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TERRY MOELLINGER
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TO THINK DIFFERENT: THE UNEXPECTED CONSEQUENCES OF PERSONAL COMPUTER AND INTERNET USE

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BY

_____
Dr. Eric Mark Kramer, Chair

_____
Kevin Wright

_____
Todd Sandel

_____
Patrick Meirick

_____
Katherine Pandora

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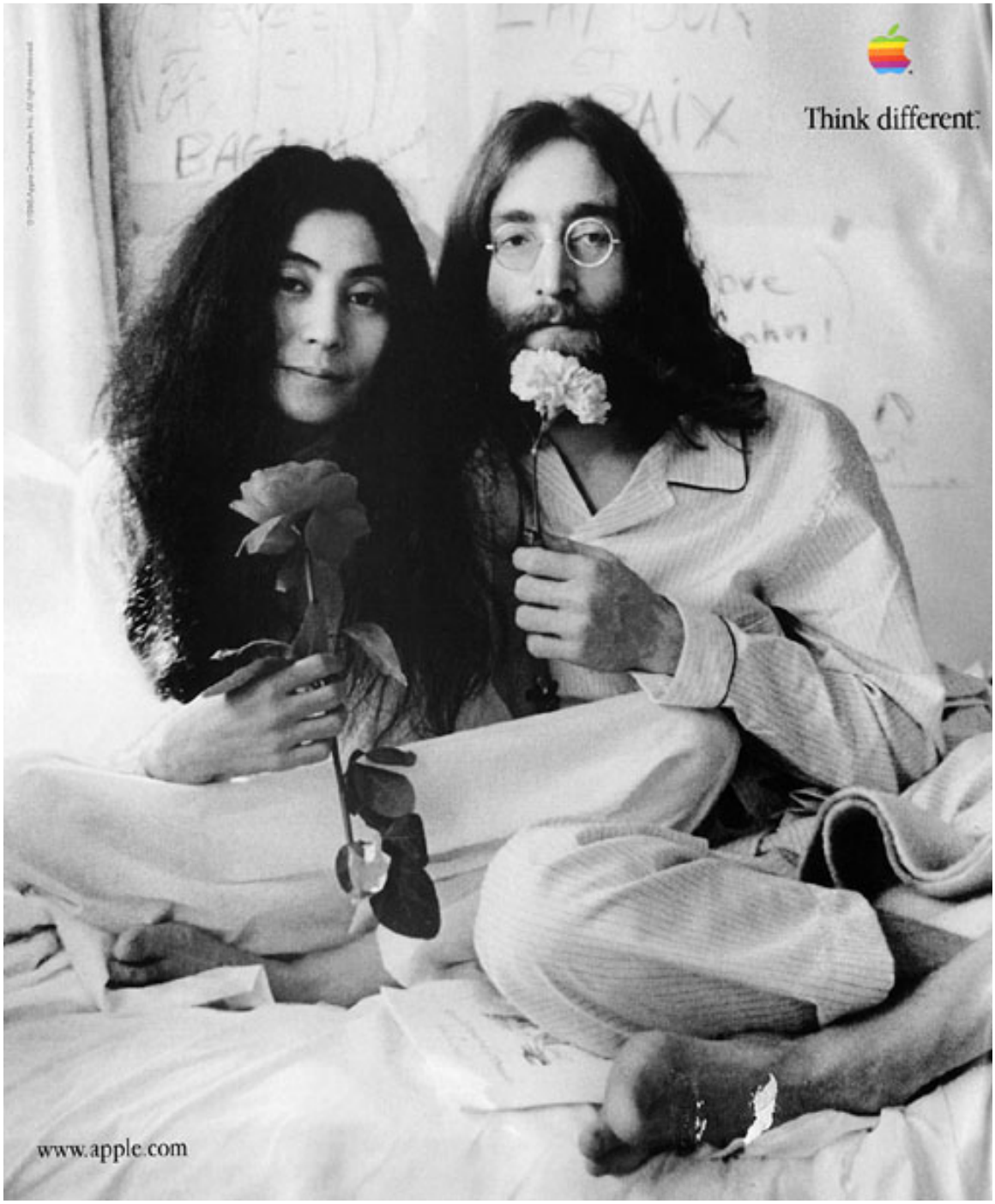
Abstract

This study examines the contemporary user patterns that emerged when a new medium—the personal computer and the Internet—was introduced into the user's media ecology. The study focuses on the introductory period and current usage. Data analysis conformed to practices accepted by oral historians (Richie, 2003, and Brundage, 2008), and grounded theory (Strauss and Corbin, 1998, and Charmaz, 2006), and was coded for dominant themes and categories. In terms of the development of technology within society, the study found support for Mumford (1934/1963), and other constructionist theorists, who argue that new technology is formed within a technological complex where social, historical, and environmental factors influence the shaping of technical innovation. In terms of the users this study found support for Rogers' (1995) assertion that the early adopters occupy the most important position in forming the pattern of acceptance within organizations. However, most importantly, this study confirmed Oudshoorn and Pinch's (2005) contention that for a new technology to be accepted it must the needs of the user. Turning to current usage, this study found that the media is not a neutral actor in the communication process. The use of the Internet encourages users to engage in their own private activities, and allows the user to become further isolated. In addition certain modalities of Internet communication elevated the importance of the thoughts and actions of the sender, and also underpin the validity of egocentric behavior. Most importantly, this study supports the notion that the speed at which knowledge is disseminated by new media, changes human perceptions of space and time, affecting cognitive processing patterns.

To Think Different: The Unexpected Consequences of Personal Computer and Internet Use

Chapter 1: Introduction



The above advertisement for Apple computer was reproduced from a photograph of Yoko Ono and Beatle John Lennon—the group had not broken up when this picture was taken—in a Toronto hotel room (Think Different/Lennon, 1997). John and Yoko were there to celebrate their famous "Love In," and it was there that Lennon composed his anti-war anthem "Give Peace a Chance." This advertisement was part of a campaign imploring consumers to "Think Different," and purchase an Apple computer instead of an IBM clone. The brochure that introduced this campaign promoted an appeal that was designed to celebrate "the ones who see things differently," proclaiming "here's to the crazy ones, the misfits, the rebels, the troublemakers, the round pegs in the square holes … because they change things" (Think Different/Brochure, 1997).

There is little doubt that both John Lennon and Yoko Ono wanted to change things, as their love-in and song exalting peace attest, and there is also little doubt that they were considered crazy misfits, rebels and troublemakers by many people who held more traditional beliefs at the time that the above picture was taken. There is also little doubt that when Apple released this advertisement promoting their computer, that John Lennon had reached an iconic position as a representative of toleration and forward thinking, not to mention the fact that his life had been tragically cut short. Apple hoped to use Lennon's image to establish a counterpoint to their main competitor, the traditionally business oriented, IBM. The larger and more established IBM had geared its presentations to embrace the new demands of modernity, promising efficiency and accuracy, and had successfully entered into the business community as the computer of choice. The Apple computer was more expensive, and the company hoped to project it as the preferred tool of creative people who were not afraid to "think different." This

advertisement is somewhat prophetic, in that it did attract many creative people in the graphic and desktop publishing professions, and that its use, along with the other personal computer products and the yet to be fully adopted new technology of the Internet, would affect their users and encourage them to think differently.

Both the personal computer and the Internet function as extensions of what McLuhan (1962/1965) would call the world of the typographic man.[1] This "new world of the unconscious" began in the 17th century with the introduction of Gutenberg's printing press and its use of moveable type (p. 244), and has been extended with the development of every new communication medium since that time. When McLuhan spoke of unconscious, he not only acknowledged the ubiquitous character of these new communication technologies as they became accepted into the everyday life of their users, but he also implied that they influence the users' consciousness structure by challenging prior notions and perceptions of space and time. McLuhan notes: "the new time sense of typographic man is cinematic and sequential and pictorial" (p. 241). The visual media that have presented themselves in the 20th century have reinforced and extended this new time sense. Meyrowitz (1985), and others, have also pointed out that such technologies have also influenced our sense of space. The challenge to time and space perception has accelerated with the introduction, and usage, of more, and more varied, new communication media and technologies. The principal purpose of this study is to examine this process and to explain the impact of the use and acceptance of newer media including computers, the Internet, and other Internet-based communication devices that have been added into today's media ecology with increasing rapidity.

Aside from examining the impact of new media technologies on the user's perception of time and space and the creation of new media ecologies[2], another purpose of this dissertation is to examine the introductory and adoption process of the personal computer and the Internet as well as the consequences of their use as they supplant older communication technologies in both the workplace and in domestic settings. This study also examined changes in social exchange and communication patterns of people as they encounter and used these technologies, which have now become an integral, if not ubiquitous, component of contemporary everyday life.

The theoretical base for this enquiry lies in medium theory, computer mediated studies, and the constructionist and/or technological complex models of industrial economic development.

Medium Theory: A Means to Explain Media Ecologies and Changing Space/Time Perceptions

Medium theory is an example of what Fischer (1992) terms the "impact-imprint" model of technological determinism—"new technologies alter history, not by their economic logic, but by the cultural and psychological transfer of their essential qualities to their users" (p. 10). However, as Meyrowitz (1985) points out, much of the work in medium theory provides more of a "perspective" for studying media than an actual "theory" (p. 22). Further, as Holbert (2000) maintains, "the study of medium theory is still far from achieving the status of a true theory" (p. 32). However there are unifying themes that run throughout the work and a general framework for understanding mediated communication. More importantly, as a perspective, it does offer a tool for explaining media ecologies, and changes in the time/space perceptions of media users.

The advantage of a time/space evaluation approach is explained by Kern (1983/2003), who asserts:

> The categories of time and space…provide a comprehensive theoretical framework that allows not only the integration of many areas across the cultural spectrum but also integration along a theoretical vertical axis from "high culture" to popular culture and the material aspects of everyday life. (p. 4).

Although medium theory can be said to be representative of the Neo-Kantian tradition—Kant (1781/2007) argues that both time and space exist only in the mind—the thinker most commonly associated with medium theory is Marshall McLuhan. It must also be acknowledged that McLuhan, and his now popularized phrase, "the medium is the message," has become part of popular culture, as well as the culture of academia.

When McLuhan (1964) expressed his observation that, "the medium is the message" (p. 7), he quickly qualified the remark by pointing out that: "For the 'message' of any medium or technology is the change or scale or pace or pattern that it introduces into human affairs" (p. 8). He further points out that, "it is the medium that shapes and controls the scale and form of human association and action" (p. 9). McLuhan also points out that there are "personal and social consequences [to the introduction and use] of any medium" (p. 7). He contends that prior to the introduction of electronic media, where the speed of information dissemination increased, "it was not obvious that the medium is the message." During that period, "the message, it seemed, was the 'content,' as people used to ask what a painting [or any other communication text] was *about*" (p. 13). The electronic media alter the user's sense ratios and impact their perception of time and space. These observations provide the underpinning for medium theory and its

principle unifying notion, namely, that the new media technologies have “personal and social consequences” independent of its “content” or programming.

Traditions prior to McLuhan

According to Postman (1993) the first medium theorist might have been Plato who relates a discussion between Thamus, a king in Upper Egypt, and the Egyptian god Theuth, who was credited as the inventor of writing. This discussion focused on the tools that could be used to acquire knowledge. Plato related that Theuth asserted that writing was such a tool, stating: “Here is an accomplishment, my lord the King, which will improve both the wisdom and the memory of the Egyptians” (pp. 3-4). However, the King pointed out that this tool would create readers who "will receive a quantity of information without proper instruction... [who will be filled] will the conceit of wisdom instead of real wisdom" (p. 4). According to Postman, Thamus, or rather Plato, understood that writing would compete with older forms of learning for users’ attention and time, and for prestige, and dominance. As each new communication medium reinforces a certain perceived view of reality, thus each medium contains an ideological bias. According to Postman, Thamus also understood that the introduction and use of new media can produce additional, and sometimes unforeseen, effects.

Postman (1989/1998) and Kramer (1988 & 1991) also maintain that other scholars, prior to McLuhan, should be credited for their observations that reflect current medium theory.

One such scholar is Lewis Mumford, who Postman (1989/1998) credits with explaining that, “with each extension of our senses in one direction, there was an amputation of sorts in another” (p. 12). Although Mumford was quite naturally limited to

exploring technology in existence during, or prior to, the time he was writing, his observations concerning picture writing, the alphabet, the clock, printing and the more recent development of the telegraph, the telephone, and the camera provide insight into relationship between these technologies, their users, and culture in general.

Mumford (1935/1963) maintains: “Our mechanical civilization represents the convergence of numerous habits, ideas, and modes of living, as well as technical instruments; and some of these were, in the beginning, directly opposed to the civilization they helped to create” (p. 12). As an example he points to the monastery, as it existed in the Middle Ages, and the development of the clock. He notes that the monastery provided regularity and order—“within the walls of the monastery was sanctuary: under the rule of the order surprise and irregularity were put at bay” (p. 13). He also asserts that the “punctuation marks in the day were know as the canonical hours and some means of keeping count of them and ensuring their regular repetition became necessary” (p. 13). This was first achieved by the ringing of the church bells. But as time went on, a clock atop the church steeple replaced the bells as the primary agent of regularity. Mumford contends: “The clock, not the steam-engine, is the key machine of the modern industrial age” (p. 14), and it was the first technic—“the deliberate shaping of specific tools and methods as circumstances change and skills improve in order to modify nature” (p. 60)—of the machine age, and because of its consistency, accuracy, and efficiency, it became a symbol of both modernity and the modern technological complex. It affected every area of economic activity, not only in developing a regular day and generalized time-consciousness, but also, helping to reinforce the belief in the accuracy of measurement, which contributed to the belief in the practices of science.

Turning to the development of the printing press and movable type, Mumford (1934/1963) acknowledges that, “compared with oral communication any sort of writing is a great labor saving devise, since it frees communication from the restrictions of time and space and making discourse wait on the convenience of the reader” (p. 136). In addition to allowing the reader to set her or his own pace, it also allows for in-depth deliberation of isolated portions of the text. He also notes that, “the printed sheet, even before the military uniform, was the first completely standardized product… [and] the first example of completely standardized and interchangeable parts” (p. 135). This served as an unforeseen consequence, and influenced the direction of future economic and technological development. Also, in keeping with this theme of explaining unforeseen consequences, he also notes that, “more than any other devise the printed book released people from the domination of the immediate and the local” (p. 136).

The trend toward standardization, as well as the emergence of unforeseen consequences, would continue as communication technology developed. This might be best demonstrated by Mumford’s (1934/1963) discussion of “the paradox of communication” (p. 239) occurring in the present technological development phase. Mumford explains that communication between humans begins with personal contact, then moved to symbols with the development of hieroglyphics and the alphabet; resulting in the development of written medium that promoted abstract forms of expression and “made more reflective and pregnant, the intercourse of men” (p. 239). He also notes that the invention of a latter communication form, the telegraph, bridged the gap of time and space required for response, however with the use of the telephone, communication has returned to its base—although still separated in space, the communicants are allowed to

react instantaneously on a person to person basis. Further, the camera, another invention associated with new media, created a new permanent record as it produced a more concrete record of events. It is this paradox of communication that medium theory acknowledges and hopes to explain and understand.

Mumford (1934/1963) also maintains that new technology, especially new media technology, can produce changes in individual perspectives and patterns of everyday life. At the very least, the necessity to master a new technology forces a new definition of success upon members of a culture as new status is confirmed on those people who are skilled in its use. This is compounded by the introduction of new jargon associated with the technology. This new jargon revolves around new relationships established through the use of the new technology. This jargon is often times transferred into everyday language. Further, the relationships dictated by the use of the new technology can affect one's day-to-day relationship patterns. Therefore, new technology not only affects social status and the individual's self-concept, but can also influence how people are expected to interact with one another.

Although McLuhan does not acknowledge Mumford's contributions from his classic work *Technics and Civilization* (1934/1963), he does recognize that Mumford understood "typography is not only a technology but is in itself a natural resource or staple, like cotton or timber or radio; and, like any staple, it shapes not only private sense ratios but also patterns of communal interdependence" (McLuhan, 1962/1965, p. 164). He also acknowledges Mumford's (1924/1955) observation that the typographic ecology influenced perceptions and expectations of architecture, as well as other creative and visual arts. However, Mumford is not quite so positive concerning McLuhan. Although

Mumford refers to McLuhan's *The Gutenberg Galaxy, The Making of Typographic Man* (1962/1965) as "happily provocative, even in its most erratic and dubious flights" (Mumford, 1967, p. 313), he is dismissive of *Understanding Media: The Extensions of Man* (McLuhan, 1964) observing: "What McLuhan understands has long been familiar to students of technics: it is his singular gift for misunderstanding both technology and man that marks his truly original contributions" (Mumford, 1964/1970, p. 456).

Postman (1989/1998) also credits Innis (1950/1972 & 1951/2003) with laying the foundation for many of the concepts that have now become part of contemporary medium theory. In both of his major works, Innis describes the social history of communication media, focusing on the domination and outcomes of the adoption of various media throughout history. Innis (1951/2003) notes: "Western civilization has been profoundly influenced by communication and that marked changes in communication have had important implications" (p. 3). He asserts that the balance, and proportional use, of various media influenced the stability and direction of cultures. Innis (1950/1972 & 1951/2003) postulates a dialectical relationship between society and technology with certain social forms, and situations, encouraging the development of new media. These media, operating within the existing parameters imposed by society, react to produce a new cycle of change.

Although this is a dynamic relationship, Innis (1950/1972) does not believe that technology drives this process, and therefore does not fit into the technological determinist mode. However, he does grant considerable power to these communications technologies through the monopolies of knowledge that they control. In this regard, Innis sees society as a network of communications systems that produce structures where

information is both stored and transmitted. In addition, those agencies that control access to these points have the power to define the meaning of perceptions. These groups derive their power from several sources: (1) their expertise (a mastery of the complexity of their field) which creates a hierarchy separating professionals and amateurs; (2) the control of the raw materials of the media; (3) the probability they can predict important outcomes; (4) the speed through which they can acquire information; and (5) their ability to finance their operation(s). These monopolies of knowledge produce certain social effects. First, they polarize societies between the masses and the elites. Second, monopolies of knowledge encourage centralization of power. Third, those who control knowledge have the power to define reality. Finally, however, monopolies of knowledge promote tendencies toward instability. Competitors and critics are always looking for ways to subvert monopoly power, and perhaps gain it for themselves.

Innis (1951/2003) links the "significance of communication to the rise and decline of cultural traits" (p. 33). Innis (1950)/1972) argues that the concentrated use of one medium of communication creates a bias affecting cultural development. Turning to early history, he establishes a dialectic between media with a time-bias—mediums such as stone and clay which are durable but heavy—and those with a space-bias—media that are light and portable and which can be transported over large distances. Time-biased media do not encourage territorial expansion, yet because of their durability they can encourage the creation of an empire over time, and they encourage the development of social hierarchies. Space-biased media facilitate the expansion of empire over space. As McQuail (2000) described: “Empires can persist either through time (such as ancient Egypt) or extensively in space (such as Rome), depending on the dominant form of

communication" (p. 86). The dominant medium also influences the time and space dimensions of those who seek to develop an empire—this development produces a need for speed (changing both time & space dimensions) and demands new technology.

However, Innis (1950)/1972) maintains that the introduction of a second medium, while tending to check the bias of the first, also creates conditions favorable to promoting instability and potential change. As examples, he notes that the shift from stone to papyrus caused a shift from royal to priestly power in ancient Egypt, and Rome's bureaucratic institutions, which relied on formal writing and documentation, extended the city's influence. In later times, printing and the use of commercially available paper allowed for books to become available to a larger public, not just the elite. The availability of books also promoted the use of vernacular expressions, which leads to more localized vitality, and influenced the growth of nationalism. The availability of books also enhanced the use of a number system, and facilitated the acceptance of the alphabet, both of which aided the advancement of literacy and trade.

There is no question the McLuhan was familiar with the work of Innis; not only were they collogues at the University of Toronto, but McLuhan also publicly acknowledged his contribution, stating: "Harold Innis was the first person to hit upon the process of change as implicit in the *forms* of media technology" (McLuhan, 1962/1965, p. 50). The influence of Innis can not only be seen on McLuhan, but also on Eisenstein (1979), and, I would contend, on Anderson (1983/1991) and his appraisal of the historical consequences associated with development of movable type and its influence on the growth of national identity.

Kramer (1988 & 1991) maintains that another thinker not associated with medium theory, Gebser (1943 and 1949/1985), should be examined in relation to alterations in individual's consciousness structure as a result of changes in time and space impressions induced by the introduction of new media. Kramer (1988) notes: "Gebser defines various epochs in the evolution of consciousness in terms of their respective relationship to the experience of space and time" (p. 606). These epochs are differentiated by how they "relate to the phenomenon of perspective" (p. 606). Gebser identifies these five phases as the archaic, magical, mythical, mental, and integral stages respectively, and each represents an alteration, or rather a mutation, in the structure of human consciousness.

The mutations that Gebser (1949 & 1953/1985) speaks of reflect changes in human perspective, however they are not just an acknowledgement of new perspectives, but rather they constitute fundamentally different ways of experiencing, and expressing, reality. This process is more than simply brining one's mental constructs into agreement with his or her perceptions of reality based upon new information. Gebser notes that this process is not evolutionary, nor does it spring from a linear progression of thought, rather: "Consciousness mutation . . . unfolds toward structural enrichment and dimensional increment; it is intensifying and inductive—a plus mutation" (p. 38). Kramer & Mickunas (1992) elaborate on this type of mutation, noting:

> Gebser's concept of "plus-mutation" is different from the conventional idea of mutation. "Plus-mutation" describes a process of enrichment rather than destruction. The "past" state is not surpassed or abandoned, but instead added to. (p. xvi).

Therefore, as Kramer and Mickunas contend, Gebser asserts that elements of each of these stages are found in subsequent phases.

Explaining the first of these phases of consciousness structure development, Kramer and Mickunas (1992) note: “The predominant mode of experiencing in the archaic structure is a sense of unity. [Here] the human is completely submerged in and coextensive with the world” (p. xvii). Gebser (1949 & 1953/1985) maintains that the archaic structure of consciousness is a zero dimensional state with no differential signification of the other or supplementary objects or distance.

In discussing Gebser’s conception of magic structure, Kramer and Mickunas (1992) note: “With the mutation from archaic unity to magic awareness, a rudimentary sense of space emerges” (p. xvii). During this period, Gebser (1949 & 1953/1985) contends:

> Man replies to the forces streaming toward him with his own corresponding forces: he stands up to Nature. He tries to exorcise her, to guide her; he strives to be independent of her; then he begins to be conscious of his own will. (p. 46)

However, at this point, an individual does not see himself as being totally apart from nature, and “witchcraft and sorcery, totem and taboo, are the natural means by which he seeks to free himself from the transcendent power of nature” (p. 46). Each of the magic tools that are utilized during this period corresponds with elements found in nature, and/or man’s experience with nature. However, Gebser observes: “Here, in these attempts to free himself from the grip and spells of nature, with which in the beginning he was still fused in unity, magic man begins the struggle for power which has not ceased since; here man becomes the maker” (p. 46). Being a “maker” has obvious technological

impacts—the attempts to master nature requires the development of tools that can be applied to this effort—and it has an impact on man's experience with his collective.

In explaining the mythical structure of consciousness, Gebser (1949 & 1953/1985) points out: "The distinguishing characteristic of the magic structure was the emergent awareness of nature, the essential characteristic of the mythical structure is the *emergent awareness of soul*" (p. 61). Because mythology is a form of oral communication, language and those who had pronounced abilities to verbally communicate begin to play a more important role within society and the rulers—the King, the shaman and/or the priest—were put into society's highest levels and seen as a repository for wisdom.

With the development of the mental structure of consciousness, humans stepped into three-dimensional space. According to Gebser (1949 & 1953/1985) this development was due to "the emergence of *directed* or *discursive thought*" (p. 75). This phase corresponds with the typographic ecology described by McLuhan (1962/1965). Speaking of this period, Gebser (1943 & 1949/1985) observes: "Scarcely five hundred years ago, during the Renaissance, an unmistakable reorganization of our consciousness occurred: the *discovery of perspective* which opened up the three-dimensionality of space" (p. 2). He also speaks of how human sense organs (audio and visual) have become extended because of radio and television (p. 132). Like the discovery of perspective, these new media produce alterations in time and space perception, Gebser notes that radio has the "capacity of nearly nullify space and time (p. 533), and "film corresponds to our wish to be released from the three-dimensional gravitational pull" (p. 533).

Like many medium theorists, Gebser (1943 & 1949/1985) acknowledges that these changes in time and space perception have consequences. Kramer (1988) contends: "Gebser clearly maintains that perspectivity creates the individual by situating her relative to space" (p. 614). Gebser (1943 & 1949/1985) maintains that perspective "locates and determines the observer as well as the observed. The positive result is a concretion of man and space; the negative result is the restriction of man to a limited segment where he perceives only one sector reality" (p. 18). Gebser also agrees with McLuhan and Foire (1967) that, "art, or the graphic translation of a culture, is shaped by the way space is perceived" (p. 57). Further, Gebser (1943 & 1949/1985) asserts that these creative expressions coming from artists and architects "reflected the emerging consciousness of space" (Kramer, 1988, p. 609). Gebser (1943 & 1949/1985) would also agree with McLuhan and Foire (1967) that, "from the fifteenth century to the twentieth century, there is a steady progress of fragmentation" (p. 20). Further, as Kramer (1988) asserts: "This corroborates Gebser's notion that with the rise of perspectival/rational consciousness, individualism become hypertrophic in its ego-centrism" (p. 612).

It is possible that McLuhan did not read Gebser's work since it was only translated into English in 1985; however many of the notions expounded by Gebser were known to him. Hall (1966) relates:

> For the past few years, Edmund Carpenter, the anthropologists, Marshall McLuhan, Director of Toronto's Center for Culture and Technology, and I have been studying art for what it can tell us about how artists use their senses and how they communicate their perceptions to the viewer. (p. 80)

He goes on to state that two authors were extremely important to their endeavor. They were Alexander Dorner (1958) and Sigfried Giedion (1962), because: “Their work has shown that by studying man’s artistic productions, it is possible to learn a great deal about the sensory world of the past and how man’s perception changes as does the nature of his awareness of perception” (p. 83). Giedion was influenced by Gebser as he was one of his students, and acknowledges Gebser’s contribution to his reasoning.

Although the works of Plato, Mumford, Gebser, and Innis predate the works of McLuhan, one must acknowledge, as does Postman (1998), that those scholars who work on medium theory are “the children of Marshall McLuhan” (p. xiii). McLuhan not only had an impact on scholarship but also entered into the popular culture of his times. As Marchand (1989) points out, cartoons featuring McLuhan and his message “began appearing in *The New Yorker* in 1966.” This entry into the popular culture served as “the final confirmation of his celebrity” (p. 193). In fact one such cartoon appears as the conclusion of McLuhan and Fiore (1967). Here the setting is a library and an older man is listening to a younger man, who has a guitar resting on the wall behind him. The message being communicated is as follows:

> You see, Dad, Professor McLuhan says the environment that man creates becomes his medium for defining his role in it. The invention of type created linear, or sequential, thought, separating thought from action. Now, with TV and folk singing, thought and action are closer and social involvement is greater. We again live in a village. Get it?” [Drawing by Alan Dunn © 1966 *The New Yorker Magazine,* Inc.] (pp. 156-157)

This cartoon content also serves as a fitting conclusion to this section. Although the later references can be topically associated with many of the youth of the 1960's, the first portion of the message points to the primary assertion of medium theory. The media greatly contributes to the ecology that humans inhabit, and the use of each medium is key for defining people's roles in it.

Resolving Medium Theory's Problem and Building Toward a Clarification of Media Ecology

Medium theory, as it is generally presented, does have a hidden problem with relation to both the validity of human knowledge and humans' interactions with their information ecology. Turning to the epistemological concern, in discussing the different effects of each medium, Chesebro (1984) argues, "the selective use of media creates a selective perception of reality" (p. 116). He notes that this perception is selective because each person digests only certain types of stimuli, and then only a small percentage of the stimuli are processed. The information is then recoded in the brain, thus humans "impose a new order upon the information they receive" and respond to that new ordering. Thus, the medium "creates links to features of the external environment while filtering out other information about this environment" (p. 117). Ong (1982/2003) explains this process by asserting that each medium forms a unique sensory ratio, and impacts how human senses are used; thus each medium creates a unique effect[3]. Both Chesebro and Ong are referring to media's effect on the viewer/reader/listener/receiver's construction of reality and imply that human knowledge can be understood through psychological methods focusing on mental processes. This form of psychologism stands in contrast to other implications promoting a more social constructivist view of media usage and consequences. Both

Chesebro (1984) and Meyrowitz (1985) acknowledge that media produce a socializing influence, through its content and visual presentation of nonverbal communication symbols. In fact Chesebro (1984) maintains that, “as a system of symbols,” media generates a “reality equal in power to the understanding produced by science and everyday experience” (p. 112), thus, rivaling other socialization systems within society. This epistemological dilemma is also represented in the level of scholarship practiced by medium theory. While many proponents, such as Lang (1992 & 1995), and Lang and Basil, (1998), Chaiken and Stangor (1987), Pfau (1990), and Reeves and Nass (1996), opt for study on the micro-level4, others agree with Meyrowitz (1997) that “the most interesting—and controversial—medium theory deals with the macro level” (p. 61).

This dilemma is partially resolved by Ong (1977) who points out, “it would appear that the technological inventions of writing, print, and electronic verbalization, in their historical effects, are connected with and have helped bring about a certain kind of alienation within the human life-world” (p. 17). Here the choice of the term “life-world” is interesting because the concept comes from Husserl (1913/1975) and the term itself can be traced to Husserl (1949), a later work where life-world is defined by using the German word “lebenswelt”—“world of lived experience” (Spiegelberg, 1976, p. 159). For Ong’s part, he is attempting to link the notion that each medium forms a unique sensory ratio with Husserl’s notion that a significant portion of one’s everyday world, objective time and space perceptions, are constituted intersubjectively. Husserl draws on empathy as a major component of this process, noting that in order to understand another’s spatio-temporal world one must assume that the other’s world coincides with one’s own. Therefore one presupposes that objects forming one’s own time and space

world exist independently of one's subjective perspective and experience, and are part of an objective reality. This is also linked to Husserl (1913/1975) who maintains that objects are transcendent, displaying an inexhaustible number of unperceived features. However the process of intersubjective experience—which Spiegelberg (1969) defines as "a plurality of subjectivies making up a community sharing a common world" (p. 719)—assumes that others' structure their world into objects in a similar manner. Merleau-Ponty (1951/1973) holds that cultural phenomena are important bridges between subjectivism and objectivism, and the most important of these is language. Using language as an example, he explains how they coexist. He maintains: "When I speak or when I understand, I experience the presence of others in myself and of myself in others, a presence which is the cornerstone of the theory of intersubjectivity" (p. 108).

Heidegger (1927/1996) expands on Husserl's (1913/1975 & 1949) concept of "lebenswelt." The vehicle used to achieve this modification is Heidegger's (1927/1996) analysis of the German word "dasein." For Heidegger dasein, which in German means life or existence, becomes "being there" (Spiegelberg, 1969, p. 713). Heidegger (1927/1996) maintains that in order to properly describe human experience it is necessary to understand humanity's relationship to existence. Dasein is the being that comprehends Being. Heidegger further defines dasein breaking it down to its components: "da" referring to the site, and "sein" being. As Spiegelberg (1996) maintains, for Heidegger human is "the being which comprehends Being" (p. 713), and human consciousness is where Being exposes itself as such.

In Heidegger's (1927/1996) analysis, dasein also assumes temporal aspects. Dasein becomes the potential for being and projects onto a number of possibilities, all of

which exist in the future. However, dasein is limited by the material and historical environment that constitute the past. Further, dasein exists alongside other beings, in the present. For Heidegger, dasein is not only temporal because it conceives of time while living in a culturally-historically constituted sense of time, but more importantly it is rooted in the unity of the future, the past and the present. Further, since its object is to comprehend Being, it offers itself as a space of possibilities, moving toward the future by always reexamining the past, and understanding that the past is still effective. Heidegger also argues that Dasein is thrown into the world with others not of their own making. But the possibilities concerning the future include the possibility and inevitability of one's own mortality. Although one of the future possibilities that exists is the submersion into the world of everyday routine and subjection by the crowd, resulting in angst, and/or a sense of nihilism, Heidegger feels that understanding these confrontations can also result is a true sense of Being and ultimately freedom.

Heidegger (1927/1996) contributes to an analysis of media ecology in several ways. First, as Schumacher (2003) maintains, in Heidegger's analysis "the Other is always present," (p. 497), not only in terms of being-with-one-another, but also in terms of being in the same cultural and material world and being influenced by that world. Further, Heidegger (1927/1996) acknowledges the importance of communication as he maintains that this world can only be understood as an element that is inherited from tradition and cannot be divorced from the history of the use of language. Therefore, Dasein is also defined as the purely linguistic being. Hence Heidegger's conceptualization of the linguisticallity of Dasein as its essential way of being-in-the-world, and understanding of Being, must embrace questions of language and meaning.

Nietzsche (1887/1974)5 also supports the notion that communication and language are an important element in the development of one's consciousness, noting that "*consciousness has developed only under the pressure of the need for communication,"* and describes consciousness structure as a "net of communication between human beings" (p. 298). He also points out that humans think continuously, and that "the thinking that rises to *consciousness* is only the smallest part of all this," but "this conscious thinking *takes the form of words, which is to say signs of communication"* (p. 299). In terms of signs, he also acknowledges the importance of the non-verbal elements of communication. He also links conscious thinking to human sense impressions, and to elements of what has now become psychologism. He notes that "the emergence of our sense impressions into our own consciousness, the ability to fix them and, as it were, exhibit them externally, increased proportionately with the need to communicate them to *others* by means of signs" (p. 299). He also links conscious thinking to elements of social construction, observing that "consciousness does not really belong to man's individual existence but rather to his social or herd nature" (p. 299). To support this observation, he argues that "a solitary human being who lived like a beast of prey would not need it [consciousness structure]" (p. 298). He sums up his arguments by noting: "Our thoughts themselves are continually governed by the character of consciousness … and translated back into the perspective of the herd" (p. 299). This not only links information that is recorded in the brain to the social construction of "the herd," but more importantly points out that the human ability to construct reality is a reflection of the consciousness structure.

Husserl's (1949 & 1913/1975), Heidegger's (1927/1996) and Nietzsche's (1887/1974) observations also reinforce the argument that media usage not only influences one's worldview, but is also an integral part of it. Hall (1966) applies these principles to the perceptions of time and space and also helps clarify the influence of media ecology on the formation of consciousness structure. Based on Whorf's (1953) paper on how language influenced both the thought and perception of the Hopi people, Hall (1966) claims that "language … is more than just a medium for expressing thought, It is, in fact, *a major element in the formation of thought"* (p. 1). He also argues that language and other communication media are important in formulating time and space perceptions, noting that "language extends experience in time and space while writing extends language" (p. 3). He bases this supposition on the observations he made while examining different time and space perspectives among members of various cultures. These observations lead him to conclude that people from different cultures "interpret their sensory data differently and combine them in different ways" (p. 3).

Hall (1983) explains these variances by noting that different cultures develop, and privilege, different technological extensions, and these are "externalized manifestations of human drives, needs, and knowledge" (p. 130). He begins to define extensions by noting that they "are basically tools and instruments, including tools of communication such as language" (p. 129). These tools also include such technologies as clocks, calendars, other modalities of communication, and the technologies that enable their usage. These tools comprise the media ecology of a particular culture. As such, they contribute to the user's perception of time and space, and are instrumental in the formation of their consciousness structure.

Hall (1983) goes on to explain that "extensions are a particular kind of tool that not only speed up work and make it easier but also separate people from their work" (p. 130). Further, they serve as "a special kind of amplifier…and in the process of amplification, important details are frequently left out…what is left out may be more important than what is amplified" (p. 130). He goes on to state:

> Examples of extensions are: the telephone extending the human voice, television extending both the eye and ear, cranes extending the hand and the arm and the back, computers extending the memory and some of the arithmetic parts of the central nervous system, telescopes and microscopes extending the lens of the eye, cameras extending the visual memory, knives extending the cutting and biting capabilities of the teeth and fingernails, and automobiles extending our legs and feet. (pp. 130

Hall also notes that these extensions are capable of producing extension transference in the people who use technology, especially media, and that "any extension not only can but usually does eventually take the place of the process which has been extended" (p. 131). As importantly, Hall (1966) notes that "the relationship between man and the cultural dimension is one in which both *man and his environment participate in molding each other"* (p. 4).

Description of the Remainder of the Dissertation

The next chapter will focus on describing communication and media ecologies. It is grounded in the work of various medium theorists and other scholars interested in changes in people's perception of time and space. It also examines the various media

ecologies in Western history, beginning with the oral phase and culminating with electronic media now in use.

Chapter 3 explores the role that technology plays in society. It reviews the literature surrounding various approaches and models used to explain technology's role—technological determinism and evolutionary models, the constructionist and technological complex models, and approaches that center on technology as an agent of conflict, as a reaction of localized trends and historical events, and as a promoter of meaning, and as a justifier of social organization. Medium theory's response to the question of technology's place in society is also examined. The role of technology users and the diffusion of innovation approach are also reviewed, with attention paid to their acceptance of new technology.

Chapter 4 four examines the reaction of medium theory to the introduction and use of the computer and the Internet. This chapter also looks at the computer mediated communication approach, and discusses the key elements from both medium theory and computer mediated communication studies that can be applied to today's media ecology.

Chapter 5 discusses the methodology employed in gathering and analysis of the data used to prepare this dissertation. The chapter features a brief examination of the techniques used to obtain a participant's oral history, with special attention paid to insuring both reliability and validity within the interview process, the determination of the proper participants for this investigation, and the questions to be used in obtaining the information needed to draw conclusions from the participants in this study.

Chapter 6 examines how the personal computer was introduced into the media ecology of the late 1970s and 1980s. In doing so, the pre-personal computer workplace is

discussed, as is the transition period between the older tools and the personal computer. This chapter also looks at the reasons why the personal computer was adopted into the workplace, and later in people's domestic spaces. Any frustrations associated with this adoption process are also examined.

Chapter 7 examines the use of the Internet focusing on how users have come to embrace an Internet lifestyle. This chapter also looks at the desire for portability and mobility that has developed in today's media ecology, and how laptop computers, new Internet-based communication devices, and wireless technology have emerged as an answer to these desires. This chapter also features two case studies, one examining the development of Internet technology, and the second focusing on rural Internet usage and the problem of connectivity.

Chapter 8 looks at the new role that the personal computer and the Internet play at both work and at home. It also focuses on the changes that these technologies have encouraged in these work and domestic spaces. This chapter also examines how Internet-based technology has become an alternative to older media forms, and the popular call to use newer and newer media.

Chapter 9 examines how the use of the personal computer and the Internet has changed people's perception of time and space. This chapter begins with a brief review of the literature concerning the role that new technology has played in altering human's time and space orientation. Based upon the participants' observations, the chapter will outline how people's concepts of space and distance, as well as of time and speed, have changed because of their use of these technologies. It also links these observations with the previously discussed literature. The chapter will conclude with an evaluation of how the

new perceptions of time and space have influenced the way people reason and process information.

Chapter 10 examines the influence of the personal computer and the Internet on today's communication process. The chapter will also examine the use of many of the modalities of Internet-based communication, as well as the consequences of their usage.

Chapter 11 explores the personal computer and the Internet's role in changing relationship patterns. This chapter begins with a review of both early and current research into the use of these technologies and their affects on interpersonal relationships. A description of the findings of this study follows, focusing on the links with previous studies, and the insights from medium theory. The chapter then explores the feeling that the participants of this study expressed toward people who do not use the personal computer and the Internet, and what these perceptions convey concerning success and failure, and interpersonal relationship tolerance.

Chapter 12 examines the paradoxes that the personal computer and Internet usage have introduced into the current media ecology. It also summarizes the changing trends and patterns in interpersonal relationships, communication, and people's perception of time and space that the use of these technologies has influenced. The chapter concludes by looking back at the various theories of technological development, and medium theory, to assess them in light of the finding of this study. The chapter will then look forward toward new implications for medium theory and future research endeavors.

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[1] Although McLuhan (1962/1965) equates the making of the typographic man with invention and use of Gutenberg's printing press and movable type and argues that "the

Gutenberg galaxy was theoretically dissolved in 1905 with the discovery of curved space, but in practice it had been invaded by the telegraph two generations before that" (p. 253). However, I would suggest, as Mumford (1934/1963) and Gebser (1949 & 1953/1985) contend that elements of each previous stage of development are to be found in subsequent phases, and are present today.

[2] Instead of the term media ecology, many communication scholars, including McLuhan (1964), and especially McLuhan and Fiore (1967/1996), use the term media environment. Turning to a definition that comes from a source close to the time of McLuhan's writing, *Webster's New Collegiate Dictionary* (1974) defines the term environment as "the circumstances, objects, or conditions by which one is surrounded" (p. 382).This description, when applied to the media and user relationship connotes a linear causal relationship between the two, with the media exercising more influence. While this may be true in term of establishing consequences, it must also be acknowledged that the user makes the ultimate choice of which media she or he will utilize. Therefore, I prefer a more dynamic construction of these relationships and opt for the term ecology, which *Merriam-Webster's Online Dictionary* (2008) defines as "the totality or pattern of relations between organisms and their environment."

[3] The call to compare media as a tactic in organizing research is not new to mass communications effects studies. In fact McCombs and Shaw (1972) saw the value of this approach in formulating their agenda-setting function of mass media. More recently, Pfau, et al. (1998), Pfau, et al. (2001), and Pfau, et al. (2002), examined the effect of the media in influencing political decision-making, Holbert, et al. (2002) looked at the effects of different media modalities in the formation of issue-based citizen groups. Pfau, et al

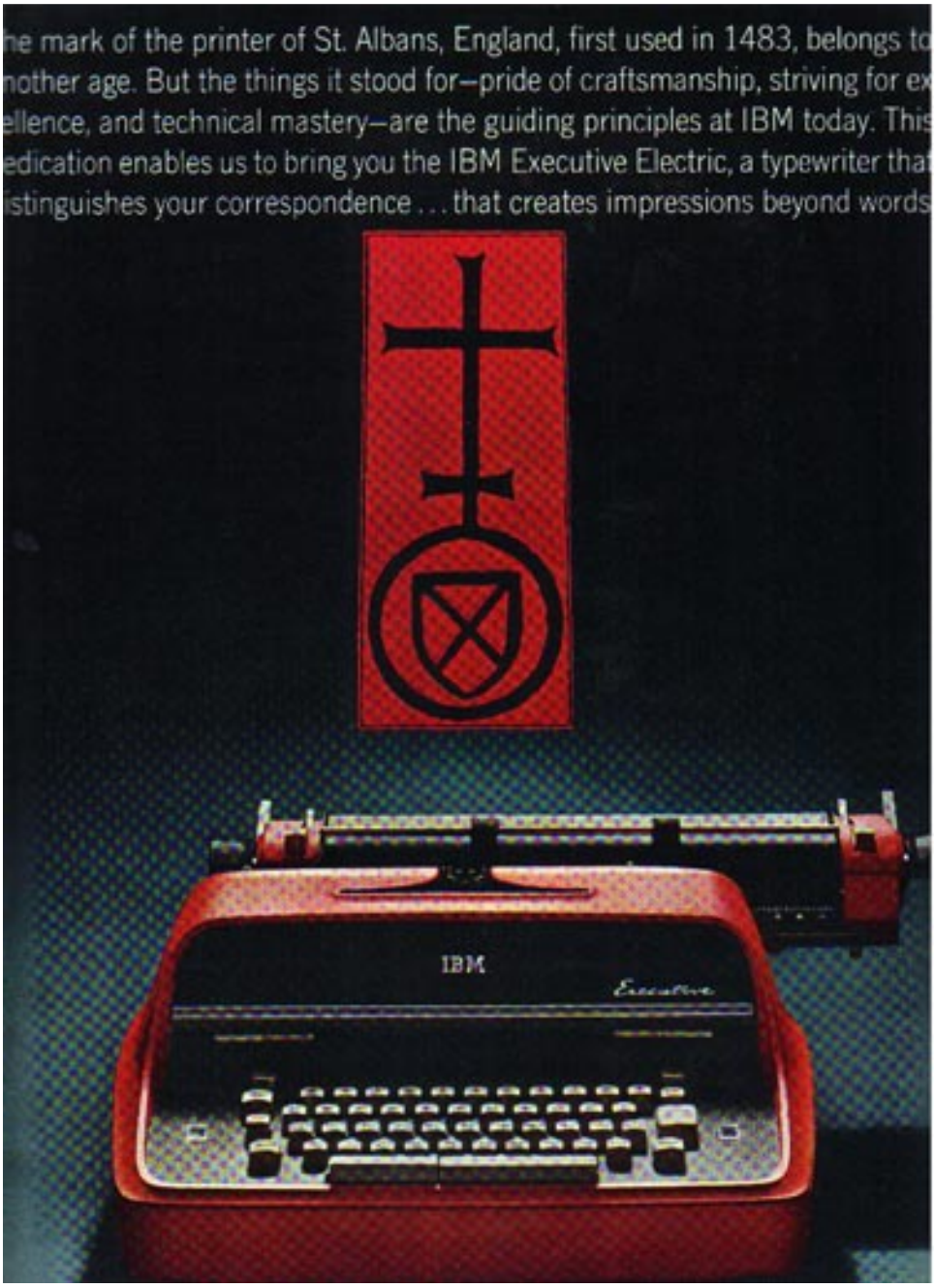
(2000) included media modality as a key variable in assessing the process of resistance to persuasion, and Moy and Pfau (2000) examine the "impact of *multiple communication sources* on public confidence in a variety of democratic institutions" (p. 51). While some of these studies do not focus on the direct effects of a particular medium on its user, they all acknowledge that differing media produce differing effects. However, Pfau, et al. (2000) pointed out that these comparisons of media form have also proved to be contradictory, as in the comparison of print to radio. McGinnis (1965) found that the print medium was superior to radio in its ability of persuade, however Cantril and Allport (1935) and Wilke (1934) found the opposing effect. Although the influence of radio in the earlier studies might be somewhat attributed to its position as the dominant mass medium at the time of those studies, the contradictory results also indicate the need to study these effects over time. Further as Pfau et al. (2000) points out, the statistical significance of these effects appears in doubt with Neuman et al. (1992), Pfau (1990) and Worchel et al. (1975) finding little difference, while Burns and Beier (1973) and Graber (1990) found considerable difference. The answer to these seeming anomalies might be found in the viewer/reader/listener/receiver's choice of which media to use as their information source. For example, as Pfau et al. (2000) note: "Print is about the content of a message, whereas video is more about the source of the message" (p. 7). The observation can apply to other visual forms as well. Therefore source cues are considered and addressed in many studies (see Meyrowitz 1982 & 1985 and Pfau, 1990 and Appendix I, which includes a brief review of medium theory finding concerning source credibility).

4 For a brief description of some of the quantitative research studies coming from the medium theory perspective see Appendix I.

5 It should be noted that Nietzsche's work preceded both Husserl and Heidegger and in many ways their reflections are built upon the analysis advanced by Nietzsche.

Chapter 2:

Communication and Media Ecologies



Between 1962 and 1964, the International Business Machine company ran a series of advertisements promoting their Executive Electric typewriter which intended to link their machine with "the pride of craftsmanship, striving for excellence and technical

mastery" associated with the early craft printers. In the case of the example above, the guild mark came from a printer in St. Albans, England in 1483, but all the advertisements also concluded with the promise that this typewriter would distinguish the users "correspondence" and create "impressions beyond words" (Mark of Printer, 1962).

This advertisement also links the various media ecologies described by Ong (1967). He asserts that "communication leading to technological culture has passed through three more or less clearly defined stages, marked by the media by which the word is transmitted" (pp. 2-3). The first of these stages was the "oral-aural stage" where verbal communications dominated. In the above advertisement, the phrase "impressions beyond words" not only harkens back to the most fundamental form of communication, but also promises a visual aspect of communication that could elevate the process. According to Ong (1967) the oral-aural phase was followed by the "chirographic-typographic stage" where the alphabet was developed, leading to the written word. This stage reached its zenith with the invention of movable type. This was represented in the advertisement by the 1483 guild mark which not only promises quality but also reinforces the visual component of communication. Since it promoted the IBM Executive Electric Typewriter, it further forecasts the third phase of Ong's (1967) historical review, which is "the electronic stage, in which we presently live" (p. 3).

Looking at each of these media ecologies one must keep in mind Hall's (1966) observation that media technologies and their users share the same ecology, and each influences the other. Also one must note McLuhan and Fiore's (1967/1996) observation that "environments[1] are not passive wrappings, but are rather, active processes which are invisible" (p. 68), and their admission that environmental ground rules are "pervasive

structures (pp. 84-85). Therefore, the unforeseen consequences of the interaction between users and the communication media that they are exposed to, as outlined by various medium theorists, will be examined. Lastly, as observed by Mumford (1934/1963) and Gebser (1949 & 1953/1984), the technology of the previous ecology anticipates the developments and uses of the technologies of the next. As an example, McLuhan (1962/1965) even pointed out that the camera obscura of the typographic period "anticipated Hollywood in turning the spectacle of the external world into a consumer commodity or package" (p. 128).

As noted earlier, the above advertisement not only forecasts, and anticipates, the future media ecologies, but more importantly demonstrates the potential power of historical identity as a means to reach a consumer base. It additionally reinforces Gebser's (1949 & 1953/1984) observation that the human consciousness structure, although continuously mutating, retains elements of previous epochs. The ecologies, promoted by the use of a dominant communication medium, not only anticipate the future but are also built upon the foundation laid by the previous ones. This chapter will examine these media ecologies as outlined by scholars associated with the observations advanced by medium theory with special attention paid to the modifications in time and space perceptions.

The Oral Ecology

The oral ecology was dependent on sound to transfer meaning. This dependency creates certain byproducts with respect to both sensory and time and space perceptions. Ong (1982/2003) explains: "All sensation takes place in time, but sound has a special relationship to time unlike that of other fields that register in human sensation. Sound

exists only when it is going out of existence" (p. 32). This has several important consequences. Because of the here and now aspect of sound, spoken words are invested with power; however this sound transfer also makes retaining important thoughts difficult.

Turning to the first consequence, Ong (1982/2003) notes that oral people, "commonly, and probably universally, consider words to have great power," and goes on to assert that "words have magical potency" (p. 32). He also notes that "oral peoples commonly think of names (one kind of words) as conveying power over things," and goes on to point out, that, unlike our current perception, names are not seen as tags, labels or descriptive tools, but "give human beings power over what they name" (p. 33).

Ong (1982/2003) also contends that "in an oral culture, restriction of words to sound determines not only modes of expression but also thought processes" (p. 33). Part of this comes from the magic power that words are granted. In his discussion of the magic consciousness structure, Gebser (1949 & 1953/1984) also elaborates on a world where oral communication is the dominant form of communication. He observes:

> Magic man's reality, his system of associations, are these individual objects, deeds, or events separated from one another like points of the over-all unity. These points can be interchanged at will. It is a world of pure but meaningful accident, a world in which all things and persons are interrelated, but the not-yet-centered Ego is dispersed over the world of phenomena. (p. 46).

Ong (1982/2003) also contends that the mode of expression also contributes to the problem of "retaining and retrieving carefully articulated thought," and in order to solve this problem, oral peoples developed "mnemonic patterns shaped for ready oral

recurrence" (p. 34). These included rhyming syntax and storytelling formulas based on certain expected hero, hero helper, and villain roles. As a result certain mental constructs were privileged. In this oral world more aggressive expressions featuring epithets and clichés favoring the denunciation of villains and evil forces were preferential to analytic thought. Redundant features were also necessary to promote retention. Conservative and traditional values were also privileged, and stories dealt with situational, rather than abstract motives. Like Gebser, Ong (1982/2003) contends that the world that favored the medium of oral expression was "close to the human lifeworld" (p. 42), "empathetic and participatory rather than objectively distant" (p. 45), and above all homeostatic. He notes that "oral societies live very much in a present which keeps itself in equilibrium or homeostasis by sloughing off memories which no longer have present relevance" (p. 46).

The Typographic Ecology

The typographic phase of communication history began with the development of visual signs, and more directly with invention of the phonetic alphabet. While the use of visual signs, such as hieroglyphs, allowed for the transmission of sacred rituals and historical myths, the development of the phonetic alphabet allowed for the storage of thoughts, and the codification of cultural norms. McLuhan (1962/1965) claims that as people interiorized "the technology of the phonetic alphabet … [they were transformed] from the magic world of the ear to the neutral visual world" (p. 18). However, this new world was not neutral. Ong (1982/2003) observes that "writing, commitment of the word to space, enlarges the language almost beyond measure, [and] restructures thought" (pp. 7-8). In fact, McLuhan (1962/1965) acknowledges that a type of "schizophrenia" (p. 22) was produced in the user, because an "interiorization of media such as 'letters' alter the

ratio among our senses and changes mental processes" (p. 24). He goes on to explain that "if a technology is introduced whether from within or from without a culture, and if it gives new stress or ascendance to one or another of our senses, the ratio among all of our senses is altered," and this results in a "break in the ratio among the senses, a kind of loss of identity" (p. 24). This loss of identity resulted in a breakup of unity between the oral people and their environment, described by Gebser (1949 & 1953/1984) above. McLuhan (1962/1965) amplifies on this loss by explaining:

> The magical mode disappears in proportion as interior events are made visually manifest. But such manifestation is also reduction and distortion of complex relations which are more fully sensed when there is full interplay of all the senses at once. (p. 52)

The change from the oral to the written modality of communication also produced other consequences. McLuhan (1962/1965) claims that "the Greeks invented both their artistic and scientific novelties after the interiorization of the alphabet" (p. 58). In cultural terms, he also asserts that "only phonetic writing has the power to translate man from the tribal to the civilized sphere" (p. 27). However, as Ong (1967) contends the typographic period reached its zenith with Gutenberg's invention of the printing press using movable type. Reed (2004) agrees, noting: "This new [printing] process resulted in the far-flung proliferation of printed matter throughout each society that it influenced" (p. 3). McLuhan (1962/1965) acknowledges the invention's importance and its consequences by noting that "with Gutenberg Europe enters the technological phase of progress" (p. 155). Ong (1982/2003) notes that writing facilitates the use of lists and their visual translation, the chart, which combined with the movable type printing press' ability to aid in the

dissemination of information, contributed to the rational/scientific mindset. McLuhan (1962/1965) also contends that events of the typographic period resulted in "the passion for exact measurement" (p. 166), and "the portability of the book, like that of the easel-painting, added much to the new cult of individualism" (p. 212). This process of ego development was also aided by the alteration of the consciousness structure from the magic to the mythic recognized by Gebser (1949 & 1953/1984). The modality of writing encourages differing interpretations, and the mythological hero became more complex, as McLuhan (1962/1965) observes: "The hero has become a split man as he moves towards the possession of an individual ego" (p. 54).

McLuhan (1962/1965) further observes that, "when technology extends one of our senses, a new translation of culture occurs as swiftly as the new technology is interiorized" (p. 40) and many other scholars have agreed with this assessment. Innis (1950/1972 & 1951/2003), Eisenstein (1979), Anderson (1983/1991), as well as McLuhan (1962/1965), maintain that development and use of the printing press had a major impact on the development of nationalism. McLuhan (1962/1965) notes that while the concept of nationalism was supported by intellectuals in the 16th and 17th centuries, it was not widely embraced by the public; however he contends that "print, in turning the vernaculars into mass media … created the uniform, centralizing forces of modern nationalism" (p. 199), including making the concept accessible to the average person. According to Innis (1951/2003), this liberation of vernacular speech also had effects on the early modern political/social environment that have been transferred to the present. He contends:

> The effect of the discovery of printing was evident in the savage religious wars of the sixteenth and seventeenth centuries. Application of power to communication industries hastened the consolidation of vernaculars, the rise of nationalism, revolution, and new outbreaks of savagery in the twentieth century. (p. 29)

The printing press also produced cultural effects. Reed (2004) notes that "the Gutenberg revolution also transformed business and social relationships, bringing forth, among other changes, one of the world's earliest capitalist enterprises, the printing shop, with it attendant class divisions" (p. 3)[2]. Also, as McLuhan and Fiore (1967/1996) observe, the printing press "provided the first uniformly repeatable 'commodity,' the first assembly line—mass production" (p. 50). Not only did the press forecast the emergence of a mass production based economy, but also the development of a consumer based society. It also impacted communications, and the production of meaning. McLuhan and Fiore note that, "with print, two copies of a given work did not merely say the same thing they were duplicates of one another" (p. 124), and people could be exposed to the exact same message. The printing press also contributed to creating one important expectation that has come to be associated with modernity—the belief that science could contribute to a progressive future. McLuhan and Fiore observe that in addition to reproducing the same message, "print can reproduce with complete accuracy and in any quantity indefinitely complex lists and charts" (p. 126). As a result, "one consequence of the new exactly repeatable visual statement was modern science" (p. 125). Noting these historical trends and consequences, the one of the primary purposes of this study will be to explore the consequences of introduction of new technology, and both the impact of the integration

of new technologies on use of old technologies, and on the ecologies into which they enter.

Technology in Late 19th and Early 20th Century:

Modernity and the Acceleration of Changes in Space/Time Perception

One of the clearest examples of changes in media ecologies and their corresponding effects on both culture and the inhabitants of the culture has been demonstrated by historian Stephen Kern (1983/2003). He states: "From around 1880 to the outbreak of World War I a series of sweeping changes in technology and culture created distinctive new modes to thinking about and experiencing time and space" (p. 1). The changing technologies he discusses are the telephone, electric lighting, steamships, skyscrapers, the bicycle, cinema, the airplane, x-ray technologies, and the machine gun. The cultural changes that were produced as a result of the introduction of these new innovations were the stream-of-consciousness novel, psychoanalysis, Cubism, simultaneous poetry, the concept of relativity, and the introduction of world standard time. In terms of the consequences for individuals, Kern notes: "The result was a transformation of the dimensions of life and thought" (pp.1-2). He contends that these changes impacted people's sense of past, present, and future, and of form, distance, and direction—in other words, they affected human conceptions of both time and space.

Although Kern (1983/2003) acknowledges that no single thesis can explain all of the technological, intellectual/scientific, artistic, and philosophical interrelationships that formed these new perceptions of time and space, he does grant some measure of primacy to the introduction of World Standard time, stating:

> The introduction of World Standard Time had an enormous impact on communication; industry, war, and the everyday life of the masses; but the exploration of a plurality of private times were the more historically unique contributions of the period. (p. 314).

The plurality of private times was a result of the establishment of time zones, where inhabitants of countries like the United States could experience four different conceptions of the same exact time at any given moment. According to Kern, the shift from a universal, unchanging, public time created a new focus of experience and provided the foundation for challenging traditional notions concerning man's place in the world. Many intellectuals of the period argued that if there were as many private times as there were individuals, then every person was responsible for creating his or her own world. Further, coupled with effects produced by the use of other technologies that promoted the feeling of simultaneity, people's sense of the present was challenged. The present was potentially separated from both the past and future as it was no longer envisioned as merely one event taking place at one place, and limited to local surroundings. The print medium of the time—both books and newspapers—also contributed to peoples changing perception of space and time, because information about far places became more accessible and timely.

Many of the consequences outlined by Kern (1983/2003) are supported by Schivelbusch (1996), although his attribution is somewhat different. He attributes the primary cause of changes in time and space perception to the development of the railroad system. He identifies these systems as both the 19th century symbol, and definition, of modernity—they were both figuratively and literally the engines of progress. They not

only stood as evidence for, but also served as a predictive vehicle of, a new progressive mechanized future. However, he also contends that they restructured the way people perceived both time and space. Although the exact attribution might be argued, as O'Malley (1990) points out, both the development of a railway system and the conversion to standard time were linked, with both serving the interests of the other. There is little argument; however, about the economic impact of the railroads—as Schivelbusch (1996) points out, it quickly became cheaper to move material over great distances. Further, it was quicker, and it aided to the "establishment of *speed* as a new principle of public life" (p.xiii). It was here that the railroad had its greatest impact of the conception of space. Schivelbusch notes: "Motion was no longer dependent on the conditions of natural space, but on mechanical power that created its own new spatiality" (p.10). In other words, the railways altered the perception of nature by speeding up the visual intake used to judge nature. It also changed the concept of landscape, and the panorama, as reflected in the work of many artists of the period, became the means of perception; reducing the importance of detailed settings. These trends produced consequences for the individual members of culture, as Schivelbusch explains: "If an essential element of a given socio-cultural space-time continuum undergoes change, this will affect the entire structure; our perception of space-time will also lose its accustomed orientation" (p.36). He further notes: "When spatial distance is no longer experienced, the difference between original and reproduction diminish" (p.42).

This concern, as well of the cultural dimensions associated with adopting new time and space perceptions, is addressed by Solnit (2003). Her work links Leland Stanford, the railroad owner who was instrumental in the construction of the

transcontinental line and later the founder of Stanford University, and photographer Edward James Muybridge. Judging by the credentials of these men, it would seem that the focus of this work would be on Stanford; however Solnit's concern is upon Muybridge because:

> His trajectory ripped through all the central stories of his time—the relationship of the natural world and the industrialization of the human world, the Indian wars, the new technologies and their impact on perception and consciousness. He is the man who split the second, as dramatic and far-reaching an action as the splitting of the atom. (p. 7).

These men are linked through a series of photographs of Stanford's racehorse taken by Muybridge—stop action pictures that proved that all of a horse's legs left the ground simultaneously as it ran. Although, as reflected in the statement above, Muybridge's life work did reflect many of the major patterns that dominated his time, he is generally remembered by his contributions to the older technology of photography and the creation of the new technology of cinema.

The first technology explored in Solnit's (2003) book is that of the railroads of Leland Stanford. Solnit notes the "the railroad shrank space through the speed of its motion" (p. 13). The second new technology addressed is the development of photography. Solnit contends that while the railroads transformed space, the photograph transformed time, noting that photography was a "technological breakthrough for holding onto the past" (p. 15), and further both had an "impact on perception and consciousness" (p. 7). The comparison of these two technologies, as well as the comparison of Stanford and Muybridge, supports her theme of shifting visions. As Solnit points out, the

experience of riding Stanford's railroads "transformed the landscape itself" (p. 12)—it altered the visual perception of the passengers—and as a technology it altered the economic and social landscape, and facilitated the process of modernity. Muybridge's motion studies—his stop action photographic techniques and the introduction of a mechanical method to continuously view those images—also affected perception, and contributed to the process of filmmaking. In fact, Sobchack and Sobchack (1987) credit Muybridge's photos of Stanford's horse, taken in the 1870s, with providing the inspiration for George Eastman's development of rolled film in 1888, and William Dickson and Thomas Edison's use of the flexible film several years later. Also, Muybridge's decision to display his photographs in public—through the use of his mechanical viewing device—proved that exhibitions of moving pictures could be profitable.

Kern (1983/2003) points out that the introduction and acceptance of new technologies produced effects that impacted society in general. In the case of the technologies that appeared in the late 19th and early 20th century, the most common theme was the leveling of traditional hierarchies[3]. This theme will be repeated by other scholars in their discussions concerning the use of new technologies, especially media technologies, and their consequences.

Meyrowitz and Television:

Additional Changes in Space/Time Perception

Among other things, Meyrowitz (1982 & 1985) is concerned with the impact of television on the performance of social roles. According to Meyrowitz (1985), the relationship between the medium and its user is established by "effects loops." He

contends that these loops serve a double function, in that they tend to support "*structural equilibrium,* yet in so doing, they bring about *substantive change*" (p. 173). He further asserts: "New media not only affect the way people behave, but also they eventually affect the way people feel they *should* behave" (p. 175).

Meyrowitz (1985) acknowledges, his primary assumptions are drawn from the work of "two significant researchers of interpersonal behavior" (p. 221). The first is anthropologist Edward T. Hal1 (1959 & 1966) whose work in proxemics provides "a possible relationship between perception of interpersonal distance and the 'framing variable"—the type of shot, long, medium or close-up, used to frame the image that appears on the screen—used in television production.

The second researcher that Meyrowitz (1985) credits is sociologist Erving Goffman (1959) and his concept of "*impression management* [which] has the character of 'drama'; that is, all social roles are, in a sense, a performance where the individual actor highlights certain characteristics and conceals others" (Meyrowitz, 1985, p. 232). Among the many concepts that form Goffman's model of behavior is what he terms a "back region," where the individuals, or "actors" engage in backstage behavior, and a "front region," where "the individual is in the presence of his 'audience' and he plays out a relatively ideal conception of the social role" (Meyrowitz, 1982, p. 233). It is in this "back region" where the actors relax, and possibly rehearse for future performances. "The social performer, like the stage actor, must have a private place to learn and rehearse his role." Also like the stage actor, the social performer attempts to keep "the audience out of the back regions" (p. 234). However, Meyrowitz maintains that television produces an effects loop which he terms "the media content loop." Here Meyrowitz

observes: “Any major change in the overall patterns of social information flow affects the content of all media” (Meyrowitz, 1985, p. 180). As a consequence, television produces a “new’ middle region’ form [as contrasted with the front and back regions of Goffman], consistent with the new information available about roles and role performance in general” (pp. 176-177). This new region allows the viewer more access into the back region of the decision makers. Although this can facilitate entry into the process, it also increases the possibility of corrosion to the decision maker’s public image.

Tichi (1991) reinforces this argument made by Meyrowitz. She maintains that television has become a dangerous territory for public figures, and often serves to deflate their authority. This process has accelerated in recent years with the creation of the 24-hour news cycle and constant reporting on cable television, and the acceptance of internet usage and blogging as information gathering sources.

Also according to Meyrowitz (1985), the emergence of television as the dominant medium in American culture has influenced the perception of social roles within culture. These are reflected in television’s etiquette loop. It is here that changes in social behavior and attitudes are placed into television programs as updated, or more culturally relevant, content. The presentation of these new behaviors as typical, or normal, by the medium serves to break “down distinctions between private and public information systems” (p. 175). Again Tichi (1991) supports Meyrowitz’ observation by noting that since everyone in today’s culture has become teleconscious, real life experiences are authorized and certified through television.

The third loop which Meyrowitz (1985) identifies is the territorial access loop and it here that the perceptions of space are most dramatically influenced. He notes:

> Television demystifies the places actually exposed on it and also promotes a new sense of access of openness to all places. As this new attitude results in a more open approach to many physical locations, the change in rules of access feeds-back into electronic media through the first-time exposure of various places on television. And these exposures further increase the demystification of "place." (p. 181).

As a result of the interplay between the medium, the effects loops, and the user, Meyorwitz (1985) contends that Americans have dramatically changed their collective "sense of place" (pp. 307-308). Further, because of the new "patterns of information flow" (p. 308), their social roles, which were previously linked to their physical place, have also been altered. These alterations can be seen in the development of new concepts of male and female, the blurring of childhood and adulthood, and the distrust of political figures as their "back-stage" behavior is exposed. Kramer (1993) agrees that the human sense of place has been influenced by television, contending that:

> Since prehistory humankind has wished for the magical power to be able to escape the bondage of space and time. Now with television, we may appear to be present while we are absent from the spatial/temporal coordinates of an event. (p. 31).

In essence, Meyorwitz (1985) maintains: "Electronic media have combined previously distinct social settings, moved the dividing line between private and public behavior toward the private, and weakened the relationship between social situation and physical places" (p. 308). As a result of these interactions between the electronic media and their users, social norms and our construction of identity have undergone changes.

Our Current Media Ecology

As Miller (2002) points out: "the mass media—television, newspapers, magazines, radio, and the Internet—are increasingly seen as shapers of our societal viewpoints and practices." She further elaborates that "the media shape our view of the world: what the world is like" (p. 257). Many scholars echo this notion that the media, in all of its modalities, is an important determinant in human perception and many also stress that this importance is increasing. In describing the current media ecology, Chesebro and Bertelsen (1996) observe:

> Increasingly, we live, work, and play in environments created, sustained and altered by and through communication. Our daily existence—from the moment we get up, as we work, during our leisure hours, and until we retire—is an unending series of messages, information bits, symbols, signs, meanings, commands, images, strategies, and artifacts. (p. 30)

They go on to note that this new ecology is a product of the mass media, and represents, "a communication revolution [that] has dramatically and decisively controlled the United States since World War II." One result of this communication revolution is that, "instead of interacting with people face to face, we now increasingly communicate through artificial channels, technologies, tools, mechanisms, and machinery" (p. 30). This assessment agrees with Ong (1982/2003) who maintains that the current media ecology is a product of past communication phases. He notes that "writing and print and the computer are all ways of technologizing the word" (p. 79). He further notes that the current communication media "only continue, the reduction of dynamic sound to quiescent space, the separation of the word from the living present, where alone spoken

words exist" (p. 81). Of course, these reflections can be directly linked to the diffusion and acceptance of the computer as an element of the daily life, not only in our society, or even in the West, but throughout the entire world.

McLuhan and Fiore (1967/1996) argue that this transition also affects the individual, noting that the "new mass culture we are moving into … [is] a world of total involvement" (p. 61). This world currently includes the media of the typographic ecology such as books, newspapers, and magazines and media of the earlier electronic phase, such as the telephone, movies, radio, and television, but also the newer medium of cable and satellite television, and the personal computer and email. Current media offerings also include the Internet and its access to information offered at greater speed and over greater distances than previously available, as well as an increased number of popular ways to disseminate and collect information, e.g. You Tube, MySpace/Face book, Twitter, and blogs. This media ecology also includes video games, and cell phones with verbal and text message capacity, as well as the ability to reach the Internet in some models. We are in a media ecology where the user is surrounded by both old and new media, and have to negotiate through a vast array of competing technologies to fulfill their gratifications.

In addition to potentially altering time and space perceptions, and influencing personal relationships, this new ecology also presents a potential problem with regard to the construction of individual identity. Mazlish (1993) argues that not only the operations necessary for the proper running of modern societies, but as importantly, the very identities of those societies' members revolve around their symbiotic relationship with the machines that serve them. Mazlish asserts that:

> The human ego is undergoing a fourth shock, similar to those administered by Copernicus, Darwin, and Freud. We are now coming to realize that humans are not as privileged in regard to machines as has been unthinkingly assumed. (p. 3)

He calls this disjuncture "the fourth discontinuity." (p. 3). Mazlish notes that Freud identified the first three discontinuties: Copernicus ultimately questioned mankind's special place in the cosmos; Darwin "destroyed man's supposedly privileged place in creation," (p. 3), placing people within the animal kingdom; and Freud himself promoted the concept that people could not even control themselves, contending that "the ego . . . is not even master in its own house, but must content itself with scanty information of what is going on unconsciously in the mind" (p. 3).

The last discontinuity is further accelerated by people's unique relationship with their machines. Mazlish (1993) contends that this relationship has historical importance, influencing the development of human civilization—"It was the success of the simplest tools that started the whole trend of human evolution and led to the civilizations of today" (p. 5). Further, this process is not static, and he advises scholars to consider that "as we try to understand evolving human nature, our guidelines tell us that human nature not only evolves but does so in intimate connection with humanity's creation of machines" (p. 8). He also sees a linkage between the functioning of the cognitive processing of humans and the data generating process of advanced machines, noting that "humans and the machines they create are continuous and that the same conceptual schemes that help explain the working of the brain also explain the workings of a 'thinking machine.'" (p. 4). In other words he asserts that there has been a continuous relationship between

humans and their machines, and each is influenced by the data processing capabilities of each other.

Although Mazlish (1993) predicts that the relationship between humans and their machines will result in a world populated by *Star Wars* type droids, capable of logic and loyalty, and primarily serving humans as tools (Kurtz & Lucas, 1977), it is also possible to envision alternative worlds that have been forecast by other science fiction writers. One alternative is the one forecast by Gibson (1984) in his classic *Neuromancer*, where a cyberspace[4] cowboy is biologically modified to perform in a virtual world. This scenario is already being played out with the advent of cloning and the possibility of generic engineering, and the fact that many sophisticated implanting procedures are now common. Postman (1993) discusses the expectations raised by medical technology and the perception that it will alleviate most, if not all, medical conditions over time. He also concludes that:

> As medical practice has moved into the stage of total reliance on machine-generated information, so have the patients. Put simply, if a patient does not obtain relief from a doctor who has failed to use all the available technological resources, including drugs, the doctor is deemed vulnerable to the charge of incompetence. (pp. 101-102)

These charges will only increase as the elements of medical artificiality, and patient vanity, come more into play. Another alternative is supplied by the producers of *Star Trek, the Next Generation,* where humans confront partial machine and partial human "Borgs." This expands on Gibson's plot line by depicting some humans morphed into semi-machines, with the mechanical/digital components of the machine dominating

(Hurley, 1989). It could be argued that many humans have already engaged in such extension transference (Hall, 1983) with their communication devices altering their language to conform to email and instant message usage. A third alternative is again supplied by Gibson's (1996) *Idoru* whereby mental constructs derived from data collected on the world wide web are combined to form an entity capable of loving and being loved by a human. Again this plot line is already occurring. In the transition period between CBS news anchors Bob Schieffer and Katie Couric, correspondent Jerry Bowen (2006) created his "own alternative identity in a virtual world" and reported from the anchor desk on the web site *Second Life*, where individual subscribers can create personal avatars and engage in virtual relationships with other people's avatars.

However, the relevance of Mazlish's (1993) observation is not in his predictions concerning the future, but in his recognition that a disjuncture exists between humans and their tools, when a new medium replaces an old. He argues that because humans can no longer assert that they dominate the machines they have created there is a disjuncture between man and machine. He explains this disjuncture, or discontinuity, by noting that "once again, we are confronted with the human need to be special, to feel superior—but in this case in regard to the machine" (p. 4). This discontinuity produces psychological disjuncture in regard to feelings of inferiority. Ong (1977) clarified this disjuncture by noting that new media not only affect humans because of the speed at which knowledge is disseminated, they also "change man's feelings for what knowledge is and what actuality is" (p. 4). These changes create disjuncture within the human psyche, and this disjuncture creates alienation. He goes on to point out, "it would appear that the technological inventions of writing, print, and electronic verbalization, in their historical

effects, are connected with and have helped bring about a certain kind of alienation within the human lifeworld" (p. 17).

One of the purposes of this inquiry is to determine the extent of this disjuncture. Can it be defined as a disjuncture or is it simple frustration growing out of a new encounter with the use of a new tool? Does it stem from the human/machine relationships or perceptions fostered by expectations of the efficiency and/or potential gratification promised by the new medium?

It should also be mentioned that this new media ecology not only includes media that incorporate the keyboard as a device for presenting information, but also other technologies that have altered either the configuration or usage of the traditional keyboard. As an example, in 2002 Tung, Chen, and Chiang (2002)[5] reported that they were working on an input system for mobile phones based on Chinese phonetic symbols. This system has the potential of completely circumventing the traditional keyboard as a delivery device. Although this has positive potential for the Chinese language—this system would replace the Western styled letters and could impact the use of English as the international language and possibly create a neo-typographical consequence of privileging the Chinese vernacular—this adoption of a system of symbols could alter the process of conveying meaning. As pointed out above, the use of the letter shorthand in text messages and by chat room proponents has already altered the graphical construction of meaning by an ever growing number of their users. This process is further accelerated by the recent introduction of surface computing. The press release that introduced Microsoft Surface ™ (pictured below) claims that this technology "breaks down traditional barriers between people and technology" and offers an "effortless interaction

with all forms of digital content through natural gestures, touch and physical objects” without the use of “a mouse or keyboard” Microsoft President Steve Ballmer is quoted as

saying that “with Surface, we are creating more intuitive ways for people to interact with technology” and the announcement claims that this technology will “bridge the physical and virtual worlds” (Microsoft Launches New Product Category, 2007). Although this medium promises cybernetic integration between the user and its technology, the old questions remain the same: What will be the consequences of this integration on the users of this new technology, and what will be the consequences on their cultural and social ecology? What will be the result of the integration of this and other new media technologies on the other media technologies now competing in that ecology? What will be the impact on the communication process?

Keeping in mind Ong’s (1982/2003) observation that, “writing and print and the computer are all ways of technologizing the word” (p. 79), this research will begin to address the above questions by looking into the uses of the personal computer, and the Internet. It will look to determine the new patterns that the usage of each generates, with an eye to supporting generalizations that can be applied to the introduction of other new technology. In addition, it will examine the consequences of the confluence of the diverse new media that now become an integral, if not ubiquitous, component of the contemporary media ecology.

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[1] As mentioned earlier, McLuhan preferred to use the term environment instead of ecology, however Postman (1989/1998), who, when asked to form a department of media studies at New York University, chose to name it the Department of Media Ecology, notes that McLuhan substituted ecology for environment in a letter to Clair Booth Luce later in his life (p. xii).

[2] While much of the work focusing on the effects generated by the introduction of the printing press and movable type is concerned with Europe, Reed (2004) examines the introduction of Guttenberg's process in China. He maintains:

> Together printing and publishing formed a knowledge-based micro-economy that merged the modern mechanized industry with the ancient literary culture of China while simultaneously advancing the organizational practices of the corporation, industrial trade association, and copyright protection in China. (p. 4)

[3] Kern (1983/2003) contends that the "overbearing hierarchical world became the target of numerous artists and intellectuals, who challenged its metaphysical foundation and its concrete social, political, and religious institutions" (p. 315). However, while the artistic and intellectual classes might challenge the prevailing institutions, Kern maintains that the introduction of new technologies enhanced the process by bring the challenge into the popular culture. He claims that the telephone penetrated the sanctuaries of privilege, and the other new technology had similar effects by creating new social distances, which promoted the leveling of the existing class system. As an example, he observes that the bicycle bridged social space by making travel over longer distances financially accessible to the lower and middle classes. Turning to the cinema, he notes:

> Already in 1913 the cinema was tagged a "democratic art," as the camera eye penetrated everywhere and as its cheap admission prices and mixed seating arrangements brought the highbrow culture of the theater to the working classes. (p. 316)

[4] It is generally conceded that the term "cyberspace" originated with Gibson's (1982/1986) work *Burning Chrome,* an early collection of his short stories, however the

word “cyber” was drawn from “cybernetics,” and first used by Wiener (1948). This term was coined to identify the study of systems that embodied goals within their structure. According to Wiener, it came from the Greek word for navigator.

5 This citation also serves as an example of another element of the current media ecology, namely that rapidity which new technology is both introduced and accepted into the user’s ecological system. While Tung, Chen and Chiang (2002) reported that they working on their new input system in 2002, less than five years later this feature was common on cell phones in Taiwan and China (Todd L. Sandel, personal correspondence, April 28, 2008)

Chapter 3:

The Role of Technology in Culture and Society

Nye (2006) argues that technology matters because it is part and parcel of being human. Not only have we grown up playing with toys that imitate our industrial and technical tools, but this playfulness also characterizes our adult fascination with gadgets, domestic appliances, and various technological devices and systems that have entered our everyday life. Nye notes that we have used tools for more than 100,000 years, and survival has not always been their central purpose. He states: "The central purpose of technologies has not been to provide necessities, such as food and shelter, for humans have achieved these goals very early in their existence. Rather, technologies have been used for social evolution" (p. 2). He also notes that humans have excelled at using their old tools to solve new problems as well as inventing new tools to solve old problems, and within this simple process he expresses one important aspect, stating: "Latent in every tool are unforeseen transformations" (p. 2). Although it would be difficult to dispute Nye's assertions concerning the importance of technology in both human history and our current everyday lives, it would also be difficult to dispute his notion that technology can produce unforeseen consequences. However, it is still necessary to ask the question: what is the role of technology in culture and society? We must also acknowledge that this question has produced multiple answers from multiple scholars.

Technological Determinism and Evolutionary Models

Elzinga (1998) describes several different perspectives through which the above question has been studied and explained. The first of these is what she classifies as convergence theory, in which "technological development is essentially unilinear…there

exist a relatively fixed path…of innovation over which all industrial societies must travel" (p. 22). The second classification is autonomous theory—which "stresses the relative autonomy of technological development, as it has an independent logic of its own… often [being] deterministic…and largely immune to social and cultural factors" (p. 22). Autonomous theory is very similar to the first classification except the product of the former is amoral instrumentalism, while most advocates of the latter use it as a vehicle for description and do not attribute normative consequences to their explanation. A third perspective is termed evolutionary theory. Here many of the elements of both of the above are present—a linear pattern moving along a fixed path and with an imbedded logic of its own—however, it "allows for variation…[arguing that] technology follows trajectories that may vary in different economic, social, and cultural contexts, but the driving force is still technological change itself" (p. 22). In reality even the most ardent proponents of the first two perspectives favoring technological determinism have turned into advocates of a limited "evolutionary" approach, acknowledging some degree of variation based upon social input. Therefore these three methods will be examined together.

Merritt Roe Smith (1994) notes that as early as the 1780s agents of the United States governmental spoke of mechanical innovations associated with the development of the national factory system in terms of inevitability and agency. Further, he contends these associations were expanded during the nineteenth century when the nation was experiencing industrial growth and were represented in the works of artists, advertisers, and even professional historians. All of these representations contributed to a popular belief that technology was a driving force in society. This observation is shared by

Michael L. Smith (1994) who maintains that the American public's deep respect for machines and the technologies that produced them are a result of the level of both national and personal identity invested in them. He also contends that the media produced a belief that technology brings inevitable social progress and moves along an inevitable path.

Although elements of technological determinism have entered into popular culture on the symbolic level, the question still remains; does it escape this symbolic role and actually drive history and/or the economy and culture of society? Heilbroner (1967/1994) comes close to arguing that it does by maintaining that technology established the nature of society's social and economic configuration. He argues that technological change follows a sequence of developments that imposes a pattern of characteristics on society. However he acknowledges that these sequences of developments are not entirely fixed within complex societies and opts for a more open interpretation, finally concluding that technology is a strong mediating factor' in the development of history and society. Hughes (1969/1994) makes an argument similar to Heilbroner by introducing the concept of technological momentum. He maintains that developing economic systems have a tendency to be more open to social and cultural influences than do more mature ones. These older systems are more deterministic because they are more independent of outside influences.

During the same time period that Heilbroner and Hughes presented their arguments favoring limited forms of technological determinism, many other scholars were advancing equally well thought-out conceptions favoring a social constructionist approach to understanding factors that influence society. Therefore it would be expected

that the major components of these deterministic approaches would come into question. Nye (2006) addresses both the notion of technological determinism and the idea that the course of technological innovation is inevitable. He first states: “Rather than assuming that technologies are deterministic; it appears more reasonable to assume that cultural choices shape their uses” (p. 21). In other words, we use technology to shape our world, yet our agency with regard to our technological choices is somewhat limited since we do not spend a lot of time thinking about the choices we are making. Secondly, with regard to whether technology is inevitable or unpredictable, he maintains: “Far from being deterministic technologies are unpredictable. A fundamentally new invention often has no immediate impact; people need time to find out how they want to use it” (p. 47). His basic argument is that “there is no single, no logical, and no necessary end to the symbiosis between people and machines” (p. 226), and throughout human history, there has been an interplay between people, their cultures, and the tools they use.

Perdue (1994) uses comparative histories of agrarian societies to question whether technological explanations actually account for the number of variations found throughout history. Rather, he argues, it is the interrelationship between environmental, social and cultural elements, as well as technology, that determines the course of development.

Bulliet (1994) questions the assertion that pre-capitalist societies are inconsequential and that the nature of the economic system determines technological change. He examines some technological innovations made in Islamic culture that failed to successfully enter into that culture—block printing, the development of the animal harness, and wheeled transport—were examples that social attitudes, or what he terms

“filters" (in these cases, relating to lifestyle as well as class and race), can stall or even deter the dissemination of technology. He maintains that power relations within a society serve to influence technological impact.

Likewise, Williams (1994) is critical of the notion that economic agendas and change are dictated by rational motives, because, as she claims, economic and technological systems are designed to ensure control and domination. This position is supported by Oldenziel (1999) who notes that historically men have been successful in promoting the idea that technology is their exclusive domain, in spite of numerous contests advanced by women in both the popular culture and on professional levels. Approaching change from another direction, Marx (1994) maintains that technological disasters such as Chernobyl and Three Mile Island, and national traumas such as the Vietnam War in America, cause a loss of faith in technology in general but also serve as the principle force that initiates progress. Scranton (1994) moves in the same direction as many of the former critics, expressing the need to recognize more contextual accounts of the development and impact of technology and focusing on the complexity of both culture and social processes. He also calls for the study of the "local” determinant of how technology is constructed in a culture.

Constructionist and Technological Complex Models

After noting the work in philosophy of science by Kuhn (1962) and in social constructivism and the sociology of knowledge by Berger and Luckman (1966), Hård (1993) argues that a theory of technological development based on the observations coming from social constructivism needs to be generated. The framework for such a theory should be based on the work of early anthropological and sociological research.

For example, Dennis, Henriques, and Slaughter (1956/1969) looked at the demands made by the production mechanism in a small British town and concluded that it affected social relations. Hård also argues that research coming from the structural-functional tradition should be examined—e.g. Emery & Trist (1960/1973) examined business organizations as well as Hughes (1983/1993) and Mayntz & Hughes (1989) who examined technology development in relation to a large number of factors and systems. Hård finally concludes that the research performed by Pinch & Bijker (1981) demonstrated that the modern bicycle was shaped by various social considerations, demonstrates the value of the constructionist approach.

Much of the work in establishing such a framework has been attributed to Bijker (1995). Elzinga (1998) notes that in this model "technology involves the social not only as an endogenous factor in an external environment but also in the very shaping of technical innovation from the ground up…the *social shaping of technology*" (p. 22).

Elzinga (1998) also identifies Mumford (1934/1963) as another key thinker associated with the constructivist/technological complex approach. Mumford uses the term machine to describe the technological complex of Western capitalism and the corporate culture that forms the environment it operates in. His choice of the term "the machine" not only links this complex to the specialized nature of the early machine but also to the utensils, apparatuses and utilities that formed the technic needed to operate it. Also his decision not to capitalize either the "t" or the "m" in the term speaks to the ubiquitous nature of how the complex has entered into society and maintained its presence.

Following Munford's analysis, the machine can be said to have the following characteristics. First, it operates as a sort of minor organism, with its own set of rules and its own culture and organization. Second, it exists to perform a single set of functions whose goal is economy and efficiency of effort. It has also developed specialized sets of equipment and processes that influence its final product, and which are reflected in the culture that it operates in. It has developed an infrastructure for support. Further, because it exists to perform a single set of functions, supported by its infrastructure, the culture and organization that characterize the machine is rigid and does not adapt to change well. Finally, the by-product of the machine's mechanical devices and standards is the nullification of skill.

Although on the organizational level the machine is resistant to change, on the economic level it demands it. As a reaction to, and as a means of coping with, these changes, Mumford (1934/1963) contends the individual people develop "minor shock absorbers" (p. 311). One includes entering into the cult of antiquarianism necessitating the production of individual environments and private worlds. The second is adopting notions of conservatism and the refusal to accept change in the hope that such a position will retard the advance of the machine. The last absorber is embracing the new technologies as vehicles for escape. However, these minor shock absorbers have difficulty in counteracting what Mumford identifies as "the first characteristic of modern machine civilization," namely "its temporal regularity" (p. 269) because this characteristic has psychological dimensions. After pointing out that "under capitalism time-keeping is not merely a means of co-coordinating … functions: it is also like money an independent commodity with a value of its own," and, even with regard to its co-

ordination function, it “does not guarantee maximum efficiency” (p. 270), Mumford elaborates on one of its adverse human consequences, stating:

> Mechanical time is not an absolute. And populations trained to keep to a mechanical time routine at whatever sacrifice to health, convenience, and organic felicity may well suffer from the strain of the discipline and find life impossible without the most strenuous compensations. (p. 271).

He also cites the potential of another undesirable consequence in the forced adjustment and attempts to counteract the “lengthening [of] time and space distances” (p. 271). This process is further exacerbated with the development of metatechnics—the term the Mumford (1967) uses to describe continuous and unrestricted expansion of the technological complex—and its tendency to compress time, space, and information, that has occurred in more recent times. Mumford (1934/1963) also observes that people’s attention span is impacted and attention patterns are altered.

Mumford (1934/1963) begins to support his argument by drawing a distinction between the terms “tool” and “machine.” Although many scholars have used these terms somewhat interchangeably, Mumford sees a distinction between them. He notes that both machines and tools were developed in an “attempt to modify the environment in such a way as to fortify and sustain the human organism” (p. 10). In other words, both are strategies that articulate the human desire to exert control over nature. The primary distinction between the machine and the tool lies in the degree to which this control becomes manifest. As he states: “The essential distinction between a machine and a tool lies in the degree of independence in the operation from the skill and motive power of the operator: the tool lends itself to manipulation, the machine to automatic action” (p. 10).

In addition to the automatic action or manipulation aspect of this delineation, Munford also points out there is a distinction between the specialization of function demanded by the machine and the flexibility associated with the tool. Here Mumford begins to discuss the social contradictions that developed with society's shift from tool to machine usage. While the automatism associated with the machine could enable better control over nature, its relationship with the user is more dubious. Because the machine allows humans less freedom of action and is more rigid in its application, it allows for the machine to control humans. Further this automation and specialization has another aspect, as Mumford notes:

> The automatic machine, then, is a very specialized kind of adaptation; it involves the notion of an external source of power, a more or less complicated inter-relation of parts, and a limited kind of activity. From the beginning the machine was a sort of minor organism, designed to perform a single set of functions. (p. 11).

Mumford (1934/1963) also looks at the early agents of mechanization and the technics that developed the tools and methods that shaped civilization in its attempt to modify nature.

The first agent of mechanization was the mine and the development of metals to be used in tools and hunting and the first effective tool was the stone that was used as a hammer to process these metals. While the mine could be considered as a conceptual model for the 17th century, producing the elements needed for tools it also was a dark environment that was perilous and unhealthy. Not only did it alter the surface of the earth, it also provided a low standard of living, and psychological disorientation for the

miners. The mine can also be seen as a model for modern capitalism. They began as a cooperative enterprise and as new technology began to develop, new finance was needed. Further, as commerce flourished, so did the demand for metal. However, the most important principle that promoted the mechanistic society was the notion of economic value. In terms of the mine, "value had a relation to the quantity of brute work done and to the scarcity of the product" Mumford (1934/1963, p. 76).

The second agent was the development of the specialized engineer and specialized production processes used to develop more effective tools, especially weapons. The third agent, closely related to the second, was the military which developed into the first mechanical system that could be used for mass-production, not to mention that it formed a body of pure consumers. Mumford (1934/1963) also contends that through war—the army's end product—the ruling class created the state where the capital cities became centers of production. As royal monopolies began to develop, those receiving them also began to acquire social power and wealth. Also this period saw the emergence of private possessions, and luxuries become the mark of economic well being. This is related to the fourth agent, what Mumford calls the "consumptive pull and productive drive" (p. 102). Consumption was first generated by courtesans, and as possessions began to define success, power, and status, the bourgeois made them an important factor in everyday life. This drive for productivity was assisted by the Puritan notion of the good life dominated by work and dedication. The new technological complexes were developed to both serve consumption needs and to give the appearance of order.

Explaining the development of machines and their relationship to culture, Mumford (1934/1963) states: “Looking back over the last thousand years, one can divide the development of the machine and the machine civilization into three successive, but *over-lapping and interpenetrating phases:* eotchnic, paleotechnic, neotechnic” (p. 109)[1]. Mumford acknowledges that civilizations develop on the back of cultures that preceded them, but also contends that there are agents that can be seen as the nucleus for future development that “were wind-blown seeds from other cultures” (p. 108). These agents gathered around technological complexes that originated in regions that sought to employ special resources and raw materials and developed specific means of utilizing and generating energy. All of these factors contributed to the creation of special forms of production. This process brought into existence particular types of workers that developed specific methods and aptitudes that promoted and sustained these forms of production. However they were also influenced by them. As a result certain aspects of social heritage were developed that helped promote and sustain these modes of production.

In summary, Mumford (1934/1963) contends that each phase was characterized and dominated by its power source. Also each phase anticipated the next phase and anticipated improvements and/or changes that created expectations which drove both the extensions of technology and the extension transference by humans (see Hall, 1983). Third, Mumford (1934/1963) maintains that human interests and desires are embedded into technology. Further, technology has a socially accepted “heroic” aspect. It implies improvement and salvation as it assumes that there is a fix to contemporary problems. This aspect conforms to the doctrine of progress and the philosophy reason which

maintains that the human condition could be improved through the use of science and applied science (technology) and as long as scientific principles were continually applied. However, Mumford also contends that technology has not really solved any of the fundamental problems associated with the human condition. Life may have been extended in some cases, but death has not been eliminated. Although information about other people and cultures may be obtained more easily and in greater quantity, the new technology that produced this information has not ensured that relations with these other people and cultures would improve. Technology, or even the fear of technology, has not resulted in world-wide peace. Further, this new technological development and the technics that have aided in its creation have produced negative human effects and anticipated the creation of the technological complex (the machine).

It is clear from Mumford (1995)[2] that he was greatly influenced by economist Patrick Geddes. In fact, in his extensive bibliography, Mumford (1934/1963) acknowledges that Geddes influenced his selection of the components of the first two phases of his analysis, stating that Geddes' work helped in "distinguishing the paleotechnic from the neotechnic period" (p. 458). The work that he refers to is Geddes (1915/1968). In this volume, Geddes examines the flow of history as an economic current guided by distinguishable material phases of development. Each of these phases was dominated by its energy source and each served as a precondition for the next economic stage. He further contends that the energy supply not only distinguishes economic development, but is also the most fundamental component for the survival of every economic system. It is necessary in order to maintain economic activity and the population's standard of living. If the energy supply runs out, the system collapses.

The first energy paradigm was associated with energy sources of wood, wind, and water. However, not only was wood used to construct shelter, but also as an energy source, it was expendable, and before either water or wind could develop into useful sources of power gear and ratio technology needed to be developed. Those societies that mastered this technology tended to dominate others. However, as their population grew, even these societies began to face an energy crisis.

The second material phase, which answered this crisis, was dominated by coal. This period saw the growth of foundries and the use of metals and metal alloys. As before, the cultures that flourished during this phase were the first to make the change from the previous dominant energy source and utilize the metal that they produced.

The current or third phase is the electrical phase, to which must be added petroleum and nuclear power. Several points should be made concerning this period. First both Geddes and later Mumford maintain that each new phase is built upon previous ones, and in the case of this last one it was also built upon the first—wood, wind, and water. The first electric current was generated by water turbines. And as they both maintain, new environments are formed based on the new power source. As an example, Worster (1985), while discussing growth of California's agricultural, mining, aircraft and other industrial output and the economic and political byproducts they produce, notes that more than any other factor, the region's command over water made the growth of the economic complex possible. Secondly, as Yergin (1991) points out, the first use of oil was as an alternative to whale tallow for lighting and did not become a dominant energy source until the invention of the internal combustion engine, a period that falls after the publication of Geddes' work. However, Geddes acknowledges both petroleum and

nuclear power as becoming a part of this phase in his latter correspondence (see Mumford, 1995). Further, Geddes was somewhat prophetic as the West found that it had to have oil to survive and maintain the standard of living enjoyed by many of its citizens when an oil embargo by established by OPEC in the 1970s. Disjunction was expressed by these same citizens because of irritation due to delay in procuring gas as well as its price. This increase in price not only caused economic tension but also brought on inflation.

While not acknowledging the work of either Geddes or Mumford, Toffler (1990) also advances a notion that technological and cultural development can be divided into three phases based on power. This work is somewhat of a refinement of a previous work, Toffler (1980), where he introduced his concept of wave theory, which maintains that collective patterns of development fall into three transforming advances or waves. The first wave began with the planting and nurturing of seed grain and agriculture took shape. This allowed people to settle in more fixed locations and develop culture. The second wave replaced human muscle with machine muscle and resulted in the Industrial Revolution. Agriculture and the peasant culture of farming became secondary to the urban factory. This wave ended with the explosion of the atomic bomb. The third wave was not based on muscle but on the mind and known as the information (knowledge) age, and is driven by information technology.

Toffler (1990) refines these waves (phases) by using a number of metaphors beginning with the letter "m," and noting that there was a qualitative difference between each phase. He used the term muscle to describe the pre-industrial phase. This represents the lowest quality phase because as a power supply, human energy is quickly exhausted

and non-transferable. The second phase is identified with the industrial age, but is termed the money phase. During this period people began to articulate perspective and demonstrate rational cognition resulting in the formation of abstractions and development of more complex mathematical systems, especially calculus. However, the most important advance was the development of the concept of trust. While many of the economic benefits based on trust can be traced to both China and the Arab states, in the West this phase began with the trading empire established in Venice and with the creation of double entry accounting.

Toffler (1990) contends that this new phase required a new way of thinking and the establishment of institutions concerned with the law, especially contract law. Without sound contract law there could be no protection of trust. Without such trust people would tend to horde their money and without money in circulation the system would fall apart. This phase represented a higher degree of quality than the previous ones, since, money was transferable. However it was also a finite resource. The third and current post-industrial phase is dominated by mental power (the mind). According to Toffler, this mind phase represents the highest quality of power because ideas are transferable, inexhaustible, and lead to the creation of even more ideas. Further, because the process of acquiring and testing knowledge required the seeker to keep records of both success and failure, he contends that knowledge is a cumulative phenomenon that demonstrates geometric growth potential. However, he also acknowledges that there is a danger of creating information gaps, and maintains that "finally, if the essence of the new economy is knowledge, the democratic ideal of freedom of expression becomes a top political priority, rather than a peripheral matter" (p. 369). He concludes that what is needed is

more creative and efficient ways to disseminate knowledge and the Internet is only a beginning.

White (1995) refers to the geography of energy and also accepts that energy is the primary element that helps explain human development. In his analysis, focusing on the Columbia River, he claims that humans developed practices and eventually technologies that combated nature and increased energy level. The initial inhabitants established settlements in areas where the Columbia was easiest to ford; later both these settlements were powered, and their mechanisms for commerce were influenced by the energy of the river—first through water power and then by electric generation. In addition, White uses the salmon that migrated from the ocean up the river in order to span to create an energy metaphor. He notes that the salmon provided food for the early inhabitants of the region—both Indian and White—and as such, were a source of their energy. He extends his metaphor further, by noting that the salmon tended to merge around areas where the rivers energy force was greatest because they had difficulty negotiating the current. It was in these areas that humans would be able to find the greatest number of fish and ultimately the source of their food (energy) to construct their settlements. White acknowledges Mumford's (1934/1969) contention that energy sources dictate the form of technical development and claims that these Columbia River locations serve as examples of geographical energy that influenced the formation of both economic and conventional political power. These relationships began with the fishing and storage patterns of the early Indians and increased as the river was developed as a commercial vehicle, first using more advanced fishing technologies and then as a power source. White further

maintains that the people who control the energy of the river are the ones who have attained political and economic power.

White also acknowledges Mumford's "heroic" aspect of technological rationale in that it implies improvement and salvation—that we can fix contemporary problems with technology. White also agrees with Mumford's argument that each new technology brings about some degree of dissociation between humans and their current environment, and many of these effects are not anticipated, however, the heroic nature and the expectations of technology have also entered into the popular consciousness forcing scientists and technological experts into the role of "talking heads," used to justify policy as well as offer solutions.

Technology as an Agent of Conflict

Noting both Bijker (1987)—who stresses that social construction is a necessary concept for the creation of a theory of technological development and acceptance—and Misa (1992)—who argued that a power perspective should be included in this discourse—Bijker and Law (1997) attempt to position the role of conflict within the developmental process of technology. They begin by discussing the relationship of technology and society, noting that "our technologies mirror our societies [and] they reproduce and embody the complex interplay of professional, technical, economic, and political factors" (p. 3). They then turn their attention to the position of conflict within this relationship between technology and society, noting that, "technologies are born in conflict or controversy. Different social groups have different concerns, or simply different practices, and hope for or expect different things from their technologies" (p. 105).

In order to reinforce their notion of the role of conflict in technology and society, Bijker and Law (1997) present five basic assumptions. The first assumption is that "technological change is indeed *contingent,"* and although social relations are shaped by technology and the economic environment, "there is no grand plan to history—no economic, technical, psychological, or social 'last instance' that drives historical change" (pp. 8-9). Second, "technologies are born out of *conflict, difference, or resistance*" (p. 9). Third, "such differences may or may not break out into *overt* conflict or disagreement" (p. 9). Fourth, the authors maintain that "technologies, then, form part of, or are implicated in, the strategies of protagonists" (pp. 9-10). Finally, "both strategies themselves and the *consequences* of those strategies should be treated as emergent phenomena (p. 10).

The issue of technology and conflict also finds its way into the creation of myths and social capital in Hård (1993). In this work he contends that "technology is formed by social groups in conflict and that technological change is never a socially neutral process (p. 416). This observation supports his primary argument that "technology is governed by the interest and ideas of certain groups in society" and more directly, "technology is applied and technological change is fostered by groups to preserve or alter social relations" (p. 409). His conception of conflict "does not entail a Hobbessian civil war" (p. 417), but rather, accepts Keesing's (1987) view and sees the process as coming from a heterogeneous society, and Weber's (1922/1964) notion that tension should be regarded "as a necessary ingredient in all dynamic societies" (p. 417). He further contends that when technologies enter the market they reinforce or reinterpret social myths and produce

social capital for both the professionals who create the technology and the users who embrace it.

Conflict and Localization

The importance of the role of conflict in the adoption of new technology, and in technology's place in the discourse concerning modernity, provides the central themes for Hård and Jamison (1998) who, along with several other scholars, also look into technology and the debates that paralleled its development between 1900 and 1939. These authors conclude that these debates were influenced by a large variety of responses that reflected localized cultural traditions. Agreeing with the observations expressed by Cutcliffe and Post (1989), Hård and Jamison (1998) note: "How a technological project is debated and judged, and how it is ultimately understood, has come to be specified and particularized—in short, situated in context" (p. 2).

Wagner (1998) defines this period between 1900 and 1939 in the West as the "first crisis of modernity." He also notes that it took place at different times in different countries and this crisis was largely determined by the country's experience in the First World War. He notes that during this period "technologies were increasingly set up as technical systems" (p. 226). Further, this transition to a technological system helped create a change from "an emphasis of the extension of the reach of human action to an emphasis on the control of social and natural spaces" (p. 231). There also emerges a new form of capitalism where the "size of the firm had grown sharply," and with that growth "the possibility of controlling the market [was] enhanced." Likewise, with this new structure came the "principle of bureaucracy, big organizations try to cover as much of the relevant field of action as possible, and to structure their actions on this field

according to clear and fixed, hierarchical rules" (p. 234). Also, he notes that, "at the same time, political debate distanced itself from classical liberalism and focused on collectives whose interests were seen as predetermined" and, with the events that surrounded World War I, "conceptions emerged that related technology directly to key questions of human existence" (p. 227). He goes on to note that "between the wars, the contours of the new, 'modern' approach to technology emerged, particularly forcefully in the United States" and were "transferred to Europe … only after the end of World War II" (p. 227).

This directional appropriation of American concepts of modernity, technology, and progress is supported by Jacobsen, et al. (1998). However, Jamison (1998) contends that America developed its own national discourse concerning these concepts and the initial response did not favor the progressive interpretation of modernity and technology, especially among intellectuals. Hård and Jamison (1998) agree with this assessment, but in support of their premise that much of the debate centered upon national events, they also point out:

> In the United States, the war led to a sense of disillusionment among many intellectuals and to a rejection of the materialism that was seen as characteristic of the modern 'wasteland'…however, not until the stock market crashed in 1929 did the disillusionment become widespread. (p. 10)

Hård and Jamison (1998) continue to address the theme that many of the events that influenced the discourse on technology and modernity were nationalistic in character and the crisis that brought them into popular attention was trigger at different times. They note that "the breakup of the union between Norway and Sweden, in 1905, long before World War I, signaled the need for…reorientation" and because of this event the hope

was fostered that “technological development would transform Sweden into a great power" (p. 10). This reading is supported by Elzinga, Jamison and Mitander (1998) who note that "Sweden, almost alone among European countries, has been spared the firsthand experience of twentieth-century technological warfare" (pp. 139-40) and for the Swedes the true crisis came earlier than the war when of the union with Norway was dissolved and its status as a great power came into question.

This theme was also demonstrated by van Lente (1998) who examined the response of Dutch harbor workers to the introduction of pneumatic machines for the unloading of grain in their workplace between 1905 and 1907. He shows how the intellectual debates occurring at the time helped form the ideologies that influenced the behavior of the workers. The trend is also evident in Germany during this period, as Hård (1998) points out the integration of modern technology into popular consciousness promoted the perception of national strength. The observations made in this study led Hård and Jamison (1998) to link technology with both national aspirations and a symbolic message of national progress, stating that in Germany “the challenges of modern technology lead to a radical symbolic shift and a new beginning" (p. 10).

Medium Theory and Society: Power and Conflict

In her examination of development of the electric light and the telephone in the late 19th century, Marvin (1988) notes:

> The early history of electric media is less the evolution of technical efficiencies in communication than a series of arenas for negotiating issues crucial to the conduct of social life; among them, who is inside and outside, who may speak, who may not, and who has authority and may be believed. (p. 4)

Here, the emphasis on communication technology is shifted from the instrument itself to issues of power between groups and the negotiation of authority, representation, and ultimately knowledge based on available resources. She contends that the introduction of new media can intrude into the established patterns of ongoing negotiations. In her evaluation, Marvin spends a great deal of time on the process of what she terms, "inventing the expert" and the establishment of an engineering elite and the development of technological literacy as social currency. While Marvin focuses on the domain of electrical experts, her observations parallel those of many medium theory proponents. Innis (1951/2003) maintains that the use of the dominant communication medium promotes one group over others allowing them to monopolize the distribution of knowledge and privileges their position. In this regard, Innis sees society as a network of communications systems that contain structures where information is both stored and transmitted; further, those agencies that control access to these points have the power to legitimate meaning. These groups derive their power from several sources: (1) their expertise (a mastery of the complexity of their field) which creates a hierarchy between professionals and amateurs; (2) the control of the raw materials of the media; (3) the probability they can predict important outcomes; (4) the speed through which they can acquire information; and (5) their ability to finance their operation(s).

Changes in technology, especially media technology, also produce consequences on both a personal and social level. Meyrowitz (1985) maintains: "A change in the structure of situations—as a result of changes in media or other factors—will change people's sense of 'us' and 'them.' As social information-systems merge or divide, so will group identities (p. 55). He explains this potential change by noting:

> Changes in media may also affect hierarchy by altering the accessibility of high status figures. Media that support the relationship between physical isolation and social inaccessibility will support hierarchal mystifications; media that undermine that relationship may work to lower many high status roles. (p. 67)

In other words, the adoption of a new medium will result in the creation of a new hierarchy of technological elites, based on the mystification of technological knowledge, or as Marvin notes, the creation of new technological literacy and social currency.

Other proponents of medium theory have also been concerned about the role of technology in society. According to Postman (1992), cultures may be classified into three types: tool-using cultures, technocracies, and technopolies, with the latter two being products of modernity. Although there were variations based on the level of technological development, prior to the Seventeenth Century, all cultures were tool-users. These tools primarily served to either address specific problems dealing with the physical environment or a symbolic purpose relating to politics and/or religion. In either case, these innovations were not intended to challenge the integrity of the culture in which they were introduced. In a technocracy, tools played a more central role with the social enterprise of the culture becoming increasingly subject to the influences and requirements of the technology. Tools became capable of attacking the traditions of the culture, and when equilibrium was created, the aspects of the technological and the traditional coexisted in uneasy tension at best and dysfunction at worst. In essence, people did not adapt to the new technology because it contradicted their traditions or they simply lacked the understanding or training to use the new technology. Postman asserts that on a competitive level, these non-adaptors were, and still are, classified as failures, because

they are on the wrong side of a cultural media war in which the new technology represents the most valued form of knowledge transmission. Yet, this new technology will always be subject to the introduction of even newer technologies which in turn will produce even more conflicts in the future. As an example he points to Innis' (1950/1972) assertion that the medium of orality stressed collective learning and cooperation while the introduction of print refocused attention on individualized learning and competition, resulting in more personal autonomy. Like the consequences mentioned in this example, the clash of media results in a complex array of affects that are not limited to one single aspect of culture or human activity, and in many cases are invisible to the people participating in that culture.

Postman (1992) argues that the last stage of technological development is technopoly, which is a cultural manifestation that eliminates alternatives to the new technology while not making them illegal or immoral nor even, in many cases, unpopular; it relegates the old technologies and the mind-set that supported them invisible and therefore irrelevant. In Postman's view, technology, within a technopoly, is not only a cultural artifact; it is also the foundation of a world-view, a state of mind. It reinforces, and in many ways represents, both the authority and the satisfaction associated with the new technology within the culture, thus presenting new forms of order and coherence. This new world-view is influenced by several assumptions, primarily introduced in the educational system, but further supported by the projection of reality that enters into the popular culture through the media. The first assumption is that efficiency is, and should be, the goal of all human effort, both physical and mental. Secondly technical calculation, because it is linked to science and the scientific method,

is superior to human judgment. Further, information is seen as the key ingredient in achieving both the goals of society and the individual within that society, and technology increases the available supply of information. However, with this increase, the mechanisms that filter and judge the validity of the information become strained and can result in a breakdown in psychic tranquility on the individual level, and the potential for questioning the institutional mechanism and structure of the society. Further, in a technopoly, the solution to these problems is seen as the introduction of more, and newer, technology as a means for providing more clear direction and purpose. Postman maintains that this effort is, for the most part, doomed to failure.

Marvin (1988) also observes: "new media may change…the permissible familiarity of exchange, the frequency and intensity of contact, and the efficacy of customary tests for truth and deception" (p. 5). These observations also reflect earlier assessments by Innis (1951/2003) who, while discussing the social effects of the creation of new technological elites, notes that in addition to tending to polarize societies between the masses and the elites and encouraging centralization of power, these new knowledge monopolies have the power to define reality, thus influencing the tests for truth and deception. These observations provide the groundwork for a number of inquiries focusing on social exchange and intensity of contact, as well as the definition of reality, and tests of truth and deception (See Appendix I for a brief description of medium theory research concerned with these last issues).

The Agents of Technological Innovation: Internal and External

One American myth involving technological innovation holds that new technology is the inspiration of one hard working inventor. While this may be true in

some cases, the invention process usually involves several people and the process of gaining consumer acceptance always does. Even Thomas Edison, paragon of American inventors, relied upon other workers for contributions. Bazerman (1999) contends that while Edison understood that the media of his time could be used to promote both his image and his company's strategies (also see Gitelman, 1999), the media (newspapers and magazines) were more than willing to present the story of an American hero. In discussing Edison's laboratory at Menlo Park, Bazerman (1999) observes:

> Both writers who communicated in the purple prose of late Victorian journalism and Gilded Age financiers who communicated in green dollars saw the laboratory as a place of private genius, the place where Edison worked his personal magic….[However] for Edison and his colleagues it was a place of collaborative work. (p. 48)

Bazerman also claims that Edison's role in the operation cannot be underplayed, noting that, "Edison was the charismatic center of the organization that formed around him.... [It was] built on the force of his authority and the trust he granted his close associates." However, he also asserts that "Edison's charismatic relationship vanished as the communicative structure no longer accommodated it" (p. 259). While Edison was the glue that held this organization together, others have suggested other methods of unification of purpose. Hård (1993), after discussing both Passer's (1953) study concerning the contest between Westinghouse and General Electric in the electric industry in the late 19th century—a battle that Edison was more than familiar with—and Kidder's (1981) work focusing on the conflicts between individual and group-centered engineers in the early development of the computer, argues that "technological change is

often driven by professional ‘status groups’ fighting for influence and control” (Hård, 1993, p. 423). In this regard, he also notes that while these status fights can produce both “segregation and polarization” (p. 423), they also “require that the conflicting agents share a common understanding of what is desirable” (p. 424). Therefore some sorts of common goal sharing, as well as cooperation, are necessary for innovation to enter the market. However, another important element must also be present. That element is consumer acceptance and user satisfaction.

A call to include users within technology studies was advanced by Oudshoorn and Pinch (2005). They argue that users should become an important part in the study of technology, citing their capacity to influence technology in all phases of its development from its initial design to its ultimate implementation. In this process, they stress that users not only consume, but they can also modify and reconfigure uses as well as possibly resisting technological development. They also call for technological studies to move into institutional settings to determine how producers identify potential users and how the designers of new technology respond to these groups’ tastes and needs.

Within the developmental process other research indicates that other agents who have contact with the end user can also influence decisions. Pinch (2005) looks at the role of sales people in the development and diffusion of the Moog synthesizer. He asserts that technical salespeople, while generally missing from technology and user-centered research, are actually boundary shifters between the dissemination of new technology and the creation of new users—in this case, he credits one particular salesman with reaching out and convincing the music industry of the value of the product. Van Kammen (2005) who looks at the role of advocacy groups in the development of contraceptive vaccines

found that in the development phase these groups can sometimes change the way producers conceptualize the user. Like Van Kammen's work, there have been a number of studies focusing on the role of users in different phases of the design, testing, and selling of technology. Ellen van Oost (2005) examines the development of the electric shaver and contends that both the production and marketing wings responsible for the development of the device operated under the conception that there was a masculine/feminine dichotomy based on technological competence. This resulted in two versions of the shaver being produced. The male version, both in terms of design and advertising, emphasized technological sophistication, while the female version stressed the device's aesthetic qualities.

Schot and de la Bruhèze (2005) focuses on the role of mediation in the development process and in doing so, also address issues concerning diffusion. The products and innovations they examine are paper cartons and snack foods and their acceptance in the Netherlands during the postwar period. They concluded that, although the transition process from glass to paper containers took a generation to achieve, an open process using such techniques as marketing experiments, user panels, conferences and workshops, and incorporating input from the government, interest-groups, and institutions, as well as consumers, can result in favorable acceptance. By contrast, the use of in-house reviews to gauge the potential of potato-stick snack consumption, while appearing to produce an item that would be accepted in the market was valueless as consumers rejected the product. According to the authors, the key for producing superior results appears to be a more open approach, not controlled by the manufacturer.

With regard to how non-use or resistance to a new technology can become a crucial component to its modification and eventual acceptance, Kline (2005) examines technological change in rural America during the first third of the 20th century, focusing primarily on the telephone and electrification. He argues that traditional rural values and practices—defending property rights and sharing work—not only provided keys to the successful marketing of the new technologies, but also those values were directly imposed upon the technologies to influence the way they developed.

Users and the Diffusion of Innovation

The process that results in a decision to accept or reject a technological innovation is also discussed by Rogers (1995) where he proposes the diffusion of innovations theory. This research attempts to isolate the variables that either increase or decrease the probability that new products, practices or ideas will ultimately be adopted by users within a given culture. Rogers contends that media presentation and its creation of expectations, and interpersonal contacts influence the potential user's opinion and ultimately their decision to accept or reject the innovation. Rogers bases his conclusions on previous research and postulations relating to diffusion including Tarde (1903), Simmel (1908/1964 & 1922/1955), Rogers (1958), and Rogers and Kincaid (1981).

Rogers (1995) begins by defining diffusion as "the process by which an *innovation* is *communicated* through certain *channels over time* among the members of a *social system* (p. 11, also p. 5). He defines innovation as "an idea, practice, or object that is perceived as new by an individual or other units of adoption" (p. 12). Technological innovation is seen as a "a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome" (p. 36).

Rogers (1995) also claims that it is composed to two elements: the tool (hardware) and the knowledge needed to successfully use the tool (software). Further there are five characteristics that determine the rate that any innovation will be adopted. The first of these is the perceived relative advantage of the new technology over older ones. The other influencing characteristics are the technology's compatibility with contemporaneous methods and forms, its complexity, its trialability—"the degree to which an innovation may be experimented with on a limited basis" (p. 16)—and its ability to be observed by others.

In noting the communication process that occurs in regard to innovation, Rogers (1995) observes, "diffusion is a particular type of communication in which the message content that is exchanged is connected with a new idea." This exchange travels through channels, and the nature of this information flow "determines the conditions under which a source will or will not transmit the innovation" (p. 18), and further whether the receiver will or will not accept the innovation. Another key element in this exchange is the amount of channel heterophily—"the degree to which two or more individuals who interact are similar in certain attributes, such as beliefs, education, socioeconomic status, and the like" (p. 19). Also acknowledging Granovetter (1973), Rogers (1995) also maintains that communications proximity is also an important element in the actual process of acceptance or rejection of innovation.

Drawing on Rogers and Kincaid (1981) and Valente (1995), Rogers (1995) forms a generalization noting that "an individual is more likely to adopt an innovation if more of the other individuals in his or her personal network have adopted previously" (p. 359). Further, within the structure (network) of these channels both opinion leadership—"the

degree to which an individual is able to informally influence other individuals' attitudes to overt behavior in a desired way with relative frequency" (p. 300)—and the role of the change agent—"an individual who influences clients' innovation-decisions in a direction deemed desirable by a changing agency" (p. 400)—becomes important in the innovation process. These people are key to determining if an innovation achieves a critical mass—"the point at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining" (p. 363).

Rogers (1995) also notes that this process is also dependent on certain elements within an organization. The first of which is agenda-setting where a problem is perceived and the "need for an innovation is defined" (p. 434), and, secondly, if the innovation is determined to fit within the organization's structure and patterns of communication. At this point, "both the innovation and the organization usually change in the innovation process" (p. 425) and undergo clarification and the use of the new technology becomes a reutilized practice. However, the process occurs over time and requires five steps: "(1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation" (p. 37). Further, as specified above, this process operates within a social system—"a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (p. 23)—that has a structure and norms.

Rogers (1995) also proposes five adopter categories that include: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. Although the process of adoption follows the S-shaped curve—first devised by Tarde (1903/1962)—the membership within these categories conforms to the standard deviation-curve, and very few fall into the innovator category (2.5%), and, in the beginning few can be called

early adopters (13.5%). However as time goes on, an early majority is formed (34%), then a late majority (34%), and finally the laggards make up 16% (p. 281). In describing the ideal type of each category, Rogers (1985) maintains that "the salient value of the innovator is ... [that he] must also be willing to accept an occasional setback (p. 283). He further notes:

> While an innovator may not be respected by other members of a local system, the innovator plays an important role in the diffusion process: that of launching the new idea in the system by importing the innovation from outside of the system's boundaries. Thus, the innovator plays a gatekeeping role in the flow of new ideas into a system. (p. 283).

Differing from the innovator, Rogers claims that the early adopter is "respected by his or her peers, and is the embodiment of successful, discrete use of new ideas" (p. 283). The members of the early majority are identified as deliberate in the decision to adopt a new innovation, while the late majority members "adopt new ideas just after the average member of a system" (p. 284) and their initial reaction is categorized as skeptical. The last classification, the laggard, "tends to be suspicious of innovations" and their "decisions are often made in terms of what has been done previously, and these individuals interact primarily with others who also have relatively traditional values" (p. 284).

Although, according to Rogers (1995), the innovator provides a gatekeeping function for the innovation process, the early adopter, because of the respect they have earned from the other members of their system, provide the most important function of supplying opinion leadership. He notes that these early adopters generally demonstrate

both great empathy and the ability to form abstractions. They are highly rational, with superior intelligence, and have a more favorable attitude toward change and the ability "to cope with uncertainty and risk" (p. 290). According to Rogers' research these people tend to have a greater appreciation of science and higher education and believe in their potential for controlling the future. On the personal level, they generally are members of higher status occupations and classes. Further, these early adopters demonstrate different communication behaviors including engaging in more social participation and maintaining interpersonal network connections. Rogers claims that they are more cosmopolitan, seek information readily, including information concerning innovations, and have more exposure to change agents and the mass media. These communication patterns result in allowing these people to gain and maintain respect in their systems networks and provide them with the ability to assume opinion leadership positions.

Conclusion

With the exception of the strict technological deterministic approach elements of all of the other models and approaches can be linked, and as pointed out, current scholars who support determinism have incorporated more constructivist approaches into their analysis. New technology exists within a technological complex that is built upon previous technology. In many ways it is similar to the media ecology discussed previously. These complexes represent social and power relations within society, and the social needs that are to be addressed by the new technology is projected on to the consumer. The technology employed in these complexes can also promote change in social and power relations. Technological development and its usage and consequences

are contingent and localized. Bijker and Law (1997) summarize these technological complexes and their relationship to human ecology, by noting:

> All technologies are shaped by and mirror the complex trade-offs that make up our societies; technologies that work well are no different in this respect from those that fail. The idea of a "pure" technology is nonsense. Technologies always embody compromise. Politics, economics, theories of the strength of materials, notions about what is beautiful or worthwhile, professional preferences, prejudices and skills, design tools, available raw materials, theories about the behavior of the natural environment—all of these are thrown into the melting pot whenever an artifact is designed or built. (p. 3)

Further, technology and its agents (users, inventors, manufactures and the distribution and promotion network) are all part of the same ecology. The final product can produce consequences as well as advancements. Within the adoption process, technology can also reinforce and create myths that also justify the technology but also have consequences.

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[1] See Appendix II for a description of the phases the technical development experienced in human history and their relationship to culture as delineated by Mumford (1934/1963).

[2] Mumford (1995) tracks the vast correspondence (383 pages) between himself and Patrick Geddes.

Chapter 4:

Medium Theory and Computer Usage

Introduction

` According to Cringely (1992 & 1996), on January 22, 1984, Apple computer announced that it would challenge IBM's position in the personal computer market. This was done during a commercial break in the third-quarter of Super Bowl XVIII where Apple announced the upcoming introduction of their Macintosh computer with the image shown above and the phrase "you'll see why 1984 won't be like '1984" (Robertson, 2007). The commercial, directed by future Academy Award winner Ridley Scott (McCracken, 2006), began with the above image. This picture, featuring a young blond woman wearing red shorts and supporting a large sledge hammer, stands in direct contrast to the world that the remainder to the advertisement presents. This world is

populated by pale males wearing grey suits either lethargically marching into a meeting hall or sitting in that hall listening to another male whose impersonal image is shown in black and white on a large screen, and black and white clad policemen wearing visor down helmets and carrying rifles. The conclusion features the girl, followed by the police, hurling the sledge hammer into the television screen followed by a large gust of wind filling the hall as the "Big Brother" image is destroyed and the promise that this 1984 will not retrace George Orwell's (1930/1963) classic novel. Although this commercial was promoted as the best of all time by TV Guide in 1999 (McCracken, 2006), nether the "Big Brother"-like IBM, which eventually got out of the personal computer business, nor the rebellious Apple, which only captured a secondary share of the market, were the winners in this commercially declared war as the various IBM clones rushed into the market. Although "Big Brother" IBM left the personal computer market, the commercial's statement that "1984 won't be like 1984" deserves more complete consideration. Has the "Big Brother" envisioned by Apple as its product competitor been replaced by the product itself?

Beginning with Lippman (1922) and Lasswell (1948), many scholars have concluded that the media has produced effects on those who are exposed to it. While these two early thinkers were primarily concerned with the effect of news content and propaganda, Merton (1946) argued for studies that concentrated on looking at content that trigger responses. He called for an examination of media's influence on persuasion and resistance to persuasion, as well as identifying people who are, and who are not, persuaded. Although not granting audience members agency, to some degree his call recognized the importance of the audience. Katz and Lazarsfeld (1955) also

acknowledged the importance of other variables for analysis when they developed their notions of a two-step flow of communication, stressing the importance of opinion leaders. While effects research and theory building has become increasingly more complex and sophisticated, other scholars have approached the question of media influence from other directions. For example, Fiske (1989) argues that the media produce a commodity that must be accepted by consumers. The commodity they produce is the text of their presentation, and for it to enter into the popular culture it must contain the force of social opinion, but also the opportunity to act against it. These opportunities can include the ability to oppose, or evade, while not totally disempowered social positions. Although these directions of scholarship differ in approaches, they are still focused on the consequences of the content of the media, and medium theory holds that media usage itself produces consequences. This is summed up by Chesebro (1984) who notes that, "the media exert an independent and profound influence upon the nature of reality apprehended by human beings" (p. 112). This observation is also true of the newest media—the computer and the internet. However before examining computer and internet usage, it might be well to expand on Chesebro's assertion concerning the influence of a medium on users' conception of reality.

Chesebro (1984) argues that "selective perceptions of reality stimulate particular or selective mental patterns" (p. 117). He supports his observations by noting that contemporary neurophysiologists have shown that certain sections of the brain demonstrate increased blood flow and increased physiological activity when stimulated (Ingvar & Risberg 1965, 1967). Agreeing with McLuhan (1962/1965), McLuhan and Fiore (1967/2001) and Postman (1993), Chesebro (1984) further contends that the "mode

or medium used to encode information or content is more likely to stimulate and to be processed by the hemisphere structure [of the brain] and conditioned to deal with such modes or media" (p. 118). Thus, there is "a media-cognition relationship" which influences how information is digested and used by people. Additionally he asserts; "specific media are linked to particular modes of understanding" (p. 119).

In elaborating on the cognitive effects of new media, Chesebro (1984) acknowledges that they can produce a socializing influence through their content, and their presentation of nonverbal systems, affecting the construction of meaning (p. 113). He further contends that "as a system of symbols" the media generates a perception of reality that equates with the perceptions produced by science and personal experience (p. 112), thus, rivaling other socialization systems within society. With reference to entertainment programming, Chesebro agrees with Rosenthal (1982), who contends that "the typical central television character does not reflect the American culture as it is" (p. H25). Also, news programming displays "pseudo events" as they cover "real events" (Berg, 1972, pp. 256-258). This programming indicates a "media logic" which serves to form a social reality and becomes "a way of seeing and interpreting social affairs" (Altheide & Snow, 1979, pp. 7-12). However, Chesebro (1984) also asserts that "the electronic media in particular now control major cognitive processes as well as the development of valuation schemata" (p. 112).

In other words, Chesebro (1984) maintains that the media, especially the electronic media, not only serve a socialization function by reinforcing society's norms and values through their content, but more importantly, the medium itself acts independently, as a "determinant of the cognitive and valuation modes of a social

system" (p. 112). Chesebro also notes that such a selective use of any mental activity can become habitual. Therefore, the media choice that an individual makes forms a habitual mental pattern that "creates a self-perpetuating and moral orientation toward reality" (p. 120). He also claims that "the electronic media function as a discrete cultural system, possessing its own orientation and concomitant value schema" (p. 120).

Computer and Internet Usage

Chesebro and Bertelsen (1996) describe the change in communications modalities that has occurred since World War II in the United States in individual terms, stating that, "instead of interacting with people face-to-face, we now increasingly communicate through artificial channels, technologies, tools, mechanisms, and machinery" (p. 30). They contend that this trend is a result of the United States entering into an electronic culture. In describing this electronic culture they agreed with Rogers' (1986) assessment that electronic media is either composed of telecommunication, or interactive forms of communication. Rogers defined telecommunications as "communication at a distance" that "moves ideas to people" and which are "primarily one-way, one-to-many mass media" (p. 28). Interactive communication is two-way, and "requires a high degree of individual involvement" (pp. 30-31).

Chesebro and Bertelsen (1996) argue that both of these technologies are "undergoing transformations in which they increasingly affect one another" and that "the specific technologies that distinguish the two are now merging" (p. 136) and more importantly are increasingly affecting individual experience. They cite several examples of this merger. The increasing use of the remote control—not only for television, but also for other video and audio equipment—has the capacity to "blur the distinction

between the two systems" by "creating a semi-interactive communication system" (p. 137). Also, because of media content specialization, cable and satellite providers have increasingly shifted from a mass to a user selective medium. In other words, the expanded menu and specialized offerings have allowed audience members the ability to personalize their viewing patterns, making the medium more interactive. Further, the use of videotapes, and development of new technologies associated with them, has allowed "viewers to make, literally, their own programs, and they can also watch them whenever they want" (p. 137). Advances in computer technology have also increased the opportunity to create new and personalized communication environments. Chesebro and Bertelsen also note that audience members are "increasingly becoming active agents when they deal with media systems" (p. 138), as a result of the integration of the telecommunication and interactive functions. They also point out that this merger is possible because both telecommunications and interactive communication technology share several structural variables—the use of electricity to transmit their messages, the use of established audio, visual, and print techniques to convey meaning, and an individual user. They further point out that as a result of this merger, a web has been constructed "unifying the thoughts, speech, action, artifacts, and knowledge transmitted from one generation to the next" (p. 135).

Chesebro and Bertelsen (1996) also observe that this merger of telecommunication and interactive technologies have "come together in yet another social construction of reality… the construction of a *virtual reality*" (p. 148). Drawing on Steuer (1992), Biocca (1992a, 1992b), and Turkle (1984), Chesebro and Bertelsen (1996) turn their attention to this virtual reality and conclude that it "should be viewed as a

replication of real time and space by closely simulating human perceptual modes." They argue that "the nature of a virtual reality more clearly emerges when it is compared to the kind of realities generated by other communication technologies" (p. 150). First, virtual reality is inter-textual—it embraces texts derived from cultural experience, and reinforced by other media. The result is the active construction of "a discrete and independent social reality" (Chesebro, 1989, p. 9). Second, this new construction can lead to the formation of new sub-cultures that will demand a distinctive social organization. Chesebro and Bertelsen (1996) also observe that "social grouping, indeed, entire cultures may be formed on the basis of a shared construction of reality or a shared emotional commitment to a particular issue or interest" (p. 152). These observations are supported by Loegran (2005), who while looking at how users privilege their own construction of reality, and how a technology is ultimately used, focuses on two distinct Norwegian subcultures and two distinct technologies—the Internet and the automobile. He observes that those subcultures adopted technologies to both build a sense of commonality, and a sense of segregation from the wider community.

Chesebro and Bertelsen (1996) also claim that these new virtual realities can produce cultural values and defined lifestyles, thus sustaining "a view of appropriate social conduct, and behavior that is directly related to the knowledge and skills necessary to be a proficient user of the medium" (p. 153). Lastly, virtual realities may alter perceptions and intellectual skills. They state: "When the perception of social place is separated from physical place in this manner [construction of a virtual reality], other sociocultural conceptions are also transformed" (p. 153). They also agree with Donohue

and Meyer (1984) who argued that altered perceptions of time and space have an effect on both cognitive processing and intellectual skills.

This new media technology reflects acceleration in the time and space consequences forecast by McLuhan (1963/1965 & 1964), McLuhan and Fiore (1967/2001), and Meyrowitz, (1985); also an alteration of cognitive processing as outlined by Postman (1990); and the potential of consciousness mutation as outlined by Gebser (1949 & 1953/1985). With this new technology, information can be obtained more quickly and over a greater distance, and more importantly, can open-up new areas of specialized interest with the potential of influencing social relationships.

Computer Mediated Communication

Another branch of media scholarship that is concerned with computer and internet usage is the study of computer mediated communication. Rice and Gattiker (2001) argue that "telecommunication networks allow access and connectivity to many others and to varieties of information across space and time" (p. 545), that can facilitate decision making. However, they also agree with proponents of medium theory that any new media technology produces both personal and social consequences that needs to be observed, defined, and explained. In addition to the aspect of the network communication mentioned above, they identify two other aspects of computer mediated communication that need to be defined and put into context. First, drawing on Rice (1987), Rice and Gattiker (2001) note that "information or communication resources range from databases to communities of potential participants," and second that the "digitization of content allows the integration and exchange of multiple communication modes—such as graphics, video, sound text—across multiple media and distribution networks" (p. 545).

The primary focus of Rice and Gattiker (2001) is how computer mediated communication fits into an organization. They acknowledge that computer networks are both part of, and supported by, an organization structure; noting that "both traditional and new media" are embedded in the structure and, more importantly, produce "a wide, overlapping range of technical and social capabilities and constraints" (p. 546). Also, citing Fulk (1993), Johnson and Rice (1987), and Rice (1992), Rice and Gattiker (2001) claim that computer network usage produces both ambiguity—"because they can be interpreted in multiple and possibly conflicting ways" (p. 546)—and continuous adaptation, reinvention, and redesign. Although they note that no single media can be viewed as either better, or worse, than another, they do contend that the "overemphasis or idealization of some characteristics of one medium can de-emphasize and limit perceived as well as actual characteristics of other media" (p. 546). They further assert that computer mediated communication systems:

> Have more capabilities than just the by-now familiar "overcoming constraints of time and space." It may well be the ability to reprocess, combine and analyze information in many forms from multiple sources has far more profound implications for organizing than "fast" or "asynchronous" interaction. (pp. 548-549)

One additional observation relating to interplay between older and new media needs to be mentioned. They point out that we accept particular characteristics and practices associated with traditional media are seen as natural, when they are really artifacts linked to that media. Further, agreeing with Carey (1990), Rice and Gattiker (2001) contend that, "as a consequence, new media are often critiqued from the position

of a privileged, artificial, idealized notion of interpersonal communication and traditional media" (p. 548). This has an impact on the structural influences of adaptation and implementation of computer mediated communication.

Before examining the adoption and implementation procedure, Rice and Gattiker (2001) discuss several key aspects of organizational structure. Drawing on Jablin (1987), Stevenson (1993), and Johnson (1993), Rice and Gattiker (2001) contend that structure is best conceptualized as a process that "both constrains and facilitates human action in organizational contexts," and "new structures can arise or be suppressed." Therefore, the relationship between technology and the organization's structure is both "contextual and dynamic," and "involve both 'positive" and 'negative' aspects" (p. 550). Also, agreeing with Giddens (1976), Rice and Gattiker (2001) state: "structure is manifested in properties of actual social systems" (p. 550). Also, noting the finding of Haines (1988), Rice and Gattiker (2001) maintain:

> Systems have structures because they are conditioned by rules and resources. But these systems depend on routines being reproduced by (more or less) knowledgeable actors supplying structural properties (intentionally and unintentionally). (p. 551)

Based upon these assumptions concerning organizational structure, they postulate six factors that affect adoption and implementation of computer mediated technologies. The first of these is media genres—"variants of a general form of a medium, associated with identifiable formats, circumscribed content, and a specific community of users" (p. 552)—and usage norms (also see Yates & Orlikowski, 1992). The second is the culture, both organizational and social, surrounding the organization. Third, Rice and Gattiker

(2001) note that, “use and performance is likely to be mediated by task equivocally and by users ‘media awareness’ of the suitability of new media to these tasks” (p. 554) (also see Short, Williams & Christie, 1976). Rice and Gattiker (2001) also maintain that within the communication networks both critical mass and physical location can impact adoption. Also, once a computer mediated communication system is established it produces an additional consequence, serving as a transformation agent for the organizational structure.

In terms of transformational effects, Rice and Gattiker (2001) identify five areas where the general communication environment can be affected. The first of these is the nature of message content, as compared to traditional communication forms. Citing the results produced by Finholt, Sproull and Kiesler (1990), Rice and Gattiker (2001) note that, “face-to face communication involved more consensus building and problem solving” (p. 559), but they also agree with Hayne and Rice (1997) that computer mediated communication may allow for easier message exchange, and voting anonymously on options. However, Rice and Gattiker (2001) also point out that the familiarity with traditional artifacts may influence usage and reinforce the more traditional communication forms. The second area relates to content flow. Noting Black, Levin, Mehan and Quinn (1983) and Kolb’s (1996) findings that most organizations have multiple levels of conversation and message reception, and Bump (1990), Rice and Gattiker (2001) concede that, “online discussions can suffer from tangential comments and loss of coherence” (p. 560). However, they also agree with Dubinskas (1993) that computer generated work products can incorporate visual and other linked references into the documents. Rice and Gattiker (2001) assert:

> Hypertext links will relax our familiar notions of a sequential textual structuring even more. Users may now move from any content mode (such as a word, picture, or reference) in a (possibly multimedia) document directly to associate contend nodes in other documents, both within and across documents. (p. 560)

The third area of change relates to the temporal aspects of communication. They acknowledge that computer information systems are "transforming how people conceptualize media in general," and they agree with Kolb (1996), suggesting that both the limited length and rapid response produced by computer messaging fosters discourse that builds over time, as compared to "point-for-point statement and rebuttals" (p. 16) common in verbal interaction. The fourth effect can arise in group communication. Rice and Gattiker (2001) note that computer information systems can be "adapted to facilitate better group interaction, idea generation, and decision making", but they also note that while the systems can be used to reinforce familiar patterns, "they many also seriously challenge traditional notions of organizational structure" and complicate interactions within groups and across the organizational structure (p. 562). The last aspect that relates to change is metastructuring, which, they contend, may be implemented to promote on-going transformation, but also may create uncertainty.

With relation to the influences on organizational structure imposed by computer mediated communication and their networking systems, Rice and Gattiker (2001) list four areas of possible conflict and change. The first area is power relations. Although they agree with Markus's (1984) conclusion that personality is a key component in predicting organizational success, they also note Blair, Roberts and McKechnie's (1985) finding that organizational power is associated with control and access to information. Therefore,

they conclude that all three aspects—individual personality, control of information flow, and access to information—are potential areas where computer mediated communication can exert influence. Looking at possible shifts in power relations, they also note Blair et al. (1985) and Sproull and Kiesler's (1991) findings that indicate that, with more access to both information and flow, hierarchical influence can be reduced or altered. Further, as Eveland and Bikson (1988) point out, the computer information system can provide new areas for organization socialization and can promote ad hoc groups in the information distribution arena. However, these systems can also contribute to a questioning of organizational goals and, as Cleveland (1985) and Taylor and Van Every (1993) maintain, can "contribute to the erosion of organizational and even national hierarchies" (Rice & Gattiker, 2001, p. 563). They also note that the use of a computer information system can force a redefinition of the characteristics that justify power in an organization as new technological terminology, and expertise become privileged. The second area where these systems can exert influence relates to participation. Rice and Gattiker (2001) contend that most research stress that computer information systems can "overcome physical and temporal structural constrains and thereby facilitate more diverse communication" (p. 564). However, they also note Keen (1991), Sackman and Nie (1970), and Taylor and Van Every (1993), who conclude that such systems also have the potential of affecting participation by decreasing interpersonal interaction.

Lastly, these systems can facilitate information flows that can increase the diversity of opinion, as well as the diversity of experience from other departments, as well as promoting the possibility of joint ventures between companies. However, these systems can also transfer the negative effects, produced by power shifts and loss of

interpersonal relationships, to the process. However, in a positive manner, Rice and Gattiker (2001) conclude that computer information systems, “by removing some structural constrains, will expose widely accepted communication norms as the artifacts they are, generating the need to develop and manage new norms” (p. 571). Yet, even this reaction can produces effects within the organization. Rice & Gattiker postulate that as the managers seek to develop new processes and norms, “the role of ‘middle manager” may be largely deinstitutionalized from organization structure” (p. 571).

Fulk and Collins-Jarvis (2003) focus their attention on computer mediated communication, and its role in meetings. In the process they review the approaches and theories associated with organizational and group meeting research. The first of these is the media capacity approach, coming from nonverbal communication and organizational information processing, which is supported by both social presence theory (Short, Williams & Christie, 1976) and media richness theory (Draft & Lengel, 1984). The second is the input-process-output approach, coming from theories of groups, especially Stiener”s (1972) process losses concept, input-process-output theory, and time, interaction, and performance theory (McGrath & Hollingshead, 1992). The third is the structuration approach, including adaptive-structuration (Poole & Jackson, 1992) and self-organizing systems theories (Contractor & Seibold, 1993; Glansdorff & Prigogine, 1971). They further review the research relating to each of these approaches and theories (see Fulk & Collins-Jarvis, 2003, p. 632, for a general recap).

Although, as indicated, this research revolves around computer systems use and effects on meetings, several trends become apparent in Fulk and Collins-Jarvis (2003) review. First, although computer mediated communication has become common in

everyday life, both professionally and personally, its use is not neutral; it produces changes in way people communicate with each other. Their review of the research further indicates that the use of computers in a communication system can influence both communication patterns and social networks. This was especially shown in their review of social presence theory. The research indicates that computer mediated communication reduces non-verbal, as well as proximity and orientation cues, and further limits cues obtained from other people's physical appearance. These losses not only affect personal perception of the other, but also affect feelings of intimacy and immediacy, and potentially allow for the formation of incorrect responses. Further research also indicates that computer mediated communication limits visual contact, and reduces both status and position cues, thus possibly affecting person awareness, and altering normative behavior and social influence exhibited by the receiver toward the sender.

Interestingly, these criticisms have found their way into the research and development departments of some media technology providers. Further these perceptions have also been acknowledged by some users, although obviously well-heeled ones, as a recent CBS news story confirms. Correspondent John Blackstone reported:

> Movie mogul, Jeffery Katzenberg, helped Hewlett-Packard design the $350,000 multi-screen system that lets film makers across the globe meet face to face. "It's not all smoke and mirrors," says a smiling Katzenberg. "To be able to see the detail of your face, your expression—that you're understanding and connecting with what I say—you know, that part of how we, as humans, communicate." (Blackstone, 2007, May 23)

As indicated above, the primary focus of traditional computer mediated research has been on organizational effects, and a great many studies are still concerned with networks and organizations. For example, Turnage (2007) examines email flames and organizational conflict, DeSanctis and Monge (1998) look at the trend to create virtual organization as communication tools, Haythornthwaite (2005) examines how mediated communication has become a collaborative process in many organizations, and Wiesenfeld, Raghuram, and Garud (2009) also look at both mediated and virtual communication practices in organizations and conclude they endanger the employee's perception of the firm's identity.

Also much current research is shifting to more contemporary computer and internet usage. The political impact of internet usage has surfaced as a topic of discussion (cf. Tan, et. al., 2007, that looks at language usage in internet political discussions, and Johnson, et. al., 2007, that discusses credibility issues in political blog). The consequences of computer mediated communication and internet usage on identity formation has also been addressed (cf. Byrne, 2007, who looks at black social networking, and Huffaker & Calvert, 2005, who look at gender and identity formation as represented on teenage blogs). Children's internet usage and play is also the subject of Sandivig (2006). Zwick (2009) examines the affect of Internet-based communication technology on stock trading. Domingo (2009) examines the use of computer-mediated communication in the newspaper publishing industry and concludes that the professional culture of this industry limits the development of interactive products. Also looking at the media, and in tune with the observations of several medium theorists, Shklovski, Kraut, and Rainie (2004) contends that the use of the Internet has changed the extent to which

people use other communication media, while Wellman, et al. (2003) contends that the Internet adds to other communication forms and does not replace them.

Conclusion:

Elements of both medium theory and computer mediated communication can inform the study of today's media ecology. Both acknowledge that new media technology produces consequences on a personal level. Also on a social level, Rice and Gattiker (2001) claim that computer mediated communication can "contribute to the erosion of organizational and even national hierarchies" (p. 563), and their assertion that the use of computer information systems can force a redefinition of the characteristics that justify power, reinforces the observations made by Meyrowitz, (1985), and Postman (1993), and earlier by Innis (1950/1972 & 1951/2003). Also, Rice and Gattiker's (2001) argument that computer and internet usage "allow access and connectivity to many others and to varieties of information across space and time" (p. 545) echo the concerns of many medium theorists (cf. McLuhan, 1963/1965 & 1964; McLuhan & Fiore, 1967/2001 and Meyrowitz, 1985), and others interested in perceptual alterations (cf. Kramer, 1988; Gebser, 1949 & 1953/1985).

Computer mediated communication can help inform this presentation through its research into new languages that are generated by new media users, in their observations concerning the nature of message content, and with regard to social exchange and intensity of contact. Fulk and Collins-Jarvis (2001) maintain that computer-mediated communication is not neutral within the communication process. They maintain that it changes personal communication and can influence communicative patterns and network structures. Rice and Gattiker (2001) agree, arguing that because it differs from face-to-

face communication, computer-mediated communication, not only limits the level of interaction, but may also cause a drop in the time, and number of personal interactions.

Medium theory and aspects derived from Computer Mediated Communication scholars informed this study through its recognition of media's role in altering time and space perceptions, and the acknowledgement that consequences, many of which are initially unforeseen, occur with both the introduction and use of new media technology. .

Chapter 5:

Methodology

This study examined how new communication technologies enter into the popular culture, how they are adapted by their users to meet the user's needs, and how their use modifies those that use them. With regard to the first two goals, this study was informed by the following considerations. First, as Fiske (1989) asserts popular culture is an active process resulting in the formulation and circulation of "meanings and pleasures within a social system" and that "popular culture has to be, above all else, relevant to the immediate social situation of the people" (p. 3). Second, as Oudshoorn & Pinch (2005), postulate, users of a technology are not only active participants in the production of its cultural meaning, they are also capable of appropriating the tool and the processes involved in its usage and rendering the technology more specifically applicable to their everyday lives. Thirdly, as Blumer (1969) maintains: "Human beings act toward things on the basis of the meanings that these things have for them." and the "meanings of such things is derived from, or arises out of, the social interaction that one has with one's fellows" (p. 2). As pointed out above, importantly this study seeks to uncover the consequences, many of which are initially unanticipated, of the acceptance of a new communication technology, in this case the introduction of the personal computer and the Internet. In this effort, the enquiry drew on observations found in contemporary medium theory and computer mediated communication studies. The methodological tools that were used to obtain this information were a number of qualitative interviews. The analysis of these interviews conformed to practices accepted by oral historian (Richie,

2003, and Brundage, 2008) and grounded theory (Strauss and Corbin, 1998, and Charmaz, 2006).

The Qualitative Enquiry

. The purpose of this enquiry was to obtain what Riessman (1993) would describe as an extended account of the past, or what Linde (1993) would term the discovery of elements of a life story—"explanations and chronicles, and the connections between them, told by an individual" (p. 21)—or what Briggs (1986) would depict as an oral history with the goal to "elicit information about past events" (p. 14). Rosenzwig and Thelen (1998) describes this process "popular historymaking" and stress that reflections of the participants being interviewed should be privileged so "that they're not just passive consumer of histories constructed by other" (p. 3). As Rubin and Rubin (1995) maintain, the participants in these oral histories use their account to explain, and in some cases justify, their past actions. Wengraf (2001) argues that such accounts are best examined through the use of interviews performed in a conversational manner. Therefore, it is necessary to outline the procedures that were used during the interview process, both generally and more importantly, in specific terms.

As a tool for contemporary intellectual enquiry, the interview serves several purposes. As Silverman (1993) points out, it can be used to both provide data that gives access to facts concerning behavior, attitudes, and authentic experiences of the participant. Silverman also notes that interviews are used within various types of knowledge acquisition. Although he discusses the role of the interview in what he terms "positivist" research, his primary focus is on the collection of qualitative data and what he describes as "interactionism," comprising a series of unstructured open-ended

interviews" (p. 91). This usage of the interview grew out of the symbolic interaction observations and approaches advanced by George Herbert Mead (1934, 1938, & 1982) and later by Herbert Blumer (1969). This intellectual tradition also owes much to the theoretical application of Goffman (1959 & 1982) and his notion of role performing actors and their performance within the interaction process, as well as the participant observation and ethnographic research done by Boas (1920), Malinowski (1926/1972) and Garfinkel (1967) and the naturalistic approach of Metza (1969). Many other researchers have offered critical evaluations, cf. Hammersley (1989), and suggested refinements of the traditional methodology, cf. Denzin (1970), Denzen and Lincoln (2003 & 2005), and practical approaches to the interview process itself, cf. Holsteinand and Gubrium (1995), and Seidman (2006).

Since, as Silverman (1993) maintains, the unstructured and open-ended interview provide an important, if not primary, component of qualitative research, it is imperative to discuss the interviewing process itself. As Miller, Sandel, Liang, and Fung (2001) point out, the interview process is contingent upon the cultural setting in which it occurs and the communication effort that transpires during this process reflects the social and normative expectations of the interview participant. It becomes incumbent upon the researcher to tease out these social and normative expectations. Briggs (1986) points out that the interview provides a chance to directly learn how people feel about events and actions, and how they reflect on them. However he also points out that in order to gain access to this data it is important to establish rapport with the participant. This can best be accomplished by being a good listener and knowing the communicative norms surrounding the interview and appreciating its social setting. Therefore, the researcher

attempted to establish an informal, friendly, and non-judgmental tone during the interview and the interview was conducted in a setting chosen by the participant.

The interview itself was designed to follow what O'Reilly (2005) calls a semi-structured approach, combining elements of a structured configuration—"questions are predetermined"—with those of an unstructured style—"free-flowing…[where] the interviewee is given the opportunity to respond in a leisurely way" (p. 116). It was also organized in what Briggs (1986) terms a linear structure. Begin during the participant solicitation process where the potential participant was not only invited to grant an interview but was also informed of the nature and purpose of the data collection effort. Keeping in mind Kvale's (1996) observation that participants not only describe their world during the interview, but also in many cases discover new relationships and refine their interpretations during this discourse, it was hoped that the solicitation would begin this new discovery process. This was continue during the initial portion of the interview which begin with an informal conversation designed to establish a degree of rapport, obtain demographic information—gender and age and professional position, both currently and at the time of introduction to the personal computer and the internet—and to reinforced the nature and topic of the enquiry. The interview began with a series of personally directed broad question, then moved to the consideration of more specific questions and finally concluded with one broad question, allowing the participant to summarize, and/or clarify, and/or expand on the topic of the enquiry. During all of these phases, follow-up, questions were asked in order to gain both clarity and a more detailed explanation from the participant.

This pattern was designed to minimize problems of both reliability—the degree of consistency of finding (Kirk and Miller, 1986)—and validity—"the extent to which our observations indeed reflect the phenomena or variables of interest to us" (Pervin, 1984, p. 48). In terms of reliability every attempt was made to ask every participant the same questions and in the same order, for as Patton (1990) contends the initial questions should be "arranged with the intention of taking each respondent through the same sequence" (p. 280) and producing, as Bernard (2006) maintains, consistency throughout the interviewing process.

Validity depends on accurately representing the observations and feelings of the participants and truthfully reporting their messages. Also as Oberle (2002) notes, if findings are reported accurately and dependably, they are more easily transferred and analyzed. However, as Briggs (1996) points out, in order to address the need for validity, it might be necessary to modify some of the questions during the interview process. This avoids what Silverman (1981) refers to as limitations on the awareness of the speakers and allows for better communication with the interview participant. This view is also supported by Spradley and McCurdy (1972/1988), Van Maanen (1988), Patton (1990), and Bernard (2006), and has proved to be a necessary adjustment in practical research, c.f. Lutz (1988), Goodwin (1990), and Philipsen (1992). Briggs (1986) describes this concern very succinctly, noting that "this means that interviews will be totally ineffectual in dealing with some topics, and they certainly will exclude important facets" (p. 98). Yet in order to assure reliability and a consistent flow of like information between all of the interview participants, specific questions will not be modified except for occasions where clarification is necessary, and validity will be insured through what Briggs (1986)

describes as periodic checks of the effectiveness of the interview. Kvale (1996) describes this process as sending the meaning back to the other participant, and what Kuzel and Like (1991) refer to as member checking, where the researcher restates, summarizes, and/or paraphrases the information received from a participant to check if it has been accurately understood , and the participant's meaning is privileged. Guba and Lincoln (1989) equate this process with hypotheses testing in quantitative research because it links the data back to the "members of the stakeholding groups from whom the original constructions were collected" and becomes "the single most crucial technique for establishing credibility" (p. 239), and, as such, validity.

In an attempt to further gain accuracy a tape recorder was used to record the interview. In addition to providing an accurate record to what really was said, its use frees the researcher from taking detailed notes—except for non-verbal cues that might help clarify or negate the verbal message, and it allows the researcher to concentrate on gaining an understanding of the participant's meanings. During both the initial solicitation and at the beginning of the interview, the participant was informed that a tape recorder would be used. Additionally, the participant was informed that the audiotape will be the responsibility of the principal investigator, who would store them in a locked metal box, and if at any point, the participant had any regrets about participation and expressed those regrets to the researcher; the tape would be destroyed immediately. Aside from these circumstances, the tapes were transcribed by the researcher and retained beyond transcription for the purpose of verifying the accuracy and totality of the transcription process at a later date. The participants in the study were assigned a number and their identity was protected. While reporting the results of the interview process the

participants were only identified in general terms or by their assigned number. During all phases of this project the participants and their responses remained confidential.

It was mentioned above that certain non-verbal cues were noted by the researcher. This was necessary for future analysis of the meaning that is transferred during the interview process. Looking at the processes that define meaning in a social setting, Goffman (1982) observes: "Social interaction can be identified narrowly as that which uniquely transpires in social situations, that is, environments in which two or more individuals are physically in one another response presence" (p. 2). One element that is embedded within these environments and through which meaning is transmitted and received is obviously language and the language practices that are followed in the communicative exchange.

The process of obtaining an oral history—a life story—can be seen as speech event. Hymes (1974) provides an approach that is useful for understanding such a speech event. First, he acknowledges that any given speech community serves as a repository for speech codes and styles, and that speech acts and/or events not only demonstrate the norms associated with speaking, but are also bound in a social context and "implicate the belief system of a community" (p. 61). He also offers some fundamental observations concerning such an information exchange: (a) a speech community is a social rather than linguistic unit, (b) a speech situation is marked as a social situation (e.g., a ceremony, a meal, or even lovemaking, and in this case, an interview), (c) a speech event is "governed by rules and norms for the use of speech" (p. 52), and (d) the speech act is an utterance that depends upon a conventional formula, which include the participants position in the conversational exchange, and the social relationship existing between the parties, and the

community's language codes. Alterations in language codes, message content with regard to topic, and changes of topic are important in assessing the participant's comfort level within the process of communicating, and also in assessing the participant's interpretation of the items being discussed. As Briggs (1986) maintains, "the key to meaning of individual utterances often lies in their *departure* from the communicative forms of the conversation as a whole" (p. 106). He also notes the importance of understanding the placement of utterances within the flow of the conversation in the analysis of the interview, stating: "Developing an ability to read such meta-messages provides the analyst with the ability to base his or her interpretations on the participants' ongoing process or sorting out the meaning of what they are saying and hearing" (p. 95).

As important as these linguistic utterances are in providing cues for follow-up questions during the interview itself, for the purpose of this research, as Briggs (1986) points out, it was necessary to begin by examining the whole and then moving to its parts in order to seek further clarification. The analysis attempted to find what Glaser and Strauss (1967) term "salient categories of information" (p. 22). Once these categories were discovered, the analysis concentrated on discerning the connection between related categories, and the discovery of patterns from which understanding can be expanded (Schwandt, 2001). Further, as Strauss and Corbin (1991) contend, the development of such categories facilitates the ability of the researcher to validate other's theoretical grounded conclusions. The specific interview questions, and their combinations, were designed to gain understanding of the participants meaning and situation, and to determine if the reflections serves as an example of a larger universe. Therefore, it was necessary to answer the following questions during analysis: Does this example have a

standardized form by reason of rule or custom? Are the persons being interviewed typical of persons in similar spaces? Is the group of people being interviewed part of a larger community? Do the participants see themselves as such?

The broader questions were designed to aid in the formation of analytic generalizations grounded in theoretical observations. As such, it was necessary to ask the following questions: Do the observed participants form a class at large? Does the data obtained form a possible example of the phenomena being studied? Does the observation reflect a "real" or an ideal existence?

The Participants and the Focus of this Investigation

In discussing the impact of new media on the structure and communication practices within organizations, Rice and Gattiker (2001), point out how difficult it is to project future ecologies. They begin by asking the reader to "imagine how a person in 1850 might explain organizational communication and organization structures in the mid-20th century." They note the difficulty of this task by reminding the reader that such a "person would have no familiarity with telephones, telegraphs, vertical files, paper clips, photocopies, elevators, electricity and a whole host of other communication and information technologies" (p. 544). Then they ask their reader to also imagine how a person in a 1950s business organization would describe the business ecology of the last two decades. This ecology would include "personal computer, desktop publishing, multi-media, the Internet and the World Wide Web, online data bases, … electronic mail, voice mail, videoconferencing, … data communication networks, [and] cellular phones" (pp. 544-545). Although Rice and Gattiker are correct in their assessment that a person working in either of these two ecologies would have problems imagining future offices,

let alone the impact of new technologies, the fact is that people did make a transition from one to the other. The participants in this study were drawn from people who could directly imagine the profession ecologies prior to the introduction of the personal computer and the Internet as well as the post introductory period, because they lived and worked in both. This study not only focused on the organizational, or professional, changes faced by these people, but also looked at the personal changes they encountered in their work and everyday life, in an attempt to discern patterns that could be applied to the introduction of future new technologies, as well as the impact of new media technologies on their users.

Fischer (1992) offers both a good starting point for this inquiry, and a number of preliminary questions. The first of his questions is who adopted the device? This is very important because it addresses the focus of this inquiry. Probably the best starting point in this determination comes from the marketing strategies of the computer industry itself, as represented in their early advertisements.

In an early advertisement for Apple personal computers, the solicitation not only trumpets the "special thrill of personal computing," but also delineates its prospective uses, and users, stating: "It's a home computer, a business computer, a classroom computer, *your* computer" (A is for Apple, 1977).

In terms of both the first and third categories, home and classroom applications, the market was more imaginary than real, with home computing generally embraced by amateurs (although soon to be professionals), such as the members of the Homebrew Computer Club in California. Also the potential for using computers in the classroom had not yet been realized—and would not be until the computer's applicability had been

demonstrated as both a business and higher educational research tool. In an attempt to encourage both of these markets, Apple ran the following advertisement in 1981:

Two elements of the above advertisement speak directly to one specific population within the American market—students within the higher education system. The first paragraph claims that "Apple personal computer systems help you collect store and analyze data as fast as you can load a disk and execute a program" and the first sentence of the middle column of the advertisement states: "Rely on Apple's word processing capabilities to write, edit and print your reports" (Three good reasons, 1981). While the collection and processing of data might only attract a limited number of college

students and researchers during this introductory period, the word processing capabilities would probably appeal to most students. Therefore, one group of participants for this inquiry would be college students and university professors that studied and worked within the higher education system during this time.

The 1981 press release announcing IBM's personal computer also acknowledges the importance of the device to the university community. The release quotes C.B. Rogers Jr., IBM vice president, as saying: "This is the computer for just about everyone who has ever wanted a personal system at the office, on the university campus or at home." The release further elaborates on this theme, and in the process also identifies another potential population for focus. The release claims: "IBM has designed its Personal Computer for the first-time for advanced user, whether a business person is in need of accounting help or a student needs help preparing a term paper" (Personal computer announced, 1981). This press release indicates that a logical focus of inquiry should be accountants who would use the computer's spreadsheet function. This conclusion is also supported by Cringely's (1992 & 1996) observation that VisiCalc financial analysis package—a key software component on the IBM computer—was the first critical application that drew businesses into the personal computer market. The press release also indicates that another focus group within the business category should be office workers, who could use the word process function instead of their traditional typewriter. In addition, to professors/students, accountants, and office workers, it was decided to expand the potential participant category to include other business professionals, and even non-urban, rural residents, in order to get a broader picture of both the introductory period and today's current media ecology.

The final group of participant in this study included information management and business professionals in insurance, accounting, as well as a consultant in public management and information technology. The participants also included office workers in business, higher education, and governmental agencies. The academics that were interviewed represented the fields of psychology, meteorology, biology, zoology, geography, sociology, mass communication and media studies, interpersonal communication, professional television and radio production, political advertising and political consulting, and journalism—with representatives with reporting, editing, upper management background, and a feature columnist. Other participants that were interviewed included professionals in visual communications and graphic design, a professional writer, a medical doctor, a lawyer, a college administrator, a middle school teacher. In addition representatives in construction science and construction practice, and architecture and engineering with both academic and professional experiences were interviewed, as were several people with rural backgrounds.

Thirty three participants participated in this study, and while the majority of the data was gather through one-on-one interviews, five participants chose to respond through emails. Surprisingly the response rate was 80 per cent for those opting for Internet-based interviews. This might be because the initial solicitation was made over the phone, or more probably because all of the people—three journalists, a doctor, a lawyer, and a professional information technology worker--were involved with use the Internet in their everyday profession and personal lives and was their primary method of communication.

The Interview and the Questions

In order to allow the participants to gain some perspective into the nature of the enquiry, and researcher to more completely understand any potential differences between the participant's current ecology and the ecology that they operated in prior to the introduction of the personal computer and the Internet, some background information was sought[1].

In his review of the early history of the telephone, Fischer (1992) adopts what he terms a "user heuristic" constructivist model to advance his study. He notes:

> "Once we have understood the genesis of a technology, its development and promotion, we can begin looking at consequences. Here we should ask: Who adopted the device? What was their intention? How did they use it? What role did it play in their lives? How did using it alter their lives? (p. 17)

Fischer's work does offer a good starting point for this enquiry. His initial question which focuses on who adopted the new technology, in this case the personal computer was addressed when discussing the participants of this study. However, his next questions serve as a good starting point for the interview process. Therefore the following questions will be asked:

1. When, and more importantly, why did you begin to use the personal computer; what was your intention?
2. How did you use it?
3. What role did the personal computer play in your work?
4. What role has the personal computer come to play in your personal life?
5. How did using the personal computer change your everyday life?

Mazlish (1993) contends that humanity is undergoing a discontinuity with regard to their relationship with the machines they create. He argues that humans can no longer assert that they dominate these machines and they no longer feel superior to them. He asserts that this discontinuity produces a psychological disjuncture and feelings of inferiority. Ong (1977) asserts that that new media not only creates a disjuncture because of the speed at which knowledge is disseminated, it also "changes man's feelings for what knowledge is and what actuality is" (p. 4). These changes have the potential of creating alienation. One of the purposes of this inquiry was to determine the extent and cause of and potential disjuncture. It was necessary to determine if this potential problem could be classified as anxiety leading to alienation or simply frustration growing out of a new encounter. In attempting to gain a handle on this concern, the following questions were asked:

6. Have you felt any frustration and/or social pressure or physical problems associated with your attempts to learn or master computer applications or programs?
7. If so, what was the cause, and extent, of this frustration, pressure, or problem?

Fischer (1992) also asserts that users, especially early users, "have multiple, often contradictory, purposes, so that use of a technology may have non-obvious consequences" (p. 18). This observation is supported by Oudshoorn and Pinch (2005), Van Kammen (2005), Schot and de la Bruhèze (2005), and Rogers (1995). Fischer (1992) explains:

> People can put technologies to various ends—which may include keeping some activities just as they were. In these ways, some major technologies may have few

> direct and overt consequences….New technologies may also have second- and third-order consequences that are unintended…. [Further], individuals indirectly experience the unintended collective consequences of *other's* use. (pp. 17-18)

Therefore, the following questions were asked:

8. Over time, did you find additional uses for the personal computer?
9. What were these uses and did they impact the original function of your personal computer?
10. At some point in time did you find that this optional device became a necessity? [2]

Meyrowitz (1982 & 1985) is concerned with the impact of communication media on both communication patterns and the performance of social roles. He contends that the introduction and use of a new communication medium produces consequences. With regard to social exchange and intensity of contact, likewise, Fulk and Collins-Jarvis (2001) maintain that computer-mediated communication is not neutral within the communication process. They maintain that it changes personal communication and can influence communicative patterns and network structures. Rice and Gattiker (2001) agree, arguing that because it differs from face-to-face communication, computer-mediated communication not only limits the level of interaction but may also cause a drop in the time and number of personal interactions. Based on these reflections, the following questions were asked with primary focus on personal and professional relationships:

11. What changed in your work place as a consequence of the introduction of the personal computer?

12. What changed in your home as a consequence of the introduction of the personal computer?
13. With the advent of the Internet have you noticed any changes in interpersonal communication practices among your co-workers?[3]

Turning to the possibility of other unforeseen consequences as described by Fischer (1992), and acknowledged by Meyrowitz (1982 & 1985), Fulk and Collins-Jarvis (2001), and Rice and Gattiker (2001), Mumford (1934/1963) notes that during the period that has come to be associated with the foundation of modernity, change was linked to an increase in energy or power. This resulted in an increase in the "size, speed, quantity, [and] the multiplication of machines" and, more importantly, "power was at last dissociated from its natural human and geographic limitations." However, another limitation was not overcome, as Mumford explains: "Power, however, cannot be dissociated from another factor of work, namely time." One of the principle economic goals of this period was to decrease the amount of time needed to perform "any given quantity of work" (p. 196). Mumford goes on to point out that, "with the enormous increase in power a new tempo had entered production: the regimentation of time, which had been sporadic and fitful, now began to influence the entire Western World" (p. 197). As Kanigel (1997) points out, in the late 19th and early 20th centuries, American business became enamored with the work of Frederick Winslow Taylor, who purported to use "'the application of scientific methods to the problem of obtaining maximum efficiency in industrial work" (p. 7). Kanigel argues that:

> Taylor bequeathed a clockwork world of tasks time to the hundredth of a minute, of standardized factories, machines, women, and men. He helped instill in us the

> fierce, unholy obsession with time, order, productivity and efficiency that marks our age. (p. 7)

Although Mumford (1934/1963) maintains that Taylor's work "involved only a change in the motion and routine of unskilled laborers" (p. 258), the reaction to his work is representative of the importance of time in industrial economies. He notes that, "time in short, was a commodity in the sense that money had become a commodity" (p. 197) and that, "mechanical periodicity took the place of organic and functional periodicity in every department of life where the usurpation was possible" (pp. 197-198). Quite naturally this concern for time and the speed of production became represented in business technology. In discussing the entrance of the typewriter into the business office, McLuhan (1964) observes that, "once any part of the economy feels a step-up in pace, the rest of the economy has to follow suit [and] soon, no business could be indifferent to the greatly increased pace set by the typewriter" (p. 262). Chesebro and Bertelsen (1996) argue that this pace has accelerated with the introduction of newer media technology, as do other scholars concerned with medium theory (cf. Meyrowitz, 1985, and Postman, 1990) and post-modernity (cf. Harvey, 1990). Further, while pace has accelerated, Kramer (1997) argues the use of time has condensed, or as Gebser ((1949 & 1953/1984) puts it, telescoped (p. 287), reflecting the perception of many people that there was not enough time in the day to accomplish needed tasks. Therefore, the following questions were asked:

14. A recent issue of *PC World* had an article entitled "How to do everything faster" (Spector, 2008, June), how important is it to have quick access to information?
15. Has the new demand for speed of communications impacted your life?[4]

Meyrowitz (1985) also argues that one important way to assess the impact of a new media is to examine "the relationship between situations and behavior" He contends that, "when the boundaries of situations change to include or exclude participants in new ways, situational definitions and behavior must change as well" (p. 333). Here he introduces the possibility of an alteration in space perspective as it relates to physical place. He states: "I argue that electronic media create new types of social situations that transcend physically defined social settings and have their own rules and role expectations" (p. 333). Chesebro (1984), Chesebro and Bertelsen (1996) and Turkle (1984) agree with Meyrowitz's assessment and argue that such new social organizations and situations currently exist on the Internet. Therefore the following questions were asked:

16. Recently I re-watched a PBS documentary on the founding of the Internet. In it Bill Gates compared a new Internet lifestyle with the older phone and car lifestyles. He noted that, like the older lifestyles, people will come to take for granted the use of the Internet as an aid for purchasing items, planning trips and solving everyday problems. (Segaller, Cringerly, and Gau, 1998). Do you share Gates' opinion about the importance of the Internet in people's everyday life?
17. How do you use the Internet?[5]

In her discussion concerning the development of issues surrounding the current Internet ecology, Grossman (1997) reflect the reading on the Internet what new friends have said concerning old topics and during conferences " is the nearest we come to time travel [with] the ability to see our friends and lovers as they were before we knew them" (p. 2). She quickly adds that this process has the potential for subtly altering our

perception of them. In order to assess the participant's opinions concerning the Internet's capacity to promote such time travel or time shifting and the possible social consequences of such actions, the following question was asked:

18. In one book discussing the issues raised by the Internet, the author noted that it had the capacity to allow time travel by enabling the user to examine previous records and writings of another person. How do you feel about this potential use of the Internet?

In order to explore the how the participant feels concerning the potential for space shifting (maintaining more than one presence) using the Internet, the following question was asked:

19. The documentary, mentioned previously, concludes with a statement by Bob Metcalfe, one of the developers of Xerox PARC's Ethernet and founder of 3Com, where he states that the most relevant function of the Internet is to create "tela-presence," or being at a place that you don't have to go to (Segaller, Cringerly, and Gau, 1998). Do you think that the Internet "connects" you to a larger world?[6]

In order to again an appreciation of how the participant uses the Internet and which modalities of Internet-based communication are popular with the group from which the participant was drawn, the following questions were asked:

20. Have you ever participated in an Internet chat room, a blog, or an on-line discussion?[7]
21. Do you have a lap-top computer?
22. If so, what features do you like the most?

Meyrowitz (1985) also discusses information-systems—"set patterns of access to information about others" (p. 333)—and their role in obtaining social information. He notes that, "control over knowledge and facts often interacts with control over social information by affecting who is authorized to play particular roles and have access to specific situations" (p. 333). Therefore the determination of roles, and/or functions, within the information system is important in order to establish both flow and availability. Marvin (1988) agrees with Meyrowitz, and she also agrees with Bijker (1987), Misa (1992), Bijker and Law (1997), and Hård and Jamison (1998) that new technology impacts the power relationship between groups and impacts the negotiation of authority, representation, and ultimately knowledge an assessment also shared by Postman (1993), and Mumford (1934/1963). This corresponds with Innis (1951/2003) assertion that the use of the dominant communication medium promotes one group over others allowing them to monopolize the distribution of knowledge which privileges their position. Innis additionally argues that new media can create new elites, a position acknowledged by Meyrowitz (1985), Marvin (1988), and Postman (1993). In other words, the adoption of a new medium will result in the creation of a new hierarchy of technological elites, based on their mystification of technological knowledge, or as Marvin notes, the creation of new technological literacy and social currency. As an example of the promise of the social currency that new media technologies produce, Louis Rossetto, the founding editor of *Wired* magazine, wrote the following for his 15th anniversary edition: "Those individuals/tribes/societies that are most connected to the larger world, as it really is, are most likely to survive and thrive—and move on to the

next level in the big game of life" (Rossetto, 2008, pp. 173-174). Noting these observations, the following questions were asked:

23. What do you think of those who do not have a computer?
24. What do you think of those who do not use the Internet?
25. Do you think that being connected is necessary for success?
26. Has the emergence of the Internet changed any of the skills need for employment?

Postman (1993) clarifies Innis' (1951/2003) observations concerning the establishment of new knowledge monopolies derived from new media technologies. He notes that "new technologies compete with old ones—for time, for attention, for money, and for prestige, but mostly for dominance of their world-view" (Postman, 1993, p. 16). Referring to this potentially new world-view, Postman observes:

> Our understanding of what is real is different. Which is another way of saying that embedded in every tool is an ideological bias, a predisposition to construct the world as one thing rather than another, to value one thing over another, to amplify one sense or skill or attitude more loudly than another. (p. 13)

This observation reflects one of the major tenants of medium theory and helps explain McLuhan (1964) and McLuhan and Fiore's (1967) statement that the medium is the message. As Postman (1993) points out, this famous phrase reflects media's role in determining user's world-view and also acknowledges Marx and Engels (1845/1972) reflection that technological media creates the "conditions of intercourse" (p. 150) and Wittgenstein's (1958/1965) notion that language is the driver of thought. Meyrowitz (1985), Innis (1951/2003), Postman (1993), and Mumford (1934/1963) all argue that the use of a new communication medium alters the way it users collect information and

impacts the way they process that information. Taking into considerations these observations, the following question was asked:

27. In a recent article in *The Atlantic*, the author made the argument that because of his constant use of the Internet as a quick source for information he now has difficulty reading, absorbing, and more importantly, interpreting long articles from both the web and in print (Carr, 2008). Do you find yourself in the same situation?

Although this study began by drawing several questions taken from Fischer's (1992) work, he also asserts that relying on a user model is not, by itself, completely adequate since "social and cultural conditions largely determine people's ends" (p. 17). Furthermore, he contends that "social and cultural conditions limit people's choices [and] people also choose within the constraints imposed by the distribution system of the technology" (pp. 17-18). Therefore, one additional question needs to be asked: "How did the collective use of a technology, and the collective response to it, alter social structure and culture?" (p. 21). Therefore it seemed appropriate to conclude this inquiry with a modification of Fischer's (1992) last question concerning the collective use of the personal computer and the Internet, and to paraphrase it to reflect the participant's personal opinion.

28. How did the personal computer and the use of the Internet alter the world around you?[8]

The interview concluded by asking the participant if they had anything they wish to add, thus allowing them to either more fully address issues that they thought important, clarify previous answers, sum-up their responses, or all three.

Data Interpretation

This study used techniques from oral history collection (Richie, 2003, and Brundage, 2008)) and grounded theory (Strauss and Corbin, 1998, and Charmaz, 2006) for the data analysis, looking for dominant themes and categories coming from interview data. The focus of the research questions were derived from inferences primarily made in medium theory. Methods used in oral history research were employed collecting extensive audio records of participant narratives, and the data was analyzed to clarify the introduction of new media and the place that these technologies now has in our culture.

In describing the core elements of oral history, Ritchie (2003) states: "Memory is the core of oral history, from which meaning can be extracted and preserved. Simply put, oral history collects memories and personal commentaries of historical significance through recorded interviews" (p. 19). Traditionally the reporting of most oral history interviews featured information drawn from prominent leaders; one important exception was Green's (1874/1899) account of history of the English people. This book attempted to shift the attention from "the historic elites to the mass of the population" (Brundage, 2008, p. 7), and was popular with both historians—for expanding the scope of history--and the public—for expanding their place in history. This focus on the place of the masses in history was also promoted by Hobsbawm (1984, 1987, and 1996) who examined the role of class in England and Lefebve (1947/1967, and 1989) who focused on role of rural people and the masses during the French revolution. In 1929 the journal *Annales d'historie èconomique et sociale* was founded in France, which leads to the development of the Annales school. "In the new school, the traditional concern with

events was replaced by a search for society's *mentalities*, the ways of life and the values that persisted despite major political and social upheavals" (Brundage, 2008, p. 11). This schools approach was best represented by Braudel (1949/1976); also see Burke (1990), and Darnton (1990). This history from below was expanded beginning in the 1960s and '70s, to include issues of race (cf. Ignatiev, 1996, Higginbotham, 1992, and Fields, 1982) and gender (cf. Schiebinger, 1989, Butler, 2004, and Scott, 1986)[9].

While discussing the major problem of interpretation of oral history interviews, Bloch (1953) notes that "the most naïve policeman knows that a witness should not always be taken at his word" (p. 10), therefore a good oral history project should attempt to record the memories of as many different people as possible. While the recollections of a single person only provides a single perspective, and can easily be subject to distortions, by interviewing widely, points of agreement sources can be uncovered. In addition, the complexity of the issues surrounding events can be more clearly understood. That is why Grele (2006) recommend that the oral historian "ask a wide variety of people to participate with them in that journey" (p. 91). That is also why the focus of this study is upon gaining information from representatives of many different professional and personal backgrounds.

The object of this oral history collection was to produce data that will support, refute, or clarify many of the theoretical observations concerning media technologies entrance and the role it plays in society (see Chapter 2). The first thirteen questions of the interview, as well as the last one, were designed to promote this effort. After gaining some background information concerning the participant's work and home ecologies prior to the introduction of the personal computer, information was solicited to gain

insight into how this medium entered into their everyday life, how it was used at work and at home, and how it affected the user's life. This information also helped to clarify Rogers (1995) observations concerning the diffusion of innovation, as well as interpretations forwarded by Mumford (1934/1963), Geddes (1915/1968), Toffler (1990), and Postman (1992) concerning the role of new media and technology in society. The responses to the questions concerning frustration and/or pressure associated with the use of this new medium, offered insight into the suppositions made by Mazlish (1993), Ong (1977), Bijker (1987), Bijker and Law (1997), and Hård (1993). The response to questions focusing on the use of the personal computer over time, were designed to gain information concerning both the adoption and adaption process of new media technology users.

Question thirteen (13) is designed to introduce the Internet into the above discussions and questions twenty one (22) and twenty two (22) were designed to include lap-top computer use. Several of the questions which focus on the historical use of the personal computer and the Internet were also designed to clarifying the observations made by Meyrowitz (1982 & 1985), Fulk and Collins-Jarvis (2001), and Rice and Gattiker (2001) concerning the impact of communication media on both communication patterns and the performance of social roles.

This study also sought to report on more than the historical period surrounding the introduction and adoption of a new technology. In fact good oral history requires an expanded approach. As Frisch (1990) points out the historical reporter "must digest essential material, a process that is more complex than mere compression" (p. 85), and this process also requires the removable of extraneous matter that fillers the narrative, and

does not necessarily represent a comprehensive expression of the event. He goes on to state:

> Doing something *with* oral history materials beyond collecting and cataloging them, necessarily involves substantial editorial intervention. The most elemental transcription and even indexing requires a range of important decisions about how the spoken material is to be represented, and how complex content is to be summarized or categorized. (p. 81)

In order to help expand this enquiry from only a discussion of the economic and cultural trends that surrounded the adoption of the personal computer and the Internet into the area of personal and social consequences, the study adapted tools used in the formulation of grounded theory. Like many of the newer studies using oral history, grounded theory hopes to gain reflections of world "from below." Although many scholars using grounded theory would agree with Geertz (1973/2000) that the explanation of culture and events within a culture must reflect and be grounded in the real life and the everyday world of the members of that culture, and would argue that the collection of ethnographic observations and participant's narratives need to adopt more precise tools for exploration.

In discussing the seminal articles concerning the foundations of grounded theory (cf. Glaser and Strauss, 1967, Glaser, 1978, Strauss, 1987, and Strauss and Corbin, 1990 & 1998), Charmaz (2006) contends that "they proposed that systematic qualitative analysis has its own logic and could generate theory." She also defines the key element that promotes such a systematic analysis. This is the "simultaneous involvement [of the researcher or research teams] in data collection and analysis." In other words, data

collection, analysis and theory building stand in a reciprocal relationship. This involvement includes the construction of analytic codes and categories and the constant comparison of incoming data with the objective of "advancing theory development during each step of data collection and analysis" (p. 5). The techniques include "memo-writing to elaborate categories, specify their prosperities, [and] define relationships between categories and identity gaps" (p. 6), sampling, and a review of the literature after analysis.

Although, as Glaser and Strauss (1967) insist that consulting the literature should only occur after data collection and an independent analysis is conducted, this insistence on this procedure has come into question, and even caused somewhat of a split between the two primary proponents of this method. Glaser (1978 & 1998) argues that objective neutrality must be preserved by following this step and allowing the data to dictate the outcome. While Strauss and Corbin (1998) stress the necessity for unbiased data collection, they also acknowledge that the respondent's views may conflict with that of the researcher, and therefore complete objectivity is problematic. Also, concerning the use of existing theory to form expectations concerning the interpretation of data, Glaser (1998) notes that in the second step of grounded theory development—theoretical coding—existing theory should be considered. He states: "It is necessary for the grounded theorist to know many theoretical codes in order to be sensitive to rendering explicitly the subtleties of the relationship in his data" (p. 72). Noting this observation, Charmaz (2006) asks: "How do we know these codes if they have not become part of our repertoire? And if they have, would we not know something of the major works from which they are derived? (p. 165). The logical question then becomes can existing theory

serve as an aid in formulating the first part of the research design, the selection of research questions? Easterby-Smith et al. (1990) seem to answer yes, contending that "evidence is interpreted in order to provide good answers to the basic research question[s]" (p. 21)[10]. These questions should come from what Strauss and Corbin (1990) term the "technical literature," or a literature review of the general problem under consideration (p. 52). Further, as Charmaz (2006) notes "grounded theory methods can complement other approaches to qualitative data analysis, rather than stand in opposition to them" (p. 9), and that existing theories, coming from a literature review, should be used to analyze relevant data in relation on one's research problem (p. 168). She recommends that the researcher should "consider treating extant concepts as problematic and then look for the extent to which their characteristics are lived and understood (p. 166).

For the purpose of this study, expectations drawn from existing theory aided in the establishment of categories which formed the basis for the studies research questions. The usefulness of this tool can be seen by examining the description of analytical categories advanced by Corbin and Strauss (1990). They observe:

> Categories are higher in level and more abstract than the concepts they represent. They are generated through the same analytic process of making comparisons to highlight similarities and differences that is used to produce lower level concepts. Categories are the "cornerstones" of developing theory. They provide the means by which the theory can be integrated. (p. 7)

In addition to the historical category discussed above, additional categories needed to be examined, and these were based on expectations drawn from medium theory, and helped form several research questions.

Based on the concepts developed by Husserl (1949 & 1913/1975), Heidegger (1927/1996), Nietzsche (1887/1974), Mumford (1934/1963), Gebser (1949 & 1953/1984), Hall (1966 & 1983), and observations made by McLuhan (1962/1965), McLuhan and Fiore (1967/1996), Meyrowitz (1985), Innis (1950/1972 & 1951/2003), Giedion (1962), Chesebro (1984), Ong (1982/2003), Chesebro and Bertelsen (1996), Postman (1990), Harvey (1990), Kramer (1997), and Kern (1983/2003) the following research question will be explored: R1—How has the sense of time and space changed with the use of this new medium, the Internet?

This category needs to be broken down into two separate sub-categories. The first constitutes S_1: How has the user's sense of space (distance) changed through the use of the personal computer and the Internet? To gain insight into this research question, the responses to the questions dealing with Internet usage, Internet lifestyle, Internet presence, the questions seeking information about the participant's opinion concerning people who do not use the Interne, and questions which ask if success now requires being connected to the Internet, were examined.

The second sub-category focuses on the following research question: S_2: How has the user's sense of time changed with the use of the personal computer and the Internet? The responses to several questions were designed to gain insight into this topic. These included the questions dealing with speed of communication in today's media ecology,

the question dealing with the user's opinion concerning the possibility of time travel into the past by use of the Internet.

In addition to these two sub-categories, a third subcategory, which reflects the time dimension, was examined: S3—How has the speed of receiving information on the Internet influenced the way people gain knowledge and has this process of information acquisition impacted mental processing? This category reflects the observations made by McLuhan (1964), McLuhan and Fiore (1967), Postman (1990), Gebser (1949 & 1953/1984), Meyrowitz (1985), Innis (1950/1972 & 1951/2003), Chesebro (1984), and Ong (1982/2003), that the use of a medium privileges both the method in which knowledge is gained, and those who master that medium. Several questions were asked in pursuit of some insight into this category. These include the question dealing with how people gain information on the Internet, the questions dealing with Internet usage, the questions which seek the participant's opinions concerning people who use and do not use the Internet and the personal computer; and finally the question that asks for information regarding reading, and absorbing and interpretation of information in today's media ecology.

Based on explanations offered by Innis (1951/2003), Postman (1993), Meyrowitz (1985), and Wittgenstein (1958/1965) concerning the ability of language and media technology to drive to human thought, the following research question was also examined: R2—How has the meaning of conversation changed with the use of Internet-based forms of communication? The study was designed to use the data collected based in the response to the questions concerning an "Internet lifestyle," Internet usage,

Internet communication, and those questions concerning changes fostered by personal computer and Internet usage, to obtain insight into this research question.

The last primary research question that was framed was R3: How has the meaning of relationships, like friendship, changed with the Internet. The expectation that such a change will occur was drawn from Meyrowitz (1982 & 1985), Chesebro (1984), Chesebro and Bertelsen (1996), Turkle (1984) and Postman (1990). Questions focusing on interpersonal communication practices at work; Internet relationships; and questions inquiring into the opinions about people's personal computer and Internet usage, were designed to address this research question.

Many of the questions in this survey had the potential of rendering data that could be applied to more than one of these research questions and sub-questions, as well as to the history category. This was dependent on how the participant responded.

In the data analysis phase of constructing a grounded theory, it is important to remember that constant comparison is the heart of the process. Here one begins by comparing interviews. This is an on-going process where the researcher constantly codes the data presented in the interview. The first step requires open coding where labeling and categorizing of the data occurs. The product of this process is the development of the concepts that serve as the basic building blocks of a theory. Corbin and Strauss (1990) sum up this process noting that "the incidents, events, happenings are taken as, or analyzed as, potential indicators of phenomena, which are thereby given conceptual labels" (p. 7).

Two further types of coding should also occur during this process. The first is axial coding, where sub-categories are put together with the hope of making connections

between a category and these sub-categories. The second is selective coding where the categories are integrated in the hope of developing an initial theoretical framework. Here a linkage is proposed and the data is used for validation.

At this stage memo writing is encouraged. There are three basic types of memos that can be used in analysis and the first two relate to the coding procedure. As the name implies, code memos reflect open coding decisions and focus on conceptual labeling. The second is theoretical memos which relate to axial and selective coding decisions and focus on paradigm or theoretical construction features. Finally, there are operational memos dealing with the evolving research design.

In order to facilitate the coding process and to organize the data contained in the transcripts, the computer program NVivo 8 was employed, for as Lee and Fielding (1991) point out, “there has been considerable progress in the analysis of qualitative data using a variety of specially written computer programs” (p. 1). The principal advantage of using a program is that it simplifies the organizational aspects of transcript comparison and speeds up data analysis without sacrificing the flexibility needed to encourage creative theory building. This program allowed the researcher to import, and sort files, which facilitates coding and memo writing, by allowing for the creation of links that attach research observations and themes together. On the conceptual level the program also aids in framework building, by similarly linking evidence into interrelated concepts and categories showing all the information relating to a theme on the computer screen. This allowed the researcher to quickly evaluate evidence, and determine if it supports or rejects an assumption. NVivo also allows for queries to be saved and rerun, making it possible to track the results over time.

Although this computer program can facilitate the research program, as Tesch (1991) points out:

> The thinking, judging, deciding, interpreting, etc., are still done by the researcher. The computer does not make conceptual decisions, such as which words or themes are important to focus on, or which analytical step to take next. These analytical tasks are still left entirely to the researcher. (pp. 25-26)

The last step in forming a grounded theory is linking the emerging theory with the extant literature and focusing on what is similar, what is different and explaining why. Eisenhardt (1989) also points out:

> Overall, tying the emergent theory to existing literature enhances the internal validity, generalizability, and theoretical level of the theory building from case study research ... because the findings often rest on a very limited number of cases. (p. 545).

In addition to the arguments addressing reliability and validity already mentioned in the section focusing on the qualitative enquiry and the interview, Pandit (1996) addresses the same issues with respect to the logic of grounded theory research. He states:

> Briefly, construct validity is enhanced by establishing clearly specified operational procedures. Internal validity is enhanced by establishing causal relationships whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships. In this sense, internal validity addresses the credibility or "truth value" of the study's findings. External validity requires establishing clearly the domain to which the study's findings can be generalized.

> … Finally, reliability requires demonstrating that the operations of a study-- such as data collection procedures--can be repeated with the same results. (p. 2).

The logic of grounded theory also maintains that the process must be rigorously responsive to the data collection situation, and is driven by the data collected. Ultimately the final shape of the theory needs to provide a good fit to the situation. Further, as stated above the date collection must be repeatable, and the results must demonstrate consistency over time. The advantage of this research tool was that it allowed the researcher to watch themes emerge.

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[1] During the solicitation process for the pre-testing interviews, it was mentioned that the researcher would also like to obtain feedback concerning the interview process itself, and the questions used to obtain information. When the initial interview was completed, the researcher turned off the tape recorder, and invited the participant to comment on these aspects of the interview. Several participants felt that it would have been desirable to allow them to recall their former working and living conditions prior to the first question. Although it had been hoped that such a recall would have been facilitated during the solitation process itself, it was decided to add an introductory question about their background before the personal computer was first introduced into their company, and home. During this pre-testing process several word choices were also discussed, with the participants who desired more clarity, and changes were made to two questions that appeared troublesome. The questions that now appear in this chapter reflect these changes.

[2] The nature of an open-ended interview process encourages the participant to elaborate and expand on the initial answer. However if such elaboration and/or expansion were not

forthcoming follow up questions might be necessary. In this case, such a follow up question was: If so, when and why?

[3] In this series of questions, dealing with the impact of communication media on both communication patterns and the performance of social roles, the primary follow up question was to ask the participants to describe any changes if they did not choose to elaborate on them initially.

[4] Again, depending on the response, the follow up question was: If so, in what ways, and what do you attribute this change to?

[5] Again, depending on the participants' responses to the initial question concerning their Internet usage, one or more of the following questions were asked: With the advent of Internet have you noticed any changes in interpersonal communication practices within your friendship network? If so, please describe these changes. With the advent of the Internet have you noticed any changes in interpersonal communication practices of your family members? If so, please describe these changes. These questions were also linked to the preceding questions that were concerned with potentially changing communication patterns and the performance of social roles.

[6] If the participant acknowledged that they feel "connected" to a larger world, a potential follow up questions was how has this "connection" impacted their life?, and why?

[7] If the participants acknowledged that have participated in chat room, a blog, or an on-line discussion, the following questions were: What has been the tone of these exchanges, and compared to face-to-face communications, were there different rules governing the interaction?

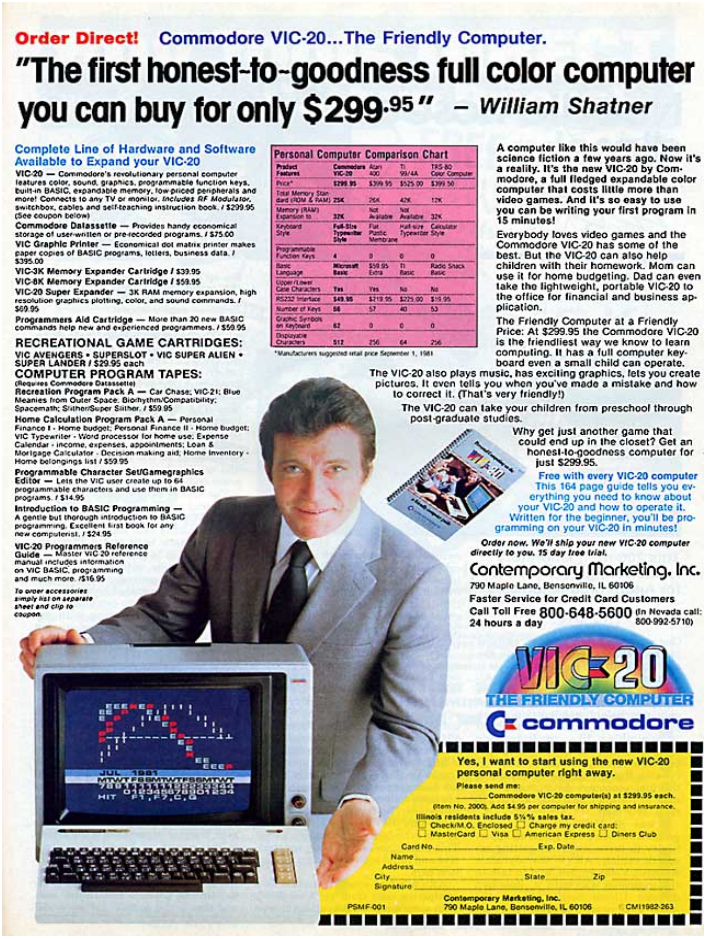
[8] Although some useful information was gathered—mainly in terms of clarification of responses to previously asked questions—this question proved to be the least productive in terms of engaging the participants. Many of the answers ranged from "it has changed everything" without elaboration (Participant 11, personal conversation, February 12, 2009) to one academic, humorously asking if the research would like him to write his dissertation, and mentioning that Internet usage was a continuation of usage patterns introduced by television (Participant 29, personal conversation, March 14, 2009).

[9] Although not a practitioner of the collection of oral history, some acknowledgement needs to be given to Havelock, whose work on oral history and classical studies, developed the thesis that man Western intellectual concepts and attitudes were influenced by the shift from oral to written communication (cf. Havelock, 1982, & 1986 and Havelock and Hershbell, 1978). This provided another historical grounding for medium theory. Since he was associated with the University of Toronto, was aware of the works of Harold Innis, and Marshall McLuhan, two former University of Toronto scholars.

[10] In an attempt to promote their method to the scholarly audience at the time, Glaser and Strauss (1967), the sociologists that first proposed the grounded theory method, expressed their belief that this method would support hypothesis formulation, although this practice is more commonly associated with testing existing theory. However, most current scholars have replaced the term hypothesis with proposition, agreeing with Whetten (1989) that propositions involve developing conceptual relationships while hypotheses require the measurement of relationships.

Chapter 6

The Personal Computer: Introduction and Use



A. It is generally accepted that the first personal computer was the Altair 8800. The demand for the Altar was primarily limited to hobbyists, as the computer had to be assembled from a kit, and those few people who saw the potential for a personal computer. The limitation of the Altair was in its programming capabilities. Like all computers, its internal operation is based on the conversion of a binary system translating 1 and 0 into commands, and to program the Altair required a lengthy process of flipping switches. If the programmer made a mistake the process had to begin again. At this point Paul Allen and Bill Gates—the eventual founders of Microsoft—entered the picture.

They produced a paper tape program that allowed the Altar to accept the BASIC computer language—a language that had evolved in an attempt to make mainframe computers easier to program (Cringely, 1992 & 1996). The keyboard was added as an additional vehicle to facilitate programming. Its inclusion probably owes much to the Homebrew Computer Club. Operating out of the Bay Area of California, its members were interested in creating a workable computer. The structure of the club was informal with each member freely sharing his or her latest developments, and several modifications were presented at meetings (Roszak, 1969, 1985, & 1986; Lash, 2003 and Levy, 2001). Two of these modifications, the screen and the keyboard, were first incorporated into a practical product by two of the members, Steve Wozniak and Steve Jobs, in their development of the Apple 1 (Wozniak, 2004).[1]

The evolution of the personal computer was very rapid after the introduction of the Apple 1. Wozniak and Jobs quickly formed a company and refined their first product, creating additional capacity, and incorporating a "user friendly" design. They developed the Apple II, and its sales quickly proved that there was a demand for personal computers in the market (Wozniak, 2004; and Miranda, 2002). Noting this development, IBM, the largest mainframe computer manufacturer in the nation, decided to enter the personal computer market. Because of the company's reputation and experience in the computer field, IBM's entrance into the market made the personal computer acceptable to business (Fishman, 1981).

The advertisement for the Commodore VIC-20 shown above, demonstrates several features that Commodore felt would be attractive to consumers and promote potential sales. First, the ad featured William Shatner, a well known actor who was

associated with the popular television series *Star Trek*, thus linking the product with both his celebrity, and the implied progressive, and exciting, future promised by his program. Second, Shatner promises "The first honest-to-goodness full color computer you can buy for only $299.95," thus offering a futuristic product at a reasonable price. Third, the advertisement promises (in bold letters) a number of "recreational game cartridges." These two points are linked together toward the end of the ad, when it asks the potential consumer, "Why get just another game that could end up in the closet?" And it provides the following answer: "Get an honest-to-goodness computer for just $299.95" (Commodore VIC-20, 1982). Rather than identify the machine with business professionals, this product's promoters appealed to a more downscale "non-business" consumer. However, the personal computer industry was already seeing the advantage of expanding this market, and targeted the majority of its advertising to the more profitable and diverse commercial and educational market.

As outlined in the previous chapter, this study focuses on participants who represented this desired market. This study found that many of the people interviewed did find that the game functions offered by the personal computer were, and still are, a factor in their enjoyment of the device, as the above advertisement forecasts. Also as the advertisement anticipated, the cost of the machine would drive the sales of the personal computer. However, the initial motivation for introducing the personal computer into the professional workplace was as an aid to business operations. This chapter will look at the uses that consumers found for this new technology**.** However, before proceeding to an examination of this adopting process, is important to gain some insight into the workplace that this technology entered, as related by the participant's shared life stories.

The Pre-Personal Computer Workplace

Prior to the introduction of the personal computer, the principal instrument for composing documents was the typewriter. Several people noted that when using the typewriter it was easy to make mistakes, and not so easy to correct them. More importantly, the entire process was time consuming. As one participant stated:

> I would type maybe twenty letters per day. If you made mistakes you would have to go back and use the typewriter eraser, or whatever. Then you would have to look at it, and proof it to make sure it was correct. (Participant 1, personal conversation, June 13, 2008)

Although this person indicated that carbon paper and Xerox copies were sometime used to produce internal duplicates, she stressed that most letters required a professional appearance, and therefore necessitated typing. She complained that the work was both time consuming and repetitive. She also mentioned that these problems were somewhat alleviated when the traditional and popular IBM Selectric was replaced with the IBM Memory typewriter.

Another function which drew people to the personal computer was its capacity to aid in the analyses of data. This was particularly true of persons engaged in engineering, architecture and construction science, accounting, and the academy. Like the preparation of documentations, data analysis was repetitive, time consuming, and, as such, often resulted in the production of errors. At this time many professionals and academics were using a mainframe computer for their data analysis; however, this practice also presented problems. As an example, one retired academic related a story that describes the

frustration associated with the use of a mainframe computer, and the punch cards needed to produce results. He stated:

> You would have a stack of cards to program the computer, and have to wait in line to run your cards, [and] if there was a mistake, or a card was bent or misshapen, the program didn't work. … If you had one mistake, you would have to go back and retype the card, and start all over again. I would have to run it at midnight. I would program all day, go home for a few hours, return later that night, go back home, get up in the morning to get the results, and hope that I didn't make a mistake. If I did, it was a wasted day—a whole day was gone. (Participant 3, personal conversation, October 8, 2008)

This was a common experience and repeated by many participants who used mainframe computers to evaluate their data. The above academic quickly added that "now it takes about ten seconds on a PC, and if I make a mistake, I know it right away and fix it" (Participant 3, personal conversation, October 8, 2008). This reflection was also commonly repeated.

Many people who were interviewed also indicated that the fourth function that drew them to the personal computer was its ability to save and store information. This function first became evident with the introduction of computers with 10-inch floppy discs. Although the use of these machines was limited, only being setup in a very small number of workstations, the advantages of saving and storing information prompted many people to desire such a function. Further, several participants related that a great deal of time was used to file, retrieve, and hunt down misplaced paperwork before the personal computer became a common tool on every work desk.

As the advertisement predicted, the last element that influenced an individual's decision to acquire a personal computer was ultimately its increased affordability. Many participants related that they were aware of the personal computer because of news stories, and promotions and advertisements by the industry. However they also agreed with Rogers (1995) and Granovetter's (1973) assessment that homogeneity and proximity are important elements in the process of innovation, since much of the information gained about computer use came through conversations with friends and fellow workers. Although some did acknowledge that they knew, and were influenced by, people that Rogers (1995) would term innovators, they also maintained that this influence was limited to the creation of expectations concerning the use of the personal computer and that it was not until the personal computer lowered its product price that they decided to acquire one. They also reported that the gatekeeper role of the innovators, that Rogers describes, was also minimized in their workforce. Again, it was the expectation of a more efficient workplace that prompted many managers and administrators to seek knowledge of personal computer use, and innovators aided this process, but it was not until the price point came down that positive procurement decisions were made.

None of the people interviewed identified themselves as innovators, per Rogers (1995) first category of people adopting new technology, although, several participants did identify themselves as early adopters. This was especially true of academics, and particularly so for academics dealing with statistical analysis, as one participant stated: "I could see that it was going to save a lot of time" (Participant 16, personal communication, February 24, 2009). The majority of the people interviewed, however, fall into Rogers' (1995) larger descriptive categories of early or late majority.

Although interest in the personal computer was increasing, many problems remained to be solved before the personal computer would become a standard part of people's work and home ecologies. These problems became evident as people transitioned from their pre-computer workplaces to one where the personal computer became standard.

Transition to Personal Computers

The first of these problems became evident with the introduction of the early mini-computers. They were bulky, and required many steps to program that were easily lost when the machine was turned off. This was partially solved by future products, such as the Wayne Computer, which one participant described as "a phenomenal thing," because it would accept around 256 instructions (Participant 9, personal communication, February 9, 2009). However, the problem of bulk still remained, and even affected the machine's support equipment, and one participant commented that the early printers were as big as his desk (Participant 3, personal conversation, October 8, 2008).

Another problem was the need to know complicated programming languages, and once programmed, information was easily lost. Also, the machines had to be booted up using a disc, and would often crash. As an example, in a statement that somewhat supports both Heilbroner's (1967/1994) contention that technological change imposes new patterns of use, and Oudshoorn and Pinch's (2005) observation that users adapt to new technology and use it for their own purposes, one participant stated that he "learned to write chapters in twenty pages because they [the computers] would often times crash" (Participant 14, personal conversation, February 17, 2009).

This problem was addressed by Olivetti, and its magnetic card for saving information, and more directly by the development of equipment that incorporated the floppy disc. However the use of the floppy disc also presented problems. While information could be saved, secretaries still had to print a copy, review it, and clean it up before it could be distributed. Other organizations would simply transfer the document to a floppy disc and hand the disc out, thus adding another layer of paper work, with the disc itself replacing the printed document.

These problems were solved with the development of the hard drive. One participant, who was engaged in early information management, described this transition in the following manner: “When everything was primarily a DOS application, you would have to program the computer, even for the simplest applications. The hard drive was the first step in making the machine more accessible and useful” (Participant 11, personal conversation, February 12, 2009). As this participant also noted, the incorporation of a hard drive into the computer also alleviated the necessity of knowing the computer’s programming language, because many applications which had previously required a separate program were incorporated into the standard program package.

The last innovation that aided in the decision to purchase personal computers was the development of software packages designed for specific markets and users. Many of the participants agreed with Pinch (2005) and Schot and de la Bruhèze (2005) that the software developers—through either their sales force or through mediation—reached out to consumers, and provided tools that helped these consumers adapt their computers to address their specific needs.

Although many of the early problems were overcome in a relatively quick manner, the decision to purchase a personal computer still depended on the user's actual needs in terms of how this new tool allowed them to perform their tasks easier, and the perceived needs of the manager, who saw this new technology as a tool that would make their workforce more efficient. The next section will examine these two dimensions of choice and why the participants in this study decided to use the personal computer.

Why Users Opted for the Personal Computer

Although one retired university administrator, and professor, stated that both he and his wife, a public school teacher, were initially interested in the personal computer "for the novelty of it, at first we were curious" (Participant 20, personal conversation, March 9, 2009), the vast majority of the participants indicated that professional considerations motivated their interest. This section will examine the motivation for users occupying several professional categories. It will look at the professional groupings outlined in the previous chapter, concerning the selection of participants for this study. This section will begin with academics and the students who were attending college during the initial introductory period, and move to professional business groups, and their office workers.

Looking at university students and academics who decided to use the personal computer around the period of its introduction there were several considerations that prompted their decision to use a personal computer, and these considerations somewhat reflected their place in the academy.

Possibly casting an eye toward their future, as well as reflecting the state of early computer development, some students decided to use the personal computer in order to

help them learn software and programming languages. However, a great many students initially began to use the personal computer to play games, with word processing, spreadsheet capacities, and data analysis functions becoming important latter. During their college years they identified their use as being primarily for word processing. However, one of the principal reasons that students began using personal computers can be directly linked to a decision by the computer manufactures themselves. As one student, and future professor, remembered: “I didn’t touch a computer until ’88 when the labs at the university were being funded by both Mac and IBM—they were trying to put their machines in the hands of students and get them hooked early” (Participant 9, personal communication, February 10, 2009)

The importance of word processing was mentioned first by academics, although for a large number, statistical analysis was a close second. As one professor said, “you could get the results back almost instantaneously” (Participant 10, personal conversation, February 9, 2009). For those people engaged in teaching, in both university and public school settings, class record keeping—spreadsheets—was also an important consideration. Furthermore, as individuals became more familiar with computer programs, many teachers relied on the graphics features for their in-class presentations, and the use of computer graphics was accelerated when Power Point was developed.

The response to the introduction of the personal computer by office personal and working professionals was, to a large extent, dictated by their pre-computer experiences. Many participants remembered the repetitious and time consuming practices fostered by the use of the typewriter, and the personal computer was seen as a tool that could alleviate these problems. This sentiment was summed up by a female manager, who

entered the workforce as a secretary/typist. She reflected that she was happy to switch to the personal computer because she thought that it would "make my life easier and it did" (Participant 2, personal conversation, October 15, 2008). For managers, the principal motivation was increased efficiency, both in terms of productivity and staff flexibility. As with people engaged in academic pursuits, business professionals at first saw the advantages of the word processing function; however this was quickly followed by the adoption of software designed for spreadsheet use, scheduling, estimating, and contract management applications, as well as programs designed to aid in visual presentations. In terms of staff flexibility, one business professional expressed the feelings of many other managers, although one probably not envisioned by them at the time of adoption, when he stated:

> One thing that I think is noticeable is that the technology has been embraced. What has happened is that multiple people know how to use the software rather than [just] the technology expert. The ability to use the technology effectively has changed [this] organization, [as] the departments know each other's applications, and the vendors are more efficient, and there is more selection. Every element within the industry had grown-up and adopted the software. (Participant 22, personal conversation, March 11, 2009)

Because the personal computer and many of the applications associated with it have been so widely embraced and accepted people can be moved around from department to department with minimal training. The knowledge of how to use one application has become easily transferable to other applications.

Although the personal computer was perceived to offer its users many advantages at the time of its introduction, its ultimate inclusion into the workplace was based on bottom line results—the cost of the system and the cost of the personnel using the older systems. A professional accountant reflected both of these concerns when he described his adoption of the personal computer. He related:

> Once the price of the computer went where it was economical for me as an individual, and when they developed laser printers that would print the forms, rather than use pre-printed forms, it became feasible for me to work with it, and not have additional personnel to operate that system. (Participant 5, personal conversation, January 13, 2009)

As the use of the personal computer grew at work, its use also began to grow at home. One participant described the situation that motivated her decision to bring the personal computer home, stating: “We were changing over from typewriters to computers in my job, and my children were experiencing computer use at their schools” (Participant 2, personal conversation, October 15, 2008). Although there were a number of other factors which encouraged people to bring the personal computer home, two factors stand out: the computer was becoming part of their everyday work experience, and they were becoming more and more comfortable using it. Aside from uses already mentioned, and those associated with the Internet, the personal computer was used as an organizer, to keep track of personal finances, and as a filing cabinet with wills and other important information being stored on it, as well as a recreational, and learning, tool.

Although knowledge of how to use of the personal computer is now expected, and to a great extent, taken for granted, the initial use of the machine did require training, and

did create a certain amount of frustration. The next section will examine this initial frustration and causes, as well as discussing the human-machine interface.

Frustration and the Adaption of the Personal Computer

As pointed out earlier, the cause of much of the initial frustration associated with computer usage was due problems with the computer itself, such as the vast number of steps needed for operation. As the machine became more refined and entered into the workplace, many participants revealed that they became frustrated because of the pressure they felt to learn new applications and programs. With the increased use of the personal computer, this situation dissipated. However, for many the fear of the learning curve was replaced by the fear of data loss, and a large number of the participants indicated that they used a number of data back-up devices in order to protect their work. Although not rising to the level of the fear associated with data loss, many people expressed a level of frustration concerning the propensity of software suppliers to change programs, and applications, simply for the sake of change, and not for any good or useful reason. As an example, while many participants indicated that learning to use new applications was less difficult after their initial experience, a larger number expressed frustration with having to continuously re-learn old applications because of these changed programs. Also, many participants were concerned with finding the correct computer applications for the actions that they need to perform. One participant expressed this frustration in the following way:

> I know what I want to do, and I know that there is something out there, a new application that can assist me. But a lot of the times I find that this application can do this one thing, and another application can do something else, I want to do, but

neither application can do everything. (Participant 13, personal conversation, February 13, 2009)

When examining the responses concerning the human-machine interface, the results were somewhat mixed. One participant did directed mention that he shared Joy's (2000) concern that today's humans were becoming a problematic species because of advances in robotics, genetic engineering, and nanotech technologies—all technological advances associated with computer development. However, most of the participants expressed more practical concerning regarding the human-machine interface indicating there were physical problems. These problems included visual strain and headaches coming from working on computer screens, and hand, wrist, and back problems emanating from continuous computer usage. Yet, many participants did reveal other sources of frustration that can be associated with the human-computer interface. The most common fear was of being perceived as being technically challenged, and relegated to a second class status position by their peers. Related to this was fear that they did not have enough knowledge of the vocabulary and jargon need to describe computer problems and gain help. This was a common problem during the introductory period, when it came to learning a new application, or remembering what they did to correct an old problem, or when they found themselves in a hurry. While many participants did express the feeling that help was readily available, almost all expressed frustration with the time needed to solve a problem, either over the Internet, or through automated telephone messaging. When they found themselves in this situation, many participants also expressed frustration for being placed in a subordinate position to the machines that were designed to aid them.

The responses to the participants also did indicate a possibility for disjuncture. There does appear to be an underlying distrust of electric technology, including questioning the long-term advantages of using the machines. These concerns fell into three categories. The first revolves around ethical concerns about the explosion of genetic engineering, artificial intelligence and nanotech technologies (see Joy, 2000). Participants who fell into the second category, expressed concern about the use of the personal computer and the Internet is affecting personal relationships, family time, and communication practices. Almost everyone interviewed fell into the third category, and expressed concern that the use of new Internet-based technology is growing and wondered if their use could even be limited. Although theses expressions of distrust and concern were generally took the form of asides or humorous reflections, they were still under the surface.

Further, although most participants do not share Mazlish's (1993) observation that contemporary people are undergoing a fourth discontinuity—a shock to the human ego where their superiority to their machines is becoming problematic—many are concerned about the speed that is now demanded in our everyday lives. One academic noted that it has become more and more difficult to "achieve a balance between the 24/7 world and one's private and personal life" (Participant 14, personal conversation, February 17, 2009). This sentiment was expressed by a large number of other people in both the academic and professional communities.

Concluding Summary and Discussion

The participants in this study recalled that the personal computer was introduced when their work tools functioned with questionable efficiency, and more often than not,

contributed to making tasks more repetitive, time consuming, and often resulted in the production of errors. This study also shows that it was the expectation of a more efficient work place that prompted many managers, and administrators, to seek knowledge of personal computer use. And, when software designed to aid in the specific applications that the consumers wanted, became a part of the personal computer product, interest increased. Initially many people saw the advantages of the word processing function. Although this was an important aspect for people engaged in academic pursuits, the data analysis capability was also a motivating factor in personal computer use. For business professionals, the perceived utility of the word processing function was quickly followed by the realization that other applications, such as spread sheets, and programs designed to aid in visual presentations, could be just as useful. The study supported Oudshoorn and Pinch's (2005) insistence that end-product users' input into necessary functions and applications is an important ingredient in both the acceptance and ultimate success of a product. It also confirmed Pinch's (2005) assertion that the sales force, through their discussions with users and feedback to the manufactures, can produce needed product refinements. There was also confirmation of Schot and de la Bruhèze's (2005) assertion that internal mediation, based on consumer complaints, can produce product change.

Cost was also a consideration in the decision to adopt the personal computer. For business operations, it became a contest between the costs of the system verses the cost of the added personal needed to do the work using the older systems. For the academic market, it became the cost of the system versus the increased time needed to perform the older operations.

The study also confirms Rogers' (1995) observation that the early adopters occupied the most important position in forming the necessary momentum to acquire new technology. Further, as he also points out, this is because they already earned the respect of other members of the organization. The study also shows that innovators only aid this process by supplying technical knowledge to both the early adopter, and the managers responsible for making the procurement decision. The study also confirms Rogers' (1995) assertion that the early majority users are deliberate in the decision to adopt a new innovation, and the late majority members are skeptical and adopted the personal computer only "after the average member of a system" (p. 284).

Although a great many of the statements gathered through the interview process provided insight into the historical use and acceptance of the personal computer, one statement stand out for its implications concerning the acceptance and use of this tool, as well as the adaptability its users. This observation was made by one participant when he discussed the early use of the personal computer, and that fact that they had a tendency to crash. He stated that he "learned to write chapters in twenty pages because they [the computers] would often time crash" (Personal conversation, February 17, 2009). The statement seems to indicate a possible contradiction between a technological determinist position and one that grants the user a higher degree of agency. Is he implying, like Heilbroner (1967/1994), that technological change imposes new patterns of use upon those that employ new technological devises, or is he agreeing with Oudshoorn and Pinch's (2005) contention that users adapt to new technology, and use it for their own purposes. Since there was not a follow-up question concerning this potential contradiction, it is difficult to gauge his exact position concerning technological

determinism. Rather than speculating if either of these polar positions helped to form his observation, it might be more useful, and possibly more accurate, to predict a meaning closer to Nye's (2006) line of reasoning. Nye argues that "rather than assuming that technologies are deterministic; it appears more reasonable to assume that cultural choices shape their uses" (p. 21). He asserts that we use technology to shape our world, yet our agency with regard to our technological choices is somewhat limited. Secondly, he maintains: "Far from being deterministic, technologies are unpredictable. A fundamentally new invention often has no immediate impact; people need time to find out how they want to use it" (p. 47). Since personal computer (and Internet) usage has entered into our popular culture, it might be well to remember Fiske's (1989) assertion that the people who determine what falls within the parameters of popular culture, live in the culture of everyday life where, as Certeau (1984) maintains, they make do with what they have, and that everyday life is the art of making do.

Although the personal computer has become accepted, and embraced, by the majority of Americans, its introduction did run into problems. Initially the both the personal computer and its support equipment were bulky and complicated to operate. However, for whatever reason—either through their own experience; or their acceptance of the notion, fostered by our popular culture, that technology promotes progress; or their fear that they might be identified as technologically challenged—most of the participants in this study felt that the problems associated with using the personal computer were similar to those associated with learning anything new. Further, as the technology improved and people became more familiar with its operation, many of the problems diminished, but some level of concern remains.

With regard to potential problems resulting from the machine-human interface, this study shows that most people reject Mazlish's (1993) assumption that humans are undergoing an identity crisis because new technology is producing machines that function in a superior fashion to humans. Those few people who did express concerns that peripherally touched on Mazlish's observation seemed to relegate these concerns to a secondary level. To understand this reaction one can turn to Mumford (1934/1963) and his distinction between a tool and a machine. Mumford notes that both were developed in an "attempt to modify the environment in such a way as to fortify and sustain the human organism" (p. 10), and articulate the human desire to exert control over nature. He goes on to observe that "the essential distinction between a machine and a tool lies in the degree of independence in the operation from the skill and motive power of the operator: the tool lends itself to manipulation, the machine to automatic action" (p. 10). This study indicates that most people think of the personal computer as a tool.

Although most people approach the personal computer (and the Internet) as a tool which they could manipulate, the study did show that people do have concerns about communication practices fostered by personal computer and Internet usage. The study also shows that people have concerns about personal relationships, family time, and Internet usage. While the study rejects Mazlish's (1993) concern about human-machine identity transference, it dose confirm his speculation that machine use can influence human cognitive processing, and many people did express such feelings relating to the use of the personal computer and the Internet. Many also seem to embrace the observation made by Ong (1977), who maintains that because of the speed at which

knowledge is disseminated by new media, the use of that new medium will "change man's feelings for what knowledge is and what actuality is" (p. 4).

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[1] See Markoff (2005) for an appraisal of the countercultures role in the formation of Apple and early computer development, also see Turner (2006) for an assessment of counterculture icon Stewart Brand's role in the development of the Internet, For a counter narrative, see Sturgeon (2002) examination of the economic culture of Silicon Valley that promoted the development of the personal computer and Saxenian's (1994) comparison of the development occurring around MIT and the East Coast with Silicon Valley.

Chapter 7

The Development and Use of the Internet and the Drive for Portability and Mobility

The above picture is a publicity still of Miranda Cosgrove promoting both her role as Carly Shay in Nickelodeon's popular teenage situation comedy, *iCarly*, and a music CD featuring the actress and "inspired by the hit TV show" (Cosgrove Images, 2009). This representation is included in the introduction of this chapter to demonstrate the extent to which the Internet has placed itself in our current media and social ecology. The television show, that stars Cosgrove, revolves around Carly and her best friends

Samantha “Sam” Puckett (Jennette McCurdy) and Freddie Benson (Nathan Kress). These friends are linked because of proximity—they all go to the same school, and Carly and Freddie live next door to each other with Sam, the product of a rather dysfunctional family, spending most of her free time at Carly’s apartment—and their joint participation in a web show. Although the plots do present potential teenage problems, like trouble and grades at school, dating and one’s first kiss, and parental and social tribulations, the show is driven by circumstances involved in the production of the protagonist’s web show. The importance of the Internet is continuously acknowledged throughout the television show, and the young viewers are expected to understand both the technology and the jargon related to it. This is a realistic expectation according to several parents interviewed for this study who mentioned the popularity of this show among their younger children. The show also promotes a new visual language that is associated with Internet usage. The traditional fade to black format designed to let the viewer know that a scene has ended and action has shifted, is replaced by several visual elements associated with Internet usage. Either the action is stopped and the screen is filled with a shot of a computer screen with the old scene appearing on the left and a number of windows with other stop frame graphics are seen on the right. A cursor arrow then quickly roams around this right side and stops and clicks on an image, and the new scene automatically begins. Another technique that is applied also stops the action and a tool bar similar to the ones seen on YouTube, or other Internet video presentations, is inserted onto the frame. Future events are cued as the cursor advances the action forward. This television show demonstrates that Internet usage has not only entered into popular culture, but is also a factor in the everyday life of its young viewers.

Internet Usage: Initially and Today

When conducting the interviews for this study it quickly became apparent that most people now identify the use of the personal computer with the use of the Internet, and view them as interchangeable. This was also demonstrated by looking at the word frequency drawn from the study.

After transcribing the participants' interviews, and before a more complex data analysis began, a word frequency query using NVivo 8 software was performed. Since the object of the study was to seek the participant's recollections and opinions, it was not surprising that the most used word was "I" (appearing 1550 times), as in "I do" (do being the fifth most frequently used word), "I use" (use was the sixth most used word) and "I think" (think was the thirteenth). The results also showed that Internet was the third most frequently used word and computer was the fifth. This was not surprising either since the subject of the interviews was computer and Internet usage. However the placement of the word Internet is somewhat surprising because there was not a direct question relating to the Internet until half way through the questioning process.

Although people now identify the use of the personal computer with their use of the Internet, as with the use of the personal computer, there was a transition process for interacting with the Internet. Furthermore, as with the use of the personal computer, there were early problems that needed to be overcome. One participant, who worked at the National Science Foundation during the period when they were responsible for establishing Internet protocols—although not involved in this project—recalled some early email problems he encountered when he came to a university setting. He remembered "When I came here in 1989, the process to send and address an email was so

cumbersome that it required more key strokes to send a message to people in same building than to send a message back to NSF" (Participant 12, personal conversation, February 13, 2009). Like many of the other problems that existed with the use of the Internet, this problem was overcome by later refinements.

Although the initial usage of the Internet was not free of problems, this initial use also pointed to the potential value of this new media form for many of the people interviewed. One observation, though certainly not the only one, reflects how quickly the potential for the Internet was discovered. The person interviewed recalled:

> Initially for us, it [the personal computer] was used to do numerical computing. We weren't interested in using it for a word processor because at that time, its capabilities were very limited. I do remember that at one time we came across a card for the unit and weren't sure what it was for because we didn't have an instruction book. It did have a number on it, and the other fellow went into another room and went to what was a rather primitive Internet link, and put in that number and came back with the instructions for the toggle switches. That was an enlightening moment for me, I began to understand that the Internet could actually be used, and it was a useful tool. (Participant 10, personal conversation, February 9, 2009)

The realization that the Internet could be a useful tool is now taken for granted. This study showed that people now use the Internet for personal finances, finding information concerning legal and medical issues, finding music and entertainment programs, transmitting family and personal pictures, making travel plans, and getting the

news. A large number of people noted that they used the Internet as an aid to shopping, as one participant noted:

> One thing that is somewhat interesting is that the Internet has made some things available for me to buy that I wouldn't have had a chance to get. I've found certain older books and collectables on EBay that I wanted for a long time, and probably wouldn't have ever found. It has certainly become a part of my life. (Participant 29, personal conversation, March 14, 2009)

Almost as many people said they used the Internet, in the words of one working professional, "just for the simple pleasure of "surfing" (Participant 26, personal conversation, March 2, 2009).

The Development of the Internet Lifestyle

One of the questions that this study asked concerned the participants' opinion about a statement made by Microsoft founder Bill Gates in a PBS documentary in 1998. In the show Gates projected the formation of a new lifestyle based on Internet use. He predicted that, similar to the use of older technologies like the telephone and the car; people will come to take for granted the use of the Internet as an aid for purchasing items, planning trips and solving everyday problems (Segaller, Cringerly, and Gau, 1998). When asked if they shared Gates' opinion about the importance of the Internet in people's everyday life, the participants almost unanimously reported that it was an important tool. While a few stressed that its use was a minor part of their life, they still acknowledged that for certain uses it was invaluable. In fact, a large number, noting that the question was based on a future projection made in 1998, argued that they participated in such a lifestyle today.

For the majority of the participants, this lifestyle began with use of the Internet at work. All of the business professionals interviewed, in one form or another, agreed with the assessment of an accountant that was interviewed, and who maintained that the use of the personal computer and the Internet "has increased ease and quality of communications and the immediate availability of business records." He went on to say:

> Now I can bring the client into my office either through the Internet, fax or the phone, and using those devices will pretty much provide me with all the data that I need. Occasionally, when I have a one-on-one discussion outside the office, I use the lap-top, which allows me to have access to a computer. (Participant 5, personal conversation, January 13, 2009)

Another business professional, a journalist and newspaper editor, insisted that the Internet has provided new opportunities for his business, observing that "newspaper publishing on the Web has allowed us to develop interactive uses, from readers commenting on news stories and submitting news tips to participation in staff blogs" (Participant 8, personal conversation, February 10, 2009). Another journalist maintained that these opportunities are increasing, stating that "web publishing continues to create opportunities for new uses for both us and our readers" (Participant 27, personal conversation, January 15, 2009). Almost every business professional acknowledged changes to their workplace brought on by the use of the Internet, and these will be discussed in the next chapter. However one change that was echoed throughout the interview process was that the use of the personal computer, and the Internet, allowed people to take home their work because files could be saved and easily retrieved at other locations.

Most of the people interviewed maintained that after experiencing the Internet at work, they quickly adapted the Internet to domestic uses. One person stated that by using the Internet "I have visualized, designed and created materials lists for home improvement projects" (Participant 18, personal conversation, March 5, 2009). Many other people cited the advantages of maintaining an Internet presence. As an example, one participant recounted:

> I recently compiled hundreds of family photos (some of them dating back more than a century) with narratives and period music (obtained online) for a DVD Christmas gift for family. I also have learned Content Management System software in order to design, post and maintain my Web site. (Participant 8, personal conversation, February 10, 2009)

Other people mentioned that they created an Internet presence using Facebook pages, and of course, using email.

This study showed that there were several major factors that lead to the realization of Bill Gates' prediction of the development of an Internet lifestyle. The first supports Fiske's (1989) assertion that for a commodity to enter into the popular culture it must circulate pleasure. For a few of the people interviewed that meant engaging with an on-line community, and for others in meant having the ability of download music and videos, but for the vast majority it meant finding information. However the key factor rests in the notion of what is convent. On a practical level, one person who is a writer argued that the Internet was a convenient tool for his research, noting: "I can find information about people and things that I want to write about" (Participant 14, personal conversation, February 17, 2009). For others the Internet has provided other convenient

uses. As Gates predicted, one person said: “I make all my travel arrangements using the Internet. I don’t go out to shop, I shop on-line (Participant 2, personal conversation, October 15, 2008), and she added that using the Internet was convenient and fit well into her daily routine. This sentiment was echoed by another person who also spoke about convenience and shopping on the Internet as he related:

> I just ordered a pizza the other night, for the first time, using the Internet and that was convenient because I hate calling and being put on hold. It is convenient and you can get delivery from all kinds of restaurants, and there is actually a web site that you can go to the lists all of the local options, so now you don’t have to even go out to eat. (Participant 21, personal conversation, March 10, 2009)

This statement also indicates that many people, while acknowledging that the Internet is a convenient tool that supports their chosen lifestyle, also think that it can also present potential problems. In the above case the implied problem is a limitation on person-to-person contact. Another potential problem was management of family time as computer usage by all members of the family has grown and the tradition of watching television programs as a family unit has decreased. However, the most repeated potential problem related to the nature of the information found on the Internet. This feeling was represented by the following observation made by the first person interviewed and paraphrased by a large number of people in subsequent interviews. She stated that “there are some web sites that are very informative … I try to find web sites that improve my life … the rest of it is garbage” (Participant 1, personal conversation, June 14, 2008).

Although the Internet is now a part of everyday life, its development still deserves to be studied as a guide to how new technologies enter into one’s everyday life. The next

section is a case study looking into the development and introduction of the Internet into American society.

The Development of the Internet

Mumford (1934/1963) notes that the military supplied the model for the modern industrial process; in addition it also provided a source of consumption for many industrial products. Further, the military provided motivation to develop numerous new technical innovations from roads in Roman times to the Bessemer process to meet the demand for steel production made by Napoleon III in the middle of the nineteenth century. As he states: “In short, the partnership between the soldier, the miner, the technician, and the scientist is an ancient one” (p. 87). This relationship was again demonstrated in the early development of the Internet. As Norberg and O'Neill (1996), Abbate (1999), and Hafner and Lyons (1996) point out, the Internet had its foundation with the military’s telecommunications project, under the Advanced Research Projects Agency (ARPA) in 1957. Its funding was the direct result of the Soviet Union’s launch of the Sputnik satellite and the nation’s obsession with the Cold War.

The role of the military in the computer research did not begin with the creation of ARPA. Hafner and Lyons (1996) point out the Navy was already supporting the development of the Mark I main frame computer; the Army was supporting the University of Pennsylvania’s Electronic Numerical Integrator and Calculator (ENIAC), and the Air Force and Navy was funding the Whirlwind computer at MIT. However, the role of the military involved more than simply funding projects; it also provided a culture that influenced development. As Abbate (1999) observed, this culture "favored military values, such as survivability, flexibility, and high performance, over commercial goals,

such as low cost, simplicity, or consumer appeal" (p. 5). Edwards (1996) argues that these values have transitioned into popular culture, contending that people have become conditioned to believe that because of their use of logic and unfailing accuracy that computers could provide the correct solution to any problem, even social ones.

This culture quite naturally influenced the work of ARPA, which quickly became interested in developing a new data transmission network. As Abbate (1999) notes, the drive for efficiency mandated that each terminal on the network should operate using the same protocol. This also reflects a desire for economy with the network designed as an alternative to main frame computers. To insure these results, Bob Taylor, the ARPA manager, was not reluctant to use his funding control to force research universities to adopt his network approach.

Mumford (1934/1963) argues that “invention is almost never the sole work of a single inventor, however great a genius he may be” (p. 142) and this is especially true of the development of the Internet. However, the common stereotype of the inventor creating innovation in the garage was replaced with academics working in universities. One of the first insights came from J. C. R. Licklider (1960) who saw the possibility of linking the computer and the human brain. However, it was Lawrence Roberts (1967), the ARPA administrator and former MIT professor, who cited the need for a message switching network, and Leonard Kleinrock (1961a. 1961b, 1962, & 1964/1972), of UCLA, who developed the packet switching technique necessary for the network to succeed. Other key contributors were Paul Baran (1960 & 1964) of the Rand Corporation and Donald Davies (1965) of the National Physics Laboratory in Great Britain, who also worked on packet switching.

Another key contributor with links to the academic community of MIT was the engineers at Bolt, Beranek and Newman which was awarded the contract to build Interface Messaging Processor (IMPs) for the network 1969. In 1972, the network was revealed at the first International Conference on Computer Communication in Washington, using phone lines to connect the network. Another academic, Norman Abramson (1970) of the University of Hawaii, developed a network with radio transmitters and a protocol which told the computers how to share the airwaves (also see Abramson and Kuo, 1973). This was the beginning of the wireless communication protocols and the technology that has now become so popular in today's media ecology.

The next advance came from Vinton Cerf and Robert Kahn (1974), of UCLA, who developed TCP/IP—Transmission Control Protocol/Internet Protocol—which allowed network machines to communicate with one another. Finally the world took its first step to becoming "wired" with the development of the Ethernet, which connected computers using a coaxial cable. This was developed by Bob Metcalfe, who received a Ph. D. from Harvard, and David Boggs, who got his Ph. D. at Stanford, while working at Xerox PARC.

At this period of time, as Abbate (1999) maintains, the only real value of the ARPANET was as a tool for file sharing, and this was primarily for the academic community. She goes on to say that the "unplanned, unanticipated, and almost unsupported" (p. 109) development of e-mail, "opened the network up to non-techies" (p. 110). Even more unanticipated was the fact that Queen Elizabeth II was an early adopter, sending an email in 1976. As Segaller (1998) points out, the application of email, first developed by Ray Tomlinson, moved computer networking from machine-to-machine

communication to a person-to-person exchange. This new form of communication motivated not only the early development of computer networking, but, in time, offered a usage with commercial applications. However, before this could happen, three other academics, David Clark, K. T. Pogram, and D. D. Reed (1979) would need to develop the protocols for Local Area Networks (LAN), which connected groups of computers for the purpose of sharing files and exchanging emails.

One possible reason that so many people were needed to develop the Internet at this early stage was because, as Ceruzzi (1997) asserts, they all had a limited vision based on their own research needs. However their unified effort did produce a network that linked personal computers together. One other player who entered into this network picture in 1985 was Stewart Brand and his Whole Earth 'Lectronic Link (WELL). This connection, along with the work of the Homebrew Computer Club, is the major reason that the counterculture is associated with the development of this technology (see Turner, 2006). While it can be argued that Brand was not limited in his vision to create a collaborative digital utopia to be used for personal liberation, it can also be argued that the commercial interests that followed were also not limited in their vision of Internet usage.

The history of this technology will also demonstrate that the process of technological innovation sometimes does fail "to reward the inventor" although it does succeed "by blandishment and promises in stimulating him to further efforts" (Mumford, 1934/1963, p. 27). Many of the academics mentioned above did not grow rich because of their contributions. The individuals who grew rich were the venture capitalists. The next advancement in Internet technology reinforces Mumford's point. Academics Len Basack

and his wife Sandy Lerner of Stanford University developed the router that directed information packets between separate local area networks at their university, and later formed CISCO Systems. Although they were making a profit, they realized that future growth depended on both a capital infusion and a better management organization. Therefore they sought out a venture capitalist for assistance. The new management team began to have difficulties with Lerner, and the real power behind the scene, the venture capitalist, dismissed her, and Basack soon followed (Segaller, 1998).

The growth of the computer industry in Silicon Valley during this same time also demonstrated that another observation made by Mumford (1934/1963) is well formed. Mumford argues that technology is developed within a technological complex model where social, historical, and environmental factors influence the shaping of technical innovation. In the case of the growth of Silicon Valley as a center for computer development, Bahrami and Evans (2000) point out that the region has historically been the home of companies that specialized in new technologies, such as The Federal Telegraphy Company in 1909 and later Litton Industries and Hewlett Packard, as well being the home of Lee De Forest—a pioneer in the development of the vacuum tube—and television innovator Philo Farnsworth (also see Sturgeon, 2000). In addition to a corporate culture that embraces new technological innovations, the region developed support institutions to advance development. These support institutions include lawyers who also serve as advisors and dealmakers (Suchmann, 2000), venture capitalist who are not afraid of the risk associated with the creation of new firms (Kenney & Florida, 2000), a labor market that is knowledgeable, experienced, and flexible (Angel, 2000), and a communication and support network between the firms in the area (Saxenian, 2000).

Leslie (2000) also observes that the region benefited from Federal funding for research development, as a reaction to America's defense needs. In addition to these factors, Sturgeon (2000) adds the following: "a close relationship between local industry and the major research universities of the area; … an unusually high level of inter-firm cooperation; [and] a tolerance for spinoffs" (pp. 16-17).

The next step in the advancement of the Internet, and, according to Segaller (1996), the first of the three seminal developments that made Internet usage an everyday experience, was the creation of the World Wide Web (WWW) in 1991. This was accomplished by another academic, Tim Berners-Lee, working at the Centre Européenne pour la Recherche Nucléaire (CERN) in Geneva. Berners-Lee devised Hyper Text Markup Language (HTML) and the Uniform Resource Locator (URL) protocol that allowed the people at CERN share information over a very diverse computer network (see Berners-Lee, 2000). In 1996, Segaller's (1996) second seminal development occurred with the introduction of the browser, a software package for navigation of the Internet and the display of retrieved documents and files. Netscape Navigator included MOSAC, a graphical interface created by Marc Andreesen a graduate student at the University of Illinois, in their browser's software. The next advances were the servers, the Internet providers, the search engines, and the potential for Internet commerce. However, this could not have occurred without the creation of a common language that would link all the programs and applications on the Internet. This was done with the creation of Java by Sun Microsystems and represents Segaller's (1996) third seminal development. Segaller reports that James Gosling, the developer of the Java programming language, noted that while he developed several innovations that were

welcomed by the computer community, Java was the only thing that he created that affects people's everyday lives. The next section will consider how the development of the laptop computer and wireless technology has increased flexibility within the new Internet lifestyle.

The Laptop and Other Internet-based Technology

The notion of what is convent was also dramatically emphasized when people discussed their laptop usage. Almost everyone who responded indicated that they liked the laptop because of its portability and mobility. The utility of the laptop's portability was summed up by one person who reflected that he could "fold it up and put it away and it's very lightweight" (Participant 9, personal conversation, February 3, 2009). The light weight of the laptop also contributes to its mobility, which is also a major element of convenience attributed to the laptop. As an example, one academic stressed that he could use the computer in the field when he traveled to do research. Another mentioned having the ability to make video calls home, when traveling. Another academic indicated that he uses it as a redundancy tool to insure the safety of his data. Many others mentioned its utility for class presentations. In fact, the laptop's mobility is not only seen as a convenience, for some it is also seen as a necessity when traveling. One university professor mentioned that:

> It makes it possible to multitask. For example, during the break I taught an on-line course, and when I went down to my parents, and other meetings during that period, I could take care of student papers and communication, while I was off doing other things. I can go anywhere and get work done. (Participant 4, personal conversation, December 23, 2008)

Mobility and portability are key elements in the desire of many people to use all Internet-based communication technology, and helps explain the attraction of wireless connectivity. While discussing his use of the laptop, one participant also summarized the utility of that all of the Internet delivery devices provide, he mentioned that “today, my laptop is my best friend. It’s an entertainment machine, it’s a communication machine, it’s a word processing machine, and it’s a virtual library (Participant 9, personal conversation, February 3, 2009). In fact, with the growing use of the laptop, the Blackberry, and especially the cell phone, wireless connectivity is a key element in today’s media ecology. The next section will be a case study looking at rural Internet usage and its links with the study of technological development and use, as well as the importance of wireless technology in today’s Internet lifestyle. Further, many of the points about rural usage can also be applied to the American media ecology at large.

Rural Internet Usage and Wireless Technology

In November of 1994, the Tennessee Valley Authority established a research branch to explore the issues impacting the future of rural America. The central question was whether rural communities would embrace, or fall further behind in their ability to use the Internet. Equally important was the question of how the TVA could help rural communities and businesses use new technology to improve their economic and social conditions. In an effort to aid in this effort, the TVA published *The Farmer’s Guide to the Internet.* Citing their founding mission and experience, the TVA drew a direct analogy to the transmission of electricity in the 1930’s and today’s rural problem of receiving electronically transmitted information. They pointed out that both then, as well as now, the issue was "will access to the most basic raw material of economic advance be

equitably distributed or will we divide into two Americas—plugged-in urban populations and disconnected rural ones" (Freshwater, 1994).

The TVA's assertion that the failure to receive an Internet connection would negatively impact rural wealth generation was, historically, well founded. They were aware of the economic problems they had encountered in their effort to provide electricity to rural areas. On an economic level, the problem was one of providing connectivity. While the problems of connecting rural users were daunting, it was achieved through substantial help from the Federal Government. The TVA could also draw on their experience to assess problems on the social level. They knew, as Bazerman (1999) points out, that the initial appeal of electrification was directed toward the "aspirations of the newly urbanized and increasingly prosperous American family" (p. 313). The TVA also knew that as more and more urban homes and businesses became connected, electricity itself "became a symbol of consumption, cultivation, and upward mobility" (p. 315), and conversely, the absence of electricity implied a lack of progress and status that could easily affect rural inhabitant's self-image.

The TVA hoped that Internet connectivity would follow the trends demonstrated by the early introduction of radio—America's first attempt at wireless communication—into rural areas. As Douglas (1989) pointed out, "radio broadcasting resulted from more than two decades of scientific and technical research, institutional jockeying for position, and changing conceptions of how the invention should be used, and by whom" (p. xv). He also observed that the economic problems of transmission had largely been overcome, and "by 1910, wireless had been a part of America's cultural and economic landscape"

(p. 216), even in rural areas. On the symbolic social level radio was portrayed as an egalitarian technology, as Douglas maintains:

> Radio, then, meant progress for all. The technology would bring improvement to many areas of American life and thus benefit everyone, the ignorant and the well read, the poor and the rich, the individual and the institution. In these press accounts there was no tension between corporate ambitions and individual desires: they were really the same thing. (p. 306).

In order to insure the perceived egalitarian and progressive of the Internet, the TVA realized that it was necessary to conquer the problem of connectivity. However, initially rural inhabitants had the same problems that urban dweller faced, namely having access to personal computers and the Internet, as one person related:

> I grew up in rural Kentucky and we didn't have computer labs and, at the time it was all about learning to program so you could get a job. Windows hadn't been invented yet and Mac wasn't there yet either. (Participant 9, personal conversation, February 3, 2009)

When this problem of providing computers was overcome by local school districts, the problems with connectivity began to surface. One former rural resident recalled that "we used the Internet when were in high school," but quickly added, "however it was very slow because we had a dial-up system" (Participant 24, personal conversation, March 25, 2009). Another person that was interviewed recalling his early life and his use of the Internet stated, "At my parent's home in rural Texas, the density of their development was not high enough to encourage AT&T to put in fiber cable," and he added that when a fiber optics cable was introduced, "there wasn't enough bandwidth. It is even worse now

because so many things have graphics in the presentation and the volume of the files have grown" (Participant 12, personal conversation, February 13, 2009). In fact, this has taken on a minor role in recent national politics as witnessed by the inclusion of rural conductivity infrastructure funds in the economic stimulus package. Also, this problem has a social dimension, as one former rural resident related, when comparing its impact to the early fears surrounding the mass proliferation of the automobile. She noted:

> It was speculated that teenagers would use the car to escape from traditional family life and other things. The car definitely had a huge impact on the way people are distributed in terms of city versus small town residence, and many rural areas are losing people. (Participant 28, personal conversation, March 10, 2009)

Her fear, like those expressed by the TVA, is that the quality of rural education will suffer and the economic base of rural areas will be diminished without Internet connectivity, and the younger residents will be drawn into larger population centers. Another former rural resident noted that "as the younger generation grows up, this technology will just be taken for granted" (Participant 28, personal conversation, March 10, 2009), and she was concerned that the younger rural generation will be placed at a disadvantage with regard to their knowledge of how to use this technology, and their technological literacy could be questioned in the future. Another person, who grew up in a rural setting and was also concerned about the issue of providing connectivity, noted that "this problem takes on an additional dimension when one considers the ability of people to access the Internet with their cell phone. The cell phone is going to change

how we use the Internet for sure" (Participant 7, personal conversation, February 3, 2009).

Concluding Summary and Discussion

The development of the Internet supports Mumford's (1934/1963) assertion that there is an historical partnership between the military and "the technician, and the scientist" (p. 87), and in the case of the Internet, academics working in universities have assumed the roles of both the technician and the scientist. The development and growth of the computer industry in certain regions located in Silicon Valley and near Boston, also supports Mumford (1934/1963) and other constructionist theorists' argument that new technology is formed within a technological complex where social, historical, and environmental factors influence the shaping of technical innovation. At the time of the early development of both the personal computer and the Internet, these regions already had a well-established business culture based on technological innovation and, at least partially supported by government funding for defense needs. Both of these regions also developed support institutions such as lawyers familiar with the innovation process, venture capitalist, and a knowledgeable work force. Also both areas drew upon local research universities for support. Because of the historical dominant business culture, there was also a support network between the firms in both areas.

The development and use of the Internet also supports Bijker and Law's (1997) observation that "all technologies are shaped by and mirror the complex trade-offs that make up our societies … [and] technologies always embody compromise" (p. 3). For a technology to become adopted it must address the special needs of the consumer.

The ability to address many of these special needs also helps explain why the personal computer, and the Internet, has become part of people's everyday lives, and is now an accepted part of today's popular culture.

This study shows that the use of both the personal computer and the Internet has become an accepted part of everyday life for a large number of people. Their use has made communication and information gathering easier at both work and at home. The ability to use the Internet to retrieve files and business records has allowed people the luxury of flexible work schedules, and at various locations. It has also allowed people to, as Bill Gates predicted, purchase items and plan trips, as well as access important information from the convenience of their homes and businesses. It has also allowed people, and businesses, to maintain an Internet presence so other people can keep up with them, and their products.

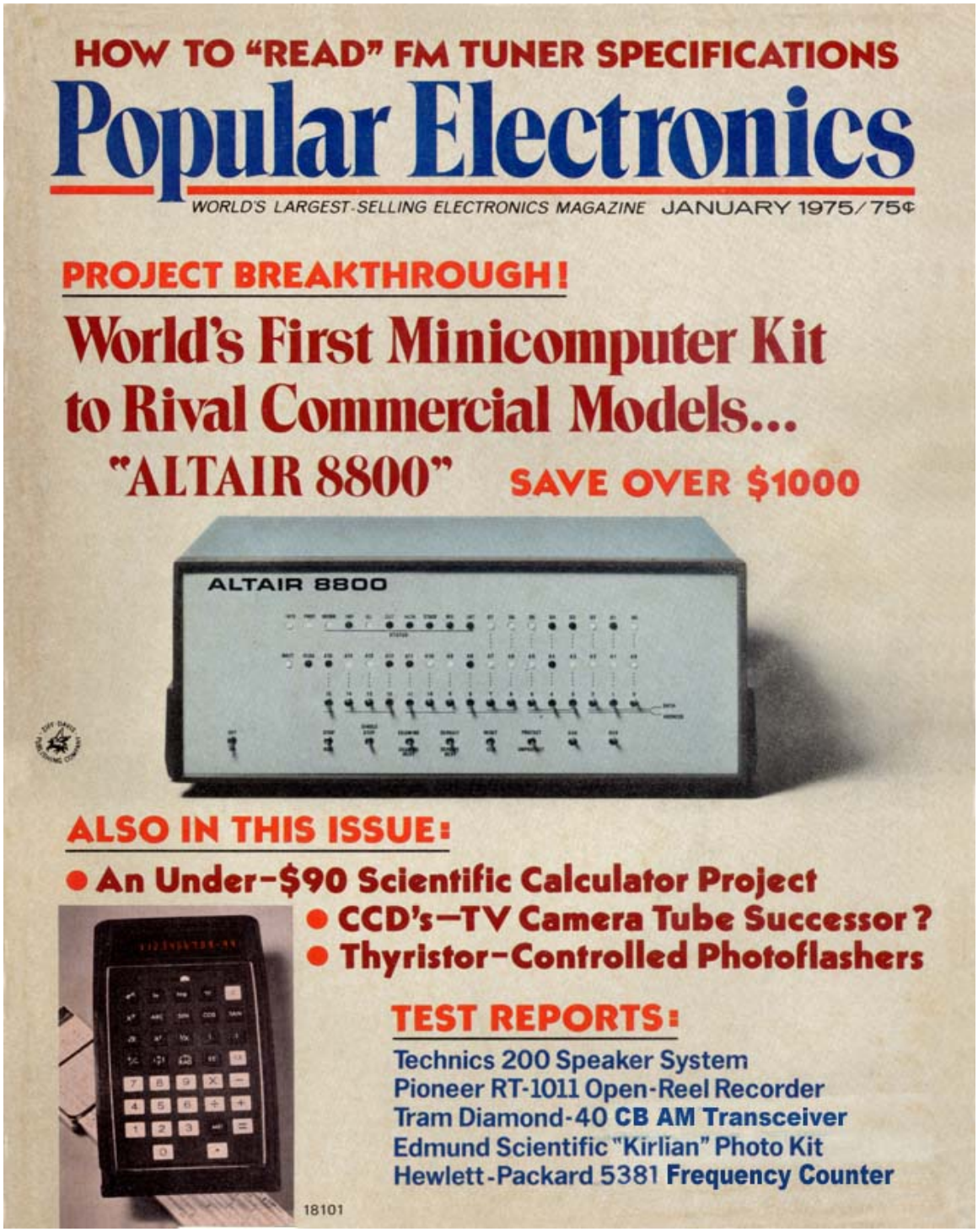
This study has found that many people actually do participate in an Internet lifestyle today, and while there was some disagreement about the extent of this participation, there was no disagreement concerning the importance of the Internet in addressing various needs of the users. This supports Fiske's (1989) assertion that a commodity must circulate pleasure to become accepted into popular culture. Another element that influenced acceptance, and fostered the development of the Internet lifestyle, and the one that was most commonly mentioned, was the everyday convenience that personal computer, and especially Internet usage, provides. This notion of convenience links the pleasures demanded from popular culture with the utility expected in everyday life. This notion of convenience also helps to explain current laptop usage, as most people stressed its portability and mobility

Like the discussion of *iCarly*, the television series that introduced this chapter, the case study that examined rural Internet usage, and the Tennessee Valley Authority's role in promoting its development, demonstrates how important Internet usage has become in people's everyday lives and in popular culture. Based upon their historical experience with providing electricity to rural areas, the TVA feared that rural inhabitants would face economic limitations if they failed to become connected to the Internet. However they were also aware of a potential urban and rural divide that could present problems on the social level. Their experience with electrification has shown that its early development was seen as a measure of civilization and upward mobility, and they feared the absence of Internet connectivity could adversely affect rural inhabitant's self-image. This supports Meyrowitz's (1985) observation that the use of a new media helps redefine the traditional notions of group identity. Given this, the TVA hopes that becoming connected would produce similar results to the early introduction of radio, the nation's first exposure to wireless communication. Radio was symbolically presented as an egalitarian technology that could produce progress for all.

This study found that many former rural inhabitants also shared this concern for Internet connectivity. They related that initially they had the same problems as experienced by people in urban areas. First there was the problem of gaining access to personal computers and the Internet at school, and even when they did get personal computers, their use of the Internet was limited because of slow dial-up systems. The providers had to overcome the financial burdens of providing fiber optic cables for school, rural business and home usage. However, when this was overcome in some areas,

there was still the problem of limited band width. The solution has become wireless connectivity.

This study also found that former rural inhabits were concerned with the quality of life in rural areas and the migration of children into urban areas. In addition there were expressions of concern that the younger rural generation would be placed at a competitive disadvantage to their urban counterparts because of their limited exposure to computer knowledge and the Internet. This opinion could draw on Meyrowitz (1984), as well as Innis (1951/2003) who maintained that the use of a new communication medium not only promotes one group over others, but also allows them to monopolize the distribution of knowledge, and Postman (1992) who asserts the non-adaptors of a new medium will be seen as failures. Although there is still a problem of connectivity within rural America, which might affect the technical literacy of some inhabitants, there is still the force of popular culture at work. The younger generation of rural America also watches *iCarly* either over cable or satellite, and they know its language and the appeal of the Internet. They use cell phones to communicate with their friends. They also use the Internet to further communicate with theses same friends, and when allowed by their parents, use it to purchase items and get information about topic that interest them. In other words, they too participate in an Internet lifestyle.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On July 23, 1829, William Austin Burt received the first American patent for the typewriter. Burt's machine seemed to resemble the modern label maker, with the letters revolving around a wheel and producing an indentation after a lever was depressed (Current, 1954, p. 23). Although Burt's invention proved unusable because it required a great deal of time to produce a document, it did inspire what A. Ely Beach, an editor of *The Scientific American,* would claim was an improved printing instrument for the blind, and the fact that this invention was announced in *The Scientific American,* inspired other inventors, and ultimately lead to the development of a practical writing machine by Christopher Sholes—"the fifty-second person to invent the typewriter, and the only one to call it that" (Romano, 1986, p. 1). Like the publicity generated by Beach's article in *The Scientific American,* the January, 1975 cover of *Popular Electronics* featuring the Altar 8800, and shown above (Popular Electronic Cover), created interest in the possibility of developing a personal computer. Cringely (1992 & 1996) maintains that the *Popular Electronics* cover inspired Bill Gates and Paul Allen to seek out MITS, the Altair's manufacturer, about designing a program language that would facilitate its use. They got the job, and later founded Microsoft.

There also can be little doubt that the early personal computer developers had knowledge of MITS, and the Altair (Roszak, 1985; Wozniak, 2004; and Markoff, 2005). There is also little doubt, according to most of the participants in this study, that the development of the personal computer, and later the Internet, facilitated the creation of a new work, and domestic, ecology. Most of the participants also confirmed Chesbro and Bertelsen (1996) observation, that "increasingly, we live, work, and play in environments created, sustained and altered by and through communication" (p. 30). This chapter will

examine the role that these technologies play in that new ecology and as a contributor for change.

Role of the Computer and the Internet at Work

As has been previously mentioned, the initial attraction of the personal computer came from its word processing function. Compared to the use of the typewriter, many office workers found that the computer was quicker, and their work could be saved and easily corrected and modified for future use. Most of the participants in this study also revealed that, combined with the Internet, the personal computer is their primary tool for communicating and transmitting information. However, the initial appeal of these technologies was the efficiency they brought to the office. This was voiced by both managers and office workers alike, as an example, one business professional reflected:

> [Their use] made things easier. We were able to accomplish more work, not only one person, but all of us became more efficient. We could complete more tasks. When one person was gone, another person could pick it up where the other left off (Participant 2, personal conversation, October 15, 2008).

One of the major reasons for this increase in efficiency is the file sharing ability afforded to the personal computer because of its linkage to the Internet. As an example, one professional in construction sciences mentioned that "the use of the Internet and file transfer allows for greater cooperation between the end user and the designer (Participant 22, personal conversation, March 11, 2009). He also mentioned that these technologies have allowed for increased coordination between suppliers, architects, and on-site managers.

Just as the personal computer has come to replace the typewriter in many offices, combining it to the Internet has allowed for the replacement of many other tools. In the engineering and architectural professions, the computer screen has replaced the drafting table for design and rendering. Specialized software has also allowed for modeling in virtual three-dimensional space. In many ways it has transformed these professions, as one participant recalled:

> The use of a computer allows for the construction of [an] animation walk-through, and can feature such elements as surface texture and color treatment, lighting, and energy analysis. They are also used in the layout and printing of plans, and the writing of reports. (Participant 22, personal conversation, March 11, 2009)

The elimination of the drawing board has also been a byproduct of the use of these technologies in the graphics and visual arts professions. One graphic artist recalled that when he first got into the business, "type would be set in either cold metal or hot metal, and you would produce galleys of type, and wax paste them up, do overlays on your art work, and [then] bring a board to the printer to make printer's film." The personal computer has altered this entire composition process. He reflected that his profession "has gone from very hard concrete stuff, that was very time consuming, to a process that is now done on the keyboard" (Participant 18, personal conversation, March 5, 2009). In fact, the only feature of the old process that remains is the delivery of the final work product to the printer, and this is now generally done using file transfer over the Internet. Another tool that has been almost eliminated is the traditional filing system, replaced by the personal computer's ability to store and catalogue information, as demonstrated by one academic who stated, "I don't use my filing cabinets anymore, except to store my

annual teaching evaluations, and for some hard copies of documents" (Participant 9, personal conversation, February 2, 2009).

One of the professions that have changed the most because of the introduction of the personal computer, and the use of the Internet, is the accounting business. A CPA who was interviewed related that "before the computer came along, the accounting business was pretty much repetitious." He recalled that all of the financial information was manually posted into a spreadsheet, totaled, and these totals were transferred to another spread sheet to again be totaled, and transferred to a summary form that generated the set of books. He added that "to generate a financial statement you would have to take that summarization of all that data put it into another manually prepared form, identifying the balances for a particular period." He also stated that all the tax computation was done on a calculator, which was also a repetitive, complex, and time consuming operation. He briefly summarized older accounting methods and the advantages of the newer computer based operation in the following manner:

> It [the old method] was a mechanical, mathematical, computation that you went through over and over and over again. It was just a lot of pencil pushing, that's what it amounted to. So, when the computer came along, it not only helped you speed up the process, but it also relieved some of the drudgery. The biggest thing it did for me was when an error came along, and you went back and corrected the error. The computer would automatically correct anything associated with that error. (Participant 5, personal conversation, January 13, 2009)

Newspaper publishing is another business that the use of the personal computer and the Internet has markedly changed. Like many other professions, the reporters and

editors were drawn to the word processing function of the early computers. Also like many other professions, many reporters first used mini-computers, especially for remote reporting, with the stories being "transmitted to a mainframe using a bulky acoustic modem." However, now "pages are now composed with pagination software, and sent digitally to plate-making equipment. Darkrooms are now obsolete, with all image work done on PCs, with off-the-shelf software" (Participant 8, personal conversation, February 10, 2009). Another journalist added that "digital production has made the newspaper industry a cleaner/greener industry, with the elimination of most chemical processing and much material waste," but adds that these new technologies have "required that reporters and photographers learn new skills" (Participant 27, personal conversation, January 15, 2009).

Both of the news gatherers interviewed stressed that the use of the personal computer and the Internet has positively contributed to their final work product, and have embraced their potential. Their opinions seem to call into question Doningo's (2008) findings that the standards, and culture, of professional journalism limits interactive news gathering. However the participants also expressed concern about the future of newspaper publishing, because of the current tendency of consumers to get their news online. They also agree that the Internet has affected the advertising (see Talbot and Bergman, 2007) and classified (see Wolf, 2009) revenue streams of most news organizations.

Generally speaking, most of the participants in this study acknowledged that, as one person who was interviewed put it, "everything in my office has changed because of the computer." However, some were more positive regarding the progressive nature of these changes, as also reflected by the same participant, who noted: "We are totally

automated in this office and we do nothing manually" (Participant 5, personal conversation, January 13, 2009). Other people were a little more negative about the changes, and some were somewhat nostalgic concerning the older practices. As an example, one academic reflected:

> It used to be that to engage in quantitative research you used to have to be a fairly good mathematician. Now we can do simulations to produce results. In fact, because of the PC, we don't even need to know as many things. We no longer have to be clever; none of us are as smart as the old guys were. (Participant 17, personal conversation, February 26, 2009)

As pointed out above, most people laud the personal computer and the Internet for helping to create a more efficient workplace. However, many also questioned certain aspects of this use, and some even claimed that overall their use has resulted in less work being done, because the level, and number, of distractions has increased. One office worker was very direct in her assessment, stating:

> There was less work getting done, because people were playing on their computers. This was not on break time, this was anytime. They would check the Internet before they started work, and they would get on eBay. They would send jokes back and forth. There were many times that I heard fellow workers laughing and they would say that they got a joke from a friend, and that would also distract people from their work. (Participant 1, personal conversation, June 14, 2008)

While others acknowledged the potential for abuse, especially in regard to constantly checking their emails, and noted that during certain periods they felt pressure to keep up with on-going events, e.g. September 11, 2001, they also maintained that the

organizational structure, and the pressure of work assignments, generally limited the potential for this abuse. While the uses of the personal computer and the Internet has changed the way many people use the tools associated with their work, the use of these technologies has also impacted both the operation and employment patterns in many professions as well.

Changing Employment Patterns

The participants in this study revealed the job elimination was one of the first changes in employment patterns that occurred, when the personal computer was incorporated into the workplace. The traditional draftsman was one of the first to go because people in the engineering and design, and the graphic arts fields, found that certain computer applications could provide a useful alternative to time consuming manual drafting. This was also true in the academy, where certain fields like zoology and botany, which depended on draftsman to highlight their reports, found that many illustrations could be produced using a computer, or even found on the Internet. The convergence of the personal computer and the Internet also forced a reevaluation in business operations as well, as it became evident that the number of personnel needed to perform required functions could be reduced. In fact, this down-sizing motif seems to have become totally accepted in many workplaces, as explained by one business professional who observed that “without the computer you would have to cut your workload and increase your workforce” (Participant 5, personal conversation, January 13, 2009).

Although many people experienced a transformation due to the introduction of the personal computer and the Internet at work, women were possibly the one group that was

most profoundly affected. The introduction of the personal computer forced the elimination of some traditional jobs associated with women in the workplace. As an example, one academic and former administrator recalled that back "in 1977, letters had to be typed. Our typist did have a machine with some sort of memory, but it wasn't very smart. It didn't take long after word processing came out to realize that you could get by without secretarial help to type letters and manuscripts" (Participant 20, personal conversation, March 9, 2009). While certain functions were eliminated, the primary effect was a redefinition of many traditional roles. As an example, one professional, a retired doctor, recalled that during the transition, "much of the work of my office shifted home, freeing up employee time for other things. My wife became interested and became the office manager and home bookkeeper" (Participant 6, personal conversation, January 15, 2009). Another professional, an accountant, recalled a similar shift, although at the workplace. He remembered:

> [Many of] the functions we assigned certain people to do, they didn't have to do those anymore. As an example, we used to have a receptionist that had to manually type all the financial statements, because they were prepared by hand and given to her to type on a form. When the computer came along, it printed the financial statement itself, so the responsibility no longer rested with her; it was with the bookkeeper. (Participant 5, personal conversation, January 13, 2009)

He also recalled that this allowed him "to assign her other responsibilities." In addition, the role of the bookkeeper, also traditionally a female position in many accounting offices, was reshaped. He noted that "a little later on, when the programs became more sophisticated, the bookkeeper could access the data they needed from any computer in the

office" and from the client's files, allowing them to assume more responsibility, and increasing their exposure to the client base (Participant 5, personal conversation, January 13, 2009). Although this study cannot demonstrate that the introduction, and use, of these new technologies shattered the glass ceiling faced by women in the workplace, it does appear that, on an incremental level, they did aid in providing a little more job satisfaction.

However, cracks did appear when the adoption of the personal computer eliminated the physical requirements of some jobs. An example of this came from a professional in the graphic arts industry, he remembered:

> When I actually started, I was a printer's devil. I would bring galleys of type and distribute them into boxes; it was a heavy mechanical thing. Now it's all done at the desk. There is no physicality to it. It opened our field up from mostly a male profession, to a profession that is somewhat shaded toward dominant female, because it no longer requires the physical strength in the print shop. (Participant 18, personal conversation, March 5, 2009)

Traditionally the problematic role of women in American society, and in the economy had been rendered invisible by ignoring any inequality of opportunity that exists on one hand, or offering an alternative reading of the conditions that might reveal the existence of any gender related rifts. As an example, one such alternative was suggested by Bliven (1954) when discussing the introduction of the typewriter into the workplace. He credits the typewriter with opening up the downtown corporate offices for women, and in the process transforming both the internal and external office environments. He claims that internally, the introduction of women added elements of

civility and decorum to the workings of the office. Externally, Bliven credits the larger number of women entering the office workplace with transforming the downtown area to include sandwich shops and drug-store lunch counters, instead of the "omnipresent bars that gave away a substantial amount of food for free" (p.8). He also maintains:

> The typewriter operator, and, in particular, the female typewriter operator is a terrific power. Her take-home pay, in many cases, is less than $50 a week, but she has got the average business office, not to mention the average businessman, lawyer, doctor and governmental official, under fairly good control. The basic tool of business communication is in her hands. Although the telephone is steadily growing in importance, the typewritten letter and the typewritten memo remains the primary means men of affairs have for telling each other what they think. The typewritten record is their memory. The typewritten contract is their instrument of agreement. (p. 5)

Bliven's (1954) assertion those women gained power because they controlled the basic tool of business communication is questionable at best. While he might be correct in his assumption that the introduction of the typewriter opened up some employment opportunities for women, their pay scale discounts their perceived value to the organization. The typewriter was not a boon for female workers generally. However while the introduction of the personal computer, and the use of the Internet, did not change the position of women in the workforce, their use did offer many some relief from the drudgery of typing, and allowed some to assume positions of more responsibility, and possibly did open up opportunities in some professions.

Another group that has experienced changes in their professional roles is sales personal, because of the new demand for maintaining an Internet presence. One academic, who had done business organizational research summarized this new demand, observing:

> Even if you have a small business, you need to have an Internet presence out there just to keep up with the competition, and attract new customers. You have to realize that people are going online more and more for product information and services. It you don't have that Internet presence you are probably missing sales and it doesn't cost as much as traditional advertising. (Participant 21, personal conversation, March 10, 2009)

Now the sales force in many professions is expected to have a working knowledge of the Internet, and have at least one person who is familiar with web site layout and management.

While some of the participants in this study did not indicate that their job has substantially changed, almost everyone did mention that personal computer and Internet usage has produced changes in their work patterns.

Changes in Work Patterns

Upon analysis of the interviews from the participants in this study, it seems evident that the early prediction that the use of the personal computer would produce a paperless workplace did not completely materialize. However, there is some movement in that direction. As an example, one person reflected that "for the last ten years, the hard copies are becoming fewer and fewer, almost everything you get is generated electronically and storied electronically, and it has been nice in terms of space"

(Participant 9, personal conversation, February 3, 2009). Another participant added "another thing that has changed is the correcting and editing of galleys, and submission of manuscripts electronically instead of sending paper copies. Almost everything is electronic now and not paper" (Participant 14, personal conversation, February 17, 2009). This capacity to transfer files has contributed to the reduction of paper in the office, as well as changing the daily schedule of some professionals. An accountant, who relies on other's financial information to do his work, mentioned that "things can be scanned and emailed to you, and you can have them almost immediately. I do most of my work from my office now, without traveling to the client's office" (Participant 5, personal conversation, January 13, 2009). However, several people indicated that the amount of paper generated was around the same, or even slightly higher. They cited an increased workload that required hard copy reports, as well as an increased number of meetings, that also normally required a written presentation. A professional insurance agent reflected that paper might not be the issue, while increased workload, and management's expectations, certainly were. He noted that his organization "generates more paper than we ever did, just because you are expected to putout quarterly reports" (Participant 26, personal conversation, March 4, 2009).

However, most of the participants in this study mentioned that the most common change resulting from the introduction of the personal computer and the Internet regarded people's daily routines. Most people admitted that before they settled into their work, they checked their emails, and some acknowledged that they engaged with one or more of their favorite Internet sites. The use of the personal computer also affected the way many did their work. Many managers and academics stated that they now take

responsibility for their own letters and manuscript editing. Also because of the information storage features of the personal computer, the necessity to check old files and documents has largely disappeared, and many people have changed the way they keep both their personal and professional records. The use of the computer, and other Internet-based communication technologies, has made work patterns more flexible. One person summed up the effect of the combination of these technologies, claiming: “It has made me mobile and I can work anywhere I want. It provides convenience and I probably do a little more work” (Participant 18, personal conversation, March 5, 2009). However, many people did voice concerns that the necessity for keeping up with new technology caused problems with time allocation.

A great number of the participants expressed the feeling that the use of the personal computer and the Internet either allowed them, or forced them, to more easily take their work home. Many of the participants were positive about working at home, as reflected by one academic who committed: “I’m very fluid in terms of whether I work at the office or at home because I can easily send files and check my email, where that would not be the case without the PC” (Participant 28, personal conversation, March 10, 2009). However other people stressed that the increased pressure to work at home was an invasion of their private time, and many worried about balancing the demands of their professional and private lives.

These dualities between allowing and forcing, and professional and private time, were best demonstrated by an observation made by a mid-level manager in a state regulatory agency. She described the nightly exchange between members of her work team, commenting:

> We are talking to each other at night, we start about 8:00 o'clock [and] some of these cases are pretty big and we can put everything together at that time. We seem to be relating better at that time. We're not in the office, we don't have interruptions, we don't have phones ringing, so were able to scan it in and zip it over to the next person to observe it. We are looking at it as we are talking on-line. (Participant 2, personal conversation, October 15, 2008)

It is clear from the above observation that the work team has chosen to attend to their required tasks in this after-hours manner, and it has proven to be an efficient way to achieve their goal. It is also clear that they feel a certain amount of pressure to extend their work day in order to complete their assigned tasks.

The above reflection seems to acknowledge the positive observations of Haythrnthwaite (2005/2006) that computer-mediated collaborative practices can cut across geographic boundaries, and in this case, normal office work hours. It also confirms Rice and Gattiker (2001) observation that computer information systems can "overcome physical and temporal structural constraints and thereby facilitate more diverse communication" (p. 564). This also supports Eveland and Bikson's (1988) suggestion that Internet communication can provide new areas for organization socialization, and can promote ad hoc groups in the information distribution arena. However, it must be remembered that as Keen (1991), Sackman and Nie (1970), Taylor and Van Every (1993), and Rice and Gettiker (2001) point out, these ad hoc groups have the potential of affecting participation by decreasing interpersonal interaction. Also Cleveland (1985), Taylor and Van Every (1993), and Wiesenfeld, Raghuram, and Garud (2006) assert that these types of arrangements can "contribute to the erosion of organizational …

hierarchies" (Rice & Gattiker, 2001, p. 563), and produce power shifts within organizations which could have negative effects on people within the organization, not just the supervisors.

The necessity of taking work home is a symptom of the change that most participants mentioned regarding the increased expectations for efficiency and productivity. While such observations were made by people in business, they were most often expressed by academics that are expected to publish more each year.

Most of the participants in this study indicated that the demand for speedy results at work has produced anxiety for many of them. This anxiety took two forms. The first was reflected by an academic, who mentioned: "The expectation of productivity is higher, much higher. Now I wonder if we really have time to think, and we often don't wait for the big hit and only produce little bitty things. I'm not sure about the value" (Participant 16, personal conversation, February 24, 2009). His concern was not only for the amount of work now expected, but also the quality of the work produced. The second observation was also made by another academic, although the same sentiment was also expressed by a number of people in business. When the academic reflected about the amount of email that now came across his computer, he noted that there was "too much email with the expectation of quick response, and this fosters impatience." He further added that "therefore [he was] never too far from the Internet" (Participant 21, personal conversation, March 10, 2009). His concern, and the underlying concern of many other participants in this study, was that the expectations for quick responses to communication not only created impatience but also facilitated the perceived need to constantly monitor their communication sources in order to keep informed and respond to messages in a

timely manner. A large number of the participants indicated that this perceived necessity, coupled with the demand for increased productivity, have produced feelings that their time, and preferred routine, is being impinged upon, creating frustration and anxiety. In both of the cases mentioned above, this anxiety is caused by the new expectation for speed. In the first example quick results have replaced more deliberative thinking, and in the second, private time has been replaced by other people's expectation of quick results and quick message response. Both of these elements have also found their way into people's domestic spaces.

The Use of the Personal Computer and the Internet at Home

In their discussion of how they, and their family, use the personal computer and the Internet at home, every participant in this study mentioned that they received and sent emails. Several other uses were also prominently mentioned, such as organizing family finances, storing personal records and their family's digital pictures, and as a daily organizer. Many also confirmed that they have adopted at least some aspects of an Internet lifestyle. In addition to shopping, many mentioned that they receive information on topics that interest them, including their pursuit of their family genealogy, keeping up with news, receiving and storing music and videos, and playing online games. In fact the use of the personal computer, and the Internet, has almost become a ubiquitous part of everyday life at home, as confirmed by one person who noted that "basically it allows me to do everything I need to do, on a day-to-day basis. It also frees up so much time to do other things in my life" (Participant 29, personal conversation, April 14, 2009).

Although many participants maintained that these technologies have become a part of their family's everyday life, with every member of his family using them, they

also confirmed that their use has brought about changes at home. The most frequently mentioned change, not surprisingly, was that the Internet has allowed people to work at home. While many people stress the flexibility that this arrangement allows—for example, as one person recalled, "it allows me to work at least a couple of days a week from home, which is a very productive way for me to operate" (Participant 18, personal conversation, March 5, 2009)—many others were concerned about how this has impacted their personal time. This concern was best represented by one business professional who reflected:

> I seem to have less time that is my own — work demands frequently spill over into my private life. Because I'm perpetually at the other end of a cell phone (with e-mail and Web features), I am frequently contacted either to make a decision or to complete some [business related] chore. (Participant 8, personal conversation, February 10, 2009)

While many other participants also confirmed that they were troubled with the increased amount of work that was now expected of them, a large number also expressed concern this requirement forced alterations in their family's home life. As an example, one academic mentioned that both he and his wife, who had a home-based business, have found that their individual requirements have extended their work days. However to compensate for this additional work time, they have attempted to place a time limits on nightly work. He notes that they "try to get an hour to ourselves. [However] these are expectations, of course, [and] we see that machine and know that we have work, and it brings on guilt sometimes" (Participant 9, personal conversation, February 3, 2009). This paradox was confirmed by many other participants, they feel guilty for avoiding work,

and also feel guilty for not spending quality time with their family. The problem of frustration with the requirement of working at home and the guilt of missing time with one's family is examined in Chapter 11, which deals with changing interpersonal relationships.

In addition to the requirement of working at home, many participants expressed feelings that their use of the personal computer, and the Internet, also altered their evening and non-work time patterns. While several participants mentioned the pleasure they received from surfing the net, and a few said that they enjoyed collaborating with other people in on-line communities, however, a large number also related stories of minor conflicts with other family members because of the amount of time, either they themselves, or the other family member spent on the Internet. Many participants also mentioned that their children were constantly using the Internet to play games or to communicate with their friends. These reflections demonstrate an underlying concern for the general loss of family time associated with Internet usage. Almost as many participants expressed concern about changing of communication patterns that the use of Internet-based technologies is advancing. As an example, one participant noted that the use of any new medium alters familiar communication patterns, and observed that "communicating by email is just a different process, than communicating by the phone, or writing a letter." He added, "my kids communicate with their friends using instant messaging all the time, and that is also a little different. Each form has its own culture," and by extension, its own rules and patterns (Participant 22, personal conversation, March 11, 9009). The potential of changing communication patterns is more fully explored in Chapter 10.

Alternative to Older Media

The vast majority of the participants in this study revealed that the use of the personal computers and the Internet has become an everyday feature in their lives, and while older mass media, like newspapers, magazines, radio and television are still used, these new technologies are increasingly becoming a viable and, in many cases a preferred, alternative. As an example, when asked if he noticed any change in his use of other media, one academic responded: “Oh yeah, this phone rings maybe once a week now” (Participant 29, personal conversation, April 17, 2009). Of course, he was also referring to the increased use of emails as a communication source, a reaction that was almost universal from the people interviewed. Another participant observed: “I spend less time watching television because I’m speeding more time on the computer” (Participant 13, personal conversation, February 13, 2009). This statement was repeated, in one form or another, by a great number of other people interviewed. Many other people also mentioned that they do not write letters anymore, because they find emails are more convenient. In addition, one academic noted that, while still reading, he spent “less time reading printed material because of the ability to search digital documents for the specific information I seek” (Participant 4, personal conversation, December 23, 2008). This sentiment was repeated by many other academics and business professionals alike, with several saying that the Internet has replaced television, radio, newspapers, and magazines, as their primary source for news.

These observations support Shklovski, Kraut, and Rainie’s (2004/2006) conclusion that the use of the Internet changes the extent to which people use older communication media. They also would not have been a surprise to the early medium

theorist McLuhan (1963/1965 & 1964), and McLuhan and Fiore (1967), who argue that the use of a new medium impacts almost every aspect of people's everyday life, and especially McLuhan and Powers, (1989), who argues that use of electronic technology has extended throughout the world. Nor would they be a surprise to Meyrowitz (1985), who maintains that new media usage tends to replace the use of older media. These observations further support Innis' (1950/1972) argument that the concentrated use of one medium of communication creates a bias toward that medium, and Postman (1993), who cites Innis and maintains that the use of a new medium privileges it own use at expense of older media, and also privileges the people who use it over the people who continue to use older media.

In further support of Innis (1950/1972) and Postman's (1993) observations, one female business professional committing on her enjoyment of Internet usage as compared to television, reflected:

> Another part [of using the Internet] is exploring, staying up on everything that's happening all day long. There so much in the world that's happening all day, and the TV feels like it is slower than the computer. At least you know the computer is going to give you a minute by minute account. (Participant 2, personal conversation, October 15, 2008)

This statement also supports McLuhan's (1963/1965 & 1964) observation that the use of electronic technology impacts the user's daily routine, and McLuhan and Fiore's (1967) insistence that people are now becoming totally involved with their media.

In addition to using the personal computer, and the Internet, as an alternative to older media, many people related that they have sought to alter the older forms by

incorporating aspects of the newer. As an example, one professional related that "actually we gave up cable because we used the computer and an old X-Box, which I modified, to stream video from any web site into the TV," and he further added, "I found the instruction for this modification on-line" (Participant 13, personal conversation, February 13, 2009). Another business professional observed: "I thought about having the telephone wired into my computer and having it voice activated, so I could tell the computer who I wanted to call" (Participant 5, personal conversation, January 13, 2009). These examples support Oudshoon and Pinch (2005) assessment that users really matter in both the adopting and the adaption process of technological development.

Call to Use Newer and Newer Media

The conversion of the personal computer, the X-Box, and the Internet, mentioned above is also an example of the perception that is a necessity to be aware of newer media offerings and uses. This need was predicted by McLuhan and Fiore (1967/1996) when they argued that our media ecology is transitioning to a mass culture of total media involvement, and acknowledged by Chesbro and Bertelsen (1996) who state that "increasingly, we live, work, and play in environments created, sustained and altered by and through communication" (p. 30). The following statement by one participant illustrates both the total involvement of media in people's everyday lives, and also the perceived necessity of having access to newer media.

> The Internet significantly changed family communication. In addition to sending family photos via e-mail, I use instant messaging to communicate with my wife (her office is 95 miles from mine), and we use Skype and webcams to make video calls when one of us is out of town. I also maintain a family genealogy Web site

> with an extensive photo gallery of more than a dozen branches of our family. (Participant 8, personal correspondence, February 10, 2009)

Several other people mentioned their desire for clearer, quicker, most importantly, newer technology has forced them to abandoned their analogue antennas, and telephones, for Wi-Fi wireless connections throughout their home. The attractiveness of wireless connectivity is also due to the mobility that these technologies promise. One academic provided such an example, stating:

> I'm thinking about moving away from the desktop format of the PC, to an iPhone, or at least a Blackberry, because when I travel, or even travel from home to work, I miss messages. I think that I need to make that transition to the mobile Internet. I can then have the Internet available 24/7. (Participant 21, personal conversation, March 10, 2009)

This need for newer and newer media technology is reinforced by our popular culture, especially for young people, and is inspired by the aspirations of the new Internet life style.

Concluding Summary and Discussion

Within the workplace the use of the personal computer and the Internet was generally credited as useful tools because of their convenience and utility by their users, and the promise of increased efficiency by managers. People soon realized that with the personal computer, one could write, correct, and store written documents, and using the Internet, they could communicate over a wide area, as well as, doing research, and moving files around. Although the Internet has facilitated many changes at work, its use did not completely fulfill the projection of a paperless workplace, however most of the

participants in this study agreed with Cairncross's (2001) claim that these communication technologies have increased efficiency and productivity.[1] Also many felt that the use of the personal computer relived them from some of the drudgery formerly associated their job, by releasing them from many repetitious practices, and many practices some laborious and time consuming tasks were reduced.

In terms of adopting these technological innovations, the vast majority of the participants confirmed Oudshoon and Pinch's (2005) argument that new technology must advance the needs of the users. They also confirmed that in the case of the personal computer and Internet usage, the adoption process is all but complete, and the ability to use these technologies is now seen as a necessity in today's workplace. Their observations confirm Mumford's (1934/1963) contention that mastering a new technology forces a new definition of success. This was even more pronounced during the initial adoption process, where a new status was confirmed on those people who were skilled in these technologies. The participant reflections also confirms Postman's (1993) assertion, that on a competitive level, non-adaptors are classified as failures, and the new technology represents the most valued form of knowledge transmission. Therefore, as Mumford (1934/1963), Meyrowitz (1985), and Postman (1993) point out, new technology can affect social status, and its use and mastery can affect the individual's self-concept.

Mumford's (1934/1963) also contends that use of a new technology can affect people's everyday work patterns, and according to many of the participants in this study, Mumford's observation appears to be correct regarding personal computer and Internet usage. These technologies have affected many people's daily routines, from checking

email and web sites on a regular basis, to adapting to changing situations at work. The most dynamic change is the elimination, or re-structuring, of some jobs. This is especially true of many jobs traditionally associated with women. The word processing function of the personal computer quickly made the initial author of a document responsible for the final end product, and the file sharing functions of the Internet, also made them responsible for the document's distribution. Many offices found that they could replace the typist/secretary, or re-define her function, adding additional duties and responsibilities, and potentially providing a little more job satisfaction. Many other participants mentioned that these technologies eliminated many of the physical requirements necessary for of some jobs, thus potentially opening up employment opportunities for women.

The trend toward continuously check email and web sites at work lead some to complain about workplace distractions. Other participants reported a certain amount of temporal anxiety relating to personal computer and Internet use. This is due to the increased expectation of productivity—also a byproduct of these technologies—forcing many people to take work home and extend their work day, thus decreasing people's personal and family time. This has also fostered additional frustration because they feel guilty for missing family time or not completing their work tasks. Also the new expectation for a quick response to communication fosters impatience, and more importantly, many participants revealed that they do not feel comfortable and/or secure without being close to an Internet-based communication device. Other participants, with some apparent nostalgia, were concerned that the expectation for productivity actually

produces lesser end products than during the time they were mentored into their profession.

In addition to either forcing, or allowing for, more work at home, a large number of people mentioned that they spend too much time on the Internet, even in non-work related areas. Many parents also mentioned that their children constantly use the Internet to play games and/or communicate with their friends.

Most of the participants on this study offered support for Innis (1950/1972), McLuhan (1963/1965 & 1964), McLuhan and Fiore (1967), Meyrowitz (1985), Postman (1993), and Shklovski, Kraut, and Rainie's (2004/2006), observations that the use of a new media technology changes the extent they use older communications technologies, creating a bias toward the new medium. Many participants mentioned that while they still read books, magazines, and newspapers, and watched television, their main source of information was the Internet. Also many participants confirmed that while they went to movies, listened to the radio (mainly in their automobiles), and watched television, increasing they used newer technologies available on Internet delivery devices to receive entertainment content. Many related that this new medium was a more convenient fit in their lifestyle.

The vast majority of the participant in this study also confirmed McLuhan and Fiore (1967), and Chesbro and Bertelsen (1996) contention that new media is an important component in people's everyday lives, and its use fosters a desire for more and more involvement. Many also mentioned that they formed the perception that it is necessity to have access to the Internet. While many observed that this was especially

true of younger people, there was every indication that this is also true of people from all age groups, and all professions.

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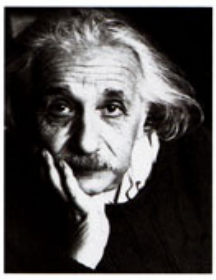
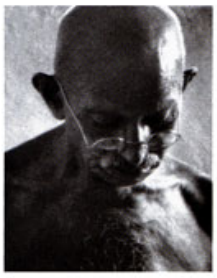
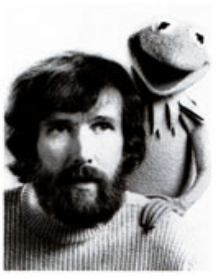
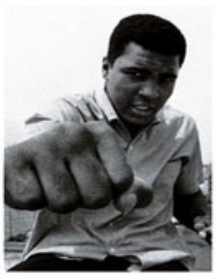
[1] Cairncross, the management editor at The Economist, also maintains that the use of the Internet has produced positive financial benefits for many companies. She offers Cisco Systems as an example, noting reports that it saved 250,000 telephone calls, reducing its operating costs by 17 per cent, by establishing a technical back-up website for its customers.

Chapter 9

The Personal Computer and the Internet's Role in Changing People's Perception of Time and Space

The above picture comes from the first page of a 1997 brochure announcing an advertising campaign for Apple computer, called “Think Different.” The choice of these people—Pablo Picasso, Albert Einstein, Mohandas K. Gandhi, Jim Henson, Maria Callas, Neal Armstrong, Muhammad Ali, Alfred Hitchcock, and Amelia Earhart—to represent this campaign was explained: “They invent. They imagine. They heal. They explore. They create. They inspire. They push the human race forward.” Although the brochure claims that Apple “make the tools for these kinds of people” (Think Different/Brochure, 1997), it is obvious that most of the famous people pictured were not alive when Apple came into existence, and it is questionable whether Neal Armstrong, Jim Henson, or Mohamed Ali actually used an Apple computer at the time this advertisement appeared. However the images used in this advertising campaign were designed as a visual metaphor to link potential consumers that formed what Rogers (1995) might call the early and late majority of technological adopters with Apple products. These consumers were educated, knowing all of these famous people on sight, but the implied consumer was also assumed to be aware of the personal computer. They also were probably aware of the Internet and could also see the value of its usage, which requires a person computer for connectivity. It was also hoped that the consumers would think that they needed a tool that could fulfill their desire to invent, imagine, explore and create.

The inclusion of this cover at this point also serves as a visual metaphor. Although all the people pictured above offer a fine example of daring and creativity, it is the person in the middle of the top row, Albert Einstein that can, in a metaphorical fashion, link computer and the Internet usage to changes in people’s perception of time and space. It was Einstein’s Theory of Special Relativity (1905/1912/2003) that presented

the importance of the relationship between space and time and presented the concept of Space/Time to the international physics community. He latter recognized that this theory was limited to one specific case—movement in one direction at a constant speed—and realized that acceleration and gravity had to be incorporated into a finished theory (Koughan, Tarver, & Druckerman, 2009). Einstein's (1907/1917/1921) theory of General Relativity was that finished theory. It is rightfully known for changeling the Newtonian notion of gravitational pull, and postulating that gravity was a result of objects being pushed through space and following curved contours within the time/space fabric. Along with others who foreshadowed his work in philosophy such as Henri Bergson (1989/1994, also see Bergson, 1965), Wilhelm Dilthey (1883/1988), Edmund Husserl (1913/1975), and Alfred North Whitehead (1919/1955), Einstein catapulted reflection on the nature of space and time into the popular consciousness like no one since Saint Augustine (circa 397-401/2006)

In the Western intellectual tradition, one of first to argue that the perceptions of time and space were formulated in the mind was Immanuel Kant (1781/2007). Although he brought the concepts of space and time to the forefront, Kant was primarily interested in aligning his observations with the objectivism of Descartes (1641/1998). Many other philosophers reacted with a more subjectivist interpretation of the consciousness structure that produces individual concepts of space and time. Nietzsche (1887/1974) argues that communication and language were important elements in the development of one's consciousness. Husserl's (1949 & 1913/1975) observes that a significant portion of one's everyday world, including objective time and space perceptions, were constituted intersubjectively. Heidegger (1927/1996) maintains that human consciousness is where

Being is exposed and understood. He also argues that the world can only be understood as an element that is inherited from tradition and cannot be divorced from the history of the use of language. Merleau-Ponty (1945/1948/2003 & 1951/1973) holds that cultural phenomena served as a bridge between subjectivism and objectivism, and the most important of these is language. Gadamer (1975) argues that people are embedded in the particular history and culture that shapes them and that understanding is a process of negotiation between oneself and the other. In an attempt to link many of these perspectives together and weave the construction of time and space perceptions into a fabric that accounts for the special relationship of time and space envisioned by Einstein, Gebser (1949 & 1953/1985) postulates that "whenever we speak of space and time we must remember that these are concepts worked out by our consciousness" (p. 162).

Changing Perceptions of Time and Space

It could be argued that humans had some sort of conceptualization of time—at least the concepts of past and present—over 50,000 years ago. Ralph S. Soleck and Rose L. Soleck excavated the Shanidar Cave in northern Iraq in the 1950s and found pollen from several types of flowers among the human bones found there. These bones were dated, and found to be around 50,000 years old. This led them to conclude that flowers were used in a burial ritual (Hirst, 2009).[1] This would have occurred in what Gebser (1943 & 1949/1985) might describe as a transitional period between the magical phase of the development of the human consciousness structure and the mythical phase. As previously stated, "Gebser defines various epochs in the evolution of consciousness in terms of their respective relationship to the experience of space and time" (Kramer, 1988, p. 606), and each epoch is identified by an alteration, or rather a mutation, in the human

consciousness structure. These mutations constitute fundamentally different ways of experiencing, and expressing, reality. And "consciousness mutation . . . unfolds toward structural enrichment and dimensional increment; it is intensifying and inductive—a plus mutation" (Gebser, 1949 & 1953/1985, p. 38).

Gebser (1949 & 1953/1985) identified the dominat forms of expression during the magic period as craven images, with rituals promoting the power of these totems. During the period that saw the rise of the mythical structure, the concept of gods developed, as did symbols and mysteries linking these gods to the human world (p, 148). The primary differentiation between these structures was in the formation of their temporal relationships. While the magic structure was undifferentiated, the mythical structure was predominantly past-oriented (p. 149). This led Gebser to observe that we could "locate approximately the time of the mutation from the magic to the mythical structure, since a consciousness of time, however rudimentary, would have had to manifest itself before the mutation was possible" (p. 61). Also with the emergent consciousness of gods as compared with animate and defused "spirit," a rudimentary sense of space emerged as the divine ones were thought to be located and distant (Kramer, 1997).

Gebser (1949 & 1953/1985) observes that myths fostered polarity and the "phenomenon of complentarity: day and night, brightness and darkness, heaven and earth" (p. 165). This in turn permitted humans to create mental images which facilitated their placement in the natural world. Therefore he maintains that "the distinguishing characteristic of the magic structure was the emergent awareness of nature, the essential characteristic of the mythical structure in the emergent awareness of soul" (p. 61).

During this time, another element associated with time-consciousness emerged. As Boorstin (1991) points out, the necessity of insuring a proper planting season caused people to follow both the cycles of the moon and sun, which ultimately led to the development of the calendar. This also influenced human's perception of their self. Gebser (1949 & 1953/1985) concurs: "There must have been a far-reaching connection between the discovery of the first perceptions of regular, that is, periodic movement and the discovery of the soul" (p. 61)[2].

The next consciousness formation that Gebser (1949 & 1953/1985) identifies is the mental structure, and he notes that within this construction the temporal relationship is "predominantly future-oriented" focusing on "purpose and goal" (p. 149). This was certainly true of the next technical innovation concerning time, the clock. Mumford (1934/1963) points out that after the clock replaced the church bell as the instrument that regulated the day its use affected every area of economic activity. Gebser (1949 & 1953/1985) also points out that "time … conveys the idea that it is a divisor" (p. 173), and as Mumford (1934/1963) observes, the clock reinforced the belief in the accuracy of measurement. He also notes that the clock, more than any other technological instrument, contributed to a generalized time-consciousness among humans and quantification.

Innis (1950/1972) points out that the concept of distance was familiar to the early human experience, but not space sui generus. We have no evidence that early humans talked about space as a dimension. Distance, rather, was a function of practical affairs. Rivers were used to reduce travel times and later the Romans, in the first full-blown expression of urban modernism, constructed roads to facilitate their army's movement, promote their trade and commercial advantages. For them speed, distance divided by

time, was essential. Gebser (1949 & 1953/1985) asserts that it was not until the Renaissance that "an unmistakable reorganization of our consciousness occurred: the discovery of perspective which opened up the three-dimensionality of space" (p. 2). But Kramer (1997), Mumford (1934/1963), Johnson (2000), Casson (2001), and Rubenstein (2003) argue that this was a reawakening in Europe of a perspectival, mental rational structure that had existed previously among the Greco-Romans. And Gebser notes that elements of this new consciousness structure "began to find expression about 1250 A.D. in Christian Europe," when man gradually became "aware of his body as a support for his ego" (p. 11), it was the artistic expression associated with the Renaissance that most clearly demonstrates the change in human attitudes toward their world. As Gebser notes, "not until the third decade of the fifteenth century did European man begin to reflect and theorize, that is, consciously come to terms with the possibility and expressive forms of the new style" (p. 15). Many artists are representative of this period. Schama (2006) credits Caravaggio's *David with the Head of Goliath* for expressively portraying the physical body and Bernini's *The Ecstasy of St. Theresa* with demonstrating the strength of human feelings. Ceysson (1999) credits Ghilberti and Donatello's bronze representation on the doors of the Florence Baptistery as the first expression of this perspective, and Gebser (1949 & 1953/1985) contends that Leonardo established the purist mathematical formulation of the representation of spatial depth that came to characterize this worldview. He notes:

> Leonardo was able to place the vanishing point in space (on the horizon) in opposition to the passive or 'enduring' point of the eye, the preceptor of the

> stream of object impressions, and thus realized the close interrelationship between the two. (p. 20).

Gebser further observes that "the emphasis has shifted to the eye of the subject—the eye which has realized space and thus established an equilibrium between the ego world (of the eye) and the external world (of the horizon)" He also maintains that this "realization … has determined the Western image of the world ever since" (p. 20).

Gebser (1949 & 1953/1985) also points out that this consciousness mutation produced a "transformation of Euclidean plane surfaces" (p. 16) which invited new concepts of mathematics and measurement into human's intellectual inquiry. He also asserts that Leonardo's *Trattito della Pittura* was "the first truly scientific and not merely theoretical description of all possible types of perspective" (p. 19). On a more practical level it "made technical drafting feasible and thereby initiated the technological age" (p. 19).

One of the technical innovations that appeared during this technological age was the printing press using movable type. Deibert (1997) contends that its development "favored the strategic interests of the Protestant Reformation and scientific humanism to the detriment of the papal-monastic network," as well as facilitating "the rise of the urban bourgeoisie" (p. 203). Also as Innis (1950/1972 & 1951/2003), Eisenstein (1979), Anderson (1983/1991), and McLuhan (1962/1965) point out, the printing press increased the quantity of books in national languages, thus promoting nationalism as well as making more books available to more people. This was an important element in mutating the human consciousness structure with regard to time and space perceptions. As Hall (1966) maintains "language … is more than just a medium for expressing thought, It is,

in fact, *a major element in the formation of thought"* (p. 1), and "language extends experience in time and space" (p. 3). The increased availability of printed material also had a practical implication for time and space perceptions. Mumford (1934/1963) observes, "compared with oral communication any sort of writing is a great labor saving devise, since it frees communication from the restrictions of time and space and making discourse wait on the convenience of the reader" (p. 136).

The technological innovation did not stop with the printing press. Kern (1983/2003) claims that "a series of sweeping changes in technology and culture [in the late 19th and early 20th centuries] created distinctive new modes to thinking about and experiencing time and space" (p. 1). The changing technologies of the steamships, the bicycle, the airplane, increased mobility and impacted people's perceptions of distance and space. New media technologies like the phonograph, the cinema, and the telephone influenced people's sense of time—creating new notions of the past, present, and future. Like Gebser (1949 & 1953/1985), Kern (1983/2003) also maintained that changes in perception were reflected in the cultural products that developed during this time—the stream-of-consciousness novel, Cubism, simultaneous poetry, the concept of relativity, and psychoanalysis. However, he maintains that the introduction of World Standard time was the most historically unique contribution of the period, because it promoted the concept of "a plurality of private times" (p. 314). He maintains that this shift from a universal, unchanging, public time fostered a new center for individual experiences. Events were no longer seen as taking place in one place or limited to a local area, thus bring into question the traditional notions of human's place in the world.

While agreeing that changes in time and space perceptions occurred during this period, Schivelbusch (1996) claims that the primary cause of these changes was the development of the railroad system.[3] Because of this new conveyance, it became cheaper to move material over great distances, and the railroads aided in the "establishment of *speed* as a new principle of public life" (p.xiii). He claims that "motion was no longer dependent on the conditions of natural space, but on mechanical power that created its own new spatiality" (p.10). Solnit (2003) shares this opinion, noting that "the railroad shrank space through the speed of its motion" (p. 13). However, she also notes that the railroads "transformed the landscape itself" (p. 12) because it altered the visual perception of the passengers.

Solnit (2003) also discusses photography which was a "technological breakthrough for holding onto the past" (p. 15), and Muybridge's motion studies that comprised both his stop action photographic techniques and the introduction of a mechanical method to continuously view those images, both of which contributed to the process of filmmaking. She also notes that the invention of the telegraph bridged the gap of time and space required for response, as did the telephone. While people were still separated in space, people were allowed to react instantaneously, especially in the case of the telephone, and on a person to person basis.

All of these technologies had an impact on their user's time and space perceptions, especially the media technologies, because, as Chesebro (1984) points out, "the selective use of media creates a selective perception of reality" (p. 116). This is accomplished because, as Ong (1982/2003) explains, each medium solicits the formation of a unique sensory ratio that impacts how human senses receive information. Also this

process of the introduction, and use, of new technologies has accelerated, and with an impact on users. As McLuhan and Fiore (1967/1996) argue the "new mass culture we are moving into … [is] a world of total involvement" (p. 61).

The relationship between the dominant medium of a linguistic community and the mode of thinking and even perceiving has been documented in the computer age. Synaptic plasticity and the formation of neuronal networks has been shown to be the result of exposure to stimulation and that attending for hours to one form of medium over another changes the very structure of the brain and how it works (Doidge, 2007, Schwarts & Begley, 2002, Le Doux, 2002, Bass, Gornoztaev, & Unger, 1993, Wolf, 2007, Palfrey & Gasser, 2008, Tapscott, 2009, and Small & Vorgan, 2008). It has been known for decades that the brain is a social product and that Nietzsche's (1887/1974) rather startling assertion that consciousness is a social phenomenon is true (also see Geertz, 1971/1974 & 1973/2000).

We have entered into what Deibert (1997) calls a "hypermedia environment comprised of the television, the computer, the fax machine, the cellular phone, the satellite reconnaissance system, or the hand-held video camera—it is all of the above and more linked together into a single seamless web of digital-electronic telecommunication" (p. 115). In examining the potential for change in user's time and space perceptions we must remember McLuhan (1964) admission that "the message of any medium or technology is the change or scale or pace or pattern that it introduces into human affairs" (p. 8). The use of the personal computer and the Internet has changed individual patterns, as reflected by one person who led off his interview by noting: "I'm looking at my email as we are talking and I see notes from my classmates from 1955, and for thirty years we

never talked to each other since we got out of high school now we're almost communicating daily" (Participant 11, personal conversation, February 12, 2009).

The Internet and Changes in Space Perceptions

There is no doubt that through the use of emails, and other modes of Internet communication, "we can contact people not only across the country, but around the world, and do it routinely" (Participant 10, personal conversation, February 9, 2009). On the one hand, this reflection acknowledges that the participant, like most of the others in this study, now use the Internet routinely, and accept its use as a tool in their everyday life. On the other hand, this observation also reflects the feeling of many others in this study that acknowledge that a primary feature of space perception, distance, has diminished. The observation also addresses one of the primary advantages of using Internet communication, as another participant stated the use of the Internet "reduces the distance between family and friends" (Participant 3, personal conversation, October 8, 2008).

Most of the participants in this study also viewed the inclusion of Internet usage in their lives as a positive development. This was reflected by one person who observed:

> It opened up a new world. The Internet allows you to intersect with things all over the world, and know what is going on. I can know what is going on in every country in the world, and in Washington D.C., and in real time. (Participant 25, personal conversation, April 1, 2009)

Similar observations were expressed by a great number of participants who have adopted the Internet into their own personal lifestyles. As has already pointed out, people now use

the Internet for information gathering, purchasing items and planning trips, and as a modality for extending their leisure pleasures.

Both of the above observations illustrate that Internet usage has promoted the expectation that information is now available in a timely manner. People can now find timely information from distant place, and some activities can be performed without the need of personal travel. Reflecting this and a new notion of distance that is encouraged by the use of the Internet, one participant observed that "the world has grown larger, or smaller, depending on how you want to put it" (Participant 10, personal conversation, February 9, 2009). However, this comment also illustrates a paradox that concerns Internet usage. Has its use drawn users into a larger world, or has it facilitated an escape into a smaller one?

In discussing their inclusion in a larger world, many participants argue that the Internet holds the potential for broadened people's world-view through its capacity to introduce them to new things—new places and new ideas. This attitude was summarized by an academic who stated that Internet usage "has broadened what we are able to access, and what we're able to read. It's not just in science; it's anything, now there's not a topic, not a place that you couldn't find something about" (Participant 10, personal conversation, February 9, 2009). He went on to observe that its usage has produced positive benefits for his students. He noted:

> There is no question about that and it broadens students' ideas about the world, and it opens a whole realm of things that you wouldn't simply know about. It has broadened their world-view. It has inadvertently introduced them to things way

beyond what they would have considered. (Participant 10, personal conversation, February 9, 2009)

Many business professionals mentioned that the Internet connects them to a larger customer base. Although most were referring to a local base, some also acknowledged support for Cairncross' (2001) observation that now small companies are able to offer the same services that large companies used to provide, and therefore, because of the Internet, company size has become irrelevant. Also, one person who was interested in grass roots politics mentioned that the Internet has the capacity to bring a "larger audience, and over a much longer distance" into political discussions (Participant 25, personal conversation, April 1, 2009). This sentiment, with slight modifications regarding the content delivered, was also express by journalists and professional writers. Many participants also articulated the belief that Internet usage allows people who cannot travel, or who cannot afford to travel, to still view distant places, although most also mentioned that using the Internet in this capacity does not provide the same experience as being at a distant location in person. Several other participants also mentioned web cameras can allow for virtual travel. These reflections ranged from positive—checking out locations for possible trips—to negative—questioning the ethics of surveillance, and the use of this technology as an infringement on personal privacy.

Many of the elements that argue for users being drawn into a larger, more broadly based world also argue for the realization that the Internet invites its users into a smaller world. This was illustrated by an observation made by a business professional who called upon the past to make a comparison to the present. He noted:

> The computer has made the world so small. If you think back to about one hundred years ago, before the automobile, the world was large. People very rarely saw more than the county that they lived in. Now because of computers, the Internet, and other space-age technologies that allow you to rapidly move around the world, over and over again. Even if you don't leave your home, you can still visit just a miraculous number of places, and have visual contact through videos. (Participant 5, personal conversation, January 13, 2009)

Whether the Internet invites its users into a larger world or fosters the impression of a smaller world probably depends on the user's attitude, and both interpretations imply a certain amount of agency for the individual user, and agency in terms of individual choice as to how to use the Internet is one aspect that most participants in this study indicate is the medium's most attractive feature. In describing the nature of the individual access to information that the Internet promotes, one academic compared its affects to that of the automobile, stating that "the automobile individualized mobility where the Internet individualized access" (Participant 9, personal conversation, February 3, 2009). There is little doubt that the very nature of Internet usage promotes individualized access. It allows people to select the content that interests them, and select the source of that content. However a large number of participants also indicate that this feature is also a source of isolation. Some revealed that its use limited their personal and family time. Some also indicated that its use has altered aspects of their personal relationships, as they choose to become involved in virtual groups at the expense of human contact. Even the decision to purchase items on the Internet was acknowledged to limit personal contact.

Goossman (1997) avoids the argument about big or small world, by adding another interpretation, claiming that for some, the Internet seems to flatten the world, making it possible to be heard throughout the World Wide Web.[4] She maintains that this version grew from the early utopian visions of the Internet as a tool that would empower its users by allowing them to access information. However, she maintains that this vision does not really reflect reality. Rather than the users controlling the Internet, she claims that the middlemen have more influence. The principle middlemen are service providers that have shown limited vulnerability to user's demands, and maintain a basically immoveable business plan. She draws an analogy between these middlemen and the middlemen in Adams' (1979/1986) *Hitchhiker's Guide to the Galaxy*. Adams' middlemen were placed on a spaceship and sent to a new planet to aid in the infrastructure maintenance for its more creative explorers. However, they crashed on another planet. The planet that these middlemen ultimately populated suffered from a loss of both incentive and creativity.

Looking at the present world that these middlemen have helped create, Grossman (1997) claims that two important trends that have emerged. The first is that communications are increasingly mediated, and secondly, perspective is easily lost when using the Internet. This process is facilitated by the structural mechanisms employed by Internet search engines where topics are classified according to popularity. Because people tend to word their topic inquiries to reflect their individual conception of the topic, they evaluate the results on their screen as representative of the majority opinion of everyone else on the Internet, and, quite possibly, in the world. Therefore, the opinions of others, who do not share their outlook, can be easily discounted.

The limitation of interpersonal contact, and the out-of-sight, out-of-mind structural feature of Internet usage, accelerates a trend recognized by Meyrowitz (1985) when he discusses the effects of television. His arguments revolve around changing space perceptions instigated by television viewing, and notes that, "television demystifies the places actually exposed on it and also promotes a new sense of access of openness to all places," and contends that these "exposures further increase the demystification of place." (p. 181). As Kramer (1993) explains, "we may appear to be present while we are absent for the spatial/temporal coordinates of an event" (p. 31). Meyrowitz (1985) also observes that the demystification of place is increased by the content of the medium which constantly exposes public figures, and their behind-the-scenes workings. He contends that the invasion of this behind-the-scene space has "moved the dividing line between private and public behavior toward the private, and weakened the relationship between social situation and physical places" (p. 308). This process is accelerated by Internet usage, and reinforced by today's popular culture, that has come to embrace the Internet. Not only are public figures, both leaders and celebrities, constantly under surveillance in today's media ecology, their every misstep, even minor, are exposed. Now users are now under pressure to expose their thoughts, and actions, through Internet modalities like twitter, YouTube, and instant messaging. Although, on the surface this exposure appears to support the concept that the world is opening up, in actually it tends to promote egocentrism and reinforce the users retreat into their own private, small, world. The exposure and opening up of user's social situations and practices also calls into question the traditional social linkage between situations, culture, place, and individual identity.

Although the big world, small world dichotomy, or the flat world analogy, might simply be described as a matter of subtle linguistic interpretation, and while there is a question of who actually controls the Internet, the users or the middlemen, there is little doubt that the very nature of Internet usage promotes changes in people's perception of distance and space, and the position of the user's place within that space. This has an added dimension with the increased desire of many people to maintain an Internet presence. Several participants indicate a temporal aspect of this use of the Internet, revealed that they enjoyed the opportunity to be in two or more places at the same time, there is quite obviously a spatial aspect as well—being in more than one place. While the desire to maintain an Internet presence is growing, there is also some indication that the maintenance of this presence forces an actual shrinking of user physical space. As an example, one participant mentioned that he played "in a virtual environment and try to develop that sense of presence when you're not really there." Although the entrance into a virtual setting represents an entertainment choice, it does limit the individual's actual physical space because "you're not really their" (Participant 13, personal conversation, February 13, 2009). The use of the Internet is, by its nature, an individual effort, thus limiting the space in which others are invited to enter, this is further increased by the use of contemporary Internet-based devices, which tends to segregate people located within the same physical environment, and many entertainment choices also contribute to this effect.

The Internet and Time Considerations

Most of the participants in this study confirmed that they now feel it is important, if not necessary, to receive information in a fast, if not instantaneous, manner. This

expectation of speed is not limited to information gathering it also extends to communication, and is a product of using the Internet. Like the railroad before it, the Internet is responsible of the "establishment of *speed* as a new principle of public life" (Schivelbusch, 1996, p.xiii). This section will examine the affect on Internet users of this "new principle," and the new perception of time that the Internet encourages. Like the affect that Schivelbusch describes concerning the incorporation of the railroad into the everyday life of people in the 19th century, the use of the Internet parallels other historically technological introductions. When Kern (1983/2003) describes the introduction of universal public time in the late 19th century, he points out that it provided a new center for individual experiences, and as Solnit (2003) observes, photography provided a "technological breakthrough for holding onto the past" (p. 15). The medium of the Internet, and the changing perception of time that it promotes, have produced similar effects.

Many of the participants in this study related that the acceptance of the new perceived necessity for speed produces several forms of temporal anxiety. Many mentioned their fear of being left behind other people, both in terms of technical experience and literacy, and in terms of acquiring the information needed to perform their job. Other participants mentioned that this new demand for speedy information also produces a number of "chicken or the egg" paradoxes. For example, one academic commented, "given the increased demands on our time these days, it is good not to have to struggle to get a hold of what you need" (Participant 12, personal conversation, February 13, 2009). In this case, and in many others, the paradox appears to be between the assumption that the use of these technologies helps to solve the problems associated

with the demand for increased productivity, and an underlying concern that they actually contribute to the problem, by the creation of the expectation of increased productivity in the first place. A large number of participants also revealed that they feel temporal anxiety associated with both the inversion of home and office time, and the demand for conforming to a lifestyle that encourages multitasking. If Cairnecross (2001) is correct in predicting that time zones will matter more than distance in determining corporate operations, and even locations, these potential problems cannot help but increase. The possibility of job relocation, or even job loss, would add to the worries about the increased time now demanded for work.

Several other participants also mentioned a paradox between the necessity of having quick information to make financial decision, and the overall health of the financial system. In fact, a large number of people related that in order to maintain strong personal finances, it is now necessary to constantly check on their investments through the Internet. These comments support Zwick's (2006) contention that Internet trading provides its users with a real sense of agency. However, possibly because that during the time when these interviews were collected the United States was entering into a severe recession, almost as many people indicated that the speed of stock transactions only allows for investor reaction and not their reflection. They feel that this use of the Internet puts the investor in a problematic position, as summarized by one participant who commented: "Transactions are in real time, and thoughtful investment suffered. There is a discussion about building lag time into the market, because of this. The real time aspect of the Internet is both a blessing and curse" (Participant 22, personal conversation, March 11, 2009). Many other participants even questioned the use of some of the advanced

formulas and models used in financial analysis that grew out of more sophisticated computer statistical programming.

Another source of anxiety, or at least frustration, almost universally expressed by the participants, is the expectation for rapid communication feedback, as one participant said that "people [now] expect an instantaneous reply" (Participant 16, personal conversation, February 24, 2009). Another mentioned that "fast information, is essential [and] everyone wants a quick fix" (Participant 2, personal conversation, October 15, 2008). These statements reflect the potential for experiencing frustration, by both the sender and receiver. Further, the mention of the need for a quick fix also brings into question the new relationship between time perception and cognitive processing, which we be examined in the next section.

Confirming Meyrowitz (1985), Gebser (1949 & 1953/1985), and Kramer's (1988) observations that media involvement fosters egocentric behavior on the part of their users, many of the participants in this study related that they engage with the Internet in order to establish their own individualized presences. Some people insisted that the Internet allows them to be at two places at the same time, e.g., working while maintaining a personal connection on Facebook, or engaging in private pursuits while also being connected professionally through their web site. While this allows people to deal with many facets of their life simultaneously, it also feeds back into the problems associated with multitasking. The positioning of these technologies in the private and public lives of their users, and the time consumer using them, also affects people's evening and family time to the detriment of family and other personal relationships, and potentially creates guilt, and another the possibility of temporal disjuncture.

Many of the participants in this study also indicate that the concept of past time has undergone some alteration. On one hand the use of the Internet has facilitated more complete historical research, allowing many academics to now visit libraries and archives without leaving their office, or spending much-needed money for travel. Other academics who are interested in more current research note that the use of the Internet can place them at a specific place, and at a specific time, thus offering them more complete insight into the phenomena that are attempting to understand. As an example, one participant mentioned:

> Now we have records of almost everything, and a wealth of personal perceptions of what has happened through blogs, and email records, and web sites that went up in the early days of the Internet, and information that is publicly archived by Google. So I do think that historians will have the potential to travel back into time, [to] see what daily life was like. They can see what was published, the photos, the videos, the blogs, at that time. (Participant 13, February 13, 2009)

On the other hand, many participants worry about the longevity of posted personal records on the Internet. They are concerned that such records do not allow people, especially today's young people, to forget unfortunate statements and occurrences. Interestingly, several participants remembered such situations in their past and even confirmed their reappearance on the Internet presented problems in their present. This was reflected by one academic who related:

> One of my kids looked me up on Google, and found a discussion that I had entered into in the mid-1990s where I got into a "flame war" with somebody, and my boys told me I owed them a quarter for each bad word that I used. It really is

> space and time, as I was living in Virginia, and I'm still paying for it. (Participant 9, personal conversation, February 3, 2009)

Other people placed this problem is a historical/social context, but were also equally concerned, as reflected by the following statement:

> People should be allowed to forget unfortunate things that they have said and done. In the nineteenth century, you could just leave town and probably nobody in the new town would ever find out what you had done. You could be totally redeemed. Now, especially in politics, people look for anything that was said, or written, that was unfortunately worded, and throw it back at the other person. You've got to have a chance to grow, in some degree. It kind of reminds me of the oppression of living in a small town, no one ever forgets the fact that you stole a candy bar when you were five from the neighborhood grocery store. In a big city, that kind of thing would be forgotten, they take you on the face of what you've become, and not what you were. A record of everything is not necessarily good. (Participant 14, personal conversation, February 17. 2009)

The growth of memorial pages on the Internet was also mentioned by several people as a way to both remember and celebrate the past. Most feel that this is a way to ensure the presence of someone even after their death. However, some questioned the nature of memorial pages designed to solicit funds, and others thought the validity of the information on many pages was problematic.

Referencing the personal computer and the Internet, one participant reflected that "this connection allows one to have the ability to extend space and time with the click of a return button. This ability to extend ourselves over space and time is probably the most

important feature of the Internet" (Participant 9, personal conversation, February 3, 2009). While it is true that these technologies have allowed their users to extend their reach over space, there is every indication from the responses collected for this study that that many feel that time has not been extended. Rather, we have experienced a compression of time, similar to the time-space compression described by Harvey (1990), where he contends that while time seems to be accelerating, the amount of time necessary to complete tasks appears to be condensed, and the significance of distance is diminishing. Like the railroad system discussed by Schivelbusch (1996), the use of these technologies has reinforced the importance of speed within our culture. In this regard, the personal computer, and the Internet, is like the middle-age church clock tower described by Mumford (1934/1963), because they impact, and to a large extent, regulate the rhythm of everyday life. Also, like the introduction of World Standard time, these technologies have promoted "a plurality of private times" (Kern, 1983/2003, p. 314), in terms of the amount of time spent on individualized encounters on the Internet. These pursuits have resulted in what Meyrowitz (1985), Gebser (1949 & 1953/1985), and Kramer (1988) describe as a tendency on the part of media users toward egocentric behavior. However, because of the importance of speed, this behavior is influenced more and more by the new demands of popular culture, to the point where the expectation of both quick information and communications responses have become a necessity. Also as McLuhan and Fiore (1967/1996) argue, "we are moving into … a world of total involvement" (p. 61) with our media and with the quantity of new technologies now entering into that popular culture, this process is accelerating.

The Internet, Space and Time, and Changing Mental Processing

Fischer (1992) might describe many of the reflections made by the participants in this study as representative of the "impact-imprint" model of new technologies, referring to "the cultural and psychological transfer of their essential qualities to their users" (p. 10). This appears to be true of the Internet's impact on time and space perceptions, and the imprint of these changed perceptions on mental processing.

The simple, and more or less constant, use of the Internet has begun to imprint itself on people's mental processing. Many participants commented that because of email, and other modalities of Internet-based communication, people tend to write less, and many indicated that people did not write as well as they did in the past. This observation was generally made of younger people who have grown up embracing the new media ecology. One former teacher made this point when she mentioned: "I've done some tutoring with adults and children [recently] and I've noticed that those people who use short-hand in their emails, and little smiley faces, and that kind of stuff, have more problems in writing sentences correctly, and their grammar is just shot" (Participant 1, personal conversation, June 14, 2008). Many other educators, both on the secondary and collegiate levels, indicated that students now rely on quick Internet searches to do their research, and in some cases their writing contains commonly used acronyms prevalent in instant messaging, both reinforcing the implication of questionable composition skills. This was also expressed by a college professor, who related:

> There is also the problem of students getting on the Internet to get information. Many of them just transfer the information into their paper, and there is a problem

> of plagiarism. They have trouble putting ideas together at the beginning, in the middle, and at the end. (Participant 18, personal conversation, March 5, 2009)

When asked to respond to Carr's (2008) assertion in *The Atlantic*, that because of his constant use of the Internet as a quick source for information, he now has difficulty reading, absorbing, and more importantly, interpreting, long articles from both the web and in print, a few people denied such an effect, while others mentioned that they read the article and agreed with many points that it made. However, every educator interviewed mentioned that their students seem to lose interest while reading longer articles, and did not seem to retain important information. While some attributed this to the use of the Internet, one academic mentioned that this reaction to longer articles began before the introduction of the Internet, and could be attributed to another media form, television. He maintained that people became conditioned to receive smaller amounts of information, because television presented both news stories and entertainment in short bursts. However, he did acknowledge that Internet use has extended this process (Participant 29, personal conversation, April 14, 2009).

No matter the exact attribution, the majority of the participants in this study seem to confirm Innis' (1951/2003), Postman (1993), McLuhan (1964), McLuhan and Fiore (1967), and Small and Vorgan's (2008) observation that new knowledge formations are derived from new media use. This also supports Marx and Engels' (1845/1972) reflection that technological media creates the "conditions of intercourse" (p. 150) and Wittgenstein's (1958/1965) notion that language drives thought.

The response of many of the participants seems to indicate that Gebser (1949 & 1953/1985) is correct in his observation that time and space perceptions are imprinted on

human mental processing. This conforms with resent research by LeDous (2002), Schwartz and Begley (2002), and Doidge (2007), who observe that the circuit in the human brain can be redirected, and according to Small and Vorgan (2008) the use of the Internet can facilitate this redirection process and can impact time and space perceptions. These new perceptions and the new demand for speed were demonstrated by many participants in their justification for the use of short Internet articles as a primary information source. They mentioned that they could skip through the content without feeling guilty because of time considerations, as one person related, "there is not enough time in the day to do keep up with everything" (Participant 2, personal conversation, October 15, 2008). This desire for speedy information, coupled with the popular culture's reinforcement of instantaneous communication responses, also causes some educators to speculate that the use of the Internet has created different forms of knowledge. One participant referred to this short cut method of obtaining information as encouraging a "microwave mentality," (Participant 5, personal conversation, January 13, 2009), and many educators described this practice as promoting indolent practices that do not force much cognitive effort, or encourage deferred gratification, both of which are necessary for obtaining reasoned conclusions. Many other people acknowledged that by relying of short cut Internet information, important information is lost. Several educators also expressed concern that their students are not learning to follow longer, and more elaborate, arguments because of this practice. Almost everyone interviewed mentioned, at one point or another, that it was possible and many times probable, to access information that is incorrect, and that information that can easily be faked and/or manipulated.

Almost every participant indicated that they believe that there is a problem with the volume of information on the Internet, and many feel that this volume made it difficult to process. They agree with Grossman (1997), who points out that the volume of data on the Internet makes it almost impossible to read and assimilate everything. She also contends that compared to the traditional indexing systems employed by libraries, the search engines on the Internet do not offer meaningful selections from the data that is available, since it is listed according to its popularity. In addition to the absorbing the massive volume of information now available, the participants in this study pointed to several other areas where Internet usage has become problematic.

One academic, a professor of psychology, questioned if this amount of information was compatible with human mental architecture, pointing out that the brain has a limited capacity to process information, and that humans are really "cognitive misers" and can only process one thing at a time (Participant 16, personal conversation, February 24, 2009). Many participants also saw a problem with perception that information must be gathered quickly. In fact, almost everyone interviewed indicated that people need more time to process information, and draw connections based on that information. Another participant demonstrated the concern that the new demand for speed imposed a new demand for multi-tasking (see Tapscott, 2009, and Rushkoff & Dretzin, 2010), stating: "I think our world is caught up in this swirl where we try to do too many things at one time. We try to think faster. Research has shown that our brain can only handle one thing at a time" (Participant 1, personal conversation, June 14, 2008). Still another drew a comparison from everyday life, stating: "I don't think that we should be driving down the street, putting on our make-up, and talking on the cell phone,

and listening to the radio at the same time and something suffers," (Participant 21, personal conversation, March 10, 2009), to express his concerns for the current demand for multitasking.

Another area of Internet usage that appears to be problematic according to several participants in this study, relates to the process of innovation. Many people expressed concern that while the Internet facilitates communication, it does so at the expense of person-to-person contact, and at the expense of innovation. These concerns focused on the reduction of meetings, trips and professional conferences because they can now be handled over the Internet, and personal contact, and interaction, is diminished. Many participants pointed out that exchanges with other people at such gatherings produce different ways of looking at problems, with new ideas and innovations resulting. This also applies to email conversations, and several participants expressed concern that insight was being sacrificed without person-to-person contact. Another person extended this concern to include other features of our current media ecology, stating: "I also think that the level of creativity suffers. Now a lot of kids want to play the guitar in a game, but they don't want to learn how to play it in actuality" (Participant 21, personal conversation, March 10, 2009).

Concluding Summary and Discussion

The vast majority of the participants in this study indicated that the use of the Internet allows them to contact other people, and find information, throughout the world, and like Adams (2005), they feel it empowered them to transcend their physical space and extended their exposure to distant places and cultures. However the participants also revealed that there is an underling question as to whether the use of the Internet has

drawn users into a larger world, by making information available on almost any subject, or if its use has allowed them to escape into a smaller one?

As the perception of distance has become diminished, as Meyrowitz (1985) points out, place is demystified. Distant locations have lost some of their allure because of increased exposure, and as the "openness to all places," are accelerated, "exposures further increase the demystification of place" (p. 181), even one's own domestic place. Further, the use of the Internet has allowed its users to also escape into a smaller world, where their egocentric behavior becomes paramount. This egocentric fetish is enhanced because users have chosen to expose their private actions and thoughts to everyone on the Internet. Also many modalities of Internet communication, as well as the structural mechanisms of Internet search engines allow them to privilege their individual opinions and relegate the opinions of others to a second-class position. This is a continuation of a trend seen by Meyrowitz (1985) with television usage. He notes that because of use of the remote control devise, and the growth in the number of content providers, the use of television has become more individually orientated.[5]

The perception that distance has diminished because of the use of the Internet was also echoed by many educators that were participants in this study. Almost every one of them mentioned that they used the Internet to logon to various libraries and databases to find information for their research. Many also indicated that this usage had a temporal, as well as a spatial, aspect. Most stressed that this usage saved time.

Another temporal aspect of Internet usage that many participants in this study revealed also has a spatial component. They indicated that they maintained an Internet

presence through their Facebook entries or personal and/or professional web pages. They claimed that this allows them to be in two places at the same time.

Although both of these temporal/spatial aspects of Internet usage reflect important new usage patterns, the most dynamic temporal change that the participants revealed was their conviction the time had in fact accelerated. In describing these changes probably the most common word that was used was instantaneous. Many participants mentioned the necessity of having instantaneous information to make quick decisions, their expectation for instantaneous responses to communication messages, and now the necessity for quick, almost instantaneous results.

Another trend that was revealed by the participants of this study is the necessity to maintain a connection to the Internet. They worry about missing important information and messages and this constant concern has the potential for creating stress. While they use Internet-based communication to mollify the expectations of productivity at work, and the communicative expectations of their peers, the increased dependence on the Internet can also reinforce these same expectations that created the stressful situation in the first place.

The participants in this study also revealed that there is an increased desire for maintaining a personal and profession Internet presence, which has also produced another new demand in today's popular culture. Although this trend was viewed as a professional necessity by many participants, allowing them to position themselves in a competitive position, this trend can also be seen, using Kern's (1983/2003) phrase, as an example of "a plurality of private times" (p. 314). The choice of having an Internet presence not only demands the individual's time to maintain that presence, but also encourages others to

devote their private time to respond and/or react. This also increases the trend observed by Meyrowitz (1985), Gebser (1949 & 1953/1985), and Kramer (1988) toward egocentricism. This is increased by the tendency toward an expansion of users' Internet presence while at the same time fostering shrinkage in their usable physical space resulting in a collapse into a more rigid ego. Gebser (1949 & 1953/1985) explains this dual position, and notes it has both a positive and negative effect. He notes:

> This dualistic opposition of contraries, whose positive aspect is the concretion of man as well as of space, includes at the same time the negative component recognizable in the fixity and sectorization. The fixity leads to isolation, the sectorization to amassment. (p. 95)

While examining the collected interviews for this study, it became evident that the participants tended to perceive that time is accelerating, although their individual time is compressing, while the consequences of distance are diminishing. This corresponds with Harvey's (1990) description of time-space compression. It also represents the continuation of the alteration of human perceptions of time and space influenced by the use of new technologies, especially media technologies, recognized by Meyrowitz (1985), McLuhan (1963/1965), McLuhan and Fiore (1967), Mumford (1934/1963), Innis (1951/2003), Gebser (1949 & 1953/1984), Postman (1993), Ong (1967, 1977, & 1982/2003), Kern (1983/2003), Schivelbusch (1996), Solnit (2003), Chesebro (1984) and Kramer (1988 & 1997).

The responses of the participants in this study suggest that these changes in time and space perception have imprinted themselves on human mental structure, and affect mental processing. As LeDous (2002), Schwartz and Begley (2002), Doidge (2007) assert

the human mental structure is capable of change, even beyond early years, and as Ong (1977), Chesebro (1984), Wolf (2007), and Small and Vorgan (2008) contend, the use of any medium can, and does, influence the channels of the brain that lead to the formulation of perceptions and mental processing. This includes Internet-based communication.

E-mail use has conditioned people to expect and return, short messages, and text messaging rewards abbreviation usage within the body of the communication. Both tend to discount traditional writing practices, both in terms of the length and the quality of written communications. In addition, the use of quick Internet searches and the abbreviated structure of most of its content, accelerate the tendency, begun with people's reliance on television to gain information, to lose interest while reading longer articles and formulating more nuanced interpretations. The temporal justification that there is not enough time in the day to fulfill the demand for productivity, combined with the desire for speedy information, and instantaneous responses in popular culture, has created a condition were speed is prized over cognitive effort. This condition is acerbated by the massive volume of information now available on the Internet, and difficulty people have with processing such a large amount of information. The use of the Internet also limits person-to-person contact. Many participants in this study recognized the value of personal communicative exchanges as a means of acquiring different viewpoints about a problem, and as an aid for formulating new ideas.

The accelerating use of new media technologies, especially among younger people, is also problematic. As was mentioned previously, one academic observed that "now a lot of kids want to play the guitar in a game, but they don't want to learn how to

play it in actuality" (Participant 21, personal conversation, March 10, 2009). He was probably referring to the popular "Guitar Heroes" video game, however similar games are offered over the Internet and through many other media delivery devices. This use not only poses questions concerning the potential for imposing physical limitations on youth, but also for their potential loss of cognitive development associated with actually learning, and, in this case, understanding the musical experience. Chesebro (2000) also observes that such activity invites people into a new virtual reality system. He maintains that "the nature of cognition is a virtual reality system departs dramatically from the forms of cognition contained in other realities," because, within such a system, what is seen as real "becomes what is articulated" (p. 11). Here, one might add that what becomes articulated depends on the individual using the technology, which reinforces the trend toward egocentricism.

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[1] Sommer (1999) claims that the flower pollen discovered in the cave might have been brought by rodents burrowing around the area.

[2] It should be noted that Gebser (1949 & 1953/1985) is not presupposing any metaphysical duality and so when he uses the word "discovery" he means the emergent awareness of a phenomenon, not the physical or empirical discovery of a thing like a mineral or a planet.

[3] As previously mentioned, O'Malley (1990) links both the development of a railway system and the conversion to standard time together as both promoted the interests of the other.

[4] Friedman (2005/2007) also claims that because of the growth of personal computer and Internet use (along with the development of fiber-optic micro cable networks and work-

related software) the world has grown flatter. Rather than promoting individual empowerment, as Grossman (1997) contends, Friedman sees this development as promoting more opportunity for commercial competitors from non-Western countries. In fact he asserts that increasingly former historical and geographical boundaries are becoming irrelevant. However, Friedman agrees with Grossman that privacy concerns are a byproduct of this technological convergence, as it is becoming more difficult to manage one's reputation is a media ecology that encourages everyone to become a public figure and publish accounts of their actions and thoughts. It should also be noted that Kramer (2003) maintains that while commercial usage of the Internet by non-Western countries has increased, given the inability of most of these societies to provide Internet access to the majority of their citizens, there still exists an information gap between the Western population and their non-Western counterparts. This gap promotes the existence of information ghettos, and calls into question the real nature of the empowerment potential that Grossman (1997) forecasts.

5 In addition to the observations made by Meyrowitz (1985), the overall the analysis of the responses of the participants in this study, also tend to supports the contentions of other scholars, like McLuhan (1963/1965) and McLuhan and Fiore (1967), Mumford (1934/1963), Innis (1951/2003), Gebser (1949 & 1953/1984), Postman (1993), Wolf (2007), Ong (1967, 1977, & 1982/2003), Kern (1983/2003), Schivelbusch (1996), Solnit (2003), and Kramer (1997), that the use of a new medium effectively diminish the perception of distance for its users, and that new medium brings the outside world into the home, resulting in a demystification of place. The analysis also tends to confirm the

observation made by Kramer (1988), that “individualism become hypertrophic in its egocentrism” (p. 612), because of the use of these new media technologies.

Chapter 10

The Personal Computer and the Internet's Role in Changing Communication Patterns

In an attempt to expand on their potential market, in 1980 Apple computer released the above advertisement. It was hoped that this campaign would reinforce business professionals' desire for a personal computer. Through the use of a representation of Benjamin Franklin, this advertisement attempts to link the computer with one of America's founding fathers, and suggests that it might have been used by this visionary icon of the American Revolution and early American science, had he been alive in 1980. This visual is reinforced by the copy, as it asks "What kind of man owns his own computer?" It answers its own question, by asking another: "Rather revolutionary, the whole idea of owning your own computer? Not if you're a diplomat, printer, scientist, inventor…or a kite designer, too." This advertisement also references the American entrepreneurial spirit, not only by embracing the concept of ownership of a computer and referring to Franklin's profession as a printer, but also by the inclusion of the more contemporary phrase that "time means money" later in the copy, thus linking the product with modernity. It also addresses one of the criticisms associated with modern capitalism, promising the personal computer will "uncomplicate your life," while at the same time promoting another goal of modernity: to "make you more effective" (What kind of man, 1980). As stated above, the intent of the advertisement was to both reinforce the desirability of the personal computer as tool for professional business applications—accounting and word processing—but also to offer it as a tool for other inventive and visionary users.

By 1980, the year this advertisement first appeared, many people were already familiar with email communications; remember this was four years removed from the time that Queen Elizabeth II first sent an email. Although this advertisement does not

mention either emails or the Internet, it does promote the advantages of the personal computer because it is both convenient and fast. When this tool was coupled with Internet technologies these advantages increased. However the daily patterns of communication began to alter.

Advantages of Internet Usage for Communication

Many of the participants in this study expressed agreement with the implied advantages that above Apple Computer advertisement attempted to convey, mentioning that the personal computer, and the Internet, were both convenient and fast. Many participants also mentioned other advantages of using the Internet, such as for finding old friends and keeping up with them through social networking sites. Others mentioned tracing family members whom they had lost touch with, in addition to keeping up with their direct nuclear family. As an example, one person related that because of his Internet connection he was "able to use my computer to see and talk to my son, his wife, and their two children, who live in Berlin, Germany. This is extremely important to me and my wife" (Participant 6, personal conversation, January 15, 2009). His observation also illustrates two other advantages that were expressed concerning Internet communication. The first is the transmission of images, linking family and friends together. In one way it links the present, as least visually, with past memories, and directly reinforces the notion that the receiver is part of the everyday life of the sender. The second factor is that Internet communication costs less than telephone usage, and several participants also mentioned that group discussions reduce travel costs.

In addition to cost factors, many participants also mentioned the Internet's utility as an education tool. Many parents saw it as a resource for gaining information for their

children. This was especially true for one family that engaged in home schooling. Many participants in the teaching profession also mentioned that it aided in grade posting, transmitting class assignments, and information about the subjects discussed in class. In addition, many people, both in education and business, indicated that the Internet allows for quick information gathering as well as document transfer.

Several participants also mentioned that Internet-based communication devices were also useful for communicating with members of the younger generation. One parent related: "I also had an account so I could instant message my daughter when she was in high school, and I was out of town" (Participant 12, personal conversation, February 13, 2009). Many college professors also mentioned that they used the Internet, in one form or another, to communicate with their students, because most of them now received their information and communication through the Internet, and expected their teachers to also use those channels.

The Form Influences the Function

The terms, form and function, are commonly associated with architecture and the aesthetics of early 20th century modernity. Many credit sculptor Horatio Greenough (1957) with linking these two terms together, in his expression that form must follow function. However, this concept can be traced to the end of the 19th century. Historian William Cronon notes that the neo-classical revisionist motif that prevailed in the 1886 Chicago World's Fair influenced the direction of many American architects, and was responsible for the Neo-Greek structures on the mall in Washington, D.C. He further observes that it also produced a negative reaction from famed Chicago architect Louis Sullivan, and his soon-to-be famous protégé Frank Lloyd Wright. Sullivan felt, and

Wright latter refined the notion, that architectural form should evolve in harmony with its intended use (Ward, Burns & Novick, 1997, also see Cronon, 1991). In one sense, form follows function in media technologies as well, since the primary function of all media is to communicate—convey content—and the form of each technology is expected to achieve this function. However, as pointed out in the introductory chapter of this dissertation, the use of any medium produces consequences independent of its content. This was acknowledged by Plato in his dialogue between Thamus and Theuth, as Postman (1993) points out. Here Thamus contends that new media forms compete with older forms for their user's attention and produce a specific perception of reality. This was also acknowledged by Innis (1951/2003), who maintains that the use of a new medium produces a bias toward favoring its continued use; by Ong (1982/2003), who argues that each medium forms a unique sensory ratio and impacts how human senses are used; and McLuhan (1964) who observes that "the message of any medium or technology is the change or scale or pace or pattern that it introduces into human affairs" (p. 8). This has also been acknowledged by several participants in this study. As an example when discussion Internet-based communications and his children, one participant commented, "my kids communicate with their friends using instant messaging all the time, and that is also a little different [from other communication]. Each form has its own culture" (Participant 22, personal conversation, March 11, 9009). The acknowledgement that each form has its own culture, including its own rules, and patterns, also suggests that it would be fruitful to examine the various new media forms that are now available through Internet-based communication, and see how they influence the communication function.

Many participants responded that the use of emails allows them to efficiently keep people in the loop, both professionally and socially. As one academic said, it "takes less time to interact with people electronically than to physically go to their office" (Participant 21, personal conversation, March 10, 2009). However, while the use of emails may be less time-consuming, there are also constraints forced upon its users, as reflected, somewhat nostalgically, by another academic who mentioned that he used to "have wonderful conversations with colleagues. I knew them and I knew them well, and good intellectual exchange can't be found anymore." He also added that now he also feels constrained in his teaching, noting "using email, you don't get to know the student" as its use limits one-on-one interaction between the teacher and the student (Participant 16, personal conversation, February 24, 2009).

Many participants in this study also related that while they use email communication, they take communicative risks that they might not take in person-to-person encounters. They argue that the use of this communication form creates an illusion of invisibility because they can assume a somewhat anonymous persona in these exchanges. Several participants also expressed that email use in organizational networks and conference settings, allow them to detach, and respond in a more objective manner. While some assert that emails can promote an avoidance of personal conflict, they also acknowledge that this use also allows for the avoidance of personal contact, which can also create problems. Several people, drawing from personal experience, noted that perceived invisibility and perceived objectivity do not go hand in hand. People still become offended by utterances that they feel attacks them and/or their ideas, and these communications can facilitate defensive attacks (flame wars).

The illusion of being invisible is even more pronounced in chat room conversations, according to many participants, however most also indicate that chat rooms are valuable because they can offer aid and information to people with medical conditions, and other personal problems. One person indicated that seeking entertainment was a motivation for participating in chat rooms, and related that he participated in a virtual on-line community drawn from initial contacts made in a chat room. However, many of the same people who mention that they received support and information from chat rooms also mentioned that some of the information they received proved to be false. Similarly, several indicted that some of the information was designed to solicit money from people by playing on their problems and concerns.

Many of the same observations made about chat room were also made about discussion groups. Most participants feel that because these groups promoted less social interaction, they are less formal than face-to-face discussion setting. This creates a situation where people can become more relaxed, but because people can also communicate anonymously, this form also can promote less concern about other people's feelings. Several participants who participated in discussion groups also mentioned that if they are not moderated, they can easily become both unpleasant and ineffectual. They also indicated this format opened up a communication channel for people with "axes to grind," a phrase used by a number of participants.

Like emails, several academics said that they have used discussion groups and chat room formats as educational resources. They mentioned that their students understood the format and felt comfortable with it. Many quickly added that, like emails, they also limit one-on-one interaction between themselves and their students. Another

academic also indicated that chat rooms and discussion groups could be an aid in research gathering. He stated: “I’ve used them in researching some television programs. I would ask people questions and they would respond. This was a quick and easy way to get feedback from the on-line community that I might not otherwise get” (Participant 29, personal conversation, April 14, 2009). Additionally, researching older discussion groups and chat rooms can provide insight into the historical temper and concerns that surround events and issues.

Like the other forms of communication now popularized by Internet usage, instant messaging has some good aspects, and some draw backs. These were summarized by one professional, who noted that “with instant messaging you have instant access to someone, but you don’t have the pleasantries, you don’t have the social requirements” (Participant 13, personal conversation, February 13, 2009). This form of communication has also impacted the educational process, as related by one academic, who pointed out that “in student writing, a lot of people use a lot of those cute acronyms like OMG and BFF, that would never have been used before” (Participant 14, personal conversation, February 17, 2009). This observation reflects the concern that this college professor has for the quality of contemporary education.

Taking a sideways look at the form and function argument that introduced this section, it should be noted that in the Ken Burns and Lynn Novick’s documentary on the life of Frank Lloyd Wright, historian William Cronon mentioned that Wright advocated that people should follow an egocentric vision to build one’s own world (although the documentary made clear that the primary egocentric vision was Wright’s, and not that of his clients). The forms that best demonstrate such an egocentric vision are blogs and

twitter in today's media ecology. As an example, one academic described blogs as "opinions without the necessity of thoughtfulness or correctness. A lot of bloggers don't fix their mistakes" (Participant 17, personal conversation, February 26, 2009). In addition to the commonly stated concern about the quality of information on the Internet, this statement illustrates the elevation of personal opinion within this medium, and specifically throughout this form. This egocentric pattern is even more pronounced on Twitter, which Levy (2009) describes as a communication application "which does little more than circulate bursts of text limited to 140 characters to a list of people who have chosen to receive them" (p. 148). This body of recitations of individual actions and reflections, as Levy also points out, "has established itself as a staple of social networking, commerce, electioneering, celebrity culture, public relations, media, and political protest" (p. 148). The egocentric nature of this form of communication has been reinforced by recent developments within the Twitter user community. The messaging service announced that it was making "retweets"—the circulation of other people's Tweeter messages, usually with short comments—easier for it users, however without the comments. This limitation of user's reflections and opinions was quickly rejected by many users who initiated a media-based protest (Levy, 2009). It is obvious by the user protest that other people's opinions must assume a secondary position to that of the person sending the Twitter message.

Many participants feel that, while various communication forms available on the Internet have made an impact on the communication function in general, they also feel that the structure and use of the Internet itself presents a problem. This problem revolves around establishing patterns of communication norms for proper usage. This feeling was

expressed by one person, who observed: “I do think that we are in a transition period, where we are adjusting to what the Internet does, and what it offers, and how we should properly communicate on it.” However he quickly pointed out a systemic problem—which also notes the egocentric nature of many Internet communications—when he stated that “there is so much information being circulated that many providers try to make their information stand out, and that is how facts can become distorted” (Participant 22, personal conversation, March 11, 2009).

Many of the participants interviewed indicated that they perceived a generational difference concerning the acceptance of the newer communication technologies. Generally speaking, most people attributed this difference to expectations placed on young people to remain “cool” by popular culture’s texts and their peers. They are expected to know about, and use, newer and newer communication technologies in order to keep up with their friends. However, many participants were also concerned that the use of Internet-based communication devices would impact people’s social and communicative development. This concern was reflected by one academic who related that he “was walking across campus the other day and noticed that no one was talking to other students; they were all on cell phones and iPods” (Participant 16, personal conversation, February 24, 2009). Another academic was concerned about these new communication forms and their impact on his teaching. He stated:

> There is a big communication path difference between my students and me. I use email because it looks and feels like a more traditional communication form. But my students have a whole abbreviated language, and their use is kind of forcing me into using some of these things—chatting, instant messaging, and those sorts

of things because that's their medium. I have to communicate with them through their medium. (Participant 18, personal communication, March 5, 2009)

Many participants are also concerned that younger people are losing their ability to communicate correctly. They are particularly worried about written communication, mentioning that email and text messaging patterns are shorter and usually are not in complete sentences, and that many young people have adopted an abbreviated language structure. They also mention that the use of new media technologies and communication forms is accelerating, with the use of texting, cell phones, Facebook, You Tube, and Twitter entering into the popular culture. Many also point out that using these new technologies has become an end goal in itself, as reflected by the following observation:

> The original ARPANET was set-up to exchange files quickly and data bases quickly, and that seemed to me at the time a good thing to do. But now we just exchange things just to exchange them, as if the transaction was what matters, and not the content. (Participant 16, personal conversation, February 24, 2009)

Changing Communication Patterns

The use and the expectation of the use, of the Internet as a delivery device for information have produced several changes in communication patterns. On the simplest level, as an educator pointed out, the use of the Internet has produced "more emails and less verbal communication at the office, and across campus." However she quickly asserted that this change has also produced consequences. She reflected:

> One-on-one conversation, either face-to-face or over the phone, allowed for clearer communication and encouraged more cooperation, because you could hear the tone in their voice. You know exactly if you have gone too far in asking for

something, and know when to draw back. With an email you can't do that. (Participant 1, personal conversation, June 14, 2008)

The absence of face-to-face communication, and the concern for ensuring cooperation among coworkers and family members, is a dominant theme running through many discussions about use of Internet technologies.

As many participants pointed out, with less face-to-face contact, meaning can become lost because facial expressions and vocal tone indicators (paralanguage) such as rate, volume, and pitch (see Argyle, 1988, and Trager, 1958, & 1961) are lost. Facial expressions communicate the amount of agreement and sympathy that people have toward other people, and, according to Graham, Bitti, and Argule (1975), and Graham and Argule (1975), the intensity of emotions. Also eye contact helps monitor feedback, securing the attention and interests of others; and signaling the nature of interpersonal relationships (see Knapp and Hall, 2002; Malandro, Barker, and Barker, 1989; Marshall, 1983; and Marsh, 1988). Also, eye avoidance can indicate truthfulness, and also indicate respect for other's privacy (Goffman, 1967). Similar to facial expressions, Ekman and Friesen (1969) contend that body movements (kinesics) like emblems, which translate words, e.g. waves, and the "OK" sign, and illustrators, which DeVito (2004) describes as body movements that "literally illustrate the verbal message" (p. 182), help clarify meaning. Ekman and Friesen (1996) also point out that affective displays that communicate emotions; regulators, that indicate emotions; and adaptors—the unconscious and unintentional movements that can also indicate feeling—all express meaning. There is another verbal element that is negated by the reliance on much of the Internet-based communication options. As Ehrenhaus (1988) points out, the use of

silence in conversations can communicate emotional responses. Loss of these elements can alter, or redirect, the meaning expressed in communications. Not obtaining a correct reading of the meaning of an utterance, or written communication, prompts fear among several participants, that with incorrect interpretation, interpersonal relationships can suffer, and cooperation could be hindered.

Several participants cited the use of webcams as a potential cure for this problem. However, many also acknowledged that they primarily used this technology to see how family members physically appeared, and not as a means for clarifying meaning. They also mentioned that many people do not use this technology; therefore its potential is limited. A few other participants also indicated that they refused to use web cams because they considered them intrusive and an invasion of their privacy.

The most common concern expressed about electronic communication regarded the anonymous nature of many communication exchanges. They noted that with anonymity also comes the possibility that people will lose some degree of civility in their communication efforts, and/or possibly assume false identities and distribute false information. Talking about the potential loss of a social veneer, several participants directly expressed the feelings that people are now talking to computers and not to other people, and therefore free to express feeling, and observations, that lacked proper concern for other people. In fact, this sentiment was an underlying trend in many discussions concerning the Internet's role in today's culture. As an example of this concern about people's assumption of invisibility, and the transmission of false information, one retired academic reflected that many people use the Internet to "tell stories that are not truthful and some act like what they want to be. They become a personality that isn't even real.

Face-to-face is a whole different story. You have to be honest, or it is better if you are." (Participant 20, personal conversation, February 9, 2009)

The use of the personal computer and the Internet has also produced changes relating to work patterns. There is now a tendency to continuously check email and web sites at work, which somewhat negates the promise of a more efficient workplace, and can force workplace distractions that might be encouraged by sharing emails and information that is non-project related. This usage, and the expectation that people must be more productive, has also led to a certain degree of temporal anxiety. Not only are many people expected to, or chose to, take work home and extend their work day; they are also faced with the real situation of decreased personal and family time. In addition to the potential for guilt that many people might feel for shirking their family responsibilities, there is an increased potential for overwork and loss of focus. This can lead to the production of lesser end products, and even more frustration. The expectation for a quick response to communication can add to this frustration. Not only is impatience promoted, but the perceived necessity to continuously monitor communication delivery devises creates an ever expanding cycle of temporal anxiety.

Concluding Summary and Discussion

The vast majority of the people interviewed for this study confirmed the thrust of the advertisement that introduces this chapter, and feel that the use of the personal computer is both convenient and results can be obtained quickly. They also stress that the Internet is useful for communicating with family and friends, transferring pictorial images, and as an educational and information gathering tool. Some participants also

mentioned that Internet-based devices also serve as a convenient way to communicate with their children, and transmit information to their peers.

The study confirmed the observations made by Mumford (1934/1963), Innis (1951/2003), Ong (1967, 1977, & 1982/2003), McLuhan (1964), Chesebro (1984), Meyrowitz (1985), and Postman (1993), and succinctly phrased by Fulk and Collin-Jarvis (2003), that electronic media does not serve as a neutral actor in the communication process. The various modalities of Internet-based communication affect their users, and impact the communication process. Emails allow their users to efficiently keep other people in the communication loop, but their face-to-face visual contacts diminish. Emails also reduce conversational exchanges and the intellectual insight gained through these exchanges. Chat rooms and discussion groups can provide useful information and support for people, but they can also be a source for false information and, in some cases, false support. Instant messages provide an easy method for exchanging quick and short exchanges between people, but like many of the other methods of Internet communication, it forces the user to negate communicative depth, and potentially limits empathy and concern for the other person. Also many educators expressed concern that their communication style can negatively affect their student's writing.

The participants in this study revealed an almost unanimous agreement that there is more Internet-based communication, and less verbal communication, than in the past. This trend, while accelerating, is a continuation of communion patterns established in the past. Ong (1982/2003) mentions that all forms of writing, especially those that are technologically produced, "only continue, the reduction of dynamic sound to quiescent space, the separation of the word from the living present" (p. 81). This "technologizing

[of] the word" (p. 79) is an indication of the second feature of today's media ecology that was acknowledged by almost everyone interviewed. They observe that with the increase in electronic communication there is a reduction of face-to-face communication. With this reduction, the word, or more precisely the words, can easily lose their intended meaning, reducing the speaker to virtual silence as the meaning is separated from that person. Like the anonymous nature of many communication exchanges, the diminished nature of face-to-face contact eliminates one of the safeguards for determining the truthfulness of people, and statements, and facilitates the spread of false identities, and false information. This fear, or at least concern, about being deceived was one of the underlying trends also revealed by most of the participants in this study.

This avoidance of personal contact, which was mentioned by most of the participants in this study, accelerates a trend toward a retreat into egocentricism on the part of the users. The most extreme communication forms that promote this trend are blogs and Twitter, as both elevate the sender's personal opinion and action over those of the receiver. The structure of the Internet has also contributed to individual egocentric behavior because there are no established communication norms.

Another communication pattern that has emerged is the perceived necessity to constantly check emails, and other Internet communication sources, for messages. The tendency to obsessively be aware of communication devices, has also lead to the desire to incorporate newer and newer communication technology in people's everyday life.

According to many participants interviewed for this study, the desire to use newer technology seems most pronounced in the younger generation. In fact, many identified a generational difference concerning the use of all media technologies. Most attributed this

difference to the expectations placed on young people to keep up with their friends. However, many also insist that this new goal of having the latest technology produces consequences. Not only does this present a potential financial drain, but many parents, and educators, are concerned that the use of these Internet-based communication devices cause a loss of communicative and social development, because people end-up communicating with a machine and not a human. These observations by the participants in this study support the assertion made by McLuhan and Fiore (1967/1996) and Chesbro and Bertelsen (1996) that people are now totally involved with their media, and also seems to support the observation made by Mazlish (1972) that our technological tools are now assuming superior, and dominate, roles in our everyday life, at least with regard to people's perception of the communication process. However, it should also be noted that the participants in this study did not share Mazlish's perception that because of the dominate position that these technologies now have in our media ecology that a disjunction exists between the users and their tools. Rather, there appears to be some concern about the importance of these technologies, and the affects of their usage on interpersonal relations, and some frustration associated with the amount of usage among friends, family, and especially young people.

Chapter 11

The Personal Computer and Internet's Role in Changing Relationship Patterns

The above picture comes from an advertising campaign designed to promote IBM personal computers in 1988, and featured the several cast members of the *M*A*S*H* television series (in this picture William Christopher, Harry Morgan, Jamie Farr, Gary Burghoff, Wayne Rogers, Loretta Swit, and Larry Linville are shown, and notably not Alan Alda, the principal star) (Good job…Radar, 1988). The campaign was designed to piggy back the IBM computer on top of the popular television show—its last episode in 1983 was, at the time, the most watched television program in history, and the program was currently appearing in syndication on numerous local television outlets (Barnow,

1990). As the title of the advertisement, “Good job, as usual, Radar,” implies business people rarely got in trouble by purchasing IBM products (Cringely, 1992 and 1996). This advertisement also attempted to link potential business consumers with the dedication and creativity of the doctors and support staff that the actors portrayed on the series. The success of the campaign is questionable because IBM began to lose market share to other personal computer manufacturers during that period, and some credit this campaign with fostering IBM’s decision to change advertising agencies (McCracken, 2006). However, this picture is included here as a representation of personal relationships and group dynamics, and to visually link the changing roles of these relationships in a media ecology that was dominated by the personal computer and the Internet.

Chesebro and Bertelsen (1996) point out that “instead of interacting with people face to face, we now increasingly communicate through artificial channels, technologies, tools, mechanisms, and machinery” (p. 30), therefore the use of personal computers and the Internet has become very relevant for the study of interpersonal communication. This is especially true since much of interpersonal theory is based on precepts drawn from face-to-face communication (see Boase & Wellman, 2006). With the use of email, test messaging, and other mediated forms of personal communication, many of the cues formerly generated from face-to-face communication are becoming questionable. Further, as Blieszner and Adams (1992), Wood (1995), and Johnson (2001) point out, because of the greater number of communication channels now available for use, geographic distance is not only growing smaller, but face-to-face contact may no longer be a necessity for maintaining a relationship. However, a great amount of early research speculated that as people used the Internet closer relationships would suffer. Current

research now calls these assumptions into question, especially as people have become more accustomed to the Internet.

Brief Review of Early Research

One of the first communication technologies that were examined for its ability to influence relationships because of the different distance parameters it created for its users was the telephone. As Fisher (1992) observes, this interest grew out of the telephone's ability to extend messages both effortlessly and instantaneously across space without any significant deterioration of content. However the consequences of its use were debated. Marvin (1990) maintains that its use modified social relations by replacing the customary ways of communicating with family and friends. Person-to-person contact suffered as conversations across the backyard fence, or on the front porch, with friends and neighbors, and weekly visits by family members, were replaced by telephone calls[1]. However, Fisher (1992) asserts that the telephone promoted cultural homogenization by cementing family and friendship ties on the local level. He cites the usage patterns of rural residents—who were more fervent about using the telephone than their urban counterparts—as evidence of local homogenization.

While these initial use studies were informative, when Internet communication became a more common practice, most researchers concentrated their effort on examining the strength of relationships over distance. Many research studies in computer mediated communication and relationship development found that people did not tend to interact with the people they met over the Internet, outside of the confines of cyberspace (Clark, 1995; Cohill and Kavanaugh, 1997; Preece and Ghozati, 2001; Rheingold, 1997; Turkle, 1984 & 1995; and Wellman, 1997). Many of these studies were based on the

common assumption that personal relationships were very fragile and distance would increase this fragility. As an example, Allan (1979) and Davis (1973) question whether long term relationships can survive distance. This was supported by Bersheid, Snyder, and Omoto (1989) who assert that "people who do not see each other frequently—for whatever reason, even involuntary 'good' reasons—simply cannot be as close, other things being equal, as people who *do* spend a lot of time together" (p. 794). Distance was seen as compounding relationship maintenance procedures, as well. Canary and Stafford (1994) contend that "relational properties erode without the benefit of maintenance behaviors" (p. 4), and Johnson, (2001), reported, that at the time, long-distance friends used cards, letters, and telephone calls, rather than emails, as maintenance devices to insure a satisfactory relationship. Further, Rohlifing (1995) holds that increased distances result in increased costs, and communicative rewards become more difficult to justify.

Other research assumed that long distance relationships were not as close and satisfactory. Canary et al. (1993) found that friends were less likely to use mediated communication as a maintenance method, and preferred more traditional methods like letters, cards, and telephone calls. More directly, Walther and Burgoon (1992) and Walther (1992) argue that because of the lack of nonverbal information, Internet based communication cannot produce satisfying relationships, Walther and Boyd (2002) contend that computer mediated communication allows for selective self-presentation, as personal cues can be manipulated. Other research also concurred that lack of nonverbal cues allows for editing and manipulation of information; the promotion of an idealized version of the sender, and a delay in message response (see Lea & Spears, 1998; Walther, Anderson & Park, 1994; and Wright, 2000).

Many people also assumed that some of the people who got heavily involved with the Internet—especially in chat rooms—tended to be individuals who lacked strong personal relationships, and who have a predisposition to withdraw into Internet relationships. After all, as Chesebro (2000) maintains, “virtual reality communication constitutes a new social reality” (p. 11), and “in a virtual reality system, each individual ultimately constructs his or her own reality and own communication system” (p. 12). Some early research did indicate a possible pattern between socially shy people and their involvement in Internet usage. However, as more people got involved with the Internet such a correlation disappeared. Much of the later research confirmed Innis (1951/2003) and Postman’s (1993) assertion that new communication technologies create a bias toward their use by the people that adopt them, and any form of obsession was really a selection issue. Later research indicated that when people first get involved with a new technology they become consumed with using it, but over time older usage patterns reemerge.

Brief Review of Current Research

Adams (2005) asserts that the Internet and other newer communication modalities empower people to transcend their body's physical boundaries. He goes on to argue that "new media such as the Internet (and older ones such as the telephone) provide an increasing range of ways to communicate without being an embodied actor" (p. 12). In addition to now having increased opportunity to communicate over distance, many researchers now argue that long term relationships are either not affected, or are even enhanced, by this increased availability to communicate over distance. Guldner and Swensen (1995) found, while looking at romantic relationships, that distance produced no

significant difference in relationship satisfaction. Further they claim frequent face-to-face contact is not essential for the maintenance of the relationship. Likewise, Van Horn et al. (1997) found that long-distance relationships, using the Internet as the primary source of communication, can be as satisfying as more traditional modes of interaction. Johnson, et al. (2008) found that there were few differences in the commitment levels between close friends over long-distances and closer distances, and email communication played a key role in leveling differences. People engaged in romantic relationships use emails to express assurance, family members discussed and engaged in social networking, and friends stress joint activities. In term of the potential for enhancing relationships, Barnes (2003) and Parks and Floyd (1996) contend that the use of computer mediated communication increases the opportunity to build on relationships initially formed through face-to-face channels, and Fox et al. (2001) also asserts that Internet communications is a useful way of meeting new people. Johnson, et al. (in press) reported that more than 80 percent of the people surveyed claimed that the commitment levels between themselves and their long-distance friends had increased using the Internet, and concluded that face-to-face communication and proximity might not be a important as early research had suggested. In reviewing these trends, Johnson, et al. (revised and resubmitted) contend that there is a tendency to privilege face-to-face interaction in the literature discussing interpersonal relations; and Becker, et al. (in press) maintains that the traditional view that friendship is fragile has become questionable because of the increased number of communication channels now available. These findings have lead Cummings and Kraut (2002) to observe that the increase “in the

number of Americans online means that people can use the Internet to keep in touch with a larger proportion of their friends and relationships" (p. 229).

In the above section it was noted that while people were initially obsessed with Internet usage, but this obsession diminishes over time. Recognizing this trend, Wright (2004) delineates exclusively Internet-based relationships and primarily Internet-based relationships, with the latter comprising people who use the Internet to keep in touch with friends, colleagues, and family member over distance, and the former reflecting the concerns of many earlier researchers who worried about the depth of relationships with anonymous acquaintances. Many researchers have also found that Internet communications offered many other advantages. Flaherty, Pearce and Rubin (1998); Papacharissi and Rubin (2000); and Walther and Boyd (2002) report that Internet-based communication allows for more reflection concerning responses because people do not have to answer inquires in real time. O'Sullivan (2000) claims that such Internet communication also allows for more control over impression management. While Van Horn et al. (1997) claims that Internet discourse allows its users to contact each other at times when they feel more like communicating. Baym (2000) found than some people who participated in on-line groups perceived the people they interacted with as being friendly strangers. Wright (2000) found that a great number of the respondents considered the other people in their on-line support network as close friends, despite the fact that they had never meet face-to-face.

Finding of this study

Several participants revealed that at one time, or another, they were involved with an on-line community. Everyone who disclosed such an involvement would fall into

Wright's (2004) definition of a person engaged in a primarily Internet-based relationship, and the majority of these people mentioned that their motivation was to seek information and support regarding medical and personal problems. One person, who was worried about such a medical problem, outlined this information gathering and support function, as well as the pleasure she received from these encounters. She related:

> I felt comfortable using the Internet to find individuals that were experienced, and going through the same things that we were all going through. We were able to converse that feeling with each other, and get new ideas that could help. Some of the things might not help me, but could help others. That was so awesome! I think that we had over a hundred people in that group, from all over the United States that had gone through that procedure. Various people had complications, and we learned from each other. It was great! (Participant 2, personal conversation, October 15, 2008)

While these encounters were an important part of her life, like everyone else that discussed on-line communities, the involvement was limited. They would fit these exchanges into their schedule, with work and family responsibilities taking preference. They also seemed to diminish when their personal and/or medical problems dissipated.

One exception to this trend appears to be connected with the choice to engage because of the entertainment potential that some of these groups provide. As an example, one person mentioned:

> My entertainment and relaxation time used to be spent watching a lot of videos, now I spend time collaborating with people on-line, doing things together on the computer. So it has changed how I spend my evening time. I play in a virtual

> environment, and try to develop that sense of presence when you're not really there. However, it does take a lot of my time—doing something cool takes a lot of your time, and sometimes I do ignore social connects with other people. (Participant 13, personal conversation, February 13, 2009)

This disclosure represented the closest to Wright's (2004) delineation of a person who participated in an exclusive Internet-based relationship because he mentioned entering into a virtual environment, and trying to develop a sense of personal presence within that environment, and at the expense of other social engagements. However, he also acknowledged that he was forced to fit his entertainment choice into his social schedule, and that he never engaged with the virtual community at work. He also mentioned the creative attraction that this site had for him, and compared it to the imagined world found in the literary works of William Gibson. Aside from the potential for a creative challenge, these sites seem to offer the same type of fantasy and escapist promises of many other entertainment programs, including video games. These choices might be better classified as entertainment and activity options within the increasingly egocentric media ecology.

One person related that she engaged in an on-line work group. While this is representative of the increased demand for efficiency and production at work, as well as a limitation on personal time, (and possibly the poor structure of her workplace), she strongly indicated that these encounter were also a social engagement between her co-workers. This encounter, like the ones described above, allows for reflection concerning message response, and at a convenient time. All of these encounters also support Baym's (2000) contention that people feel that they are engaged with friendly strangers, and

Wright's (2000) observation that many of these people consider the people they communicated with as close friends.

Several participants in this study indicated that they use virtual and/or on-line communities for the same reasons that they use the Internet in general. The sites provide useful information and an enjoyable experience, and for some, a chance to participate in a challenging endeavor with others. In these on-line communities, the participants are provided with a shared experience.[2] They are also time consuming, and may force changes in people's evening and family time. Several other participants, reflecting on the enjoyment they experienced on the Internet, did mentioned the potential these sites had for replacing aspects of their real life. As an example, one person observed:

> In some ways I mediate so much of my life through the computer screen, I sometimes wonder if I'm not privileging my virtual life over the other. Although I don't think that I take it that far, one of my friends commented that he thought that I spent too much time on Facebook, and not in the material world. (Participant 9, personal conversation, February 3, 2009)

On the surface, this observation seems to confirm the fear of some early researchers that people will become obsessed with on-line groups and use them as a substitute for person-to-person, face-to-face relationships. However, as Johnson, et al. (revised and resubmitted) and Wright (2000) point out, person-to-person communication is not limited to face-to-face contact, and as Baym (2000) maintains relationships can exist and thrive with friendly strangers. However, this statement does confirm the position that the Internet now has in influencing relationship patterns in today's media ecology and how important that Internet usage, and the new Internet lifestyle, has become for some people.

There is little doubt the many people have chosen to adopt elements of an Internet lifestyle. The Internet is now used routinely, and has changed the way the many people get their information. It has also changed the way we communicate. In 2002, the Pew Internet Project reported that on a normal day 56% of Americans sent or read an email, with 10% also sending instant messages, and 9% engaged in online social networks like MySpace or Facebook (Pew Internet, 2002), and according to Small and Vorgan (2008), Palfrey and Gasser (2008), and Tapscott (2009) the numbers have increased since then. Because of the acceptance of Internet-based communication, several participants mentioned that they felt that this constant use could limit people's ability to interact with other people. As an example, one academic, while committing on his students and their reliance on Internet as a communication and information gathering tool, mentioned:

> I've noticed a lot of behavioral changes. I don't think people write as well as they use to. I don't think they have the same ability to interact with other people. I also think the people have a tough time dealing one-on-one with other people. (Participant 11, personal conversation, February 12, 2009)

Other people attribute other aspects of Internet usage with isolating people and creating the potential for dysfunctional one-on-one relationships. One person observed:

> You can log onto a personal computer and order groceries and have them delivered. If you got to that point, where you didn't leave your home and did not need to go out to keep in touch with the world, I guess that it would really alter your environment.

This statement represents a trend that ran through many interviews. Some of the participants were concerned that, at some point in the future, it would no longer be

necessary to leave home for work, gathering news, or to shop, and speculated that these limitations on person-to-person contact could adversely affect personal relationships.

A secondary trend also emerged, this one on more of an economic and social level. Many participants saw a potential problem with the digital divide between both generations and economic classes.

Concern for generational difference also emerged when participants discussed the use of Internet-based communication at home. Representative of this concern, one participant made the following observation:

> I do worry that [Internet] usage does tend to cause people to ignore some of the personal relationship that they have among their family members. Because it encourages the family member to go to their separate portals, and live their separate lives, and ignore each other. (Participant 28, personal conversation, April 10, 2009)

In addition to this potential for separation, many participants expressed concern that the constant use of the Internet, like the use of television previously, was limiting family conversations at home. The use of Internet delivery devices has produced a double bind on family relationships. Some people are either spending too much time on the computer and ignore family members, or when they are together, many migrate to their movable laptop, cell phone keyboard, or other media devices, and still ignore other family members. Generally speaking, most participants agreed with a study which ran from 2005 to 2008 and covering 2000 American households, by the Center for the Digital Future at the University of Southern California's Annenberg School for Communication. This study found family time decreased during the period, falling some 30%. The Center also

reports that American children, as well as their parents, are now spending increased time using Facebook, Twitter, and other social networking sites, resulting in less familial time (Gardner, 2009). Also many participants were concerned that this trend was accelerating and Internet-based communication was creating expectations for even younger children. As an example, one academic reflected that his "grandkids, the youngest is eight, do email, and they want you to email them back. They have their own email address and get excited when they get an email" (Participant 29, personal conversation, March 14, 2009).

Although concern about the Internet's affect on people's relationships, and a generational difference in media use, were pronounced, the most commonly mentioned concern revolved around the demand for working at home, and its affect on relationships. Not only did this activity limit family time, it also reduces social and recreational time.

There are numerous links between this study and previous ones, in addition to the ones already mentioned above. First, this study does not support the findings of Walther and Burgoon (1992) and Walther (1992) that due to the absence of nonverbal information Internet communication lacks satisfaction. This possibly reflects the acceptance that Internet-based communication has achieved in today's media ecology as compared to its acceptance in 1992. Further, the study supports Guldner and Swensen's (1995) assertion that frequent face-to-face contact is not an essential element of relationship maintenance, and Wright's (2004) findings that people primarily use the Internet to keep in touch with family, friends, and colleagues. This study also supports the conclusion of Johnson, et al. (2008) that many people use the Internet to engage in promoting interpersonal relationship assurance, and joint activities.

This study also supports Fox et al. (2001) findings that people consider Internet communication a useful way of meeting new people, especially with regard to support networks. However, this study also supports Walther, Anderson & Park's (1994) assertion the Internet communication sometimes promotes an idealized version of the sender, and O'Sullivan (2000) claims that such communication allows for more control over impression management. These factors have produced a limitation in the trust that is accorded to Internet communication.

Perceptions of Internet Users about Non-users

There is one consistent element within communication theories that deal with developing relationships, from social penetration theory (Altman & Taylor, 1973), to the social exchange theory (Thibaut & Kelley, 1959), to uncertainty reduction theory (Berger & Calabrese, 19750), to theories of relational dialectics (Baxter & Montgomery, 1996, and Rawlins, 1992). This element is that one person's perception of the other person is a key to establishing and preserving a relationship. As such, Internet users' perceptions of others who do not use the personal computer and the Internet should offer some understanding into role that both groups play within today's media ecology. It should also offer insight into the importance of the Internet in today's culture, and its role within that culture.

As one might expect, given that the pool from which the participants of this study was drawn were primarily academics and business professionals, the majority of the people interviewed demonstrated a level of toleration toward non-users. Most people indicated that Internet usage was dependent on the individual's need, as reflected by the following observation:

> I think that that's fine and it is their call. Most of them, I think, are older folks whose lifestyle is pretty well defined, and they really don't need a computer to mess with their patterns and routines. While some find it stimulating, some don't need this tool. People who don't hammer nails don't have a great need for a hammer. (Participant 17, personal conversation, February 26, 2009)

Given the demand for production that now exists in today's society, another person saw a potential advantage for not being connected to the Internet. He explained, "I do think that there are some people that can be very successful not using the Internet … there might be an advantage to being isolated; you may be able to concentrate, and get more things done" (Participant 10, personal conversation, February 9, 2009). In fact, a few people, even those who expressed that they participated in an Internet lifestyle, mentioned that they sometime longed for the past without being connected to the Internet. One such person admitted that:

> Sometimes a totally analogue vacation—say camping beyond the reach of cell phones—sounds extremely attractive. I can also understand deriving enjoyment from woodworking, gardening, or any of a hundred activities that require no computers. My parents have rich, fulfilling non-digital lives. (Participant 8, personal conversation, February 10, 2009)

Several academics also reflected, with admiration, about their mentors who did not use the personal computer, or the Internet, to achieve success, as well as to pass on a great deal of knowledge to their students.

Although most people expressed tolerance for non-users, there was still an underlying feeling that not being familiar with Internet usage was not standard in today's

media ecology and people who failed to learn about personal computer and Internet usage exhibited non-conformist attitudes. Several other people indicated that was now no reason to remain ignorant of these technologies. One person made this viewpoint clear when he stated "there are basically no excuses for people not to have access; they can go to the public library, if they don't have transportation, that's another problem. However, there are cities that provide transportation. It is getting less and less a problem" (Participant 11, personal conversation, February 12, 2009). Other people were more critical and linked non-usage with either Luddite tendencies or some psychological problem associated with resisting anything new. As an example, one person said: "I think that they are either anti—I mean, they oppose the establishment to a degree that they will not be part of it—or they have some type of psychological problem" (Participant 5, personal conversation, January 13, 2009). Although it must be emphasized that this was a minority opinion, there was an underlying tendency to question the appropriateness of non-use. Several people mention that not having a computer connected to the Internet was harmful to children now growing up. Others felt that not having a computer connected to the Internet would place the non-user in a difficult position to function in today's society. This feeling was summarized by one person who stated:

> I just don't see how you can be successful now [without the Internet]. If everyone else is on it, then you have to be on it. I don't see how one can function properly in society as it is developing. It's like not being able to read or write and you just wouldn't be functional in so many areas. (Participant 14, personal conversation, February 17, 2009)

Many other participants, when discussing whether knowledge of computers and the Internet was necessary for success in today's media ecology, reflected the same attitude, but incorporated a more tolerant approach. As an example, one person noted that "a lot of people don't use it and I haven't noticed any difference, except for the fact that if you have to find a job now you are expected to know how to use a computer and the Internet" (Participant 16, personal conversation, February 24, 3009).

These reflections, from the participants of this study, seem to confirm Mumford's (1934/1963) observation that the mastery of a new technology forces a new definition of success on the members of a culture. While most people expressed toleration toward non-users, it is clear that most of these people also dismissed them into to realm of quaintness, and some categorize them as neo-Luddites or non-conformists with personal problems. Also, the toleration for non-users seems to be limited to outside the workforce domain. This confirms Postman's (1993) assertion, that on a competitive level, non-adaptors are classified as failures. These reflections also confirm the observation made by Meyrowitz (1985) that "a change in the structure of situations—as a result of changes in media or other factors—will change people's sense of 'us' and 'them' (p. 55), as well as Mumford's (1934/1963) assertion that the use of a new technology affects one's day-to-day perceptions of people and their relationship patterns, at least at work.

When discussing the topic of success in today's society, most people interviewed acknowledged that it was possible for individuals to live a rewarding, and even productive, life without computers and Internet connectivity. They also stressed that as tools, these technologies have allowed people to accomplish tasks in a more expeditious manner that previously. However, there was also evidence to support Innis (1951/2003),

who maintains that when a communication medium becomes dominant, its users are promoted over non-users, and Postman (1993) who asserts that non-users are perceived as being on the wrong side of a cultural media war. Further, as Innis (1951/2003) observes, this cultural media war places users in a position to monopolize the distribution of knowledge.

Concluding Summary and Discussion

As has been mentioned, Blieszner and Adams (1992), Wood (1995), and Johnson (2001) contend that geographic distance is growing smaller because of the increased number of Internet communication channels that are now available. The vast majority of the participants in this study related that they use the Internet to keep in touch with their family, friends, and colleagues, and that feel that distance is no longer a factor in either the communication process, or the costs associated with the communication exchange. Further, this study confirms another finding of Blieszner and Adams (1992), Wood (1995), Johnson (2001), and Guldner and Swensen's (1995) suggestion that face-to-face contact is not essential for maintaining a strong relationship.

However, as Johnson, et al. (revised and resubmitted) and Wright (2000) point out, person-to-person communication is not limited to face-to-face contact, and as Fulk and Collin-Jarvis (2003) assert, computer-mediated communication reduces non-verbal orientation cues, limiting the assessment of other people's attractiveness, suitability as a friend or romantic partner, and power position in society (see Sheppard and Strathman, 1989). Other items that sway perception can only be gained through person-to-person contact. According to Jones and Yarbrough (1985), haptics, or touch communication, can convey positive emotions, playfulness, and attempts to control the behavior of others.

Olfactory transmission can not only influence one's perception of the other, for good and bad, it can also serve as memory aid (Rubin, Groth, & Goldsmith, 1984; and Malandro, Barker, & Barker, 1989). Another element which can only be gained visually is clothing and a make-up color choice, which Kanner (1989) contends influences people's perception. While a large majority of the participants in this study supported the conclusion that people no longer consider distance, or lack of face-to-face interaction, as an impediment to interpersonal relationship maintenance, many also revealed a tendency to distrust, or at least question, information on the Internet, and the lack of certain cues discussed in interpersonal communication studies contribute to this feeling of distrust.

Many modalities of Internet communication promote user egocentrism, especially blogs and Twitter. This tends to contribute to the perception of distrust surrounding information coming from the Internet. Some participants pointed out that many Internet exchanges were superficial in nature, only revealing the sender's egocentric opinion(s), and do not reveal the dynamics of the sender's inner feelings. This egocentric element within the communication exchange calls into question the dimensions of honesty, accuracy, and intentionality, mentioned by Altman and Taylor (1973), and decreases any element of trust accorded to Internet communication. When discussing Internet-based communication formats, many participants concurred with Walther, Anderson and Park (1994) that these messages produce an idealized version of the sender, and allow the sender to control the impression management created in the exchange.

Fulk and Collin-Jarvis (2003) also observe that Internet-based communication not only produces changes in way people communicate, but also influences the communication patterns of their social networks. Most participants engaged in Internet

networking feel their communications provides relationship assurance, and for the planning of joint activities. Many also mentioned that the Internet is useful for meeting new people, and they looked at many of those people as friends. Also most participants in this study expressed that they gained pleasure from these encounters. This pleasure is extended from family and close friendship relationships to new relationships formed in support groups and virtual communities. In support groups people exchange feelings and get new ideas, and many virtual communities offer the potential for entertainment and adventure, similar to the fantasy function offered by more traditional media.

Many participants in this study also expressed concern regarding some elements associated with Internet use, and their affect on interpersonal relationship. Many participants mentioned that instead of interacting with other members of their family, during television commercial breaks, many family members switched to other forms of mediated communication. Although several participants mentioned friends and spouses as multiple media users, most of the people interviewed referred to members of the younger generation, when describing these episodes. While Tapscott (2009) would claim that this is an example of the younger generation's ability to multitask, and satisfies their desire to participate in an interactive experience, the underlying implication of many of the participants was that this generation was composed of users who inhabitant their own private world, and tend to ignore other people. No matter what perspective one takes, this use of the media in this way is an example of McLuhan and Fiore (1967/1996) observation that people are now caught up in "a world of total involvement" (p. 61) with their media.

The above reflections concerning people's total involvement with their media is a continuation of a historical trend. Kramer (1993) points out that "since prehistory humankind has wished for the magical power to be able to escape the bondage of space and time" (p. 31). Media has become an essential tool is this escape process, as McLuhan (1964) maintains. He speaks of the ability of media to change the "scale or pace or pattern" of everyday life when a medium is introduced "into human affairs" (p. 8), and as Schwartz and Begley, (2002), LeDoux (2003), and Doidge (2007) point out in their discussions of the plasticity and adaptability of the human brain, this scale and pace can directly influence the formulation people's perception of time and space. This multitasking involvement with media also accelerates another trend that was reflected in television usage. Kramer (1993) observes contemporary people's sense of place was influenced by television. He notes: "now with television, we may appear to be present while we are absent from the spatial/temporal coordinates of an event" (p. 31). With the advent of the personal computer and the Internet, the escape from the spatial/temporal coordinates of any event and place has been expanded, and with the advent of the laptop, cell phones, and other mobile Internet delivery devices, the trend now extends to the same physical location that other people occupy. This condition affects interpersonal relationships through promoting isolationist and egocentric behavior.

The use of the personal computer and the Internet also extends another trend that began with television viewing. During the period where television was the dominant medium, its users felt comfortable gaining their information over a screen and, continuing a process that began with photography and the movies, forming opinions concerning other people by using the images projected onto a screen and not through interacting with

other people. By availing themselves of the Internet, people have extended their use of the screen to communication, for as Chesebro and Bertelsen (1996) point out "we now increasingly communicate through artificial channels" (p. 30). Several participants in this study attributed the use of Internet-based communication with encouraging members of the younger generation to avoid making eye contact and exposing their emotion through facial expressions. These participants also indicated that they worry about the impact of this feature of Internet communication on traditional forms of socialization.

Because of the acceptance of Internet-based communication and the expectations now placed on its use within popular culture, it is important to gauge the perception of users of these technologies toward non-users. These perceptions can influence the status and position of both groups. While most participants demonstrated a tolerant attitude toward non-users—arguing that use is dependent on the individual's needs—there was an underlying tendency to question the appropriateness of non-use, especially at work. Therefore, this study did find some support for Mumford's (1934/1964) observation that new technologies offer a new definition for success, with non-users commonly seen as potential failures or quaint representatives of past times. This underlying trend demonstrated by many participants in this study tends to support Meyrowitz's (1985) assumption the use of new technology serves as a key element in defining people in "us" or "them" categories.

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[1] Marvin (1990) also mentions that adoption process for the telephone encountered difficulty because users applied standards drawn from face-to-face conversation to its initial use, e.g., people talked louder when calling long distance, and worried about catching contagious diseases over the phone.

[2] Although not referring to virtual communities, one person, who engaged in home schooling, related that the entertainment function of some Internet games not only attracted, and kept, the attention of his children but also many times forced them to share ideas in order to surmount challenges presented within the game (Participant 9, personal conversation, February 3, 2009).

Chapter 12

Santa or the Grinch:

Paradox, Changing Trends and Conclusion

The above advertisement for MITS' Altair 8800 computer appeared in December, 1975. This Christmas commercial ended an important year for the personal computer industry, as the Altair 8800 was introduced to the public in the January edition of *Popular Electronics* (see the introduction to Chapter 8). Although this was a very small public at the time primarily comprising early computer enthusiasts and the hobbyist market, the tag

line of the advertisement, “if you had been *very* good, Santa might bring you an Altair!” (MITS Altair 8800 and Santa, 1975) reflected a desire to reach a large public. However the realities of the product did not match the expectation projected by this advertisement, because the Altair required assembly, so the purchaser needed to have at least a passing knowledge of electrical engineering, to construct the computer.

This picture was chosen as a lead-in to this chapter because the MITS Altair 8800 promised a Santa-like gift to its consumers, and its introduction inspired the creation of the first commercially successful personal computer, the Apple 1 (Wozniak, 2004), as well as many other innovations in early personal computing (Lash, 2003). However, the Altair also had a Grinch-like quality (Seuss, 1957), because it was directly responsible for the creation of the popular computer culture’s anti-hero, Microsoft. The first major project of founders Bill Gates and Paul Allen was to write the BASIC computer language that allowed the product to be programmed (Robertson, 2007). As such this advertisement also serves as an appropriate visual metaphor to introduce other Santa and the Grinch paradoxes associated with new media technologies.

When asked when the use of the personal computer and the Internet had become a necessity, one participant observed: “Sometime between 1984 and 1987, I can’t put an exact time on it—we saw that some many things had become possible and whatever becomes possible becomes necessary. We can’t live without it now” (Personal conversation, March 18, 2009). This chapter explores the expectations created by these possibilities, as well as the unforeseen consequences of the use of the personal computer and the Internet. In addition to the Santa versus the Grinch paradoxes of these media technologies, this chapter will also examine the changing trends that their use has brought

forward. The chapter will conclude by looking back at technological development, the use of current media technology, the role of medium theory in examining the patterns that the study revealed, and will look forward to new elements that should be included in future studies.

Santa and the Grinch:
Aid in Teaching vs. Change in Learning Patterns

A large number of the participants in this study who are parents mentioned that they considered the personal computer and the Internet a valuable educational tool. They most often commented that the use of this combination of technologies enabled their children to find information quickly and, more importantly, in a format they had grown to appreciate and understood. Many professional educators, on both the secondary and collegiate levels, also mentioned the value of the personal computer as a tool for enhancing classroom presentations and efficient record keeping. Many others also mentioned the value of the Internet as a resource for providing their students with both primary and secondary information, and providing visual links too many areas of their study.

Several academics also mentioned that the use of the Internet facilitated their research efforts. Some indicated that they found valuable information from institutional archives, old postings of topic centered discussion groups, and even current Internet-based groups. In fact, the use of the Internet has become such an important tool in the education process that most professional organizations include its use as a topic in their professional gatherings and publications. As an example, when discussing the ways to bridge the gap between the professional concerns of historians and the popular interests

of the public, Rosenzweig and Thelen (1998) recommend that historians should "make use of the World Wide Web, which has emerged as a popular venue for amateur historians, to create virtual meeting grounds" (p. 184). They note that such discussion groups can not only can provide insight into the events and issues that interest the public, but can also provide information into the private history of members of the public, regarding these events, issue and historical trends.

Many educators also indicated that discussion groups can also serve as an educational resource for reaching out to their students because they feel comfortable with this format. However, many also mentioned that this use also limits one-on-one interaction with their students. Others also observed that their students demonstrate an increased expectation for visual presentations, and a few commented that their presentations are now expected to rise to the level of professional media entertainment, using videos, animation, and elaborate graphics. They attribute these expectations to the use of media technologies in the students' everyday lives. Several educators also complained that their students want class presentations to be posted on the Internet, so they can avoid classes, or if attending, they can circumvent having to take notes. Many educators also worried that student desire for instantaneous information and results reinforces the expectation for instant gratification and affects the depth of their learning experience.

This concern for the student's learning experience was the most commonly mentioned negative effect of the use of the Internet by the professional educators who participated in this study. They agree with Mazlish (1993), who argues that machine use

can influence human cognitive processing. Current research on brain activity also indicates that the use of media technology can influence people's cognitive processing.

Schwartz and Begley (2002) contend that the brain has the capacity to reconfigure itself even into adulthood. They refer to this ability as neuroplasticity, and note that throughout one's life neurons can reform brain connections, stimulating new pathways in the cortex, thus allowing for new functions to emerge. Their work with patients with obsessive–compulsive disorder has led them to conclude that positive mental activities can both produce acceptable social behavior and change the brain's circuits. Doidge (2007) also believes that the brain is malleable, not only in childhood but also throughout the course of a lifetime. He also believes that humans are sensitive to their surroundings and even a small amount of input can dramatically alter the way humans perceive, and react to, the world around them. Importantly for the purpose of this study, Doidge contends that use of media provides a significant impact on this process. LeDous (2002) explains that these changes occur within the brain's synapses—the junctions between the brain's neurons. These synapses encode and convey information and stimulate brain functions. He argues that these synapses are also plastic and are shaped by a person's experiences, impacting both thoughts and feelings. While one's genetic makeup produces the proteins that determine how the neurons are arranged, life experiences can alter these arrangements, because the synapses allow for both learning and memory. He also argues that emotional processing is able to influence what is perceived as reality in any given situation.

Wolf (2007) points out that humans taught their brain to read a few thousand years ago, which serves as an example of the learning ability of the brain. The key

development came with the use of the alphabet. In essence this use forced the brain to become configured in different perception patterns. Wolf notes that the process of writing down thoughts leads people to refine those thoughts with the potential of learning new ways of thinking (p. 73). Many of the educators who participated in this study also share the opinion that writing aids in the refinement of ideas, and they fear that the short messages and cute acronyms used in many of the modalities currently popular in today's media ecology not only affect their students' writing, but also can affect their cognitive processing.

The majority of the participants in this study, both in the academic and commercial professions, were also concerned with possible information overload and its effects on mental processing. They agree with Grossman (1997) that the simple volume of data available on the Internet makes it impossible to read, and assimilate, everything available, and therefore some potential information is ignored. However, their most pressing concern centers on the effects of the use of the Internet, and other media technologies, upon the members of the younger generation. Many implicitly, and a few explicitly, share Doidge (2007) and Small and Vorgan's (2008) assessment that media technology has altered the circuitry of the human brain, and that these changes are most evident in young people. They also express concern that the pace of digital advancement, and the expectation and acceptance of speed associated with the use of Internet-based technology is adversely influencing cognitive processing. However, it should also be pointed out that not every contemporary researcher focusing on the younger generation's use of Internet-based technologies is as concerned as Small and Vorgan (2008). Palfrey and Gasser (2008) refer to the young people born after 1980 as digital natives, because

they are at home on the Internet, and like Tapscott (2009), contend that their impact is being felt in many areas of American life. Tapscott (2009), while acknowledging that young people do not read as much as previous generations and do not process the information they do read in the same manner, contends they have formed a remarkably insightful and revolutionary community encompassing new ways of thinking, interacting, working, and socializing. However, the participants in this study do not share these optimistic assessments of the younger generation's new ways of thinking; rather, they agreed with Wolf's (2007) concerns about the potential loss of critical thinking skills that are encouraged by reading and writing.

On the whole, the majority of the participants in this study support the conclusions of Small and Vorgan (2008). They agree that current communication technologies have produced benefits in their everyday lives at home and at work, and many cited advances in medicine and science that are attributable to digital technology as examples of these benefits. However, underlying these perceived benefits there is also a concern for the effects of using these new technologies. Most of the educators also express the same concern observed by Small and Vorgan (2008) that students were now engaged in a sort of distraction obsession fostered by Internet-based communication usage, and they were equally concerned by their students' dependence on the delivery of micro-bursts of information, again affecting their reading techniques and the absorption and processing of information. Here, one must remember Ong's (1977) observation that the speed at which knowledge is disseminated by new media will "change man's feelings for what knowledge is and what actuality is" (p. 4), thus affecting perception. This process also demonstrates Hall's (1983) concept of extension transference—"any

extension not only can but usually does eventually take the place of the process which has been extended" (p. 131). In this case, the extension is the visual elements associated with reading, and the transference refers to the new acceptance of short bursts of information as sufficient to grasp reality. This extension transference affects the formation of cognitive processing and human perception of reality.

Efficiency at Work vs. Demand for Work and Disjuncture

Cairncross (2001) maintains that the new communication technologies have increased efficiency and productivity in the workplace, and the participants in this study agree with her assessment. They point out that the personal computer provides a tool that can simplify repetitive practices associated with producing work-related documents. Combined with job specific software programs, the personal computer is also an aid in solving math problems, making graphic presentations, producing technical drawings, and even composing music. The personal computer also provides a tool that can easily save these work products, and the Internet provides a convenient means to distribute them. Although the use of the Internet has not completely fulfilled the early projection of a paperless workplace, its use allows people to communicate over a wide area at a reasonable cost, and do research and information gathering on a great number of topics without the necessity of leaving one's office or home.

With the acceptance of these technologies in the workplace, and by members of our popular culture in general, any initial apprehension about learning to use these technologies has dissipated. Their use is taught in elementary schools and has become an accepted part of most people's everyday life. Several participants in this study also mentioned that many of the applications that computer usage has come to replace, were

more mechanical in nature, requiring physical effort to complete the task. This observation was common among people in the journalistic and graphic arts professions, who recounted the old type-setting process. They also argue that because the physical barriers for performing one's job have been removed, their fields have been opened up for women. It can also be argued that because many offices found that they could replace the traditionally female typist/secretary and re-define her functions by adding additional duties and responsibilities, employment opportunities have further opened for women, although technology's use does not ensure hierarchical changes in the workplace. However, they did ensure that office workers, both female and male, were relieved from some of the drudgery formerly associated with their jobs, by releasing them from many repetitive practices and tasks.

The use of the personal computer, and the Internet, has also produced changes in people's everyday work patterns. Their daily routine now includes checking email and web sites on a regular basis. Also with the ease of communication and information gathering offered by the Internet, as well as the ability to retrieve files and business records at work and at home, people now have the luxury of flexible work schedules, and can perform their tasks in various locations.

However, the benefits of increased efficiency, productivity, and flexibility have also come at increased personal costs for the users. Several participants in this study indicated that they now spend many hours each day using these devices and this use has become so ubiquitous that it now impinges on almost every area of their everyday life. Also, several participants who work in professional office settings implied that instead of relieving them of time-consuming and repetitive tasks, the personal computer actually

added more work to their daily routine. They note that as soon as their managers discovered that computer could simplify their work, more jobs were given out, and they were expected to complete these additional tasks within their standard work day. Other participants, from both business and academic professions, feel that their workload has increased because their professional culture now expects higher output, and to demonstrate productivity more work needs to be performed. Because of the flexibility afforded by the Internet, and this demand for more productivity, many people are forced to do their work at home after hours. They also mention that it is now important to be connected to an Internet delivery device at all times, in order to keep up with changing events and respond to work-related messages.

These demands blur the line between people's work and private time and have created several forms of anxiety. Primary among these is temporal anxiety, which occurs by first forcing people to constantly worry about their productivity and ability to meet deadlines, secondly by creating resentment for not being able to pursue personal objectives, and thirdly by producing guilt about not having quality family time. Several participants also expressed concern that the expectation for productivity, and the need to create speedy results, actually produces lesser end products. There was also concern expressed about the level of mental exhaustion, and stress, caused by multitasking. Some participants also feel that this demand for quick results also impinges upon creative decision making, while others fear that the demand for speed limits their ability to completely understand the nuances of their profession. However the most common concern related to the perception that one always needs to be connected to communication delivery devices. Many business professionals indicated that they fear not

receiving a response fast enough, while many academics related that they feel some pressure because their students expect fast, almost instantaneous, replies to emails, Facebook inquires, and, in some cases, text messages. Other participants mentioned that the expectation for quick replies to communication contributes to people's feelings of unease, restlessness, and impatience. They also worry that many people do not have the patience necessary to deal with other people in society or stressful situations that occur in everyday life. Several office workers also mentioned that the trend to continuously check email and web sites at work leads to workplace distractions.

Reflecting on the personal computer's introductory period, many of the participants revealed that the most common anxiety they faced was the fear of being perceived as being technically challenged, because of their slowness in learning how to use computer programs. This anxiety increases when new applications are introduced, and people are expected to translate the new applications format and also achieve results. Many participants told of personal techniques they used to get away from this problem, such as taking work home, watching video presentations, and asking for technical support[1]. However, all of these methods required time, and workers were expected to master new applications quickly. This demand for a speedy learning curve created another form of temporal anxiety, and frustration increased when people were facing a deadline. Even after people had become accustomed to computer usage, many participants expressed their fear of being seen as technologically illiterate because they lacked knowledge of new jargon connected with computer and Internet usage which was constantly changing as new technology entered into the popular culture. These recollections appear to be support for Innis (1951/2003) and Postman's (1992)

observations that user knowledge of new media technology is privileged, and such knowledge, or lack of such knowledge, can influence people's evaluation of success and failure, both in terms of other people's perceptions, and the user's self image.

While most of the participants in this study rejected Mazlish's (1993) argument concerning the possibility that humans were facing a discontinuity with their technological tools, based on the perception that humans were becoming inferior to their machines, they did acknowledge an underlying trend toward a disjuncture with these tools. For most of the people interviewed, the potential for disjuncture also has a temporal aspect. A few participants mentioned that they grew up in a world that operated at a much slower pace, and they resented the speed that was now demanded both at work and in their everyday personal lives. Others felt resentment for having to constantly be aware of new technology and worried that they might miss some new advancement. There was also some concern expressed about the volume of new technology that is now entering their everyday life. A few people also expressed concern about the direction of new technology, and questioned the moral and ethical nature of its development. However, the most common concern revolved around the volume of information now available. The participants were not only concerned about the validity of some of the information, but also the potential for information overload, and the ability of users to process this information.

Aid in Analysis vs. Loss of Grander Theories

There is little doubt that the advent of both the personal computer and statistical software has benefited the academics that rely on quantitative analysis for their professional research. Its use has allowed them to more easily find and change entry

errors, and obtain faster results. This is especially true for academics that began their careers relying on mainframe computers for their analysis. Many such participants also mentioned that these technologies free up time for more complete evaluation, and to engage in more sophisticated interpretative modeling. In addition to facilitating the use of mathematics as a research tool, other academics noted that the use of the personal computer and more advanced software programs helped in creating visual presentations. Almost every academic participant, regardless of their chosen field of study or method of research analysis, also commented on the positive functions associated with computer word processing. It allows them to move around information and reposition their thoughts, and because the information can be saved, it also allows them to come back to the document and reexamine it. Like most business professionals, almost all of the academics also mentioned that the use of the personal computer made their work easier, and made them more efficient. Although several of them mentioned the value of new analytical tools, they also reflected that they probably did not know as much about mathematics as their predecessors.

Most participants also acknowledged that with increased convenience and efficiency, there was also an increase in expectations concerning productivity that also increases their workload. And many academic participants acknowledged that while they were now doing more work, they were not necessarily sure that they were doing better work. One junior faculty member reflected that he was expected to produce papers, and when his research efforts are evaluated by his departmental colleagues, they stress quantity of production, and very rarely discussed the quality of his work. In fact, several senior faculty members, somewhat nostalgically, recalled their mentors who spent the

greatest part of their time developing grander, more expansive, theories, and not simply producing papers for publication. A large number of the participants in this study, both academic and business professionals, revealed an underlying concern for the quality of their end work products brought about by the desire for increased productivity.

Mobility vs. Isolation of the Individual

When describing Internet-based communications, many of the participants in this study used the terms “convenience,” “mobility,” and “flexibility” repeatedly. They mentioned that the development of these communication devices made them more mobile; allowing them to conveniently work anywhere they choose, and allowing them to maintain a more flexible lifestyle. In fact, because the usage of these technologies has become a standard component of their everyday lives, several participants also indicated that Internet-based communication has become a necessity.

Another term that was repeatedly used by participants when they mentioned Internet-based communication was connectivity. The term was used in several ways, and all of them dealt with the importance of being connected to the Internet. As has already been pointed out, a large number of participants expressed that it is now necessary for them to be connected, and have the ability to keep up with their incoming messages, as well as to have the ability to respond to their messages quickly. The second way of expressing the importance of being connected came from former rural inhabitants. Like the Tennessee Valley Authority in the early years of rural electrification, saw a potential problem of an urban/rural divide with urban areas having an economic advantage because of the ease of gaining time-sensitive information, and of establishing an Internet presence to promote their products, and concerns. They also feared that problems with Internet

connectivity would limit rural inhabitants, and their children's upward mobility. Former rural inhabitants also remembered both the difficulty that they had with obtaining the Internet, and the adjustment they had to make in college to gain knowledge of computer and Internet applications in order to make them competitive with their urban counterparts.

As important as connectivity and Internet-based communication devices are to the participants of this study, it can be argued that the process of being connected does, in itself, isolate its users from other people in society. Two of the positive descriptive terms used by the participants in this study when they mentioned Internet-based communications—convenience and flexibility—contribute to this potential for isolation. As people are able to adopt more flexible schedules and work at home, or in other convenient locations, they are not spending time with their other professional colleagues in face-to-face discussions. Also, as they rotate from one media technology to another, they tend to isolate themselves from others, even in their convenient location.

This avoidance of personal contact, even if coincidental, promotes a retreat into egocentricism on the part of the users, for no other reason than the users are enveloped within the privacy of their own computers. In addition, the use of many of the Internet-based communication forms accelerates this trend toward an egocentric orientation. The most direct forms are blogs and Twitter. The blog elevates the sender's personal opinion at the expense of both the reader's feelings and thoughts. Twitter is a moment-by-moment recitation of the sender's opinions and actions, and elevates the sender to a position that combines a reality media star with a guru, thus tending to make the sender, at least in their own perception, the most important thing on the Internet. Communicating

in discussion groups, and even group emails, can also promote a feeling that one is anonymous and/or invisible, which can reduce social constraints, and result in unsocial communication utterances. The structure of the Internet also contributes to individual egocentric behavior because there are no established communication norms. Also, as Grossman (1997) points out, it is easy for one to lose their perspective on the Internet. This can occur because topics appear on the computer screen through a process of embedded sorting, and since people tend to focus only on topics that interest them, it is easy to imagine that those topics are the most important ones, not only on the Internet, but possibly everywhere. This not only elevates the users' perceptions of their own opinions, it tends to promote a skewed reality where other peoples' interests and opinions cease to exist or are discounted.

While there are several Santa verses the Grinch parallels that can be drawn when reflecting on the use of the personal computer and the Internet, there are also several changing trends that have developed because of the adoption and use of these technologies. The next section will discuss the emergent trends that were revealed during the analysis of the participants' observations that were gathered for this study.

Changing Trends

The most dramatic trend that the participants in this study revealed was their acceptance of an Internet lifestyle. Their usage patterns and the growth in use of Internet delivery devices support Bill Gates' prediction of the development and acceptance of such a lifestyle. In addition to purchasing items, planning trips, and accessing important information from the convenience of their homes and businesses (items that Gates felt would facilitate the development of an Internet lifestyle; see Segaller, Cringerly, and

Gau, 1998), the Internet has allowed the movement of work to people's domestic spaces. Also within the home, many participants indicated that the Internet provides a tool for them to pursue their hobbies and engage in entertainment choices. Relating to the commercial functions of the Internet, in addition to procurement, many participants also mentioned that it has become a tool for the tracking of goods. And several participants in both the academic and the service professions mentioned the value of the Internet for accessing databases and transferring files. In short, the use of the Internet has altered work patens, and has also altered people's evening and non-work patterns. Many participants also confirmed that they spend too much time on the Internet, even in non-work related areas, and felt guilt at the loss of personal and family time. Also, many participants who are parents expressed concern that their children were constantly using the Internet to play games or communicate with their friends, and wondered about its impact. While this study revealed that the Internet has become an accepted part of people's everyday life, a large number of the participants elevated its use to a necessity.

The acceptance of the Internet as a component of everyday life is also reflected in a secondary trend that has emerged. Many participants in this study expressed a need for an Internet presence. Acknowledging the use of the Internet as a primary tool for purchasing and finding information about products, many people in business articulated the necessity of having a business site so other people can keep up with their offerings, and purchase their products and services. Many other participants mentioned the value of maintaining a personal presence through Facebook or MySpace, and some mentioned that they maintain an additional site to relate, and sometimes collect, information concerning secondary interests in their personal life. One participant recalled the passing of an old

friend, and mentioned that several other friends established a memorial web site for him, thus ensuring his Internet presence past his death. Also, as noted above, several parents mentioned the use of MySpace and Facebook by their children. These observations are confirmed by Tapscott (2009), Dretzin (2008), Palfrey and Gasser (2008), and Small and Vorgan (2008), all of whom conclude that an Internet presence has become an essential component of young people's communicative practices.

The participants in this study also revealed that they felt the ability to use the Internet, as well as the various Internet delivery devices, is necessary for success in today's society, and that such knowledge was now expected in order to even enter the work force. These opinions support Mumford's (1934/1963) observation that the introduction of new technologies, and the ability to master them, forces society to adopt a new definition for success. It also confirms Postman's (1993) assertion that new media technologies are seen as the most valued method for communicating and acquiring information, and that non-adaptors are classified as failures. They also support Meyrowitz (1985) and Ong's (1967, 1977, & 1982/2003) contention, which is an extension of Mumford's (1934/1963) argument, that new technology can affect social status, and thus can affect the individual's self-concept.

Another trend that has become apparent is the change in communication modalities has accelerated, as have the expectations associated with their use, and the use of older media has declined. While the desire to use new media appears especially strong in younger people, it also exists over all age groups, and all professions. This reinforces the observations of Mumford (1934/1963) Ong (1967, 1977, & 1982/2003), Meyrowitz (1985), and Postman (1993) made above. These observations are confirmed by Tapscott

(2009), Dretzin (2008), Palfrey and Gasser (2008), and Small and Vorgan (2008) with regard to members of the younger generation, and by most of the participants in this study, who could be classified as older members of our society. The participants confirmed that their major source for communication, and information gathering, is the Internet. Increasingly, they also use that technology to receive entertainment content.

Conclusion: Looking Backward and Looking Forward

Looking backward at the development, the adoption, and the early use of the personal computer and the Internet, several themes stand out. First, as Mumford (1934/1963) and Gebser (1949 & 1953/1984) contend, technological advancement is built upon previous technology. Second, as Bijker and Law (1997) point out, "all technologies are shaped by and mirror the complex trade-offs that make up our societies … [and] technologies always embody compromise" (p. 3). Third, as Oudshoorn and Pinch (2005) maintain, new technology must advance the needs of their users.

The development of the personal computer and Internet technology also supports Mumford's (1934/1963) observation that there is an historical "partnership between the soldier, the miner, the technician, and the scientist" (p. 87). Looking first at the role of the soldier, or more directly, the military, in the case of the development of the personal computer, the primary motivation for its initial advances came at the behest of the military in the Second World War. Both computer, and more directly, Internet technology was advanced as a response to the Cold War. In the case of the miner, or rather mineral influences, the refinement of the silicon chip made the smaller personal computer a viable alternative to the larger mainframe computer. The development of both technologies was

strongly influenced by technicians—professional engineers and highly motivated computer enthusiasts—and scientist and/or academics working in universities.

In the case of the complex trade-offs that shaped the development of these technologies, referenced by Bijker and Law (1997), many players within the computer industry contributed to the initial adoption of this technology. As Pinch (2005) maintains, marketing and the creation of product expectation is a key ingredient for early use, as well as a sales force that recognized the needed applications that would make the personal computer a desirable tool. This process was aided, as Schot and de la Bruhèze's (2005) observe, by flexible internal mediation within the industry that took into account both consumer desires and, as importantly, complaints in order to produce product change and refinements. In the case of the development of the Internet, the initial development was supported by the military and the academic community, with its primary applications focusing on communications and file transfer. However, its initial acceptance into the popular culture was a product of the user's desire for a quick and affordable communication tool. Therefore, this study also supports Nye's (2006) contention that "rather than assuming that technologies are deterministic; it appears more reasonable to assume that cultural choices shape their uses" (p. 21).

These technological developments support Mumford (1934/1963), and other constructionist theorists who argue that new technology is formed within a technological complex where social, historical, and environmental factors influence the shaping of technical innovation. To the soldiers, miners, independent technicians and scientists there was added venture capitalists, a knowledgeable workforce, and "a close relationship between local industry and the major research universities" (Sturgeon, 2000, p. 16). In

terms of the adoption process, many of the participants in this study confirmed the observation of Rogers (1995) that the early adopters occupied the most important position in forming the pattern of acceptance within organizations. Also like Rogers, they felt that these people had already earned respect because of their past achievements, and their willingness to accept new ideas. The early innovators, on the other hand, only aided to this process by supplying technical knowledge. Finally, as Rogers assumed, the early majority proved to be deliberate in the decision to adopt the new innovation. They only became convinced, as Oudshoorn and Pinch (2005) maintain, when they saw that the new technology would advance their needs. For most people these needs included the reduction of repetitive and time-consuming tasks that often caused errors. When software was developed to aid in customer-requested applications, interest increased. As Oudshoorn and Pinch (2005) observe the end-product users' input into necessary functions is an important ingredient in both its acceptance and ultimate success. In the workplace, the primary need reflected the manager's desire for increased efficiency, as postulated by Bijker and Law (1997), and ultimately, the people who made the decision to adopt these technologies based it on bottom line considerations.

Further, the reflections of the participants in this study indicate support the assertion of Nye's (2006) that technology is unpredictable, and "people need time to find out how they want to use it" (p. 47). As the technology improved, and people became more familiar with its operation, many of the early problems dissipated, and now the use of the personal computer, and the Internet, is an accepted part of popular culture, or as Fiske (1989) defines it, the culture of everyday life. In fact, it was now expected that everyone who receives a college education, applies for a job, or even communicates with

their distant family members should be able to use a personal computer and the Internet. However, their use also produced a number of changes in the patterns of the users' everyday life. Probably the most dramatic are the changes in users' perceptions of space and time, primarily because they have influenced many of the other changing patterns.

When discussing television, Meyrowitz (1985) notes that this medium brings the outside world into the home. This feature has been expanded with the use of the Internet. Generally speaking, the participants of this study acknowledged that they feel that distance has become reduced because they can conveniently find information about other locations and cultures, but also keep with events in those places, and plan trips or engage in virtual tours without having to leave their Internet delivery device[2]. This extension of the outside world into the everyday world of the user has produced the spatial perception that distance has diminished. This perception is further reinforced by the ability of the Internet to allow for communication throughout the world[3].

Meyrowitz (1985) not only observed that the use of television affected space perception through the reduction of distance; he also noted that it also demystified the allure of place. He also contends that the links between people and their culture are also reduced in this perceptual homogenization. Thus the place which Meyrowitz talks about also includes both one's place of origin, and one's place within its culture.

The use of the Internet extends and expands this process, for as Meyrowitz (1985) also notes, the use of media intrudes into one's domestic space. The infringement of the outside world into the users' private world is further accelerated by the constant desire to check Internet-based communication for messages. This creates another paradox of Internet usage: a larger world is extended into one's private world, and while parts of the

larger world are absorbed by the user, creating the potential for expanding horizons of understanding, the interpretation of what is absorbed is still linked to previous perspectives of the individual user. In other words, this expansion is not guaranteed, and one could just as easily make the argument that this intrusion reinforces the users' prior opinions, and invites them to escape into a smaller world. One of the reasons that this argument can be made is due to the structural mechanism used by Internet search engines that classifies topics according to the number of hits they receive. The wording of the inquiry dictates which topic will appear at the top of the list, and gives the false impression that the topic (and the user's interpretation of it) is among the most important on the Internet. This tends to privilege the user's individual opinion, thus promoting an egocentric vision. In addition certain modalities of Internet communication, such as blogs and Twitter, elevated the importance of the thoughts and actions of the sender and also underpin the validity of their egocentric vision and behavior.

The participants in this study acknowledged a new demand for speed in finding information on the Internet, and more importantly, in business and personal communication. While the importance of speed has forced a perception that time is accelerating, as Harvey (1990) points out, time can also be perceived as compressing, because for many people there does not appear to be enough time in the day to accomplish everything that they desire to do. People are forced to sacrifice one desired goal in order to accomplish another. Because their work product has assumed so much importance, work-related tasks are generally granted priority, and family and leisure activities are put on hold. This can potentially produce internal conflicts, and can affect both stress levels and interpersonal relationships.

Turning to spatial perceptions and their impact on interpersonal relations, the participants in this study revealed that because of the increased number of Internet communication channels now available, they feel that geographical distance is no longer a factor in hindering communication, and for many, distance is perceived of growing smaller. Corresponding to the increased use of the Internet as a communication tool, participants generally found that direct face-to-face interaction is no longer essential for maintaining a strong relationship. However, many of the participants also acknowledged that they, and many of their family members, are engaged with their communication media for a substantial portion of their day, and person-to-person contact has suffered. The development of laptop, cell phone, and other mobile Internet delivery devices extends this trend. Now they can engage with these technologies in the same physical location that other people occupy, and this also affects interpersonal relationships. Also, many participants in this study related examples of how other members of their family have retreated into the computer screen during television commercial breaks. This is further increased by the dualistic opposition of the expansion of users' Internet presence with their shrinkage of actual usable physical space, which as Gebser (1949 & 1953/1985) maintains results in a collapse of the user into a more rigid ego.

Looking at Internet usage as a communication medium, there is also the problem of unforeseen consequences. Internet-based communication limits face-to-face contact, which causes the loss of visual signs that might help clarify meaning, not to mention reducing insightful conversational exchanges. These communication modalities also promote a lack of communicative depth, and can also facilitate the spread of false information and support. In addition to the potential of affecting writing and cognitive

processing patterns, every Internet-based communication modality promotes a feeling of being anonymous on the part of the user, and can contribute to a loss of civility. Their constant use can also contribute to the avoidance of personal contact and isolation. Many of the participants in this study also indicated that the use of the Internet and Interned-based communication modalities has contributed to language use being modifies, and most of the participants that commented on this perception also indicated that they were concerned about this development.

One factor in the acceptance of innovation not classified by Rogers (1995), but revealed by the participants on this study, is the expectation placed on new technology by its potential users. When the personal computer entered into the workplace the expectation was for convenience and efficiency, when the Internet came alone the expectation was for what Turner (2006) would term digital utopianism and empowerment through information. However, the reality of certain unforeseen consequences for Internet usage has surfaced. Almost every participant in this study noted several concerns that fall into three categories: the ease of identity theft, the ease of computer crime—both the theft of commercial information and fraud—and the most frequently mentioned concern, privacy. Privacy concerns ranged from parents who felt that their children were sharing too much information on-line, to a concern about hackers.

Also looking backward, it was mentioned in the introduction, that this study would be informed by medium theory, and many of the observations made by the participants confirmed many of the assumptions presented by medium theory scholars. The table below recaps many of these participant observations, and links them to the theorist who posited them.

Table 12.1

Medium Theory and Study Findings

Findings	Theorist
The media is not a neutral actor in the communication process	Mumford (1934/1963), Innis (1951/2003). Ong (1967, 1977, & 1982/2003), McLuhan (1964), Chesebro (1984), Meyrowitz (1985), Postman (1993), Fulk & Collin-Jarvis (2003)
The speed at which knowledge is disseminated by new media will change human perceptions of space and time, affecting knowledge	Ong (1977), & Chesebro (1984) [Pfau (1990) & Chesebro (2000) argue that different modalities affect perception, also see Appendix I]
Knowledge of the use of new media becomes privileged and can influence people's evaluation of success	Innis (1951/2003) and Postman (1993) Mumford's (1934/1963) Meyrowitz's (1985)
Mastery of a new technology can affect social status and thus can affect the individual's self-concept	Meyrowitz's (1985), Mumford (1934/1963), Postman (1993)
The introduction and acceptance of a new communication medium creates a bias toward its use, and limits the use of older communications technologies	Innis (1951/2003), Ong (1967, 1977, & 1982/2003), Meyrowitz (1985), and Postman (1993)
The use of new a new medium effectively diminished the perception of	Meyrowitz (1985), McLuhan (1963/1965) and McLuhan and Fiore (1967), Mumford

distance for its users, and that new medium brings the outside world into the home, resulting in a demystification of place	(1934/1963), Innis (1951/2003), Gebser (1949 & 1953/1984), Postman (1993), Wolf (2007), Ong (1967, 1977, & 1982/2003), Kern (1983/2003), Schivelbusch (1996), Solnit (2003), and Kramer (1997)
People are now totally involved with their media	McLuhan and Fiore (1967/1996) Chesbro and Bertelsen (1996)
The use of a new communication medium promotes one group over others, and allows them to monopolize the distribution of knowledge	Meyrowitz (1985), Innis (1951/2003), Postman (1993), and Mumford (1934/1963)

The first cell in the table above lays out the principal observation made by all medium theorists, and most of the scholars engaged in mediated communication studies, namely that the use of the media is not neutral with regard to its impact upon their users. The remaining observations shown in the table stem from this non-neutral characteristic.

Looking forward, the second and fifth observations in the table which posits that the speed, at which knowledge is disseminated by new media, will change human perceptions of space and time, affecting knowledge, is also very important and should be the subject of analysis for future medium theory research. Many of the effects described in many medium theories and by many of the participants in this study can be attributed to changing perceptions of time and space, in particular changes in interpersonal relationships. The consideration of changing time and space perceptions is particularly

important given the recent finding of LeDous (2002), Schwartz and Begley (2002) and Doidge (2007), who demonstrate that, because of its plasticity, the processing channels in the human brain can change, even into adulthood, and more specifically because of the finding of Small and Vorgan (2008), who not only agree with the above authors, but who also assert the media use is an influential contributor to the process.

Looking Forward: Medium Theory and Popular Culture

Again looking forward, medium theory might do well to include the concept of popular culture within its analysis. To begin using the study of popular culture as a guide for expanding medium theory it is necessary to define what the term popular culture means. This in itself is a somewhat difficult process, for as Hall (1992) asserts: "Cultural Studies has multiple discourses; it has a number of different histories" (p. 278), and therefore a number of applicable meanings. As Hall infers, the initial problem relates to the term "culture" itself. Storey (2009) points out that early research delineated between "high" and "popular" culture. High culture was seen representation of classic and artistic works—also a problem because it lacked a proper classification system for identifying works that fell within this parameter—with every other depiction falling into popular culture. Further as Storey (2003) observes the study of popular culture not only embraces an examination of media forms and their consumption in peoples' everyday life, but also takes numerous approached in their examination, such as encoding and decoding television discourses (see Hall, 1980, and Fiske. 1989), pleasure gained from reading popular literary efforts (see Ang, 1998, and Radway, 1987), the political economy and popular music (see Adorno, 1998), and hegemony and globalization (see Gramsci, 1971 & 1998,). However, there are several common elements in all of these approaches, and

for the purpose of providing a definition of popular culture and linking it with the application of medium theory one can turn to Williams (1958). He points out that all societies have their own structures, purposes, and develop their own set of meaning associated with these institutions and goals. He also observes that the learning system within society, as well as the arts produced in it (including media presentations) reflects commonly held meanings. He further asserts that while both social forms and meanings are always present, they are also constantly questioned, tested, and remade in the mind of the individual inhabitants of the society. Like the title of his essay, Williams contends that "culture is ordinary" (p. 74), and popular culture is the way of life endorsed by the people within a society, and cultural products reflect their desires, pleasures and attitudes. Williams infers, and Storey (2009) directly notes, that popular culture is in constant change and is unique to a particular place and time.

To further gain some perspective of the linkage between the study of popular culture and medium theory it might be beneficial to examine the uses-and-gratifications theory, which has similar elements to both approaches. Like medium theory, uses-and gratifications grew out a concern for the importance placed on media content in influencing human attitudes and behavior. Also, uses-and-gratifications, like popular cultural studies, as Morley (1992) points out, holds that the members of a society use and interpret media products in different ways from how they were initially intended, and in different ways from other members of the same society. Katz, Blumer, and Gurecitch (1974) contend that uses-and-gratification theory assumes that people play an active role in media use, and their usage is determined by various motives and/or needs they want to be fulfilled, such as information seeking, value reinforcement, social identification and

integration, social interaction, and entertainment. Morley (1992) also maintains that in addition to stressing the role of media audiences in the construction of meaning, uses-and-gratifications also recognized the role of media convergence as a means to fulfill media users' needs. Like the linkage between uses-and-gratifications theory, popular culture studies can also be linked to medium theory in order to offer more insight into peoples' needs and the uses of their media.

Here Fiske (1989) can provide clues. Because of its everyday convenience, the Internet has both entered into, and become embraced by today's popular culture. As Fiske explains, popular culture is the active process for the generating and circulating of pleasure, which most of the participants in this study have indicated, the use of the Internet certainly does. Fiske also maintains that popular culture is the culture of everyday life, and most of the participants have revealed that they engage in elements of an Internet lifestyle on an everyday basis. In the present media ecology, one could easily revise McLuhan's (1964) iconic phrase "the medium is the message" (p. 7) to read the message is today's popular culture. The use of Internet-based communication devices is driven by the expectations placed on the user by their popular culture. As McLuhan and Fiore (1967/1996) and Chesbro and Bertelsen (1996) point out, people's everyday life has become linked with, and in some cases completely enveloped, by their use of electronic media. And, as Innis (1951/2003), Ong (1967, 1977, & 1982/2003), Meyrowitz (1985), and Postman (1993) maintain the acceptance of this new medium by popular culture, has created a bias toward its use. All of these observations help explain why people have embraced the use of the personal computer, and other Internet delivery

technologies; however the active process of popular culture also aids in the formulation of the expectations accepted by those same users.

Among the expectations that popular culture promotes regards the use of the Internet as a provider of useful information. Here, again to borrow McLuhan's (1964) famous terminology, although in this case to paraphrase it, the Internet is both the medium and the message. Many of the participants in this study expressed concern about this duality. A large number of the educators interviewed questioned the writing practices of the young people that have grown-up relying on short messages using abbreviations instead of phrases, and without the necessity of complete sentences, to communicate with their friends. More importantly, many question their reasoning process, because these same young people now rely on quickly obtained summaries of information from the Internet to reach conclusions without complex analysis. These participant observations are supported by Wolf (2007) and Small and Vorgan (2008). Many parents were also worried about the influence of Internet-based communication on the development of person-to-person social skills by their children.

Although much of work product found in cultural studies focus on the texts originating in the popular media, and medium theory is not concerned with media content, these texts can add an analytical element for medium theorists to consider. As Williams (1982) notes, cultures is a "realized signifying system" (p. 207), and these texts can offer insight into why uses desire certain media, why they prefer one medium over another, and what is the expectation associated with that medium. The advertisements that introduced several of the chapters in the study serve as an example. These popular cultural texts used the process of appellation to project identity, desire, and create

expectations for members of the popular culture. Appellation is defined by the 1974 edition of *Webster's New Collegiate Dictionary* as "an identifying name or title," and Williamson (1978) states: "appellation is simply the 'Hey, you' process of ideological apparatuses calling individuals 'subjects'" (p. 40) to the product in the advertisement. Both of these definitions are accurate within the advertisement because both are concerned with the identity and desires of the potential consumer. Not only does it promise a future identity and/or pleasure but it can also link the potential consumer to other members of the culture—and possibly an important or well known members of the culture. Appellation can also serve to reestablish and/or reinforce the culturally embedded beliefs and practices of society and thus link the consumer with it ideology. According to Williamson (1978/2002), within this process, the consumer inserts herself into the ad, and the representation of the subjects in the copy is a proxy form of the person viewing the advertisement. In other words the consumer is asked to enter into the space between signifier—"the material object" (p. 17)—and the signified—what it means.

The Commodore VIC-20 advertisement (in chapter 6), featuring William Shater, the recognizable star of the *Star Trek* television series, invites potential consumers into a world of the future where computer technology could serve the users in their everyday work and pleasures. The advertisement that began this study, and featured John Lennon and Yoko Ono, invites the potential consumer to into a more creative future by acquiring an Apple personal computer. These advertisements project the expectations and ideology of American modernity onto the potential consumer and can certainly offer insight into the "why" aspects of media decisions. However, for the purpose of demonstrating the potential link between popular culture and medium theory, the picture of Miranda

Cosgrove representing another cultural text, the television series *iCarly* (chapter 7), probably offers the greatest example. The series demonstrates how computer and Internet usage has become an important element in American society. It achieves this through the use of a visual language acknowledging computer and Internet use, the development of plot lines revolving around their Internet web show, and the appeal of the program to American youth. However, more importantly, the series demonstrates the acceptance and promotion of social networking as a contemporary element of today's lifestyles. Popular culture texts provide, as Williams (1958) observes, evidence of the commonly held meanings which a society produces, and examples where these meanings are questioned and remade in individual members' minds. Like uses-and-gratifications theory, popular culture studies recognize that people play an active part in their own media use, and make these determinations based on their own motives and needs. Further, as *iCarly* demonstrates, people make these determinations in concert with their peers in communication and social networks.

The linkage between popular culture texts and their media technologies can also be aided by looking at Fiske (1989). He was focused on the television programs that the media produced, and not the medium itself. He classified these programs as products, or commodities, that the television programmer sells to advertisers in order to reach the viewer. The viewer is seen as both a moderator of the desirability of the television program and a consumer. They not only potentially consume the advertised products, but with the use of the Internet they also consume an increasing number of associated accessories, e.g. cases for their cell phones. Many participants were concerned that the pressure from their friends to maintain an Internet-based lifestyle, along with the

accouterments that indicate such a lifestyle, had become a fetish for their children. Fiske also notes that the viewers expend time in order to watch, or consume, the media presentation. He maintains that for a commodity to be accepted by members of the popular culture, it must support their interests. In terms of use, he maintains that the cultural product must also respond to the individual's creative interests by allowing them to stake out and claim a space where their perceived needs can be met to create pleasure. This helps explain the attraction of Internet usage as a tool used to promote the user's individual agenda, and as a vehicle that aids in the creation of egocentric behavior.

The use of the Internet as a primary communication and information gathering tool has accelerated a trend that began with photography and which was extended through viewing movies and later television. These media have allowed people to get their information visually. From viewing the pictures in their newspapers of battlefields, to news shorts in movie theaters, to the evening news on television, people have formed opinions about other people, other places, and events using the images projected through their media. It became natural to form these opinions without interacting with other people in person. Further, as Kramer (1997) points out the use of the Internet has expanded the ability of people to escape from the spatial/temporal coordinates of any event and place, and with newer Internet-based mobile communication devices, the trend of receiving information apart from human interaction now extends to the same physical location that other people occupy. Although the transition from viewing pictures in the newspapers to viewing shorts on the movie screen represents an increase in the visual field, with the advent of electronic communication this visual field has become increasingly reduced. Both of these trends encourage people to more directly enter into

their own private worlds, and affects interpersonal relationships as well as promoting isolationist and egocentric behavior. Although Rushkoff and Dretzin (2010) report, and a few of the participants in this study confirm, that there is a social dimension to many Internet transactions, as some people seek and find friendships in these encounters, one cannot help but wonder, as Rushkoff and Dretzin also do, if this is more of an example of being alone together, than true friendship building and maintenance. Here one must remember Chesebro's (2000) observation that "the nature of cognition is a virtual reality system departs dramatically from the forms of cognition contained in other realities" (p. 11) and ask the question: Does this perception of an on-line community of friends equate with reality?

Looking Forward: Future Research

Also looking forward, the above question can form a one justification to call for more studies of the younger generation's use of newer media technology, and the affects of this use. Another justification for a call for such study is that it might be an aid in determining if the optimistic assessments of this digital generation made by Palfrey and Gasser (2008), and Tapscott (2009) offsets the concerns about the affects of the use of digital technology on cognitive processing made by Wolf (2007), Small and Vorgan (2008), and many participants in this study. In addition to the attempt to gain insight in how the brains of this younger generation processes information, such studies could focus on the time and space perceptions of this generation, and how they are formed. Such a study could also provide insight into whether the younger generation, like many participants of this study, identifies a generational difference, not only concerning the use of media technologies, but also the importance of the effects of this use.

Another area of potential generational research would be to look at those people who have avoided computer and Internet usage entirely. While this population is probably shrinking, such a study might provide insight into both their attitudes about these new technologies, and technology in general. Such a study might also contribute to more directly delineating the generational differences between non-users, the older generation who have accepted the Internet, and the digital younger generation. This might also provide some insight into the affects of a possible information ghetto that concerns Kramer (2003).

Still another area of research could focus on the claim of Tapscott (2009) that the members of the digital generation are developing a collaborative structure that is influencing American politics. He cites their involvement in the Obama campaign as an example. This projection of collaboration stands in contrast to the concerns of many participants in this study that personal computer and Internet usage promotes a trend toward isolation and egocentric behaviors. In terms of politics, one question might focus on the attitudes of this digital generation, are they progressive in their outlook or are they simply enamored with the prospect of change, and do they really share Obama's vision or are they more libertarian and egocentric. Such research could have implications for both business and personal relationship attitudes as well.

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[1] Technical support as a source of information was commonly used by academics, and initially, this appeared to be a method of last resort for office workers, who thought that this might be an indication that they were technically challenged. Although there was a temporal aspect to this reluctance—academics were operating on their own time and responsible to themselves, while office worker were responsible to their supervisor and

operating on company time—this also appears to support Innis (1951/2003) and Postman's (1992) observations that user knowledge of new media technology is privileged and such knowledge, or lack of such knowledge, can influence people's evaluation of success and failure, both in terms of other people's perceptions and the user's self image.

[2] Although Meyrowitz (1985) recognized that the medium of television effectively diminished the perception of distance for its users, McLuhan (1963/1965) and McLuhan and Fiore (1967), and before them, Mumford (1934/1963) and Innis (1951/2003), point out that this process can be traced to the advent of the print medium. In fact, Mumford (1934/1963), Innis (1950/1972 & 1951/2003), Gebser (1949 & 1953/1984), Postman (1993), Wolf (2007), and especially Ong (1967, 1977, & 1982/2003) observe that the process of reducing the perception of distance extends to the development of writing. While communication technologies have affected human's perception of space, as Kern (1983/2003), Schivelbusch (1996), Solnit (2003), and Rabinbach (1990) point out, the introduction of other new technologies, especially those dealing with transportation, have also altered people's perception of both space and time.

[3] Although most of the participants in this study indicated support for Adams' (2005) conclusion that Internet-based communication modalities empower people to transcend their body's physical location, this does not mean that we are now living in a borderless world. Neither is there much realistic support for Deibert (1998) assumption that the Internet provides a vehicle for defying authority, except for the limited circumstances were national security and political considerations, and is not seen as being potentially jeopardized by the authorities. For as Franda (2001) points out, when the security of a

sovereign states become involved in international discussions concerning the Internet, the prevailing trend is toward mistrust and national interest, with national security concerns winning out. Goldsmith and Wu (2006) concur noting that the Internet is becoming bordered, and note that it is also separated by differences in "culture, currency, climate, consumer norms, and much more" (p. 51), all of which is marked by national borders. They also cited the Internet protocols imposed by China as an example of both of this observation, and content that China is an “example of how and why the Internet is becoming bordered by geography" (p. 90).

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Appendix I

A Quantitative Approach to Medium Theory:

User's Conception of Reality and Source Credibility

As Marvin (1988) points out, new media may change alter user's conceptions of reality, and impacts, "the efficacy of customary tests for truth and deception" (p. 5). Below is a brief summary of medium theory response to the question of the user's construction of reality and a review of qualitative research concerned with source credibility.

Turning to media use and the construction of the user's reality, Reeves and Nass (1996) believe that:

> Equating mediated and real life is neither rare nor unreasonable. It is very common, it is easy to foster, it does not depend on fancy media equipment, and thinking will not make it go away. The media equation—*media equal real life*—applies to everyone, it applies often, and it is highly consequential. (p. 5)

In explaining this, Chesebro (1984) asserts that "the configuration of media employed by a cultural unit affects the selective perception, mental patterns, worldviews, and ultimately the valuation system itself defining the essence of a cultural unit" (p. 116). He further asserts that the selective use of any mental activity can become habitual, and that the media choices that individuals make, "creates a self-perpetuating and moral orientation toward reality" (p. 120). This is supported by Chaiken and Stangor (1987), who maintain that media usage creates cognitive patterns that reinforce mental activity. Since an individual media contributes to the construction of the user's reality, and since the individual use of an individual medium becomes habitual, we would expect that the

perceptions gathered from individual users of each medium to differ with respect to how they judge the realistic quality of each medium. Several empirical studies tend to support this assumption. McGinnis (1965) found that print was superior to radio in its ability to persuade, while Cantril and Allport (1935) and Wilke (1934) found that radio was superior to print in its ability to persuade. Keating (1972) concluded that television, being a livelier, more action orientated, and medium was more influential in promoting attitude change, compared to other media forms. Chaiken and Eagly (1976) found that media forms influence message reception. Print messages were shown to be more effective for complex material and arguments, while radio and television messages appeared more powerful for less complex presentations. Chaiken (1987) demonstrated that video usage is likely to trigger peripheral processing as defined by ELM (also heuristic process as defined by HSM). Lastly, Pfau (1997) concluded that inoculation messages, being dependent of producing counterarguments on the cognitive level, have a greater effect through media that feature a reasonable tone, and the ability to present more complex messages.

One would also expect the choice of media to have an impact on perceptions and tests of truth and deception. One important element in this evaluation is source credibility. Chaiken and Eagly (1983) concluded that source credibility is important in determining the persuasiveness of a message, as compared to print, television/video and audio presentations are superior in depicting likable sources. Further, the print medium is more likely to elicit active thought, as compared to visual modalities. Meyrowitz (1985) asserts that there is a symbolic link between televised sequences and interpersonal codes, because “television images are symbolic of live experience” (pp. 239-240) He further

observes that the "meaning of many television cues may rest in unconscious interpersonal codes such as proxemics [Hall, 1959, 1966] and impression management [Goffman, 1959]" (p. 24). Unlike most medium theory, some of Meyrowitz's (1985) assumptions have been empirically tested by Pfau (1990). Pfau used a comparative approach, analyzing messages in television, print, radio, public address communication, and interpersonal communication to determine if there was a unique impact of these various medium on the assessment of source cues, and their influence on attitudes. "Results from the Pfau study confirmed that source cues, relative to content, accounted for more variance in attitudes for the television condition" while content was a more powerful "predictive variable" in print (Holbert, 2000, p. 49). This study also reaffirms the assumption made by Perse and Rubin (1989) that television effects can best be understood using an interpersonal communication framework. Further, Meyrowitz's (1985) observation that the source of television meaning is derived from "unconscious interpersonal codes" (p. 24), is also confirmed by Pfau's (1990) study. In addition, several other studies confirm the importance of source cues and the variance between media and the impact of these cues.

Additional studies focusing on media forms and source factor reception have produced the following results. Rubin (1967) and Cohen (1976) demonstrated that source factors differ across media forms with some people appearing more creditable over the radio and other over the television. Keating and Latane (1976) and Jamieson (1988) found that the video form promotes source over content when attached with projections of intimacy, and favoring s a more casual and warmer communication style. Andreoli and Worchel (1978) conclude that television best serves sources that are identified as more

trustworthy. Chaiken and Eagly (1983) showed that source credibility is important in determining the persuasiveness of a message, and as compared to print, and television/video and audio presentations are superior in depicting likable sources. Pfau (1990) demonstrated that, as in interpersonal communication, source cues were more important than content in television, however content was more dominant in the print medium. Television facilitates immediacy/affection, similarity/depth, and receptivity/trust as source cues, and relational messages are more influential than content messages. Pfau & Kang (1991) and Pfau, Diedrich, et al. (1993) confirmed the nature of source cues demonstrated in Pfau (19990). Finally, Pfau, et al. (2000) concludes:

> Overall, the pattern of results supports the prediction that video inoculation treatments employ a unique route in conferring resistance, one that relies much more heavily on source factors. This finding provides empirical support for the position advanced by Meyrowitz (1985, 1994, & 1997) that media forms vary in the manner in which they communicate: Print places predominant emphasis on the content of messages, whereas video brings into play the role and influence of sources of messages. (p. 25)

Appendix II

Mumford's Technological Phases in Human History

Mumford (1934/1963) contends that during the eotchnic phase the sources of power—fire, water-wheels, and the windmill—were still subject to nature. Wood still served as the foundation of buildings and was also used as utensils, tools, machine tools, machines, and fuel. Yet, during this period ship construction was advanced and navigational tools were developed. This facilitated ocean travel and trade that tended to coordinated industry, agriculture, and transportation, resulting in a balance between agriculture and industry. Another key aspect of this phase was the use of glass windows which tended to change the aspects of indoor life. It increased availability of solar energy as a light source, and increased the working day in factories. The advances in glass technology also aided the development of convex lens in spectacles, as well as the development of the telescope, the microscope, distilling flasks, test-tubes, the barometer, the thermometer, and eventually the electric light, and the x-ray. Although Mumford contends that use of glasses advanced both safety and hygiene, its most important effect was that it changed the inner world of people, and "had a profound effect on the development of the personality: indeed, it helped to alter the very concept of self" (p. 128). The primary inventions and innovations of the eotchnic phase were the mechanical clock, the telescope, the development of cheap paper, print and the printing press, the magnetic compass, the scientific method, and the creation of the factory. This last factor facilitated the specialization of skills and division of labor, and provided a common meeting place for work. However the most important element of the phase was the introduction of the steam engine which paved the way for the next era. In essence, the

steam engine was the manifest symbol of the new phase, further "the technical history of the next hundred years was directly or indirectly the history of steam" (p. 159), because it represented an increase of energy, an increase of technics of the machine, an increase the tendency toward concentration and larger economic entities, an increase in the size of cities, and new urban communities located along rail lines. In addition to the development of the steam engine, Mumford (1934/1963) also contends that the next phase—the paleotechnic phase—also was build upon other factors previously set into motion.

This new phase saw the development of "Carboniferous Capitalism" (p. 156), where coal became the chief energy source and the mine became the central focus of many local communities. The effects of this shift were numerous. First, the entire local inhabits became dependent on mine owners for their subsistence. Secondly, the mine produced a disorderly environment that had psychological results, including lowered morale of both workers and other inhabitants, as debris became a part of the normal human environment. This trend was further accelerated as iron became the dominant material used in production, and black became the dominant color associated with products used in both production and domestic applications. Also, cheap iron and steel made it feasible to equip larger armies, which lead Mumford to observe that during this period: "Bloodshed kept pace with iron production" (p. 165). These developments, along with the continued use of the steam engine, increased the potential for the destruction of the environment, and air and steam pollution made their appearance on the landscape. Mumford argues that these trends also resulted in the degradation of the worker—"human beings were dealt with in the same spirit of brutality as the landscape: labor was a

resource to be exploited, to be mined, to be exhausted, and finally to be discarded" (p. 172). However, the most harmful effect was, what Mumford termed, "the starvation of life" (p. 178), which included poor quality homes that were encased in dirt and squalor; undernourished children; adulterants in food, e.g. flour supplemented with plaster; and the lack of light and color.

Mumford (1934/1963) maintains that the mechanisms that justified events, and status relationships, in the paleotechnic period were "beautifully simple" (p. 182). Primary among these was the doctrine of progress, as he states:

> In the eighteenth century the notion of Progress had been elevated into a cardinal doctrine of the educated classes. Man, according to the philosophers and rationalists, was climbing steadily out of the mire of superstition, ignorance, slavery, into a world that was to become ever more polished, humane and rational….With the rapid improvement of machines, the vague eighteenth century doctrine received new confirmation in the nineteenth century. (p. 182)

Mumford (1934/1963) contends that the changes in the technics of this phase were the result of increased power, and the byproducts were an increase in the size of economic entities, and the speed of production. Mumford also contends that such increases were also byproducts of the notions of Progress, he states: "Value, in the doctrine of progress, was reduced to a time-calculation: value was in fact *movement in time*" (p. 184). With regard to the workers, their work tempo increased as timesaving became as important as laborsaving, and time became a commodity, with schedules, routines, and time keeping becoming a feature of industry and everyday life

Although this period fostered a number of disjunctive effects, Mumford (1934/1963) does acknowledge a number of mechanical triumphs. These included an increase in the professional continuity of both science and technics as the ability of the toolmakers and machine-makers caught up with the inventors. This period also saw the mass production of clothes, and the mass distribution of foods, the use of iron on a large scale, and the size and speed of the steamship increased. Further, iron structures were developed and a new class of toolmakers emerged. However, Mumford contends that "the truly significant part of the paleotechnic phase lay not in what it produced by in what it led to" (p. 211)—the neotechnic period.

According to Mumford (1934/1963), the beginnings of the neotechnic period can be traced to "the perfection of the water-turbine by Fourneyron in 1832" (p. 213). The concentration on expanding energy generation and storage continued. Between 1875 and 1900, the electric cell, the storage cell, the dynamo, the motor, the electric lamp, the spectroscope, and the doctrine of the conservation of energy were developed. The dominant energy source during the period was electricity, and new power generation is still a feature of the economic climate today.

Mumford (1934/1963) also identifies many other characteristics of the neotechnic phase. One of the primary ones was an elevation in the importance of science, not only for economic and political decision makers, but also in the eyes of the general public. On the academic level the scientific method was extended into the study of other domains, and on the more economic level, it was also applied to the knowledge of technics, and engineers emerged as a separate class of professionals. Also, with electricity becoming the new sources of energy and the trend toward automation continuing, the factory was

transformed, becoming smaller and more profitable because of diminished labor costs. Also, during this phase, new materials were developed. These included copper and aluminum, the use of rare metal and metallic earths, as well as rubber, coal tar and organic compounds that could be used to develop new medicines, dyes, and resins. Also agricultural products were used in other applications. This period saw the transition of power into mobility with the development of the internal combustion engine, and the use of lighter distillates as fuels and heavier oils as lubricants, which allowed for invention of the automobile and the airplane.

This period also saw an acceleration of the doctrine of progress as it was applied to technology: the machine became a direct ally of life, and studies of working efficiency and the nature of fatigue were developed. Technology was also brought to the aid the biological and psychological sciences, in order to prevent diseases.