experiences included in it are, by virtue of inclusion, his. An identity is not something a person has whether he knows it or not, but something he has because he acknowledges his personhood and appropriates certain actions and experiences as his own.

If a person's personal identity is captured in some sense by the narrative self-constitution, then what stories do we tell ourselves about who we are as we interact with our communications technologies and with each other using them? How do our senses become affected in such a way that you think differently about a situation, reason differently than you would have, say through personal communication, and, therefore, tell yourself a different story? I turn to the discussion to illustrate how we begin to tell ourselves stories on the complex relationship between communications technology and personal identity.

There are various types of stories to tell ourselves about communications technologies. One story from the discussion to illustrate this point takes an enthusiastic and positive outlook. A positive story can act like a positive feedback loop that amplifies potential future interactions with communications technology. The story telling can go both ways, positive and negative. One good story makes it easier to go back and develop more competence with the technologies which in turn creates more positive stories about our relations with communications technology. For example, one contributor relayed a story of how he had used the internet's wealth of knowledge to enhance his own "brain power" and, thus, felt more competent and erudite. He reasoned through this new experience by drawing on previous experience with older technology. By analogy to older technologies on how memory works he merely substituting the new technology in place of the old and tweaked through this new experience by drawing on previous experience with older technology. Viola! The human-computer interface/interaction became one step closer in identification with each other.

The contributor stated: The real thrust of the previous posting was to raise the question of whether any of these enhancements, whether remedial or expansive, actually do anything to improve the intellect or affect our educational activities. I think they do. First let's consider educational activities. For example 'speling'. Or grammer. It is quite possible to be intellectually effective while deficient in either of these, but they were traditionally taught at length in order to give the student social credibility. Nowadays technology allows this emphasis to be significantly reduced. But this is only the tip of the iceberg. The role of memorization is being dramatically reduced. Largely as a result of a social trend towards intellectual laziness perhaps, but also as a result of genuinely decreased need. Over New Year's, the Globe&Mail presented a challenging 'trivia' quiz to identify 50 prominent persons of the past millenium from obscure clues. A friend and I 'cheated' by using the web and dashed through most of them in a couple of hours. Aside from demonstrating to us that the web holds a remarkable amount of genuinely credible information (compared to say just a year or so ago), it also left me with an alarming sense of competence and erudition. Once I got used to it, it was actually quite pleasant, but with that came doubts as to whether it reflected reality or was merely a delusion. My thesis tonight is that it was real, and this brings us to the issue of intellectual enhancement. My own experience in handling a small amount of knowledge is that when we learn stuff we don't immediately "remember" all of it. Sometimes we have to think to "bring it back", and even with older technologies it was often more important to know the existence and location of a lot of information than to recall a smaller part of it in complete detail. We do this "bringing back" by means of mental links - either crude and artificial mnemonics or genuine mental maps of the intellectual landscape. And while technology may not change the quality of our map or the efficiency of our retrieval process, it may well allow us to devote more of our brain to a kind of biological FAT and less to the actual data items. Thus my friend and I might take some credit for the success of our search by thinking that our ability to generate
appropriate starting points even when we lacked the actual information in our own local memories. And with our brains plugged in to the net, we really were "superminds". Wow! Hey, if it makes you feel good, believe it!

**Conclusions**

The discussion, Communication Technologies and Personal Identity, generated widely diverse opinions and beliefs on what constitutes the nature of personal identity in the modern age of electrical communications technologies. Clearly, there was a deep-seated interest in exploring multiple aspects of this complex topic. The original call for participation asked list members to respond in a personal manner. The responses were intensely personal that covered a range of topics from abstract theoretical orientations, to middle range propositions, down to the personal subjective experience. Overall, there was no consensus on any topic and at first blush this may have appeared chaotic and random. However, the articulation of diverse opinions threw into high relief the verigated and intricate nature of the many levels of change occurring that shored up the context of this discussion.

There were at least three levels of discussion occurring simultaneously. Theoretically, the discussion addressed paradigm shifts, systems theory and theory of technology, and evolutionary and cultural changes. Technologically, issues about technology per se were addressed from both an external and internal perspective. Personally, the changing nature of literacy and the relation between narrative and personal identity were discussed.

**Note**

I have tried to capture main themes from the discussion with illustrative quotes and comments from contributors. There were themes that I did not meaningfully capture due to space limitations. I could not include all quotes or full quotes from those that were included. Many contributor's comments were lengthy, rich in content that opened fruitful lines of thought in an interdisciplinary way. I encourage all readers to review the list serve archives to read for themselves the dialog on communications technology and personal identity. Further notes about how the discussion has been incorporated into this paper is warranted. First, my focus has been to treat individual comments as independent pieces of data. Muhammad Betz in a previous discussion summary included contributors names and countries. I follow his lead in acknowledging the contributor but not their country. Although I note the author of each quote, I did not try to force consistency between one author's several remarks. As a consequence, it may be that one person's several quotes support different theoretical perspectives as outlined below. I have tried to keep duplication of quotes to a minimum but in a few cases one quote served multiple purposes. I use the heuristic device of dichotomy for illustrative purposes and to throw into high relief more obvious contrasts. Many relationships drawn out in this way deserve a more thorough treatment to explore their full complexity. Perhaps the presentation here can serve as a useful springboard for others to do so.