Literacy Literacy

This issue of Visible Language has been designed to support the final article, which discusses typography on the desktop. Therefore, the first three pages of each article demonstrate various aspects of desktop publishing.

Most desktop publishers do not have experience with design or computers, but are more familiar with traditional office equipment such as the typewriter. *Literacy, Literacy* demonstrates the typewriter's physical and formal constraints.

Literacy Literacy

Eugene R. Kintgen
Department of English, Indiana University
Bloomington, IN 47405

Abstract

The term literacy has recently been extended
into a number of different fields, the best known
probably being 'computer literacy'. A consideration
of the different historical senses of the term sug-
gests why it was chosen for generalization, and
detailed discussion of three cases--scientific lit-
eracy, visual literacy, and cultural literacy--
indicates the semantic aspects of the term that are
most important in the process of extension. In all
three cases, despite the authors' attempts to use
literacy in what I call its descriptive sense, as
an indication of the ability to read and write, the
evaluative sense of the term--the mastery of a body
of (often traditional) knowledge--is the operative one.

Few people interested in practically any aspect of reading or writing can have failed to notice that we are in the midst of a literacy explosion. Everywhere, it seems, there are references to either literacy or, even more frequently, illiteracy. Newspapers and news magazines tell us constantly of the literacy crisis. Jonathan Kozol has recently published a book called Illiterate America, ABC and PBS teamed up to bring the literacy crisis to prime-time television during National Literacy Month (September 1986), and books on different aspects of the problem headed the New York Times Book Review bestseller list during the summer of 1987-- Allan Bloom's The Closing of the American Mind and E. D. Hirsch's Cultural Literacy. And even when we are not being reminded of the problem of illiteracy, the term 'literacy' and 'literate' seem to have been multiplying so rapidly, and in so many contexts, as to threaten the extinction of the terms they are replacing: 'knowledge' and 'competence'. A brief chrestomathy will illustrate the extent of the practice:

> Visual literacy is the ability
> to "read" visual material with skill,
> and to "write" with visual means,
> expressing oneself effectively and ap-
> propriately. (Elwell, 28)

A politically literate person will
know what the main issues are in
contemporary politics as he himself
is affected, and will know how to set
about informing himself further about
the main arguments employed and how
to criticize the relevance or worth of
the evidence on which they are based,
and he will need as much, but no more,
knowledge of the institutional struc-
tures as he needs to understand the
issues and the plausibility of rival
policies. A politically literate person
will then know what the main politi-
cal disputes are about; what beliefs
the main contestants have of them; how
they are likely to affect him, and he
will have a predisposition to try
to do something about it in a manner
at once effective and respectful of
the sincerity of others. (Crick and
Lister, 84)

All of this means that people more
than ever stand in need of statistical
literacy. . .if people are not simply to
rely upon data force-fed them by people
who are likely to have a stake in the
conclusions to be drawn from them, they
will need a basic competency to analyze,
interpret, question, and arrive at their
own conclusions about facts and arguments
that are presented to them. (Miller, 226)

Computer literacy is defined as
an appreciation of the general principles
which underlie computer hardware, soft-
ware, and the application of computing
technology to various science, business,
education, government and entertainment
objectives. (Jones, et. al., 4)

Get together with a group of teachers to bring common problems to . . . conscious attention, to become aware of system causes, and to take democratic action to improve the system. We call this consciousness–raising "social literacy training" because, as in all kinds of literacy, we are interested in reading reality, understanding it better, and taking informed action. (Alschuler et. al., 606)

First–year graduate students enrolled in a required course in the history of psychology were tested for their familiarity with seventy–six eminent contributors to psychology and thirteen research and library sources. . .students who had previously completed an undergraduate course in the history of psychology fared better than those who had no such course. Nevertheless, the undergraduate course alone may not be sufficient to ensure the development of basic historical literacy. (Punches and Viney, 64)

A certain extent of shared, canonical knowledge is inherently necessary to a literate democracy. For this canonical information I have proposed the term "cultural literacy." It is the translinguistic knowledge on which linguistic literacy depends. (Hirsch 1983, 165)

The second meaning of literate—to be able to read and write at a functional level—can be extended to suggest that scientific literacy refers to the ability of the individual to read about, comprehend, and express an opinion on scientific matters. (Miller, 30)

One's first reaction to this proliferation of 'literacy' may be to deride the use of a faddish term that seems to mean no more than knowledge or competence: where one was once knowledgeable about a topic, one is now literate in it. But that would be to ignore the interesting question of why 'literacy' is the term chosen for expansion. Part of the answer no doubt lies with the fact that

'literacy' and 'literate', when modified, sound much catchier than 'knowledge' or 'competence': who would be seriously interested in 'computer knowledgeable' or 'visual competence'? Part probably also stems from the fact that literacy is a relatively recent term in these contexts, so its use suggests a new direction or initiative. And part is certainly due to the spate of educational reports which have dealt with declining literacy. But a good deal of it, I think, is due to a relatively normal extension of the meaning of the word 'literacy'.

DEFINITIONS OF LITERACY

One of the difficulties bedevilling any discussion of literacy is the fact that the term has such a wide variation in meaning, both historically and synchronically. *Litteratus* referred to anybody who could read and write Latin in medieval times, but the amount of reading and writing required varied greatly from place to place and from time to time (Clanchy, 177–82). For more recent times, researchers have suggested at least four historical stages corresponding with four levels of achievement in literacy. First is the signature stage, where the ability to sign one's name on documents is taken as proof of literacy (Myers, 26). The designation is unfortunate insofar as it suggests that the people in the stage regarded the ability to sign as proof of literacy. Instead it seems to be an artifact of our own historical research: signatures are available in greater abundance than anything else, and so are used for comparative studies. But there is also some educational warrant for their use, since until fairly recently reading was taught before writing, and so anybody who had learned how to write, even a signature, almost certainly had also learned to read (Cressy, 53–61; Houston, 178–92; Spufford, 19–44).

The second stage is often called the recitation stage, or the stage of Koranic literacy. Demonstration of literacy at

this stage requires either reading from a text or reciting portions of it from memory, without any necessary understanding of what is read. In the West the Bible was usually the text chosen (Clifford, 482–84); in Islamic countries, the Koran was, and still is, used (Scribner and Cole, 68–69). The third stage is the comprehension stage, in which literates are expected to be able to read and understand unfamiliar materials in a literal way (Myers, 27–28). The final stage is the one we are in now, the analytic stage, in which readers are expected to analyze and draw inferences from the material they read (Myers, 28; Clifford, 472–81).

As Resnick and Resnick point out, recent concern about the decline in literacy stems at least in part from using these higher–level and more demanding conceptions of literacy: "if writing one's name were what was meant by literacy, we would not be worried that illiteracy was a national problem" (371). And much of the semantic slipperiness of the term 'literacy' seems to stem from the same source. As the ability to analyze and draw inferences from texts is considered the defining characteristic of literacy, it seems reasonable to extend the word to other uses, often ones that are only tangentially concerned with reading and writing. Thus the ability to analyze material from any field, and to draw inferences from it, can be referred to as literacy in that area.

Facilitating this semantic shift is the fact that 'literacy' seems always to have had two distinct senses. One, which we may call descriptive, referred to the ability whose history has been briefly traced above. The second sense, the evaluative, assesses possession of a body of knowledge, usually of literature. This meaning apparently goes back to the Classical Latin *litteratus* "which meant 'literate' in something like the modern sense and also (in the most classical usage of Cicero) described a person with *scientia litteratum*, meaning a 'knowledge of letters' in the sense of

'literature'" (Clancy, 177). Richard Ohmann has recently treated this overlap in the nineteenth century (1985a, 675–77), and of course it is reflected in current dictionary definitions. It is presumably the combination of this evaluative sense of the word and the focus on analysis and inference characteristic of the analytic stage of literacy that leads to the use of 'literacy' to describe knowledge, and the ability to think, about any field.

SCIENTIFIC LITERACY

I don't mean to suggest that the people who use 'literate' or 'literacy' in this extended sense have necessarily reasoned this way. Indeed, one of the most thoughtful considerations of the extension of the term to another field suggests that this is not the case. Jon D. Miller, in "Scientific Literacy: A Conceptual and Empirical Review" (part of the Spring 1983 issue of *Daedalus* devoted to "Scientific Literacy"), recognizes the two senses of literacy: "To be literate has two quite different meanings: to be learned, and—perhaps what most people today mean when they speak of literacy or of being literate—to be able to read and write" (29). After a brief discussion of the century–long debate caused by the evaluative sense, he abandons it because "these contributions [to the debate] had as their focus the definition of being learned, not the issue of communicating science to broader populations" (30). He prefers instead a development of the descriptive sense; "the second meaning of literate—to be able to read and write at a functional level—can be extended to suggest that scientific literacy refers to the ability of the individual to read about, comprehend, and express an opinion on scientific matters" (30). More specifically, "two dimensions together—an understanding of the norms of science and knowledge of major scientific constructs—constitute the traditional meaning of scientific literacy as applied to broader populations. But if scientific literacy is to become truly relevant to our

contemporary situation, one additional dimension must be added: awareness of the impact of science and technology on society and the policy choices that must inevitably emerge" (31).

Even though it would be easier to derive scientific literacy from the evaluative sense rather than the descriptive, Miller prefers the other strategy because he is concerned not merely with information but with the expression of opinions based on that information. But there is a certain confusion in his argument deriving from its mixture of conceptual and empirical reviews: part of the time he presents a conceptual analysis of how he would like to have scientific literacy understood, and part of the time he reviews the ways others have actually understood and used the term. Thus between his initial characterization of literacy and his extension of it there is a subtle shift: literacy refers to the ability to read and write, but scientific literacy substitutes for writing the ability to "express an opinion on scientific matters." Presumably such an expression of opinion will be in the form of letters to the editor, to legislators, or to other officials, about "the impact of science and technology and the policy changes that must inevitably occur": the long final section of his paper is entitled "Implications for a Democratic Society," and his examples concern public reaction to such subjects as nuclear power and laetrile (31). "Expressing an opinion," however, suggests how far the definition has moved from the descriptive to the evaluative sense of literacy. First, if expressing opinions is the aim, the source of the information upon which the opinion is based doesn't much matter: it could come from listening to lectures or the radio or watching television just as easily as from reading. Although Miller thinks that most scientific information will come from reading—he refers to the popularity of *Science 83*, *Discover*, and *Omni* (46)—the ability to read has clearly been replaced by

the ability to understand, analyze, and draw inferences (the characteristics of analytic literacy) about scientific information from any source. Second, a strict translation of literacy into the scientific realm would lead to the ability to read and write *science*, the ability that scientists have. Being able to read and express opinions *about* science is quite different. And in fact the opinions being expressed are not strictly about science, but rather about "the impact of science and technology on society."

VISUAL LITERACY

Despite his attempts to derive scientific literacy from the descriptive sense of literacy, then, Miller finally depends on a combination of the evaluative sense and the analytic conception of the term. And it seems that most other extensions of literacy, certainly most of the ones quoted above, can be derived from the same combination. 'Visual literacy' is one of the most interesting of these extensions, partly because it specifically refers to the presence of a semiotic system which must be mastered and partly because the original attempt to formulate it linked it with language rather than with literacy. The definition I included in the list above refers to the abilities to 'read' and 'write' visual material, but the original statement of visual literacy traced its backgrounds to general semantics, structural linguistics, transformational grammar, and Murray Turbayne's *The Myth of Metaphor* (Debes, 25). What these separate strands share is a generic semiotic belief that the world consists largely of entities without independent meaning, that the meanings these entities have for us is conferred on them by the act of interpretation, and that these entities are elements in larger systems with their own constitutive grammars. In the case of language, this is the standard modern view. John Debes, to whom we owe the first and fullest definition of visual literacy, simply applied it to the field of vision:

Visual literacy refers to a group of vision competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. . .When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, and symbols, natural or man–made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication.(27)

The operative comparison in this definition is with language, and more especially with the Chomskyan view of linguistic competence and performance: just as normal humans learn language in the proper environment and are then able to understand it, persons who are visually literate "develop" the competencies for visual literacy in the proper environment, and are then able to use it to interpret future "actions, objects, and symbols." As with language, there is a split between competence and performance, here stated as the distinction between the "competencies" one acquires and the "use" one makes of them. There is even a nod to the oft–mentioned creative aspect of language: one makes "creative use" of the competencies in order to communicate, just as one makes creative use of linguistic competence to produce or understand new utterances.

This definition is excessively general, however, and Debes provided it only after he had specified a hierarchy of 35 skills comprising visual literacy. These skills range from distinguishing light from dark and perceiving motion to the ability to 'read' a sequence of objects or body language as representing a process, abstract idea, fictional narrative, or emotion. Correspondingly, visual literates must know how to 'compose' sequences of objects or body

language to convey processes, ideas, narratives, and emotions (26–27). Summarizing this list (and specifically "drawing on the verbal parallel"), Debes provides half a dozen skills and attributes characteristic of the visually literate:

> To read visuals with skill
> To write with visuals expressing oneself effectively
> To know the grammar and syntax of visual
> language and be able to apply them
> To be familiar with the tools of visual literacy
> and their use
> To appreciate the masterworks of visual literacy
> To be able to translate from visual language
> to verbal language and vice versa (27)

If we substitute 'produce' and 'understand' for 'write' and 'read', the first three skills are in fact quite similar to the skills of the language user: one can produce and understand an unlimited number of utterances in the relevant medium, and does so by means of a system of perhaps only unconsciously known rules. But a closer look suggests that the parallel with language is beginning to break down. First there is the curious doubling of 'grammar' and 'syntax' as if they were independent entities. Then there are the modifiers of each of the skills: one reads "with skill" and communicates "effectively." In linguistic theory, of course, one has the competence to produce or understand an unlimited number of sentences, but whether one does so skillfully or effectively is a question of performance. The fact that competence and performance are here so indissoluably conjoined indicates a conception somewhat different from the linguistic one.

This different conception becomes much clearer in the final three characteristics of visual literacy, which deal with the use made of visual competencies. Familiarity with tools, appreciation of masterworks, and ability at translation are types of knowledge that have no counter-

parts in linguistic theory. They are associated instead with the evaluative sense of literacy, in which one is deemed literate not because one can read and write, but rather because one is well versed in a literary tradition. Thus despite the overt and covert suggestions that 'visual literacy' is based on a "verbal parallel"—the list of influences provided at the beginning of the paper, the parallel with transformational grammar in the definition of visual literacy—it seems that is actually stems, as Debes says, "from the confluence of knowledge, theory, and technology in many areas" (25). Linguistics is certainly one of those areas, as is semiotics (in a rather general sense); but equally important is the evaluative component that may well have derived from common uses of the term 'literacy'. The visual world may indeed be composed of signs, but the aim of visual literacy is not merely to explain the workings of the semiotic system(s) that provide it with meaning; it is to enable people to use those systems for effective communication, to provide a rhetoric of visuality in addition to a grammar of it. And so Debes follows his various definitions of visual literacy with two short anecdotes about students who "wanted to talk, wanted to be understood, felt they could do this visually, and so they leaped at the chance" (Debes, 27).

If these stories clarify the relation between visual literacy and evaluative conceptions of literacy, the questions Debes asks immediately after proposing his definition of visual literacy and the answers he supplies elucidate it still further:

> How can we provide children with learning opportunities that will lead to visual literacy? . . . Out there in society and in the schools a great audience of concerned youngsters is waiting. They know that even though there is much that is right about school, there is also much that is wrong—for some of them terribly wrong. (Debes, 27)

The schoolroom is the only place Debes even considers as providing opportunities for learning visual literacy. And yet most, if not all, members of a society will learn the 35 visual skills comprising visual literacy as they grow up: part of assimilating a culture is learning its kinesics and proxemics. Children will naturally learn how members of their culture express emotions by using body language. What they will not naturally have the opportunity to learn is how to use the various media— film (the medium in both of Debes's anecdotes), videotape, paint, computers—provided by some schools. Nor will they naturally know the "masterworks of visual literacy," let alone appreciate them. In the end, then, Debes is not suggesting knowledge of a semiotic of visual signs so much as familiarity with a particular tradition and technology of visual representation. Again we can see that the basic conception derives from a combination of the evaluative sense of literacy and the emphasis on analysis and inferential reasoning characteristic of the analytic stage of literacy.

CULTURAL LITERACY

As a third (and final) example of the current uses of 'literacy', I would like to consider 'cultural literacy', especially as it has been formulated by E. D. Hirsch, Jr., because this conception seems to derive directly from the descriptive (rather than the evaluative) sense of literacy. "To be truly literate," Hirsch argues, "a high school graduate must be able to grasp the meaning of written materials in any field or subject, provided that those materials are addressed to a general reader. . . .And our high school graduates should also be able to convey information in writing to a general readership. Universal literacy means that every citizen must be able to give as well as receive written information" (1985a, 8). Given this descriptive definition of literacy, Hirsch believes that the national level of literacy has declined, a belief

apparently stemming from two sources. First there are quantitative data, such as NAEP reports and SAT scores (1987, 4–8); Hirsch once called the national decrease in the verbal SAT scores "the chief and decisive piece of evidence" for the "decline in our national level of literacy" (1983b, 160). Second, there is experimental evidence from a number of sources indicating a strong relation between background knowledge and efficiency of reading (1983a, 164; 1985a, 10): "What these experiments demonstrate," Hirsch argues, "is that the idea that reading is a general, transferable skill unrelated to subject matter is essentially wrong. . . .Reading is a general skill only with regard to its rather elementary aspects, those involving phonics, parsing strategies, guessing strategies, eye habits, and so on. . . Reading skill varies from task to task, because reading skill depends on specific background knowledge" (1985a, 10). Those who lack the background a particular passage assumes will be ineffective readers and thus illiterate in the descriptive sense: they will be unable to derive information from their reading.

In Hirsch's view, there are thus two components to reading: what he calls the "elementary aspects" of decoding the text, and the more advanced abilities of comprehending the text by using background knowledge. This background knowledge required to comprehend texts is "cultural literacy": "It is the translinguistic knowledge upon which linguistic literacy depends. You cannot have the one without the other" (1983a, 165). Someone incompetent in either the linguistic or the cultural component of literacy is thus to some extent illiterate: "Illiteracy, then, is not merely a deficiency in reading and writing skills. It is also a deficiency in cultural information" (1983b, 147). If literacy requires "translinguistic knowledge" and "cultural information," what seemed to be a purely descriptive conception of literacy has very quickly become an evaluative one, based on the mastery of a traditional body of knowledge.

Hirsch distinguishes two kinds of necessary cultural information: extensive and intensive. Extensive knowledge, which seems to be the central component of cultural literacy, "tends to be broad, but superficial. It is learned by rote. It is mainly enumerative. It consists of atomic facts and categories. It does not put things together" (1985a, 12). As a demonstration, these facts and categories are indeed enumerated in the Appendix to *Cultural Literacy*, which provides a list of about 5000 items representing a preliminary attempt to specify "What Literate Americans Know." This list consists of people, places, dates, and things—seas, mountains, continents, countries, states, personages historical and fictional, sayings, scientific terms, and abbreviations. The title of the list—"What Literate Americans Know"—is perhaps too enthusiastic, since what we have is merely a checklist of cultural literacy: Hirsch explains that a complete dictionary would consist not only of the words and phrases literate Americans recognize, but also of the associations they elicit. This naturally presents problems, since it isn't at all clear what associations 'truly literate' people share, and it isn't clear how—short of a massive research project—to find out. As an example, Hirsch wonders how many of the following associations should be listed for Lincoln:

> Gaunt face with a beard; log cabin; Honest Abe; debates with Douglas; Gettysburg Address; stovepipe hat; Emancipation Proclamation; "With malice toward none, with charity for all"; John Wilkes Booth; "Tell me what brand of whiskey Grant drinks, so I can get it for my other generals"; "One aye, seven noes, the ayes have it." (1987, 139)

A second problem raised by the associations is that the information they represent modulates into the other kind of knowledge Hirsch distinguishes, intensive knowledge. This consists of "understanding how to put things together. . .if we want to make isolated facts fit together in some coherent way, we must acquire models

of how to do so from detailed, intensive study and experience" (1985a, 13). Such mental models form the basis of schema theory, which argues that one understands new experiences by relating them to previously existing mental models, or schemata (Schank and Abelson; Hirsch 1987, 33-69). To comprehend a passage about a wedding, for instance, a reader must have a mental model of a wedding which serves to organize, by explaining the significance of, the actors, actions, and props mentioned in the passage. And it has to be the kind of wedding described in the passage: in one study, American readers understood a letter about an American wedding better than one about an Indian wedding, while Indian readers did just the opposite (1985a, 10; 1987, 17-18).

Understanding the associations to the contents of cultural literacy requires these mental models. Consider again Lincoln's remark about Grant. To understand it, one has to know who Grant was, the situation he was in, and traditional physiological and cultural reactions to whiskey. None of this is easily accessible in list form; one has to have mental models of warfare, the responsibilities of a general, and the situation in the Civil War to explain it. And these models have to be relatively specific: notice how different the situation would have been if Grant had not been a general fighting a war, or if he had not been successful where other generals, more abstemious, had not, or if he had been a Confederate general, or if the liquid in question had been lemonade, or if the whiskey had been for the troops rather than for the general. Understanding the extensive contents of cultural literacy thus requires a comprehensive network of intensive models, something Hirsch notes in passing but underestimates (1987, 127-30).

Schema theory reminds us of another aspect of the argument Hirsch seems to have overlooked. Although he mentions in passing the utility of schemata in understand-

ing generally (e. g. 1987, 51), his concern is with reading, and he thus underemphasizes the point that schemata are necessary for all acts of comprehension, whatever the modality. If one cannot sensibly read a letter about an Indian wedding, one could not sensibly understand an oral account of it, and one could not understand it if witnessed in person. That is, insofar as schema theory is applicable, it has nothing particular to do with 'literacy' and everything to do with understanding in general. It is relevant for reading only because we expect readers to comprehend what they read (unlike the signature or recitation stages of literacy), and that comprehension requires schemata.

To sum up: the intensive aspect of cultural literacy is of fundamental importance for reading proficiency: without fairly detailed knowledge about Grant and Lee, Grant and Lincoln, marriage customs, or any other conceivable topic, readers will have trouble reading about them. In this sense, however, cultural literacy is merely a new term for acculturation, with all the problematic political and practical ramifications of the earlier one (Edwards; Ohmann: 1985b; Warnock). The contribution of the extensive aspect of cultural literacy to reading proficiency is much more problematic, since it obviously depends on what the requisite associations for each entry in the list are and where one draws the line between extensive and intensive knowledge. Among the contents of cultural literacy are names of oceans, mountains, and patriotic songs. If extensive knowledge of them merely requires recognizing that they are oceans or mountains or patriotic songs, then it is difficult to conceive of a situation in which ignorance of them would seriously degrade reading comprehension. If, on the other hand, extensive knowledge means knowing, for instance, what "Yankee Doodle" and "Columbia, the Gem of the Ocean" are about, then it is relatively easy to see how ignorance could affect reading. But then the knowledge required

seems more intensive than extensive. Extensive knowl-
edge, taken by itself—if that is even possible—thus seems
unlikely to improve reading: it is more a newer version
of Trivial Pursuit than anything else, and the popularity
of that game may have contributed, at least partially,
to the widespread interest in the book. Despite the initial
appearance that cultural literacy is related to the des-
criptive sense of 'literacy', then, the aspect of the concept
that is actually effective in improving reading is clearly
based on the mastery of a body of knowledge, and thus
derives from the evaluative sense of 'literacy'.

Cultural literacy, visual literacy, scientific literacy, and
the other varieties represented on the list at the beginning
of this paper thus have less to do with the ability to read
and write than with the background information neces-
sary to comprehend experience in a particular sphere.
And this seems to be true even in those cases where au-
thors have specifically tried to relate their extensions
of the term 'literacy' to its descriptive sense. The reasons
for this seem to be inherent in the meanings of 'literacy'
itself: once one takes the term in either of its modern
descriptive senses, one is necessarily dealing with com-
prehension, and comprehension requires previous know-
ledge. New experiences of any sort are assimilated by
relating them to mental models based on previous exper-
iences; something that is totally novel is incom-prehen-
sible. Knowledge is thus an essential component of even
the descriptive sense of 'literacy', and this leads, almost
inevitably, to knowledge as the defining characteristic of
the evaluative sense. And thus the title of this paper.

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