Visualizing the Relationship Between Speech, Image and Writing

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The roots of the present study lie in my effort to grapple with a longstanding dilemma confronting historians of civilization: how to discover a proper balance between a general theory of the "civilizing process" and the specific instances of how this process unfolds in locations distant in both time and space. This essay seeks to avoid both the "classification of civilizations"—the taxonomies and teleologies which rank civilizations against each other—and the "relativism of values" that is the typical reaction. To balance these opposing views, I begin from the assumption that the "civilization process" is a theme, with variations specific to time, place and context. The task of the present study, then, is to visualize—and thus think about—this "theme and variation" by examining the history of writing. To understand the relationship between speech and image that produced writing is to unlock a key feature of the civilizing process.

In his classic A Study of Writing, Ignace Gelb mapped out the "stages of the development of writing." (figure 1) For Gelb, the written word has evolved from pictures through semasiography toward full writing, which has culminated in the alphabet. Such a conceptual cartography, I would argue, lies at the heart of most standard histories of writing, and with it the teleological assumption that the history of writing concludes with the alphabet. In the wake of the poststructuralist critique, such an assumption about the nature of writing and its relationship to other forms of human cognition has been challenged; however, few "maps" like Gelb's have emerged to aid in visualizing the new conceptual terrain. In redrawing the conceptual map of the history of writing, we may better explore the relationships between different writing systems, and the civilizations that produced them.

Philosophers, linguists and historians of writing have long
No Writing: *Pictures*

Forerunner of Writing: *Semasiography*

1. Descriptive - Representational Device
2. Identifying - Mnemonic Device

Full Writing: *Phonography*

1. **Word-Syllabic:**
   - Sumerian (Akkadian)
   - Egyptian (Aegean)
   - Hittite
   - Chinese

2. **Syllabic**
   - Elamite
   - Hurrian
   - Minoan
   - Cypro
eetc.

3. **Alphabetic**
   - Greek
   - Aramaic (vocalized)
   - Hebraic
   - Latin
   - Indic
   - Etc.

3. **Alphabetic**
   - Greek
   - Aramaic (vocalized)
   - Hebrew (vocalized)
   - Indic
   - Etc.


debated the relationship between speech and writing. (Mengham 1993:26) Three contemporary observations give some shape to this debate. Shortly before his death, Anthony Burgess, writing in favor of widespread adaptation of the International Phonetic Alphabet, observed that "we have to do something about the accurate visualization of speech." (1992:26) Burgess was echoing the thoughts of a long line of British writers who have wished to simplify English orthography, and bring the written word more in line with the spoken. Ferdinand de Saussure wrote that "Writing
is foreign to the internal system of language," seemingly ruling out any possibility of convergence between the spoken and the written. "Writing obscures our view of the language, writing is not a garment, but a disguise." (Mengham 1993:29) The cognitive scientist Steven Pinker reminds us that "the goal of reading, after all, is to understand the text, not to pronounce it." (1994:191) Burgess argues that writing is subordinated to speech; Saussure, that language and writing are incompatible. Pinker seeks to place writing in the space between the spoken word and the visual image, especially when he notes that "writing is an artificial contraption connecting vision and language." (1994:189) My own views correspond to Pinker's: writing exists in the conceptual space between speech and image. All writing systems produced by human civilizations convey meaning through a combination of phonetic and iconic elements.

Linguists and writing specialists are not of one mind on this problem of, to use Pinker's phrase, "understanding texts." This controversy has a long lineage. One tradition in Western thought, dating from Plato and Aristotle and continuing through Rousseau and Saussure, sees speech as superior to writing. (Mengham 1993:29-30) Another tradition draws from the Prague School of linguistics and from the work of Jacques Derrida, and contends that writing is not just a record of speech but possesses its own dynamic. Thus--Pinker's observation aside--the contemporary debate on the status of writing seems to be divided between those scholars who contend that writing systems exist outside linguistic systems, without reference to speech, and those who believe the written word is grounded in, even subordinated to, the spoken.

The anthropologist Elizabeth Hill Boone, who seems to side with the former position, defines writing "as the communication of relatively specific ideas in a conventional manner by means of permanent, visible marks." (1994:15) The wording of her definition removes any reference to the spoken word. Boone's definition draws from her study of Mesoamerican scripts, long rejected by writing specialists as "protowriting" since they seemingly
make no reference to the spoken word. She argues that the definition of writing must include "supralinguistic" scripts, such as the Incan quipu system of knotted cords, which conveys meaning through visual—even tactile—information. Rather than seeing the goal of writing as "visible speech" or the goal of art as "visual aesthetics" divorced from communication, Boone contends that "art and writing in Pre-Columbian America are largely the same thing."(1994:3) Thus, Boone rejects the linguistic basis of writing and its evolution toward the alphabet, both of which, I believe, are made visible in tree diagrams of the history of the written word.

Boone notes, sensibly, that speech cannot account for the full range of human communication conveyed through musical, mathematical and visual forms; therefore, she is willing to include mathematical, musical and kinesthetic notations in her more inclusive definition of writing. In asking us to consider a broader definition of writing, I believe Boone has been successful, if somewhat overstated. In drawing attention to the vast range of written experiences across civilizations, Boone has alerted us to the inherent visual nature of writing. Even if writing is "visible speech," it is also a system of communication visual in nature, and thus subject to visual conventions. If there is a weakness is Boone's line of argument, however, it is that it may be too inclusive. If "writing" refers to any system of conventional, permanent marks, then what lies outside of writing? Writing, in other words, cannot be any system of graphically communicated meaning. Therefore, I am not willing to completely throw out the linguistic basis of writing.

Boone specifically rejects the approach of the linguist John DeFrancis, one of the most recent, and vocal, proponents of the "visible speech" teleological line of thought. DeFrancis argues that only those scripts that record speech can legitimately be called "full writing systems;" all other systems of notation are at best "partial" systems. DeFrancis' thesis is important, since it points to the fact, overlooked even by many Americanists, that some linguistic references are to be found in even the most "pic-
tographic" of scripts, such as Mayan. However, I divorce myself from DeFrancis when he suggests that visual or iconic elements play an insignificant role in "understanding" writing. Specifically, I disagree with two of DeFrancis' central assumptions.

First, DeFrancis contends that language equals thought. Since he argues that writing is based on speech, and that "full writing is a system of graphic symbols that can be used to convey any and all thought,"(1989:5) DeFrancis indicates that only speech is capable of fully expressing thought. Thus, "partial writing," which is not dependent upon speech, "is a system of graphic symbols that can be used to convey only some thought." I would argue, however, that, by these definitions, all systems of human communication are "partial." Pinker, especially, rejects this linguistic determinism by noting that "we have all had the experience of uttering or writing a sentence, then stopping and realizing that it wasn't exactly what we meant to say. To have that feeling, there has to be a 'what we meant to say' that is different from what we said."(1994:57) Pinker refers to the "what we meant to say" as "mentalese," thought beyond language and image, arrived at--but never fully expressed--by linguistic or visual means.

DeFrancis' second assumption follows from his first: that writing is virtually the same thing as speech. However, writing cannot be said to equate to speech, since a text cannot fully express all the nuances of the spoken word such as length, stress, pitch and pauses. (Boone 1994:12) Writing also consists of graphic conventions which convey visual information necessary to "understand" a text, information that lies outside of speech. Thus, writing and speech--although related--cannot be said to convey the same information.

Consequently, I am troubled by the classification diagrams DeFrancis creates based on these assumptions, which is the real point of contention in this essay. Figure two represents DeFrancis' visualization of human communication, which makes the link between spoken language and full communication. We might also note DeFrancis' response to Boone: quipu cannot be
writing since it is not grounded in speech. Figure three visualizes DeFrancis' classification of writing systems, which is both teleological and grounded in linguistic assumptions.

These tree diagrams, while acknowledging a common root or beginning, emphasize the divergences and differences between systems of communication. The boundaries between forms of communication are stark and impermeable. These images also suggest that the history of writing is a teleological process culminating in the alphabet, or other systems that best record speech. I am troubled by the implications of referring to the arti-

Figure 2: Source: John DeFrancis, Visible Speech, the Diverse Oneness of Writing Systems (University of Hawaii Press, 1989) :6.
facts of any culture as "dead-end," as DeFrancis does with cave paintings and Amerindian pictographs, suggesting that these cultures failed to "evolve" toward full writing. There is a hint of nineteenth century European anthropology in these taxonomies. My argument is that writing is a theme with many variations; therefore, alphabets and cave paintings are more related than not related.

If Boone overemphasizes the iconic to the detriment of the phonetic, then DeFrancis overemphasizes the phonetic to the detriment of the iconic. I am not convinced that either of these

![Diagram of writing systems]

*Figure 3: Source: John DeFrancis, *Visible Speech, the Diverse Oneness of Writing Systems* (University of Hawaii Press, 1989) :58.*
perspectives alone gives us the answers we seek: what we need is a diagram that will allow us to think of the "oneness of writing systems" that includes both phonetic and iconic information.

To begin such an inquiry depends on visualizing the problem correctly. How does one compare writing systems, if not in hierarchical or teleological fashion? How does one visualize such comparisons if not by tree diagrams? Do such hierarchies still work, or can we devise new ways of visualizing the relationship between writing systems?

Writing, like all forms of communication, is a system: a particular configuration of signs embedded within specific cultural, psychological and physiological processes. All writing systems exist in the conceptual space between speech and image. To "understand" a text, in Pinker's sense, involves deriving meaning from both the phonetic and iconic elements present in any given writing system. All writing contains combinations of both, but in different degrees; however, no system of writing can exist without some reference to speech or some visual representation. Take two examples: English and early Sumerian cuneiform. In English, like many alphabetic systems, the phonetic dominates the iconic. Very little--but at least some--meaning is conveyed by visual messages, such as the spacing between words, paragraphs and italics. (Landow, 1992:49) In cuneiform, the iconic dominates the phonetic.

We might represent this relationship as in figure four, where meaning derives from different combinations of phonetic and iconic elements; any writing system could be identified on this chart based on the mix of these elements, what the Mayanist Michael D. Coe refers to as "a complex duet involving sound and meaning." (1992:36) DeFrancis hints at this relationship, when he "ranks"--again, in hierarchical fashion--different scripts based on their efficiency of speech representation (figure five): Finnish ranks high, Sumerian and Mayan low. The visual appearance of these charts conveys messages, in this case, higher up the scale means "better" or "more efficient." In my conceptual map, Finnish would be depicted as chiefly phonetic with some iconic
elements, on the left of the image. Mayan would be chiefly iconic with some phonetic elements, on the right of the image.

Figure six makes this point clearer. I envision writing as on a continuum between orality and pictoricity. I am using these terms in the same way Mitchell (1986) refers to "poetry" and "painting" as families of signs. By orality, I refer to a family of signs--speech, song--related to sound. Pictoricity, then, refers to a family of signs related to vision, such as art and architecture.
(Beyerchen, 1989) Next, I conceptualize these families as primary colors: orality as red, pictoricity as blue. (The choice of colors is completely arbitrary. There is nothing symbolic or aesthetic in making orality "red.") Writing, as another family of signs, is depicted as yellow. As I have conceptualized the debate, both DeFrancis and Boone concentrate on those writing systems near the boundary areas, in the transitions between speech/writing and writing/image. DeFrancis is concerned with writing systems that best record speech, like Finnish; in other words, those systems in the "orange" area between speech and writing. Boone is interested in supralinguistic systems, like quipu, which I would place in the "green" area between writing and image. Such a conceptualization may help to unite these divergent points of view, and allow us to map out the relationships between orality and pictoricity that have produced writing.

If the reader believes that I am stretching the "color" metaphor too far, I would point out that we often speak of complexity as "the gray area," without giving much thought to what we mean. A "gray area" assumes a black and white area on the boundaries, which give shape to the middle. My conceptual map, however, is based on three variables, not two, meaning that we must find new words, new metaphors to think about these complex relationships. I can think of no better metaphor than color, which conveys rich and complex levels of information. (Dondis
This information must be used with caution, however. "Color often generates graphical puzzles," contends the graphic designer Edward R. Tufte. "Despite our experiences with the spectrum in science textbooks and rainbows, the mind's eye does not readily give a visual ordering to colors." (1983:154) I am using color here as most scientists who use "false color" maps do: as a way to think about and visualize the problem by "[allowing] another layer of information to be squeezed into the same limited amount of space." (Hall, 1992:13) Color is used here as a way of distinguishing information, not as an aesthetic device.

An example of how "false color" is used to distinguish information is in the way mathematicians explore the fractal basin boundaries of the Mandelbrot Set, which are created by assigning colors to each point in the set. Each color represents a specific number of iterations of the algorithm before it breaks off to either zero or infinity. The use of color not only has aesthetic appeal, but also reveals and intensifies the complex boundaries areas. Color is also helpful in conceptualizing the complex boundaries between physical states that physicists refer to as "phase transitions," the mathematics of which are highly nonlinear and not just simple straight-line boundaries. (Gleick 1987:160) Hues of color help to capture this complex, nonlinear boundary.

These complex boundaries are what interest theoretical mathematicians and physicists; I believe a similar type of conceptual boundary exists between different writing systems and between different types of cognition. The "secondary colors" in my scheme mark the major "phase transitions" between the "primary" forms of communication. Color references suit this analysis better than black/white dichotomies, since I want to distinguish between the boundaries between speech/writing and writing/image.

The most fruitful areas of exploration, I have found, are the writing systems near these conceptual "phase transitions." The International Phonetic Alphabet belongs in the "orange" area.
between speech and writing. The IPA is a communications system designed as a guide to pronunciation, although it is not capable of fully expressing the nuances of the spoken word. Yet unlike conventional alphabets, the IPA is not intended to be read as a written text, as much as Burgess would have wanted this. Very little information is conveyed via iconic means, which is why it is "orange" in this map.

Written English, on the other hand, includes more visual information in the process of "understanding," which is why it is more "yellowish." Consider, for example, the white space between words. We know that early printed texts continued the medieval tradition of not placing spaces between words, which reflects an attempt to make speech visible and spatial, since there is no oral counterpart to the space between words,

unless...I...were...to...pause...between...every...word. Each pause between words would have to be of equal length, to match the uniform spacing between words in a printed text. Linguists point to the fact that words are not "broken up" in speech, but only on the page. The spacing between words, therefore, is a visual element in writing that does not derive from speech.

Orthography is also a form of visual information. It is almost axiomatic to state that in alphabetic texts differences in spelling often denote differences in meaning, but there are other forms of information conveyed by orthography. The German Federal Ministry of the Interior is currently considering a proposal to reform the written language by abandoning the letter "Eszett" in favor of the "double s" to make German more accommodating of foreign words. Another proposal, rejected by many German linguists, would eliminate the capitalization of nouns. Such proposals would change the visual appearance of the German script, as well as the process of "understanding" a German text, but would have no effect on the pronunciation of the words.(The Week in Germany, 1994:6)

Dropping the Eszett has other cultural implications as well, which point to the remnants of pictoricity in alphabetic scripts. The Eszett is a distinctive feature of the German alphabetic
script; to lose this cultural artifact, then, would be to surrender a part of German culture—perhaps under the pressure of increasing Americanization. Decades earlier, Bauhaus designers understood that the modernist aesthetic also applied to the alphabet; Herbert Bayer's Universal type redesigned the visual appearance of the alphabet by streamlining and stripping it of decoration. Corporations and advertisers have appropriated this aesthetic, and have learned that changing the visual appearance of the script in a logo conveys novelty, cachet and cutting edge modernity.(Lupton and Miller, 1993) An alphabet, as a visual communication system, carries within it extralinguistic information and, therefore, is not just a transcription of speech.

This level of information is not universal, however; that is, this extralinguistic information cannot be deciphered by anyone unfamiliar with the cultural context. Early decipherers of Egyptian and Mayan, for example, believed that these scripts were not grounded in speech, and therefore could be interpreted by anyone since the "pictures" conveyed information directly. Many erroneously continue to believe that written Chinese conveys meaning strictly through pictures, a point DeFrancis has wisely discredited. This does not alter the fact, however, that the visual appearance of a script, even an alphabetic script, continues to convey meaningful information.

Alphabets, like all writing systems, are grounded in image as much as speech, and therefore possess a spatial dimension. The ancient Greeks, before settling on a left-right direction to the reading order of their alphabetic script, wrote in several directions, boustrophon being most noteworthy. "This fluidity in the choice of direction," writes Rod Mengham, "together with an utter carelessness about the division between words and larger units such as clauses and sentences, has been seen as evidence of a tendency in early Greek writing to reflect the continuous flow of speech."(1993:45) In other words, early efforts at alphabetic writing might be thought of as an attempt to give direction to speech, which has no spatial order as such. Indeed, as Walter Ong has observed, "Writing had reconstituted the originally oral,
spoken word in visual space,"(1982:123) therefore subjecting the word to visual conventions. Reading order, spacing and orthography are purely visual in nature, not oral, although they have affected oral habits. These properties of visual thinking are as important to "understanding" texts as are the linguistic elements; the point here is to demonstrate the persistence of the iconic in those scripts that make speech visible.

In contrast to alphabetic scripts, Chinese, Sumerian and Mayan are found near the green "phase transition," since each are more visually oriented than alphabetic systems. In each of these systems, the distinction between "writing" and "image" is blurred. The linguist Roy Harris refers to this state as "graphic isomorphism," where a sequence of visual signs might be interpreted as either pictures or writing.(1986:126) The Mayan script provides a good example of this "graphic isomorphism," since a sign could convey meaning either alone as a picture or in tandem with a phonetic component. "Among the Classic and Post-Classic Maya," suggests Michael D. Coe, "writing and pictorial representation were not distinct. Just as in ancient Egypt, texts have the tendency to fill all spaces which are not actually taken up with pictures...[which is] hardly surprising when you consider that the artist and the scribe were one and the same person."(1992:264)

In Chinese culture, the techniques of writing and painting are nearly identical; word and image coexist in close proximity. Further, Chinese poets have for centuries conveyed mood, feeling and expression based on the visual appearance of the script, which points once again to the fact that writing is as much a visual system of communication as it is phonetic. In visually oriented systems, text is embedded and entwined with image.

Each of these scripts relies on "semantic determinatives," which are symbols that convey meaning without reference to speech. These are not the same as pictographs, since the visual clues often work in tandem with phonetic symbols to facilitate "understanding." Unlike alphabetic scripts, however, more meaning is conveyed via iconic information, as in the case of the
Chinese word "ma." Originally, the word was a pictograph for "horse," but eventually became a phonetic sound to represent "mother," "scold" and "sacrifice," among others. To arrive at "mother," an unpronounced symbol for "female" is added. This semantic determinative in front of the symbol provides the visual meaning to the reader of the word, as intonation provides the phonetic meaning to the listener. DeFrancis has calculated that after the 18th century, fully 97 percent of Chinese characters are understood as "semantic-phonetic," and that the strictly pictographic elements of the script had largely disappeared (1989:99). DeFrancis minimizes the importance of the semantic determinative in favor of the phonetic symbol, to better emphasize his thesis that all true writing is grounded in speech. To my way of thinking, semantic determinatives might be understood—in the context I am creating here—as systems of visual thought that contribute to "understanding."

However, these systems are far from the supralinguistic systems studied by Boone, which is why they remain within the "yellow" region. DeFrancis remarks that the transition from pictographs to "semantic-phonetic" symbols occurred once the "rebus principle" had been invented. (1989:74) Each system began to develop symbols meant to reflect spoken sounds, not visual images, what Harold Innis has termed "ear-pictures" versus "eye-pictures." (1986:20) In fact, the key to deciphering Egyptian and Mayan was to "overlook" the graphic appearance of the script and instead link each to the appropriate linguistic system. While Sumerian, Mayan, Chinese and Egyptian may have begun as pictographic scripts, each developed phonetic conventions.

Supralinguistic systems, therefore, do not belong within this category of scripts. The systems of knots that lies at the heart of the quipu "syntax" and "grammar," for example, suggest the visual conventions of a writing system; however, since quipu makes no reference to speech, it cannot be considered writing, as we have defined our terms. Therefore, I would place quipu deep within the "green-blue" boundary area.
The archaeologist and linguist Elizabeth Wayland Barber argues convincingly that textiles have served as systems of visual communication beyond the conventions of speech, which would place them within this supralinguistic "green-blue" region. In many cultures that had yet to develop written systems, memory, history and status were often stored in visual form, on clothing or on "storytelling cloths." Barber contends that textiles have for centuries conveyed "social messages visually, silently and continuously."(1994:148) Barber provides us with another way of conceptualizing the relationship between speech, writing and image: writing exists in that conceptual space between the immediacy of speech and the continuity of visual messages.

We may now see a parallel between writing systems near both boundary areas. Creators of early alphabets sought to mimic speech, then developed visual conventions, such as spacing and reading order. Creators of early ideographic scripts sought to mimic images, then began to develop phonetic components, such as the "rebus principle." However, all are writing systems since they are made up of different combinations of phonetic and iconic elements. Consequently, writing cannot be separated from either speech or image, which is why tree diagrams fail to capture this complex relationship. Here is "the diverse oneness of writing systems."

As figure seven indicates, this unity extends to the boundary area between speech/image, a "purple" phase transition where we may locate gestures. Armstrong, Stokoe and Wilcox (1995) argue that the origins of linguistic capabilities—the use of both words and syntax—lie in the evolution of the human cognitive ability to create symbols and relations between symbols in gestural form. Language and syntax depended as much on the use of hands and the human visual system as much as it did on the sounds produced by the vocal system. The authors conclude that spoken language is a type of gesture, that is, a particular use of the human physiological and neurological system.

If visual processing through gesture is an important component of human cognition, it stands to reason that gesture and
vision were important in the development of writing. Gordon Hewes (1995) has provocatively suggested that the hand movements and body positioning necessary to produce writing are themselves gestural acts embodied in material form. The French historian of writing Henri-Jean Martin (1994:6) notes that early humans "must have expressed [themselves] with gestures as much as words" and as a result were "able to develop both graphic schematization and verbal conceptualization..." or, to paraphrase Pinker, writing merged graphic schematization with verbal conceptualization. Roy Harris (1986:133) has argued that the origins of writing can be traced to early gestural counting, which grew out of an initial state of graphic isomorphism between pictures and scripts. We might think of the divergence of graphic isomorphic signs identified by Harris as the visual
counterpart to the "rebus principle," suggesting that the path to writing followed two tracks, both leading from gestures: one oral, the other visual. The systemization and conventionalization of images—first located in gestures—was at least as important in the origin of writing as was the association of symbol and sound. It may be more correct, therefore, to speak of "the origins of writing," rather than "the origin of writing:" that there have been at least two conceptual paths toward written expression, as opposed to a singular line of development.

Another important argument in Armstrong, Stokoe and Wilcox is their insistence that language evolved alongside the evolution of the body, specifically bipedalism and the freeing of the hands. Thus, language emanates from the entire body, which may explain why so many of our metaphors refer to the orientation of the body in space. (Lackoff and Johnson, 1980) To return to our conceptual map, I would argue that those symbols located in the upper half of the diagram—speech, gesture, song, dance—are those produced by the body. Humans reached an important cultural threshold—civilization?—once they developed the capacity to preserve these bodily signs on materials outside the body—such as cave paintings and writing—which would occupy the lower half of the diagram.

Once we begin to think of the relationship between cognitive systems as a circle, we can begin to uncover new relationships, new ways of thinking. Perhaps something like the complementary nature of color exists between communication systems. For example, gesture and writing, when compared in this fashion, exhibit parallel—but not identical—characteristics. Like writing, gestures exist in the conceptual area between the temporality of speech and the spatiality of image. According to David McNeill (1992:29), gesture—or more correctly gesticulations—and speech are dual channels which work in tandem to form a "single process of utterance formation." Thus, gesture shares the temporality of spoken language. However, unlike spoken language, gestures also unfold in visual space, which McNeill identifies as "gestural space." We could conclude, then, that the signs on the right of
the diagram are those that unfold in space and on the left are those signs which occur in time. Gestures and writing, therefore, are located on the boundary between space/time. (figure 8)

The gestural space identified by McNeill shares some characteristics with the "writing space" explored by such scholars as J. David Bolter (1991). One notable similarity is the way in which different cultures utilize this space in different ways, as with the case of Turkana speakers from northern Kenya, who use more of the gestural space around the head than do Western speakers (McNeill 1992:86). The cartouche, the paragraph and the Chinese calligraphic frame all demonstrate how writers of scripts have also organized the writing space differently depending on cultural conventions. The flexible organization of the bodily gestural space and the material writing space is evidence of a complementary attribute.

According to McNeill, gestures work along with speech to convey meaning. Given this argument, we might then discover
another complementary attribute between gesture and writing. If the gesticulations which accompanies speech are a necessary feature of "understanding" the meaning of an utterance, then perhaps we might view the gesture as a visual "semantic determinative" for the listener of an utterance. When thinking in terms of a circle, new interpretations are opened that would not be possible using tree diagrams.

Something like the unity of the color wheel strikes me as a more appropriate metaphor for the relationship between forms of human cognition, thus serving as a means of thinking about the "civilizing process" in both general and specific terms. Rather than being separate and distinct, human cognition might be understood as different hues of physiological, psychological and cultural activity intended to convey meaning, linked together conceptually by the unity of the circle.2

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NOTES

1. This continuum is similar to the visible light spectrum; beyond "red" and "violet" lie "infrared" and "ultraviolet." Think of "orality" as being like infrared light and "pictoricity" as being like ultraviolet light. "Writing," then, is like the visible light spectrum. Speech and picture-making are not endpoints, but rather the boundaries which give shape to the middle, which is writing.

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