58. H. Jenkins, *Textual Poachers: Television Fans & Participatory Culture* (New York: Routledge, 1992), 18, 34, 53.
59. H. Jenkins, Star Trek Rerun, Reread, Rewritten, in *Fans, Bloggers, Gamers: Exploring Participatory Culture* (New York: New York University Press, 2006), 39.
60. Jenkins, *Textual Poachers*, 67.
61. H. Jenkins, "Do You Enjoy Making the Rest of Us Feel Stupid?": alt.tv.twinpeaks, the Trickster Author, and Viewer Master, in *Full of Secrets: Critical Approaches to Twin Peaks*, D. Lavery (ed.) (Detroit, MI: Wayne State University Press, 1995), 59.
62. B.L. Ott, "Oh My God, They Digitized Kenny!" Travels in the *South Park* Cybercommunity v4.0, in *Prime Time Animation: Television Animation and American Culture*, C.A. Stabile and M. Harrison (eds.) (New York: Routledge, 2003), 228–9.
63. Mazar, 1148.
64. Mazar, 1141.
65. R. Bury, A Critical Eye for the Queer Text: Reading and Writing Slash Fiction on (the) Line, in *The International Handbook of Virtual Learning Environments*, J. Weiss, J. Hunsinger, J. Nolan, and P.P. Trifonas (eds.) (Dordrecht: Springer, 2006), 1152.
66. Jenkins, *Textual Poachers*, 102.
67. C. Bacon-Smith, *Enterprising Women: Television Fandom and the Creation of Popular Myth* (Philadelphia, PA: University of Pennsylvania Press, 1992), 94.
68. Bacon-Smith, 102.
69. Keft-Kennedy, 49; see also Mazar, 1147.
70. Bacon-Smith, 249.
71. C. Penley, Feminism, Psychoanalysis, and the Study of Popular Culture, in *Cultural Studies*, L. Grossberg, C. Nelson, and P. Treichler (eds) (New York: Routledge, 1992), 492.
72. Keft-Kennedy, 50.
73. Jenkins, *Textual Poachers*, 189.
74. B.L. Ott, Review Essay: Rhetorics of Social Resistance, *Quarterly Journal of Speech* 2011, 97, 335.
75. de Certeau, 30–1.

13 Ecological Analysis

KEY CONCEPTS

ACOUSTIC SPACE
COOL MEDIUM
EPISTEMOLOGY
HOT MEDIUM
LITERACY
MEDIUM THEORY
ORALITY
PARADIGM SHIFT
SPACE-BIASED MEDIA
TIME-BIASED MEDIA
VISUAL SPACE

In October of 1999, as a way of ushering in the new millennium, *Biography*, a television show on the Arts and Entertainment (A&E) cable channel, counted down the 100 most influential people of the past 1000 years. To create the remarkable list for the program's 4-hour world premiere, A&E polled 360 noted scholars, scientists, and artists. Their responses, along with individual ballots cast through *Biography*'s website, were evaluated by A&E's editorial board, who eventually settled on a rank-ordered list. Sitting atop the list as the single most influential person in the past 1000 years was Johannes Gutenberg, the inventor of moveable-type mechanical printing. Gutenberg, who edged out such legendary historical figures as Sir Isaac Newton, Charles Darwin, William Shakespeare, Karl Marx, Leonardo da Vinci, and Mahatma Gandhi, was awarded top honors because the printing press was felt to have more profoundly transformed the world than any other invention, discovery, or action by a world leader. The invention of the printing press was, after all, one of those pivotal events in history when, in the words of philosopher Mark Taylor, "technological innovation triggers massive social and cultural transformation."[1]

With the advent of Gutenberg's printing press, the flow of information was no longer limited to individual transmission. For the first time in human history, it was now possible to circulate messages to large, anonymous, and distant audiences. The world had its first mass communication technology. As more and more people had access to the printed word, literacy spread, forever transforming the spheres of science, politics, and religion. Scientists had greater access to the insights of others, allowing them to build upon previous discoveries. Literary and political figures could more easily disseminate their ideas, shaping beliefs and understandings. And while religions could also share their doctrines more widely, they could no longer exercise such strict control over the interpretation of their religious texts. Today, the development of the printing press is credited

Critical Media Studies: An Introduction, Third Edition. Brian L. Ott and Robert L. Mack.
© 2020 John Wiley & Sons, Inc. Published 2020 by John Wiley & Sons, Inc.
Companion website: www.wiley.com/go/ott/criticalmediastudies

with everything from the rise of rationality to the Industrial Revolution. In altering how information was created, distributed, and circulated, Gutenberg's invention initiated a massive **paradigm shift** – a fundamental transformation in how persons know and perceive the world.

The printing press's revolutionary impact on society offers a particularly clear example of the centrality of communication technologies (i.e. media) to our lives. For many, it points to an underlying truth about social life, namely that media or communication technologies are not merely something *in* our social environment, but actually *are* our social environment. This perspective, known broadly as media ecology, highlights that social environments are, first and foremost, communication environments, which, in turn, are dominated by certain communication technologies at particular historical moments. Thus, the central goal of media ecology, according to Neil Postman, is to

> Study the interaction between people and their communications technology. More particularly, media ecology looks into the matter of how media of communication affect human perception, understanding, feeling, and value; and how our interaction with media facilitates or impedes our chances of survival. The word ecology suggests the study of environments: their structure, content, and impact on people in their daily lives.[2]

In this chapter, we will unpack the perspective of media ecology, or what we have dubbed Ecological Analysis, by explaining the central tenets of medium theory, exploring the work of several well-known medium theorists, and reflecting on our current digital environment.

Medium Theory: An Overview

The basis for doing media ecology is **medium theory** – a research tradition that considers the *technology* or individual *medium* of communication to be equally important to, or even more important than, the content of media in understanding our social environment. To clarify this distinction and why it matters, we can think of "sending a package" as a metaphor for communication. In this metaphor, the contents of the package would represent the *message*, the shape and size of the packaging would represent the *form*, and the means by which it was delivered would represent the *medium*. Historically, media scholars have focused far more on the message and its form than on the medium. What difference, after all, does it make if the package was delivered by a horse or a truck? Seemingly little. But what if the message (the contents) happened to be fresh fruit, the packaging a mesh bag, and it was being delivered from thousands of miles away? In that case, assuming that the truck is refrigerated, the medium makes a world of difference (at least to one's taste buds). Medium theory posits that the technology of communication *always* makes a world of difference, or, to adopt Marshall McLuhan's famous aphorism, "the medium *is* the message." Medium theorists are quick to point out that studying the specific medium of communication is important precisely because we do not typically think about it, which means that we are largely oblivious to its influence and effects.

The three central premises of medium theory are: (1) that each medium of communication has a relatively unique and fixed set of characteristics; (2) that those characteristics produce a particular type of communication environment; and (3) that the communication environment has consequences for human consciousness and social organization. Thus, medium theorists seek to identify the characteristics of a medium – what senses it appeals to, its directionality, speed of dissemination, structure, mode of use, size and location of audience, and so on – that distinguish it psychologically and socially from other media.[3] Medium theory can be utilized at either a micro (single-situation) or macro (social) level. At a micro level, medium theory might ask, for instance, what are the consequences of breaking up with your significant other in person versus via text message? Even if the message was identical (e.g. "I can't stand you. I never want to see you again. And you smell funny!"), the medium would matter. By contrast, macro-level medium theory asks what types of human relations and social structures emerge in a particular communication environment.

Most media ecologists are interested in medium theory at the macro level, which despite their very different approaches has produced a remarkably clear and consistent picture of the history of civilization – one that, broadly speaking, connects three eras of civilization to three modes of communication.[4] As Table 13.1 illustrates, medium theorists generally divide civilization into

Table 13.1 History of civilization from a medium-theory perspective

	Oral	Print	Electronic
Primary medium (technology)	Speech (words are *events*)	Paper (words are *objects*)	Light and sound (words are *bytes*)
Sensory experience	Multisensory (balances the senses)	Visual (privileges sight)	Aural and visual (sight and hearing)
Scope	Tribal	National	Global
Message directionality	Bidirectional	Unidirectional	Multidirectional
Information dissemination	Slow (face-to-face)	Medium (transportation)	Instantaneous (wires/waves)
Audience	Local and small	Distant and mass	Decentered and niche
Memory and knowledge	Living memory (concerned with *preserving* knowledge)	Recorded memory (concerned with *discovering* knowledge)	Digital memory (concerned with *accessing* knowledge)
Thought	Communal and experiential	Linear and rational	Associational and affective
Social System	Collectivist	Individualist	Coalitional
Period or era	Nomadic or agricultural (premodern)	Industrial (modern)	Informational (postmodern)

premodern oral societies, modern print societies, and postmodern electronic or digital societies.

The information in Table 13.1 offers only broad brushstrokes, however. For a more nuanced and complex picture of communication technologies or mediums and the particular types of communication environments that they create, we turn to the work of medium theory's leading proponents: Harold Innis, Marshall McLuhan, Walter Ong, and Neil Postman.

Harold A. Innis (1894–1952)

Harold Adams Innis was a professor of political economy at the University of Toronto, where his interest in economic monopolies would eventually lead to the study of information monopolies. The exercise of political power within society, Innis argued, is influenced by the unique character of the communication media that dominate the dissemination of information. Hence, information monopolies can be diffused or reconfigured by the development and spread of new media. The printing press, for instance, is regarded as having had a democratizing effect because it diminished the privileged position held by religious scribes and undermined the medieval Church's monopoly over religious information and ultimately over salvation.[5] Even though the content of the Scriptures had not changed, the change in medium – from an elite class of scribes that painstakingly reproduced Scripture by hand to the efficient mass reproduction of Scripture by the printing press – fundamentally altered the public's relation to the Bible. As the Scriptures became widely available and literacy spread among the masses, they no longer relied as heavily on the Church to interpret religious doctrine for them.

Innis' interest in the relation among monopolies of knowledge, political power, and technologies of communication in society is most fully explored in his 1950 book, *Empire and Communications*, which was based on a series of lectures he delivered at Oxford University in 1948. It was here that Innis introduced his now famous distinction between time-biased and space-biased media, arguing that most communication media are inclined (i.e. biased) toward either enduring for long historical periods or moving easily across vast distances.[6] "Media that emphasize time," according to Innis, "are those that are durable in character, such as parchment, clay, and stone."[7] **Time-biased media** are characteristic of tribal or oral civilizations. Because their production utilizes heavy materials and is frequently labor-intensive (e.g. carving and hand-writing), they reach only a limited audience. Politically and organizationally, civilizations based on such media are usually decentralized and hierarchical.[8] Since time-biased media do not allow for efficient or easy communication over great distances, the various communities that make up such civilizations tend to be relatively independent and autonomous. As it is difficult for a leader located in one tribal area to communicate with other areas, it is also difficult to exert direct political influence and control. Meanwhile, leadership *within* a particular tribal region or community is exceedingly hierarchical because knowledge is tied to tradition, which is preserved by community elders or religious figures.

Whereas time-biased media favor religion and political stability, **space-biased media** are inclined toward secularism, materialism, and rapid social change. They are typically lighter in character, less durable, and more ephemeral.[9] Space-biased media such as papyrus, paper, television, radio, and newspapers can reach many people over long distances, and thus support centralized systems of government that are less hierarchical. Because societies built upon space-biased media can communicate easily over great distances, it is easier for a government located in one place (i.e. highly centralized) to govern faraway places. At the same time, because knowledge is not controlled by a select few, the structure of government itself is more egalitarian, which in turn fosters rational deliberation and democratic debate. The fundamental differences between time-biased and space-biased media are summarized in Table 13.2.

Innis' interest in the bias of media informed his analysis of the Egyptian, Babylonian, Greek, and Roman empires in *Empire and Communications*. Since empires are characterized by rule over large areas for long periods of time, Innis believed that they had to strike a careful balance between media biased toward space and time. He wrote:

> Large-scale political organizations such as empires must be considered from the standpoint of two dimensions, those of space and time, and persist by overcoming the bias of media which over-emphasize either direction. They have tended to flourish under conditions in which civilization reflects the influence of more than one medium and in which the bias of one medium towards decentralization is offset by the bias of another medium towards centralization.[10]

To more fully understand this process, it is helpful to look at his specific analysis of a particular empire. We have selected the Egyptian empire, as it furnishes a fertile example.

Table 13.2 Time-biased vs. space-biased media

	Time-biased (binding)	Space-biased (binding)
Medium	Stone, clay, parchment, and speech	Papyrus, paper, and electronic media (radio and television)
Character	Durable, heavy, static	Ephemeral, light, mutable
Biased toward	The *preservation* of knowledge; endures for a long time	The *dissemination* of knowledge; reaches large audiences
Favors	Stability, continuity, community, religion, tradition	Rapid change, individualism, secularism
Institutions	Decentralization, hierarchical	Centralization, less hierarchical
Social organization	Religious control	Political control
Knowledge	Moral	Scientific/technical
Systems of writing	Complex (hieroglyphics, cuneiform script)	Relatively simple/flexible (Phoenician alphabet)

Innis begins his discussion of the ebb and flow of the Egyptian empire by reflecting on the importance of the Nile, and its role in agricultural production and trade. Though this may seem like an odd place to begin an analysis of the relation between media and empire, Innis moves quickly from the water itself to the necessity of creating a calendar that could accurately predict the river's annual floods. The first such calendar, which relied upon astronomy to reconcile the lunar calendar with the solar year, imposed Ra – the sun god – as the supreme author of the universe. From roughly 2895 to 2540 BC, this "divinely inspired" calendar affirmed an absolute monarchy in which the pharaoh – by controlling knowledge associated with the calendar – was elevated to the status of a god. The rigidly hierarchical character of society at this time was reflected in the dominant communication medium, pictorial hieroglyphic writing on stone. These sacred engravings functioned to consolidate power, allowing the pharaoh to establish authority and control over all arable land. This authority was perhaps most evident in the construction of the pyramids and the elaborate burial rites of the pharaohs, which "suggested that the people expected the same miracles from the dead as from the living king."[11]

Over time, difficulties in the sidereal year created irregularities in the calendar, which the priests exploited to challenge the authority of the pharaoh, who was lowered in status from an individual godhead to the Son of Ra. Eventually, the absolute monarch was replaced by a royal family when the clergy of Heliopolis established a more contemporary calendar and imposed it on the empire.[12] This shift in power led to the development of a more feudal society that ceded authority to local administrators and clergy. "The profound disturbances in Egyptian civilization involved in the shift from absolute monarchy to a more democratic organization," Innis notes, "coincides with a shift in emphasis on stone as a medium of communication or as a basis of prestige, as shown in the pyramids, to an emphasis on papyrus."[13] As power was increasingly decentralized, the necessity for administrative communications increased. This led to the development of new forms of writing that were more secular and less like the sacred symbols used in hieroglyphics, a development that broadened literacy and brought even more change. In an effort to resist this change and recentralize power, the scribes were elevated to the upper classes, which included priests and nobility. Though this re-centralization was successful in re-monopolizing knowledge over writing and thus accurate predictions about the Nile, it caused problems in ruling over a space that had grown quite large. Consequently, Innis argues, the new monopoly over writing defeated efforts to solve the problem of space and gradually cost Egypt its empire.[14] The ideas introduced by Innis in *Empire and Communications* would eventually be extended by a fellow professor at the University of Toronto, Marshall McLuhan.

Marshall McLuhan (1911–80)

Herbert Marshall McLuhan began his academic career teaching English at St. Louis University in 1937. He continued teaching there even as he worked on his graduate degrees at the University of Cambridge. McLuhan earned his PhD in 1942 after completing his dissertation on the historical development of the verbal arts or *trivium* (rhetoric, dialectic, and grammar). Prior to leaving St. Louis University for a position at a Canadian institution in 1944, McLuhan would direct Walter Ong's Master's thesis and introduce him to the topic on which he would later write his doctoral dissertation under Perry Miller's direction.[15] A few years later, McLuhan took up residence in Toronto, where he was influenced by Harold Innis, and served for several years as chairperson for the Ford Foundation Seminar on Culture and Communication. During that time, McLuhan published his first book, a broad-ranging study of popular culture titled *The Mechanical Bride: Folklore of Industrial Man*. But it was his 1962 book, *The Gutenberg Galaxy: The Making of Typographic Man*, that established McLuhan as a major scholar of media.

The Gutenberg Galaxy is a sustained study of the printing press's influence not only on European culture, but on human consciousness itself. According to McLuhan, technologies create unique social environments that modify our "*forms* of thought and the organization of experience in society and politics."[16] For McLuhan, moveable-type printing constituted a decisive break from the oral societies of the past and produced "Gutenberg man": a subject characterized by rational, linear thought processes. The cognitive reorganization of humans was accompanied by an equally dramatic social reorganization, not the least of which included the creation of *publics*. Prior to the development of mass printing, there was no way to create publics on a national scale – and, indeed, what we call "nations" could not, according to McLuhan, have preceded Gutenberg's invention. For both individuals and publics, the printing press fostered a visually oriented self-consciousness, which isolated the visual faculty from the other senses and affirmed the principles of uniformity and continuity. Linking technologies to specific senses was one of McLuhan's key contributions to media studies. In his view, each medium is an extension of human senses, limbs, or processes, and therefore of ourselves.[17]

Since different communication technologies privilege different senses, the prevalence of certain technologies at any given historical moment contributes to our overall *sensory balance*. Based on the idea of sensory balance, McLuhan argues all of human history can be divided into three major epochs or periods: oral, writing/print, and electronic. In each of these periods, what matters is not the content delivered by media, but the character of the medium itself. To illustrate this point, McLuhan adopts the example of electric light in chapter one of his most famous book, *Understanding Media: The Extensions of Man* (1964). He explains:

> The electric light is pure information. It is a medium without a message, as it were ... Whether the light is being used for brain surgery or night baseball is a matter of indifference. It could be argued that these activities are in some way the "content" of the electric light, since they could not exist without the electric light. This fact merely underlines the point that "the medium is the message" because it is the medium that shapes and controls the scale and form of human association and action.[18]

In the remainder of the book, McLuhan proceeds to identify the unique characteristics of various media using his distinction between hot and cool media as a broad template.

A **hot medium** is one that "extends a single sense in 'high definition,'" while a **cool medium** is "low definition" because it is "high in participation or completion by the audience."[19] For McLuhan, the distinction is not so much an either/or as it is a spectrum for evaluating the degree to which media are low or high in participation. Media such as radio, photographs, film, and the phonetic alphabet are relatively hot, while media such as television, telephones, speech, and cartoons are comparatively cool. This distinction can be a confusing one, especially when encountering it for the first time. To underscore the point McLuhan is making, it is helpful to consider his inspiration. Paul Levinson offers this insightful history:

> McLuhan's invocation of hot and cool derived from jazz slang for brassy, big band music that overpowers and intoxicates the soul (hot) versus wispy, tinkly stretches of sound that intrigue and seduce the psyche (cool). The brassiness of the big band bounces off us, knocks us out – we neither embrace it nor are immersed in it – in contrast to the cool tones that breeze through us and bid our senses to follow like the Pied Piper.[20]

So, whereas hot media fully satiate the senses (at least, those that they engage), cool media have less clarity, depth, and vividness, and therefore invite our involvement; they ask us to fill in the details. McLuhan regards film as a hot medium because it asks very little from us, supplying all the necessary input. Television (at least, analog television), by contrast, is cool because it is incomplete, less overwhelming than cinema, and more fleeting. But McLuhan also recognizes that mediums change over time, thereby altering their relative degree of hot or coolness. The advent of high-definition television has almost certainly, for instance, made TV a less cool medium than when McLuhan was writing.

Near the end of his life, McLuhan began working on updating *Understanding Media* with his son Eric. The result of that effort was the posthumous publication of *Laws of Media: The New Science* in 1988. Many of McLuhan's most mature ideas can be found in that book, but we will concentrate our attention on just two: (1) the distinction between acoustic and visual space; and (2) the four laws of media. McLuhan's interest in how human senses (sight, hearing, touch, taste, and smell) and their interactions produce different experiences of space dates back to the 1950s,[21] but it did not gain much intellectual traction until a few decades later. The first chapter of *Laws of Media* is dedicated to distinguishing between acoustic and visual space. For McLuhan, **acoustic space** characterized the world as it was experienced during primary orality. At this time, space involved the interplay of multiple senses; it was "spherical, discontinuous, nonhomogenous, resonant, and dynamic."[22] But the invention of the alphabet, McLuhan argues, ushered in a new kind of space, which was later extended and intensified by the technologies of print.[23] This new space, **visual space**, detaches

Table 13.3 Acoustic space vs. visual space

Acoustic (pre- and post-Euclidean) space	Visual (Euclidean) space
Orality and electronic media	Writing and print media
Multisensory (hearing, touch, etc.) interplay	A single sense (vision) detached from others
Dynamic, spherical, and discontinuous	Static, linear, and continuous
Heterogeneous and multidimensional	Homogenous and uniform
Open, boundless, and creative	Enclosed, contained, and controlled
Experiential, resonant, and sensual	Abstracted, rational, and mental
Participatory, cool	Detached, hot
Primeval, natural, environmental form	Civilized, artificial, human-made artifact
Amorphic, undirected, and simultaneous	Geometric, directed, and sequential
Figure and ground continually transform one another	Abstract figure minus a ground

sight from the other senses; it is "an infinite container, linear and continuous, homogenous and uniform."[24] While visual space would dominate society for centuries, McLuhan believes that electronic media have reinvigorated and retuned us to acoustic space. Table 13.3 highlights a number of key distinctions between acoustic and visual space.

To appreciation McLuhan's distinction between acoustic and visual space, consider the difference between having a conversation with a friend and reading a book. When you are chatting with a friend in a public place, all of your senses are engaged. You see, smell, and hear your surrounding environment. In addition to your friend's voice, you hear the voices of others in the background, perhaps birds chirping or an automobile passing by. You feel a cool breeze on your neck. You take in everything from multiple directions all at once. And since the stimuli activating your senses keep changing, the space itself is in a constant state of flux. This is acoustic space. But when you read a book (even when you read in a public place), you focus your attention in one direction and largely block out your other senses. Indeed, if you are unable to do so, you probably will not get much out of what you are reading. This is visual space. As this example illustrates, different communication technologies produce different *experiences* of space.

McLuhan's distinction between acoustic and visual space, as well as that between hot and cool media, was an attempt on his part to understand the effects of a medium upon other media, the environment, individual users, and society as a whole. As valuable as these analyses were, however, they did not establish a general blueprint for conducting this kind of analysis. So McLuhan set out to identify the basic functions, or what he called laws, of all media. These laws, he argued, had to be provable or disprovable through direct observation. Ultimately, McLuhan concluded that media perform four basic functions: extension, closure, retrieval, and reversal. These form the basis of McLuhan's four laws of media, which he posed as questions.[25]

1 *Extension* describes McLuhan's belief that every technology extends or amplifies some organ, sense, or faculty of the user. So, he proposed that medium theorists begin by asking: What does a medium enhance or intensify or make possible or accelerate?
2 *Closure* refers to his belief that as a technology amplifies or extends one aspect of experience, it must necessarily diminish or push aside others. This led to the question: What does a medium erode or obsolesce?
3 *Retrieval* takes into account McLuhan's conviction that all media recast and remake previous media, bringing back into play earlier experiences. Thus, the third question is: What does a medium retrieve that has been earlier obsolesced?
4 *Reversal* is rooted in the notion that a medium, when taken to its extreme, will reverse certain of its characteristics. McLuhan's fourth and final question, then, is: What does a medium flip when pushed to the limits of its potential?

McLuhan believed that his four laws, or tetrad, could be applied to virtually anything, and in the glossary to *The Global Village* he employed them to assess 44 different mediums. Keeping in mind that McLuhan understood media to be "any extension of ourselves,"[26] here is what he had to say about the medium of the "crowd": it intensifies the desire to grow; it obsolesces individual identity; it retrieves paranoia; and it reverts into violence at the fear of decrease.[27] As interesting and provocative as McLuhan's ideas are, it was a student of his, Walter Ong, who was perhaps most responsible for bringing medium theory into the mainstream of academic study.

Walter J. Ong (1912–2003)

While McLuhan's work is characterized by its breadth and generalizations, Walter J. Ong's is defined by its historical depth and specificity. A Jesuit Catholic priest, Ong spent most of his academic career at St. Louis University as Professor of Humanities in Psychiatry and then as William E. Haren Professor of English. He had earned his doctorate degree in English from Harvard University in 1955 after completing his dissertation on the French logician Peter Ramus. This dissertation would lead to the publication of *Ramus, Method, and the Decay of Dialogue: From the Art of Discourse to the Art of Reason* in 1958, in which Ong argued that the emergence of a visualist print culture enabled a new, mathematical state of mind in the Middle Ages. In his 1967 *The Presence of the Word: Some Prolegomena for Cultural and Religious History*, which was based upon the Terry Lectures he delivered at Yale in 1964, Ong turns to the "word" – humans' primary medium of communication – and its successive stages or transformations: (1) oral or oral–aural; (2) script (alphabet and print); and (3) electronic.[28] He explores the phenomenon of sound, and specifically the spoken word, arguing that it "is more real or existential than other sense objects [such as images] because it occurs in time and, thus, produces a feeling of liveliness."[29]

But Ong's most famous study of the word and its transformation over time comes in his 1982 book, *Orality and Literacy: The Technologizing of the Word*. The most popular of Ong's writings, *Orality and Literacy* has been translated into more than 10 languages. It explores the critical changes to society and human consciousness that accompanied the shift from orality to literacy in the ancient world. For Ong, **orality** refers to "thought and its verbal expression."[30] Primary orality describes those cultures that had no known literate modes of communication. In contrast, **literacy** refers to the technologies of writing and print. Literacy is reflected in both *chirographic* (writing) and *typographic* (print) cultures. While oral, writing, and print cultures all relied upon *words* as the basis of communication, they conceptualized them in fundamentally different ways. In primary oral cultures, the word was an *event* – something that is experienced only in the moment of its utterance.[31] Because sound is evanescent or fleeting, one had to be physically present at the time of speaking to experience the word in a world before writing. But writing and print transformed the word from an event into an *object* or *thing* that could be preserved and widely distributed.[32] Suddenly, one could see, rather than simply hear, words. As an image, the word was understood spatially, *where* it appeared, as opposed to temporally, *when* it was heard.

The transformation of the word from (aural) event into (visual) object, Ong argues, altered the character of human thought and expression. Accordingly, Ong's main objective in *Orality and Literacy* is to chart the specific modes of thought and expression (i.e. psychodynamics) that characterize oral, writing, and print cultures. Ong identifies nine deeply interconnected psychodynamics of orally-based thought and expression:[33]

1 *Additive rather than subordinative.* Oral expression piles ideas one upon the next, often using words like *and* or *next*, rather than organizing them according to the reasoned, analytic subordination typical of the printed word. Notice how the information in this chapter, for instance, is structured according to headings and subheadings, rather than presented as one continuous flow.
2 *Aggregative rather than analytic.* Oral expression employs clusters of words to aid in recall and memory. This is generally frowned upon in writing as cumbersome and unnecessary. For example, orality prefers the "beautiful princess" to the "princess" and the "courageous knight" to the "knight."
3 *Redundant or "copious."* Because the word is fleeting in oral expression, the speaker relies upon repetition and redundancy to keep the listener oriented. In print, such redundancy is unnecessary because if readers lose their place, they can simply back up a few sentences and reread them.
4 *Conservative or traditionalist.* Since knowledge that is not repeated aloud vanishes quickly in primary orality, "oral societies must invest great energy in saying over and over again what has been arduously learned over the ages."[34] Oral expression is conservative in the sense that it values the retention of existing knowledge (through repetition) over the production of new knowledge. Print, by contrast, is all about the production of the new.

5 *Close to the human lifeworld.* Since abstractions are not easily recalled, oral expression depends upon linking information and ideas closely to lived experience. This explains, in part, why oral cultures rely so heavily on storytelling as opposed to analytic categorization to convey information.

6 *Agonistically toned.* Oral expression favors a combative engagement in terms of both style and characters (villains and heroes) so as to encourage intellectual combat and the testing of ideas. Literary works, by contrast, often locate such tensions internally, as something an individual character wrestles with psychologically.

7 *Empathic and participatory rather than objectively distanced.* While writing and reading are solitary activities seen as distanced, objective, and rational, oral expression is a shared experience that fosters communal identification. It depends on connection and active participation.

8 *Homeostatic.* Oral societies are concerned with the present more than the past, in contrast to print cultures. To maintain equilibrium or homeostasis, there is a willingness to let go of memories and meanings that no longer have relevance to the present moment. Print culture, on the other hand, carefully records, catalogs, and stores outdated and obsolete information.

9 *Situational rather than abstract.* Since memory is biased toward that which is concrete, oral expression tends to employ concepts in situational, operational frames of reference so that they remain close to the living human lifeworld. Homer applied the epithet or byname of *amymōn* to Aegisthus, which does not mean "blameless," as it is often translated, but "beautiful-in-the-way-warrior-ready-to-fight-is-beautiful." Hence, the concept supplies the listener with the necessary contextual framing.

As a consequence of these psychodynamics, people in oral cultures did not know history in the same way that people in literate and electronic cultures do. In oral cultures, one was constantly losing contact with the past because of the fleeting character of speech. Since nothing was recorded or written down in primary orality, there was no way to look anything up. Thus, the only way to learn something other than through direct experience was to ask another living person. If there was no living person who experienced or could recall what one wished to know, that information or knowledge was lost. This is, of course, quite different than in literature cultures, where technologies of writing and print allow for the storage and retrieval of knowledge (in the form of libraries and museums). The transition from orality to literacy also shifted our sensory experience of the social world from predominantly one of sound, which is group-oriented, to one of sight, which is individually oriented. Reading is, after all, an inward, isolated, introverted practice. Memory also decreased in importance with the rise of literacy, as events could now be recorded for posterity.

The rise of print had an array of other consequences as well. Because print can reproduce with complete accuracy and in any quantity extremely complex information, it made possible the rise of modern science, which builds upon the findings of others to advance knowledge. Print also favors a fixed point of view. While you may disagree with that last statement, this book is entirely unresponsive to your objections. The printed word presents its point of view and is generally unaltered by its reception; it is a product to be consumed. Additionally, print contributed to the romantic notions of "originality" and "creativity," which fostered a sense of the private ownership of words, as reflected in modern copyright laws. Similarly, print fueled the notion of individuality and personal privacy by allowing persons to withdraw or escape into their own mental states through the solitary acts of writing and reading. The whole concept of a *private* diary, for example, is a modern invention, since an oral diary would by necessity be public. Interestingly, as we have moved from a print-dominated society to an increasingly electronic one, the concept of a *public* diary has been revived through blogging and social networking.

The connection we have just made between blogging and orality is not an isolated one. Electronic media such as motion pictures, radio, television, and computers all contribute to what Ong calls "secondary orality," by restoring the strong group sense associated with the spoken word. He does not regard secondary orality as identical to primary orality, though, noting that "secondary orality generates a sense for groups immeasurably larger than those of primary oral culture: McLuhan's 'global village.'"[35] Ong stopped short of identifying the psychodynamics of secondary orality and its impact on human consciousness, as the electronic revolution was still in its infancy when he was writing.[36] But the idea of secondary orality was a central concern of our final media ecologist, Neil Postman.

Neil Postman (1931–2003)

Neil Postman was born and spent much of his life in New York City, having earned both a masters and a doctorate of education at the Teachers College, Columbia University. Following his graduate work, Postman began teaching at New York University in 1959. In 1971, he founded a truly innovative graduate program in media ecology at NYU's Steinhardt School of Education, and he served as the chairperson of NYU's Department of Culture and Communication until 2002. During his career, Postman authored 20 books, including *The Disappearance of Childhood* (1982), *Technopoly: The Surrender of Culture to Technology* (1992), *The End of Education: Redefining the Value of School* (1995), and *Building a Bridge to the 18th Century: How the Past Can Improve Our Future* (1999). But his most famous work was, by far, the 1985 book *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*, which in addition to being a bestseller, has been translated into a dozen languages, including German, Turkish, Danish, and Chinese, and sold more than 200 000 copies worldwide. It is, quite simply, one of the most influential books on media ecology ever written.

According to Postman, the inspiration for *Amusing Ourselves to Death* was his participation in an academic panel on George Orwell's *1984* at the Frankfurt Book Fair in 1994. For Postman, the state of our world at that moment was better characterized by Aldous Huxley's dystopian vision in *Brave New World* than by Orwell's in *1984*. In contrast to Orwell's nightmarish vision of a world where the truth is concealed from people and control is exercised through pain, Huxley's

vision focused on how truth was drowned out in a sea of irrelevance and control was exercised through pleasure.[37] Huxley's vision resonated powerfully with the role that Postman believed television was performing in contemporary society. According to Postman, television was the command center of a new **epistemology**, a way of processing and making sense of information.[38] Television and a culture of entertainment had supplanted the printed word and a literate culture as the dominant paradigm of the era. This paradigm shift was of grave concern to Postman because he believed the epistemology of television was inferior to the epistemology of print. Table 13.4 highlights a number of key distinctions between the age of typography and the age of television according to Postman.

One of the strengths of Postman's analysis of culture in *Amusing Ourselves to Death* was his recognition that television and the culture of entertainment it perpetuated did not emerge in a vacuum. On the contrary, he believed that the groundwork for TV's new epistemology – one that would challenge print – had been laid by the development of two earlier technologies: the telegraph and photography.[39] In addition to conquering space by freeing communication from transportation and commodifying information by turning it into a product to be sold, the telegraph undermined the logic of print by making information irrelevant (unconnected to a community's affairs), impotent (abstract and remote), and incoherent (quickly and easily replaced).[40] For its part, the photograph, according to Postman, celebrates particularities by ignoring ideas, avoids argument by presenting a world of facts without dispute, and dismembers reality by isolating images from context.[41] Together, the telegraph and the photograph gave rise to the interplay of instancy and image, a form of expression that achieved a dangerous perfection in the technology of television.

The danger of television and its underlying epistemology, as Postman saw it, was that it was concerned with entertaining people and nothing more. In support of this claim, he pointed out that the central aim of television is to amuse rather than to educate, which it accomplishes through its subject matter, format,

Table 13.4 The age of typography vs. the age of television

Age of typography	Age of television
Print, written	Television, electronic
Reason, argument, politics, philosophy	Entertainment, amusement, commerce, nonsense
Serious, important, relevant, potent	Silly, trivial, ridiculous, impotent
Logical, linear (sequential), orderly	Illogical, chaotic (random), incoherent
Analytical, rational, expositional, intellectual	Theatrical, dramatic, entertaining, mindless
Detached, objective, seeks understanding	Distracted, emotional, appeals to passions
Words, substance	Images, style
Depth, complexity, authenticity	Surface, simplicity, simulation
Coherence, continuity, context	Incongruity, discontinuity, fragments

shot length, and mode of gratification.[42] According to Postman, television's subject matter, which is communicated primarily through images rather than exposition, requires minimal effort to understand; its format, which encompasses political, religious, scientific, legal, and educational programming, is disconnected and decontextualized; its shot length, which averages 3.5 seconds, ensures viewers' constantly shifting attention; and its mode of gratification, which aims at pleasure, is primarily emotional rather than rational. As a result of these traits, television cannot be serious, promotes incoherence and triviality, and is uncompromisingly hostile to a print epistemology.[43] In short, television has ushered in an era of entertainment, one in which, as Huxley predicted, we have come to love and embrace that which is ruining and oppressing us.

Looking back on Postman's indictment of television in 1985, it appears that he may have picked up on the leading edge of a much larger tidal wave. If, as McLuhan and Ong variously suggested, the history of communication technologies can be divided into three major eras or epochs, then the emergence of television marks just an early stage in contemporary culture. Drawing on the work of recent medium theorists, our aim in the final section is to chart the key features and logics of the third wave.

Charting the Third Wave

There is, as of yet, no consensus on precisely what to call the contemporary moment. It has variously been referred to as postmodern, electronic, digital, secondary orality, and the *third wave*. We have settled on the last of these phrases, which was coined by futurologist Alvin Toffler in 1980,[44] because despite the varying terminological preferences of medium theorists, they all seem to agree that if history is measured according to communication technologies, then we now inhabit the third stage of human history. Furthermore, as a dramatic swelling or disturbance that moves through space and time and ends with the transfer of energy, the "wave" metaphor is especially apt. For most scholars, the social changes that characterize the transition from print culture to third-wave culture are no less striking and significant than those marking the shift from orality to literacy. The changes wrought by the rise of computer-mediated communication technologies are nothing short of paradigmatic. In this section, we begin by identifying the central features of third-wave media, and then consider how repeated exposure to those features fosters a unique way of perceiving, knowing, and being.

Characteristics of third-wave media

Third-wave media, alternatively referred to as "new media," describes those mediums of communication that employ computing technology to create, store, and distribute data. This is an admittedly broad definition, including everything

from websites and computer games to DVDs and MP3 files. As such, it is difficult to identify a set of fixed characteristics shared by these varying formats of communication. So, our list will be necessarily broad. We take the defining characteristics of "new media" to be digitality, variability, interactivity, connectivity, and virtuality.

1 *Digitality*. All new media are digital, meaning they exists as *bits* or strings of numerical information typically in the form of binary code (1s and 0s). Whereas digital media are composed of bits, traditional print media like books, newspapers, and magazines are made up of matter and, thus, *atoms*. The significance of this distinction is discussed by Nicholas Negroponte in his 1995 book, *Being Digital*. Unlike an atom, a "bit has no color, size, or weight, and it can travel at the speed of light."[45] Because bits are just numerical codes, they are easy and inexpensive to replicate. Anyone who has ever made a digital copy of a text, sound, or image file on their computer has replicated bits. This process, which costs nothing if you own or have access to a computer, is virtually instantaneous and the "copy" is indistinguishable from the "original." The ways that bits differ from atoms is causing us to rethink everything from intellectual property to the concepts of authorship, authenticity, originality, and creativity.

2 *Variability*. A second key characteristic of new media is its variability; this refers both to (a) the fluidity or manipulability of its content and (b) the flexibility of user navigation. New media tend to be fluid and dynamic because digital information is easily alterable. It is fast and simple to update one's blog, change one's status on Facebook, or edit a digital photograph before posting it online. "A new media object," explains Lev Manovich, "is not something fixed once and for all, but something that can exist in different, potentially infinite versions."[46] The printed word, by contrast, is relatively static, making it difficult, time-consuming, and expensive to update or revise. Nor is new media's variability strictly limited to its content, for even when the content does not change, users have great flexibility in *where* they enter (and exit) a new media object and in *how* they navigate it. While printed books have a fixed and usually linear organizational structure designed to be followed in a particular manner, it is not at all uncommon to randomly "shuffle" the songs on one's MP3 player or to surf the web according to one's personal desires and taste. Indeed, the decentered and hypertextual character of the internet make it particularly amenable to flexible navigation.

3 *Interactivity*. While print media involve the dissemination of single-authored messages to more or less passive receivers, third-wave media demand active involvement. Perhaps the most obvious example of this capacity is video games, which as we saw in Chapter 11 require user participation. They necessitate that the user engage directly with the new media object, continuously making choices and/or taking actions. Other new media require interaction as well, though perhaps in less obvious ways. The technologies of texting, surfing, blogging, tweeting, and Skyping all depend upon

responding to content produced by others. Indeed, interface devices such as touch screens, joysticks, keyboards, motion sensors, and voice-activation software are designed precisely to facilitate direct user interaction. New media are interactive not just because they involve participation, but because such participation is also an act of co-creation or collaborative production. Hence, new media have begun to collapse the old boundaries between producer and consumer, sender and receiver, author and reader. To engage with third-wave media is itself an act of invention and authorship.

4 *Connectivity*. We live in an increasingly connected world. Nearly all of the digital media we use are connected by cable, fiber, or wireless technology to the vast and continuously expanding network of data and information stored on computer servers around the globe. Those few digital media devices that are not connected, like the standalone MP3 player, are rapidly becoming obsolete. Due to the decreasing cost of computing technology and the convergence of media (a process we discussed in Chapter 1), an astronomical amount and array of media content is available almost anywhere and at any time – at least, if you are willing to pay for it. But new media technologies are linking us to one another as well as to media content. Smartphones and social networking sites allow us to easily stay in touch with family, friends, and even acquaintances. But *connectivity* should not be confused with a strong sense of community, commitment, and connection. Even as digital media allow for heightened connectivity, they may also be alienating us and undermining the depth of connection we once felt with others.[47] This is due, in part, to the fifth and final characteristic of new media.

5 *Virtuality*. New media create and foster intensely engrossing virtual environments. In using the term "virtual," we do not mean to suggest that those environments are in any way fake or unreal. While the digital image of a giraffe on one's computer screen is not an *actual* giraffe, it is nevertheless a very *real* image of a giraffe. In much the same way that a digital image of a giraffe is real, virtual spaces generate real sensations and experiences. When you are speaking with a friend on your smartphone, for instance, your friend is virtually (though not actually) present. In other words, it *feels* like she or he is there. The simulated, virtual worlds or environments of third-wave media can generate intense sensations and feelings that are every bit as real and consequential as actuality. But, since a virtual world is not bound by the constraints of the actual world, new media have the potential to create virtual experiences that are not possible in the actual world. There are countless examples today where individuals form real relationships with virtual people – people who do not actually exist.

The five characteristics of new media we have just discussed, though radically different than those of modern print media, extend and intensify some dimensions of non-digital electronic media like film, radio, and analog television. We highlight this point because it suggests that the transition from one communication paradigm to another may involve intermediary steps or technologies.

Just as chirographic culture served as a bridge between primary orality and modern print culture, televisual culture may have been a bridge between modern print culture and the global network culture of new media.

It is also worth noting that while digitality, variability, interactivity, connectivity, and virtuality generally describe the structural characteristics of third-wave or digital media, these traits do little to help us understand the important differences among various digital technologies. As media ecologists are quick to point out, even as various digital platforms and technologies share certain key characteristics, they also develop features unique to themselves. It would be a mistake, for instance, to assume that Facebook and Twitter share all the same traits just because they are both micro-blogging platforms. Because of Twitter's distinctive 280-character limitation, it functions somewhat differently than other social networking sites. For one thing, it strongly favors message simplicity, as it is not possible to craft a complex message in only 280 characters. We stress this point because we want readers to appreciate the distinctiveness as well as the coherence of various digital media.

Logics of third-wave media

Having cautioned readers about the importance of attending to the individual traits of various digital media, we nevertheless want to close this chapter by looking broadly at the four key logics that underlie new media technologies. Despite their differences, digital media do promote some consistent patterns of thinking and sensemaking, and, therefore, it is worth considering the underlying epistemology of third-wave media and how it differs from a print epistemology.

1 *Associational.* The highly linear character of print media favors a mode of information processing rooted in causality and temporality. It invites us to make sense of our world in terms of scientific rationalism, where actions have direct and measurable consequences. Indeed, the scientific method is designed to allow scientists to conduct experiments that determine causality (such as how objects move) in the physical world. In contrast to traditional print media, third-wave media favor nonlinear networks, which invite lateral connections and favor an *associational* logic.[48] In a linear system, moving from point A to point C demands passage through point B. But in a dynamic, nonlinear system, there are multiple channels or pathways for moving from point A to point C, many of which do not involve point B at all (see Figure 13.1).

Repeated exposure to nonlinear systems such as third-wave media trains the mind to perceive the world spatially rather than temporally; to see the connection among individual nodal points as relational, rather than causal. According to Mark Taylor, linear systems produce grids, while nonlinear systems produce networks.[49] The difference between the two is evident in the architecture that employs these concepts (see Figures 13.2 and 13.3). In

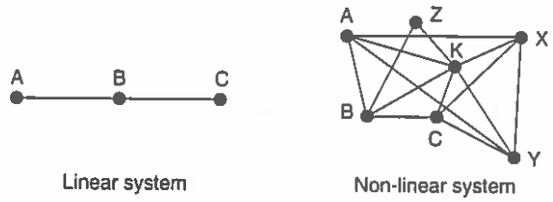

Figure 13.1 Linear and nonlinear systems.

Figure 13.2 The Seagram Building and grid architecture. Source: Philip Gendreau/Bettmann/Corbis..

grids, there are borders, straight lines, and a geometric sense of space; in networks, there are flows, curves, and an amorphic sense of space.

The nonlinear, relational, associative logic of third-wave media is evident in the practice of *surfing*. One can surf channels on television, surf stations on radio, and surf the internet online. With each generation, surfing becomes an increasingly common way of navigating media and the world.

Figure 13.3 The Guggenheim Museum and network architecture. Source: © Ian Dagnal/Alamy.

Studies of remote control use, for instance, have found that young viewers are far more likely than older viewers to "zap": to switch from one channel to another during a program.[50] Fundamentally, surfing is about "gap jumping," rather than following a straight line. Thanks to the hypertextual structure of the internet, one can jump directly to required information by using a search engine like Google instead of following an outdated linear structure like the Dewey Decimal System.[51] In *Playing the Future*, media guru Douglas Rushkoff argues that the emergence of snowboarding and digital media at about the same time is not coincidental. Snowboarders have internalized the logic of surfing, which they literally embody as they speed down the mountain. For Rushkoff, skiing reflects the old linear logic of print and snowboarding the new nonlinear logic of third-wave media.[52]

2 *Contingent*. A second logic promoted by third-wave media is contingent and conditional thinking. This is a rejection of the essentialist and absolutist thinking of modernity. In the modern era, happenings in the world were thought to be governed by a set of immutable laws and universal truths. The printed word had a way of making matters seem settled and beyond dispute. Books, after all, did not readily invite disagreement. If one did disagree with what one had read, it was not easy to circulate a counter viewpoint. Even at the start of the broadcast era, the world seemed somehow more certain. Walter Cronkite's famous nightly sign off, "And that's the way it was," indicated a strong belief in the objectivity of "facts." Due to the digitality, variability, and virtuality of new media, however, the world looks far less certain today than it once did. In a Twitter-verse and Wiki-world, where information and data are constantly being updated, extended, contested, and edited, "truth" is viewed as more subjective, situational, and contextual. New media have also contributed to contingent and conditional

thinking by collapsing physical distance, thereby exposing audiences to multiple perspectives and points of view. It is increasingly difficult in a global network society to cling to the idea that one has access to ultimate truth, because one regularly confronts the conflicting truths of a situation. The contingent logic of new media is evident not just in everyday life, but also in the rise of anti-foundational philosophy, which rejects correspondence theories of truth.[53]

3 *Prosumptive*. The term "prosumer" was first used by Alvin Toffler in 1980 to describe audiences who, thanks to interactive media, are producers as well as consumers.[54] While the closed, static, and directive character of print media privilege a logic of consumption or passive reception, the open, variable, and interactive qualities of new media promote a logic of production or active creation. Instead of consuming media in a uniform manner, as intended by the author, users of new media become active co-creators of meanings, texts, and experiences. Though audiences have long been central to the interpretive process, third-wave media make users central not just to the production of meaning, but also to the production of the text – to its direction, development, and duration – and, thus, to experience itself. The digitality of new media further contributes to a prosumptive logic by encouraging users to treat media objects not as fixed and finished, but as mutable bits to be edited, altered, and manipulated. There are countless examples on YouTube today in which users have taken images, music videos, movie clips, and other media and creatively recombined and refashioned them into something unique.

4 *Affective*. While print media rely predominantly on the sense of sight and favor linear, visual space, new media generally appeal to multiple senses (often, sound and touch), creating a spherical, acoustic space more like that of orality. But, whereas the acoustic space of primary orality was highly communal, the acoustic space of new media tends to be intimate and personal. If you have ever been walking across campus and seen someone walk into another person, a tree, or a pond while texting, you have witnessed how new media create personal bubbles, or sensual environments, around their users. People listening to their iPods while on public transportation often occupy a private sonic bubble, utterly unaware of their physical surroundings. The interactivity and virtuality of new media create this unusual version of personal acoustic space. Unlike personal visual space, which is exceedingly cognitive, the acoustic space of new media is filled with *affect*, or intensities and sensations that work directly on the body. Because we occupy virtual spaces more and more, we are increasingly making sense of the world in embodied, affective ways. In other words, our judgments about the world have less to do with what we *think* about something and more with how we *feel* about something.

Trying to give an account of new media and the ways they restructure human consciousness is sort of like describing water to fish; it is completely invisible to

them, not because it does not exist, but because it *is* their environment and not merely something within it … that and, of course, fish do not understand speech. Nonetheless, to fully appreciate just how profoundly thought is dominated by associative, contingent, prosumptive, and affective modes of knowing today requires careful historical comparison to technologies of the past, and that is the work of medium theorists.

Conclusion

The conclusion to our final perspective, Ecological analysis, offers in many ways a fitting conclusion to the book as a whole. Media Ecology is, after all, about seeing the big picture, about understanding the way that media shape and influence how we process and make sense of our social world. Medium theory has, for many years, been criticized as deterministic, as suggesting too strong a link between communication technologies and the character of human thought and the structure of society. But it is precisely these relationships that medium theory seeks to understand, not uncritically to accept. Medium theory does not claim the social changes fueled by communication technologies are causal or unidirectional. It simply insists that the underlying technologies of our social environment are as consequential as its messages. And just as society cannot be reduced exclusively to form or content, nor can critical media studies be reduced to a solitary, universal perspective. We hope the many perspectives presented here affirm that.

MEDIA LAB 12: DOING ECOLOGICAL ANALYSIS

OBJECTIVE

The chief aim of this lab is to affirm the principles of Media Ecology by furnishing students with an opportunity to consider the defining characteristics of a media and to inquire into the types of thought reflected by them.

ACTIVITY

- Divide the class into groups of 4–5 students.
- Invite students to select a contemporary communication technology such as the smartphone and then answer the following questions:
  1 What are the key characteristics of this technology?
  2 What "logics" do those characteristics foster?
  3 How has the technology changed or altered society?

SUGGESTED READING

Altheide, D.L. and Snow, R.P. *Media Worlds in the Postjournalism Era*. New York: Aldine de Gruyter, 1991.

Angus, I. *Primal Scenes of Communication: Communication, Consumerism, and Social Movements*. Albany, NY: State University of New York Press, 2000.

Castells, M., Fernández-Ardèvol, M., Qiu, J.L., and Sey, A. *Mobile Communication and Society: A Global Perspective*. Cambridge, MA: MIT Press, 2007.

Chesebro, J.W. and Bertelsen, D.A. *Analyzing Media: Communication Technologies as Symbolic and Cognitive Systems*. New York: Guildford Press, 1996.

Gronbeck, B.E., Farrell, T.J., and Soukup, P.A. (eds.) *Media Consciousness, and Culture: Explorations of Walter Ong's Thought*. Newbury Park, CA: Sage Publications, 1991.

Havelock, E.A. *Preface to Plato*. Cambridge, MA: Harvard University Press, 1982.

Havelock, E.A. *The Muse Learns to Write: Reflections on Orality and Literacy from Antiquity to the Present*. New Haven, CT: Yale University Press, 1988.

Innis, H.A. *The Bias of Communication*. Toronto: University of Toronto Press, 1964.

Innis, H.A. *Empire and Communications*. Toronto: University of Toronto Press, 1972.

Levinson, P. *The Soft Edge: A Natural History and Future of the Information Revolution*. New York: Routledge, 1997.

Levinson, P. *Digital McLuhan: A Guide to the Information Millennium*. New York: Routledge, 1999.

Manovich, L. *The Language of New Media*. Cambridge, MA: MIT Press, 2001.

McLuhan, M. *The Gutenberg Galaxy: The Making of Typographic Man*. Toronto: University of Toronto Press, 1962.

McLuhan, M. *Understanding Media: The Extensions of Man*. New York: McGraw-Hill Book Company, 1964.

McLuhan, M. and Powers, B.R. *The Global Village: Transformations in World Life and Media in the 21st Century*. New York: Oxford University Press, 1989.

Meyrowitz, J. *No Sense of Place: The Impact of Electronic Media on Social Behavior*. New York: Oxford University Press, 1985.

Meyrowitz, J. Medium Theory. In *Communication Theory Today*, D. Crowley and D. Mitchell (eds.), pp. 50–77. Stanford, CA: Stanford University Press, 1994.

Meyrowitz, J. Taking McLuhan and "Medium Theory" Seriously: Technological Change and the Evolution of Education. In *Technology and the Future of Schooling: Ninety-fifth Yearbook of the National Society for the Study of Education. Part II*, S.T. Kerr (ed.), pp. 73–110. Chicago, IL: University of Chicago Press, 1996.

Meyrowitz, J. Multiple Media Literacies. *Journal of Communication* 1998, 48, 96–108.

Ong, W.J. *Orality and Literacy: The Technologizing of the Word*. New York: Routledge, 1982.

Ong, W.J. *The Presence of the Word: Some Prolegomena for Cultural and Religious History*. Binghamton, NY: Global Publications, 2000.

Postman, N. The Reformed English Curriculum. In *High School 1980: The Shape of the Future in American Secondary Education*, A.C. Eurich (ed.), pp. 160–8. New York: Pitman Publishing Corporation, 1970.

Postman, N. *The Disappearance of Childhood*. New York: Vintage Books, 1982.

Postman, N. *Technopoly: The Surrender of Culture to Technology*. New York: Alfred A. Knopf, 1992.

Postman, N. *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*. New York: Penguin, 1995.

Stephens, M. *The Rise of the Image the Fall of the Word*. New York: Oxford University Press, 1998.

NOTES

1. M.C. Taylor, *The Moment of Complexity: Emerging Network Culture* (Chicago: University of Chicago Press, 2001), 19.
2. N. Postman, The Reformed English Curriculum, in *High School 1980: The Shape of the Future in American Secondary Education*, A.C. Eurich (ed.) (New York: Pitman Publishing Corporation, 1970), 161.
3. J. Meyrowitz, Medium Theory, in *Communication Theory Today*, D. Crowley and D. Mitchell (eds.) (Stanford, CA: Stanford University Press, 1994), 50.
4. Meyrowitz, Medium Theory, 53.
5. Meyrowitz, Medium Theory, 51.
6. Meyrowitz, Medium Theory, 52.
7. H.A. Innis, *Empire and Communications* (Toronto: University of Toronto Press, 1972), 7.
8. I. Angus, *Primal Scenes of Communication: Communication, Consumerism, and Social Movement* (Albany, NY: State University of New York Press, 2000), 20.
9. Innis, 7.
10. Innis, 7.
11. Innis, 14.
12. Innis, 15.
13. Innis, 15.
14. Innis, 25.
15. T.J. Farrell, An Overview of Walter Ong's Work, in *Media, Consciousness, and Culture: Explorations of Walter Ong's Thought*, B.E. Gronbeck, T.J. Farrell, and P.A. Soukup (eds.) (Newbury Park, CA: Sage Publications, 1991), 27.
16. M. McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962), 1.
17. Meyrowitz, Medium Theory, 52.
18. M. McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill Book Company, 1964), 8–9.
19. McLuhan, *Understanding Media*, 22–3.
20. P. Levinson, *Digital McLuhan: A Guide to the Information Millennium* (New York: Routledge, 1999), 106.
21. E. Carpenter and M. McLuhan, Acoustic Space, *Explorations in Communication*, E. Carpenter and M. McLuhan (eds.) (Boston: Beacon Press, 1960), 65–70.
22. M. McLuhan and E. McLuhan, *Laws of Media: The New Science* (Toronto: University of Toronto Press, 1988), 33.
23. McLuhan and McLuhan, 33.
24. McLuhan and McLuhan, 33.
25. McLuhan and McLuhan, viii, 98–9.
26. McLuhan, *Understanding Media*, 7.
27. M. McLuhan and B.R. Powers, *The Global Village: Transformations in World Life and Media in the 21st Century* (New York: Oxford University Press, 1989), 171.
28. W.J. Ong, *The Presence of the Word: Some Prolegomena for Cultural and Religious History* (Binghamton, NY: Global Publications, 2000), 17.
29. Ong, *The Presence*, 111.
30. W.J. Ong, *Orality and Literacy: The Technologizing of the Word* (New York: Routledge, 1982), 1.
31. Ong, *Orality*, 32.
32. Ong, *Orality*, 33.
33. Ong, *Orality*, 37–57.
34. Ong, *Orality*, 41.
35. Ong, *Orality*, 136.
36. B.E. Gronbeck, The Rhetorical Studies Tradition and Walter J. Ong: Oral-Literacy Theories of Mediation, Culture, and Consciousness, in *Media, Consciousness, and Culture: Explorations of Walter Ong's Thought*, B.E. Gronbeck, T.J. Farrell, and P.A. Soukup (eds.) (Newbury Park, CA: Sage Publications, 1991), 15.
37. N. Postman, *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*, 30th anniversary edn (New York: Penguin Books, 2005), xix–xx.
38. Postman, *Amusing*, 78.
39. Postman, *Amusing*, 78.
40. Postman, *Amusing*, 65.
41. Postman, *Amusing*, 72–3.
42. Postman, *Amusing*, 86–7.
43. Postman, *Amusing*, 80.
44. A. Toffler, *The Third Wave* (New York: William Morrow and Company, 1980).
45. N. Negroponte, *Being Digital* (New York: Vintage Books, 1995), 14.
46. L. Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), 36.

47. See S. Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2011).
48. D.D. Cali, The Logic of the Link: The Associative Paradigm in Communication Criticism, *Critical Studies in Media Communication* 2000, 17, 401.
49. M.C. Taylor, *The Moment of Complexity: Emerging Network Culture* (Chicago, IL: University of Chicago Press, 2001), 19–46.
50. R.V. Bellamy Jr. and J.R. Walker, *Television and the Remote Control: Grazing on a Vast Wasteland* (New York: Guilford Press, 1996), 97; see also J.W. Chesebro and D.A. Bertelsen, *Analyzing Media: Communication Technologies as Symbolic and Cognitive Systems* (New York: Guildford Press, 1996), 134.
51. On this point, see M. Heim, *The Metaphysics of Virtual Reality* (Oxford: Oxford University Press, 1993), 34–9.
52. D. Rushkoff, *Playing the Future: How Kids' Culture Can Teach Us to Thrive in an Age of Chaos* (New York: HarperCollins, 1996), 15–16.
53. R. Rorty, *Contingency, Irony, and Solidarity* (New York: Cambridge University Press, 1989), 5.
54. Toffler, 406.