

Transitional Generations and World Wide Web Reading and Writing: Implications of a Hypertextual Interface for the Masses

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This is a paper about a fundamental shift in textual practice—in reading, writing, and disseminating texts. The growth of the Internet and the World Wide Web represents to researchers such as Batson and Bass a contemporary shift from print to online culture, a shift that will forever alter such fundamental human activities as the way we create knowledge, work together, publish, think, and even how we approach the teaching of others. Thomas Landauer has argued that we are in the second stage of the information technology revolution in which computers will be expected not only to perform tasks that humans have previously been unable to accomplish (e.g., high-speed numerical manipulation) but also to augment complex activities that humans already carry out in various professional contexts.

For decades, computers were useful mostly because of the vast amount of information they could store and the speed with which they could manipulate that information. However, in the last decade, computers have become much more than information processors, and people now use digital technology for much more than gathering information. Now that owning a computer is almost synonymous with being networked, people use their computers for work, for recreation, for arguing about social issues and discussing shared interests, and for socializing. The number of activities for which people use their computers will continue to expand. For example, relatively few people curl up with their laptops to read novels or poetry, but with initiatives such as the Gutenberg Project, whose purpose is to produce freely available digital versions of public domain texts, and with advances in specialized hardware technology, more and more of our reading and writing activities will take place online—whether one's purpose is to gather information, to argue over a political issue, or to lose oneself in a compelling mystery novel.

Indeed, new audiences for computing and Web-based materials show no signs of losing interest in the emerging media. The *NSF Indicators Report on Science and Technology, Public Attitudes and Public Understanding* indicates that the existing and potential audience for online information has grown dramatically over the last several years. In 1997, 57 percent of Americans and almost 90 percent of all college graduates reported using computers at work, at home, or both; 43 percent of Americans lived in a household with one or more computers, and 16 percent reported having access to the Web from their home computer. Notably, 15.1 million Americans attempted to find health-related or scientific information on the Web, and another 15 million adults reported attempting to find other types of information. The NSF report concludes that the World Wide Web “is likely to become a major source of reference-type information in the decades ahead, as access continues to expand.”

Educational institutions are also rushing to create materials for the Web. According to the National Center for Education Statistics, 75 percent of some 26,000 distance education courses delivered to over 753,000 students in 1994–95 will have moved “online” by 1999. EDUCAUSE, in its 1998 review of the “rapidly-expanding phenomenon of online education,” estimates that “the Internet and World Wide Web now deliver online courses to more than one million students.” Internet providers such as CompuServe, Prodigy, and AOL have seen similar market growth, with AOL adding one million new members in a little over one month in late 1998, totaling more than 15 million users. Recently, AOL has reported the addition of more new members on Christmas day, 1998, than on any day in its history (*Wall Street Journal*, 5 January 1999).

The Web has given the population unprecedented access to all the resources of the Internet, less than a decade since its 1991 release by CERN (Hobbes 1999). And though the audience for Web reading and writing are still relatively “high brow” (most have some college experience and over 50 percent have at least one college degree), in 1998 almost 40 percent of Web users were female (with 43.8 percent aged 11–20 and 33.9 percent aged 50+) and younger users are noticeably “more diverse racially than older” (GA Tech 1998). Anticipating the ultimate numbers and diversity of the audience for such reading and writing media is a monthly endeavor and one that makes it difficult to step back from the phenomenon and reflect on the implications of a mainstream audience adapting to online communication.

Finding the time to reflect on rapid technological changes is difficult, and making predictions about future changes is risky, at best. However, it is our contention that, because of the breakneck speed at which technological changes are occurring, making predictions on a continual basis about future changes is necessary, even though these predictions will be necessarily speculative (cf., Mehlenbacher 1993, 1995; Selber 1996). Speculation about the implications of the second stage of the information technology revolution and about how the increasing ubiquity of network technologies will change the nature of reading, and therefore of writing, is by necessity tentative. However, while making specific predictions is fraught with risk, we can be certain that emerging technologies will change not just our methods for conducting business but also the ways in which we read, write, and think about language. Because much has already been written about the increasing digitalization of text and of the profound changes that this trend will have on the processes of reading and writing, we are now in a position to begin assessing some of the arguments presented in the literature and to start thinking about what changes we can predict when some of these text technologies become even more widespread than they already are.

Some of those interested in writing technologies have been writing about the “hypertext revolution” and, in 1991, Jay Bolter argued that the advent of hypertext would “threaten the definitions of good writing and careful reading that have been fostered by the technique of printing” (2). But even Bolter in his groundbreaking book could not have envisioned the explosion of interest in network prompted by the development of the World Wide Web (Benedikt 1991; Heim 1993; Rheingold 1993). Reading and writing on the computer today often means sending and receiving information across a network, using software that allows for an unprecedented level of control and sophistication on the part of the writer and, to a lesser extent, on the part of the reader.

How Technology Affects our Reading and Writing Processes

Some of the pronouncements about the effects of word processing and about hypertext may have suffered from somewhat romantic notions about the inherently positive effects of new technologies (Woolley 1993). Indeed, Dipardo and Dipardo suggest that many of these pronouncements were little more than “enthusiastic speculation

(and not a little visionary zeal)" (7). Other researchers, such as Dobrin, have also argued that the announcement of a "hypertext revolution" may be premature. Still, it is clear from everyday experience that the contexts within which we encounter text are rapidly changing. More and more of our reading and writing is being done online and on the Web, and this type of activity changes the ways in which we approach the tasks of reading and writing in some ways that are obvious, and in others that are subtle yet profound. Whether we are truly in "the late age of print" as Jay Bolter has announced (2) or whether electronic print text will continue to exist alongside computerized forms, there is no denying that digital text is here to stay. Moreover, the forms in which digital text are produced, transmitted, and received require new strategies for reading and writing effectively (Smith).

For those who think that changes in text technologies are transparent—that these changes merely alter the methods by which we get our work done but do not affect the nature of the work itself—many literacy scholars point out that the technology of writing has been evolving for thousands of years. With every leap in the technology comes a major shift in the way we approach texts. For instance, Ong describes how the advent of the printing press did not merely make life easier for the producers of text; it caused widespread social and psychological changes (1982). Literacy became widespread. Once reserved for the few and the well-educated, literacy became a necessity for the business class and is now considered necessary for every adult citizen. Compulsory education for all citizens became possible, and the education of millions of children could be standardized by using common texts. Scientific advances could be quickly disseminated to a wide audience.

Birkerts (1994) predicts that, as we move away from the "vestigial" print writing and reading patterns to electronic ones, the social and psychological effects will be just as profound as the ones that followed the introduction of the printing press (118). He argues that the increasing ubiquity of electronic text will change not just the method by which we access text but also the assumptions and expectations with which we approach the written word: "the context cannot but condition the process. Screen and book may exhibit the same string of words, but the assumptions that underlie their significance are entirely different depending on whether we are staring at a book or a circuit-generated text" (128).

From the writer's viewpoint, Birkerts posits that writers working in a digital environment will be even less careful than print writers about

pretesting their ideas and choosing the appropriate language in which to convey them because the electronic context makes the text seem more transient. There is less a sense that the writing will become part of a permanent record. Though it may be misleading to think so, writers in an electronic environment may think that their texts are temporary and forever alterable. A writer therefore may not be afraid to take the cavalier position, "I'll fix it later." From the reader's viewpoint, Birkerts suggests that words are perceived differently—in a sense, interpreted differently—based on their mode of transmission: cut into marble versus printed on paper versus appearing momentarily on a screen. On a screen, words carry less weight and therefore seem less permanent. The reader may be more reluctant to engage the ideas or to take them seriously. (For those who are skeptical that the electronic nature of text may make it seem less real or important, we offer the collective experiences of millions of credit card holders who, to their long-standing regret, do not treat electronic money as "real," even when they know better.)

The Transitional Generation

We are a transitional generation. We were raised in a world of print, in which reading and writing were print-based activities.¹ Only in adulthood have most of us begun to explore the possibilities of using the computer for text-based activities. Our children, however, are growing up in a hybrid environment, taking penmanship lessons in the first grade and keyboarding in the fourth. (We know of preschools that claim to teach preliminary computing skills to their three- and four-year olds!)

Our children will grow up in an environment in which computerized text will be even more dominant. As Bolter argues, print text will be pushed to the margins—used for special purposes or in those increasingly rare situations in which a computer is unavailable or—heresy of heresies—considered inappropriate for the task at hand. Birkerts predicts that a total shift from print-based to computerized writing will occur within fifty years, though most of us believe that print text will continue to exist along-side computerized texts.

Our point is not to argue whether or not print is dying, and surely not to put a date on the hypertext "revolution," if it is occurring. Rather, we simply assert that people's experiences with computerized text will continue to expand, these experiences will occur at an increasingly earlier age, and that in each successive re-writing of generational

expectations, computerized text will become more dominant, paradigmatic, and “natural.” (One parent has already told the first author that, when she tells her young child to get a book to read, the child heads toward the stack of CD-ROMs next to the computer, looking for one of the electronic storybooks that she likes to explore. To this young child, the electronic text is already the paradigm of a “book.”)

Again, we maintain that the shift to a culture in which electronic text is the rule rather than the exception will have profound effects on our reading and writing processes. Because of the possibilities for linking texts and for combining various media through the Web and other hypertext venues and because of the ease of quickly producing and widely disseminating texts through global networks, the shift to an electronic culture will change our strategies for reading and writing and our assumptions and expectations for the texts we encounter.

Already, in our own generation, we can see changes in the way we approach texts. We both admit to our growing impatience with the inefficiency of trying to find a specific reference or piece of information in a print book. And we both frequently find ourselves flipping through print books and journals impatiently, thinking, “I wish this thing had a FIND button.” We are more impatient with the limitations of print text than we used to be, and this growing impatience is a direct result of our experiences with computerized text. In a vicious circle, the development of new textual technologies feeds, and is in turn fed by, the increasingly obsessive demand for efficiency in our culture. When we need or desire specific information, we expect to find it immediately. Two decades ago, such an attitude would be considered unrealistic. Now, it is merely the common mark of a demanding consumer of information. The next generation of information consumers will be even more demanding, more driven by efficiency, and more impatient with the limitations of print. Limitations that we now take for granted and do not question will seem like unbearable constraints.

For the sake of comparison, imagine going back to a world in which you had to write all your texts on a typewriter and you had to use carbon paper if you needed copies. Now imagine our grown grandchildren traveling back to the present day: now they must survive in a world that uses paper money or checks for most transactions; they have to actually walk to the library to get a book; most people still do not have access to videoconferencing technologies; people have to use separate machines to make phone calls, search the Internet, listen to music, and watch television; the grandchildren still have to type in their texts rather than simply dictating to the computer. How would they

ever get by in such a primitive environment? The point is not that our descendants will seem incredibly spoiled and lazy: part of the social cost of rapid technological change is that every generation seems spoiled and lazy to the generation that precedes it. Rather, the point is that readers who grow up in an environment in which the majority of their experiences with texts are mediated by computers will have different expectations of texts than we have now.

And while it might seem like harmless fun to speculate on the nature of reading and writing in the 21st century, for all intents and purposes, the 21st century is already here. As we alluded to earlier, because of their experiences with electronic mail, the World Wide Web, and an ever-growing variety of communication appliances, readers' expectations of texts and their approaches toward them have already begun to change. If we fail to anticipate these changes and make allowances for them, the success of our writing efforts will be adversely affected. As writers, everything we do is built on our assumptions about our readers: How they read our texts, what they expect, and how they will react to different textual features. These audience features will change as a result of technological changes that we are currently experiencing.

Changes that we can see already occurring include the following:

1. The disappearance of textual boundaries.
2. The increasing demand for user control over texts.
3. The integration of various modes of communication.

The Disappearance of Textual Boundaries

One of the more profound changes we can expect from the increasing computerization of text, according to Stephen A. Bernhardt (1986), is the disappearance of textual boundaries. In the print world, each text has specific boundaries, defined by the edges of the paper or the covers of the book. Literary and rhetorical theorists such as James Porter (1986) tell us that texts are interconnected, that the real power of texts is their ability to refer to, to refute, and to elaborate each other's contents. Once uttered, this statement seems rather obvious, but it is a profound and powerful observation precisely because, growing up in the print world, we are accustomed to viewing texts as discrete entities. In the online world, though, the perceptual cues that mark the text's boundaries disappear. Texts scroll on and off our screen, and we

know that we are always looking at a small part of a work of indeterminate size. The size and shape of an online text may be invisible to the reader since the reader usually accesses only a small part of it at a time.

In fact, since an online text accessed through the Web or any other network can be continually revised and expanded, any assertion about its size or shape may be true only momentarily. Once we become accustomed to the notion that people may access a text even while it is being revised, trying to determine its size is something like trying to measure the size of a puddle during a rainstorm. The indeterminacy of the size and shape of a large text and the reader's willingness to access it in small pieces seem, at first, to make the job of the writer much easier since such considerations remove the need to organize a large text in traditional ways. If all a writer has to do is concentrate on small pieces of text that may be read independently, then all of the macrostructuring that is involved in putting together a large document, as well as all of the transitional devices that tie the individual pieces together, are unnecessary.

On the contrary, though, Slatin (1988) argues that the lack of a determinate textual structure makes the writer's job far more complicated. Since readers may take any number of paths through a text, writers need to anticipate what paths they may take and design their texts so that any number of paths will result in a coherent reading. While some print guidelines no longer apply to the creation of electronic texts, we are just beginning to establish new guidelines that we will have to follow (see Duffy, et al., 1993). These guidelines will be, if anything, more cumbersome and time-consuming than currently existing print guidelines. (See Landow, 1991, for some specific guidelines for creating effective hypertexts.) In the future, we can anticipate that intelligent systems will follow readers as they work through huge electronic databases, build profiles of each reader's needs and priorities, and build texts that best suit the needs of each reader. Even now, it is possible using CGI scripts to create parts of text that can be displayed in a customized fashion to each reader. Because of such developments, we will need to devise appropriate guidelines for creating effective hypertext systems that are broad enough to contain all the information that a wide range of readers might want, even while satisfying the needs of each individual user.

The Increased Demand for User Control Over Texts

It has been widely claimed that the increasing popularization of hypertext will shift control of the text from the writer to the reader (see Bolter 1991; Joyce 1988; Moulthrop 1989; Slatin 1990). Indeed, it has often been claimed that hypertext destroys the traditional distinction between author and reader (Johnson-Eilola 1994; Landow 1993). However, most scholars seem to realize that, in most hypertexts, the reader's level of control consists merely of choosing font size and font type and of choosing which link to follow next, while the writer decides what information is included in the hypertext, how that information is worded, and which links between nodes are possible. For instance, Moulthrop argues that "even the most densely ramified hypertext will never be 'strictly infinite,' and so must manifest some form of intentional limitation" (1991, 124). Dobrin asserts that "numerous print texts also allow readers to navigate through them at will," and asks, "Actually, what print text does not" (1994, 309)?

Joyce makes a distinction between "exploratory" hypertexts, in which individual readers may choose only which links to follow in an existing set of links and nodes, and "constructive" hypertexts, in which readers may add their own nodes and their own links and may be able to even edit the nodes that already exist. When Joyce made this distinction in 1988, constructive hypertexts were little more than an idea. (See Bolter 1991, 144–146.) However, with the increasing popularization of the Web, these open-ended hypertexts have become mainstream. But even with the Web, we would argue that the act of reading and the act of writing are more distinct processes than some hypertext advocates might claim. Constructive hypertexts break down distinctions, not between the reading and writing processes but between those individuals with the capacity to write and produce and those who can merely read what others have written. In a constructive hypertext, everyone with access to the text has the ability to add his or her own nodes to the text and to add links to existing nodes wherever he or she feels it is appropriate to do so. Instead of taking the role of either reader or writer, everyone who accesses the text is an equal participant, as Kaplan and Moulthrop posit, "both a producer and a consumer of textual information" (1993, 265). Currently, beyond the rudimentary ordering of "bookmarks" and other limited history or search devices, Web-based personal elaboration of what one reads is cumbersome and challenging.

While the idea of constructive hypertexts has existed for some time, their use is still mostly limited to educational contexts. Documentation and hypertext manuals are almost always written in the more limited, “exploratory” form (see Moulthrop and Kaplan 1994). In this more limited form, each person who accesses the text is still forced exclusively into one of two roles: (1) as the producer of the text, or (2) as the user who accesses the text and looks for information. The ratio between producers and consumers of these hypertexts is similar to the ratio between writers and readers in a print-based culture; many more people read these hypertexts than produce them.

However, other forms of online discourse are breaking down the distinction between producer and consumer of text. Many people are already doing most of their writing in conversational applications (e.g., in e-mail, newsgroups, conferencing programs, and chat rooms). In these forums, there is no implicit distinction between producers and consumers of text, as there is in a book culture. It is conceivable that, as people become used to the idea of shifting roles from reader to writer, rather than playing one role exclusively in relation to a given text, they will become dissatisfied with being stuck solely into the role of passive consumer of a text. It may be that we will have to rethink the relationship between reader and writer, even in relation to texts (such as textbooks and computer manuals) that seem to be appropriately conceived as sites for one-way communication.

As we have pointed out, the venue through which most people are becoming familiar with hypertext technology is the World Wide Web. Though nearly everyone who accesses the Web can potentially add his or her own contribution to it, much of the Web is still designed around the one-way transmission of information. A producer places information on a Web site, expecting others to access the information. However, the dialogic nature of conferencing programs and newsgroups is gradually transforming the nature of the Web. This transformation still consists largely of simply embedding a chat program into a Web site and, while Web site designers like to hawk their sites as “interactive,” the interactivity consists almost solely of the user deciding which pieces of the designers’ text he or she would like to see. However, with CGI-based bulletin board programs (e.g., *HyperNews*, *NetForum*, *Motet*, *WebBoard*, etc.), users can add permanent information and decide where on the site the new information should be displayed. On the other end, intelligent agents, while they may not alter another producer’s Web site, will “grab” pieces of information that exist on the Web and use them to create a custom display on the user’s terminal. The result will

be a medium in which the user enjoys, and then comes to expect, a level of control over the content and design of information that we can now hardly imagine.

The art of designing and organizing information was transformed by hypertext technologies when we moved from a single design that controls the way the user accesses information to designing systems that allow readers to take multiple paths through our texts. In the very near future, the task of information designers will be transformed again. Perhaps the task will be to design information systems that not only anticipate the information that users desire but that also match the heuristics that users bring to systems. Of course, systems this advanced will probably help users search relevant information and give them hints about how they might best organize and present the information to heighten reading speed, access, and recall.

The Integration of Various Modes of Communication

As multimedia becomes easier and less expensive to produce and access, traditional distinctions between exclusively textual, exclusively aural, and exclusively visual media also begin to break down. Also, the various avenues for disseminating information will finally meld together. We are already in the first phase of this transformation. Presently, all the existing venues collaborate with each other, mostly to promote each other. Magazines are accompanied by television series, which list Web sites, which include chat rooms and e-mail links.

As users of information come to rely on these overlapping venues, receiving information from a single source will become more and more inadequate. Not only will online information designers need to pay more attention to melding various media together (and to the *spaces between* the media), but also they will need to consider the various avenues through which the information travels.

Eventually, all forms of information and entertainment—music, television, video games, and Internet traffic—will come through a single cable (and eventually over the airwaves), and they will all be accessed through a single box or set of components by users. Magazines and newspapers will be accessed online, through this same equipment. And, at that time, there will be a true integration of media, and college courses in writing will be replaced by courses in multimedia design. Until that integration is complete, though, we find ourselves in a somewhat confused and demanding situation, one in which the various avenues

of dissemination, each specializing in one or two media, will compete for attention. During this transitional period, the information producer will need to be conversant not only with multimedia design but with the various systems through which information may be disseminated.

Conclusions: Online Reading and Writing Challenges, Futures

We have asserted that it is critical, periodically, to step back from the rush onto the Web and into online reading and writing and to assess how these developments are changing the way we do our jobs. We have also argued that the audience for Web-based hypertextual reading and writing is growing exponentially. Recent reports, such as a study by the Pew Research Center for the People and the Press, maintain that the audience for online information is not only growing but becoming “mainstream”; of the now 74 million Internet users in the U.S., “increasingly people without college training, those with modest incomes, and women are joining the ranks of Internet users who not long ago were largely well-educated, affluent men.”

The popularization of the Web, in turn, is speeding the general public’s exposure to online reading and writing. We anticipate that the increased public awareness and expectations about emerging media will also accelerate the development of new tools and processes.

For digital writers, the Web is still woefully inadequate as a writing tool. It takes considerable energy to annotate texts, to learn to work multiple applications on multiple platforms, to display various document formats, and to learn collaborative document software. Producing texts that are easily maintainable and reusable and that can be copied, extended, and refined by multiple writers (and potentially readers) represents an important challenge to the designers of Web-based work environments. Indeed, as technology allows readers to effortlessly integrate previously separate types of information, writers and readers will assume that texts, pictures, sounds, animation, and illustration are equally viable objects that can be manipulated in a modelless workspace.

For digital readers, the Web is somewhat more exciting (though slow) but could benefit from considerable research on how people scan, process, read, understand, and remember online information (Tomasi and Mehlenbacher 1999). This research will need to take into account the changes in people’s processes as their expectations about information are influenced by their exposure to new technologies. Older

readers of electronic texts are bound to be more tentative about their initial experiences with alternative modes of information presentation. For example, as readers become more familiar with the benefits and shortcomings of online information, they may become more goal-driven and inflexible in their thinking and problem solving. While they may explore one or two unanticipated branches of a topic for potential benefits, they will generally refuse to browse for extended periods of time to find what they are looking for. And if they get lost or confused, they will resent needing to move their attention away from their primary (and non-technological) task to the technological problem facing them.

For the digital workspaces that surround writers and readers, the nonhierarchical, multimedia nature of the Web ultimately challenges our preoccupation with text-based information; imploding media types and the potential to integrate sound, graphics, and video, are already pervasive. Research on the way people process instructions and information clearly supports the use of well-designed visual aids, though research on how people process speech, text, and pictures simultaneously is remarkably limited. As the boundaries of online texts expand, so too will alternative combinations of information.

Explicit metaphors and analogy-based systems described by John Carroll will help users adapt initially (via the electronic verisimilitude of address books, checking accounts, pencil-and-paper ledgers), but as systems become more and more functionally powerful it will become more difficult to distinguish the “real-world” functions from the digital functions that were originally meant to emulate them. Thus the cut-and-paste metaphor embodied in most contemporary word processors means little to a younger generation of users unfamiliar with the newspaper-storyboarding origins of the concept. New functionalities and new combinations of information types will require new interface designs, ones without any explicit reference to the print world from which to draw controlling metaphors.

We anticipate that the readers of digital texts will expect more and more that texts will *do* something, merging texts and software programs into something that looks like docuware. With reading and writing more closely aligned with action in the world, the “Symbolic-Analytic Worker” described in detail by Robert B. Reich will prosper. Johndan Johnson-Eilola characterizes such workers as people who “possess the abilities to identify, rearrange, circulate, abstract, and broker information” and argues that “in an industrial economy, such a job description prioritizes the technology (and technologist) and subordinates the . . . communicator. But post-industrial work inverts

the relationship between technical product and knowledge product: symbolic analysts make it clear—to themselves, to their employees, to the public—that in an age of ubiquitous technology and information, knowledge attains primary value” (1996, 255–256). Indeed, some information designers are working very hard to design systems that will ultimately automate some of these processes.

Finally, as definitions of digital reading and writing expand, so too will definitions of work and leisure surrounding these activities. P. A. Hancock (1997) argues that the separation between productivity and pleasure will likely dissolve in the future: “Our view of work, and information-based work in particular, is outmoded. Although we have reaped many of the benefits of the electronic age, we have not yet exploited fully the affective change in the fundamental nature of work that is enabled by software and computer systems” (28). Such changes will optimize the flexibility and distributed nature of information technologies, allowing a heightened interaction between our tasks and our goals, and granting us more control over the design of our work. Importantly, Rosalind A. Picard reminds us:

The last thing we need is more “information.” Information overload results in mental fatigue and negative affective responses. What we need is not just information that relates to our interests, but information that we value, information that is relevant to personal needs, goals, and preferences. (1999, 240)

Devices that may help us design our activities and protect us from information overload might well include wearable computers (or “wearables”), WearCams, remembrance agents, or even “smart sweat bands.” At that point, defining our reading and writing in primarily textual terms will be limiting and inappropriate—immersive, affective, symbolic interactions with multiple data sources will then produce the next transitional generation, trapped between conventional online technologies and reality-based simulations.

¹Matthew G. Kirschenbaum, in his review of *The Gutenberg Elegies* entitled “The Cult of Print,” describes Birkerts as a quintessential “romantic reader” and critiques his claim that our “proto-electronic” era will lead to language erosion, a flattening of historical perspectives, and the waning of the private self (128–130). Similarly, Johndan Johnson-Eilola in a wonderful 1997 chapter, “Living on the Surface:

Learning in the Age of Global Communication Networks,” argues strongly that “many adults are terrified of this place” and “do not understand or relate to these networked spaces in the same ways that our children and students do; we tend to criticize them unfairly” (186). What our transitional generation (and Birkerts’) experiences as “flattening,” our children may understand as reading that is simultaneous, parallel, and contingent.

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