

SCRIPT AND COGNITION

THE IMPACT OF ORTHOGRAPHY ON WESTERN AND EASTERN PATTERNS OF THOUGHT

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ABSTRACT

The “Greek” alphabet made literacy widely available and facilitated the growth of ideas that underpin Western society. A more important effect, however, has been the cognitive impact of the mechanism itself. Learning the alphabet entails an early and decisive investment in abstract cognitive practices that define Western theoretic culture. Oral societies, and the societies of East Asia where literacy depends on nonalphabetic scripts, lack this developmental cue and employ patterns of thought that are mirror opposite.

ASIAN AND WESTERN THOUGHT

For many decades Asian and Western scholars working in a variety of disciplines from philosophy, physics, and history to linguistics, psychology, and politics have made similar observations about the unique cognitive styles associated with Chinese-inspired East Asian culture and Greek-inspired Western culture.¹

Not only are these generalizations widely held, they have also withstood an intellectual climate hostile to the idea that deep-seated cognitive differences exist between peoples of different cultures. That these dichotomies—polar opposites—between Eastern and Western thought have been elucidated by scholars on both sides of the world is causing even the most cosmopolitan among us to question the validity of cognitive convergence.

Joseph Needham, a famous admirer of Chinese science, was puzzled by China’s lack of interest in theory and emphasis on concrete, observable phenomena, which he contrasted with the logical, theory-based science of the West. Paul Herbig, who studied Japanese innovation patterns, observed this same penchant for “holistic right brain thinking as opposed to rational left brain analysis” and for seeking “empirical rather than theoretical knowledge” (1995:12). Hajime Nakamura, in his survey of Asian thought, also remarked on

China's concern with particular instances and disinterest in universals and on Japan's preference for "concrete intuitions" over the abstract conceptualization preferred by the West (1964:543).

These historical differences carry into the present. Richard Baum, in studying Chinese scientific practices, noted a marked preference among Chinese scientists for observation over conceptualization, concrete thinking over theoretical speculation, and induction over deduction (1982:1170). Richard Suttmeir, in another contemporary study, remarked on Chinese scientists' neglect of underlying theory in favor of "simple empiricism and inductivism" (1989:379). Robert Logan, author of a book on the cognitive effects of writing, characterized Chinese thought as nonlinear, analogical, inductive, concrete, and intuitive, and Western thought as the exact opposite: linear, logical, deductive, abstract, and rational (1986:49).

More recently, Richard Nisbett et al. (2001:193–4) portrayed the differences between Eastern and Western thought as continuity vs. discreteness, field vs. object, relationships vs. categories, dialectics vs. logic, and experienced-based knowledge vs. abstract analysis. Through a series of psychological experiments, Nisbett validated the existence of these cognitive differences between East Asians and Westerners *even today*. He later added interdependence vs. independence and communal vs. individualistic to his catalog of differences, which he ascribed to global preferences between the two groups for holistic vs. analytic thought (2003:56, 88).

ORAL AND LITERATE THOUGHT

Given the consistency with which these dichotomies are cited and the wide-ranging backgrounds of the scholars who cite them, it is surprising that no one has pointed out the parallel between these differences and the differences between oral and literate societies. I suspect this is one of the many instances in science where prior assumptions have ruled out concrete data, inasmuch as East Asians, historically and now, were and are among the world's most literate people. But the parallels are too striking to ignore.

A.R. Luria, the Russian psychologist, was one of the first to marvel at the aggregative, pragmatic tendencies of nonliterate populations in contrast to the analytic and theoretical disposition of literates. In his experiments with nonliterate and literate farmers Luria found differences between the ways the two groups viewed objects – holistically or as a collection of parts – and in their ability to identify abstract relationships. When presented with problems, nonliterates focused on their practical aspects while literates were more interested in their theoretical dimensions (1976).

Walter Ong, who also studied the contrasts between oral and literate societies, argued, "A sound-dominated verbal economy is consonant with aggregative (harmonizing) tendencies rather than with analytic, dissecting

tendencies." It fosters "situational," not abstract thinking, while "abstractly sequential, classificatory, explanatory examination of phenomena" is a function of literate culture (1982:8, 69). Derrick de Kerckhove, the author of several studies on the cognitive effects of writing, wrote similarly that "Oral languages are always, of necessity 'contextualized.' Their usage is both field and context-dependent" (1988:107).

Merlin Donald, a cognitive scientist who believes that consciousness developed in stages, observed that literate or "theoretic" cultures are characterized by "differentiation, quantification, idealization, and formal methods of measurement. Arguments, discovery, proof, and theoretical synthesis are part of the legacy of this kind of thought" (1991:273-4). "Narrative" thought, that is, thought not informed by literacy or supported by a literate culture, contrasts with the "analytic, paradigmatic, or logico-scientific" thought associated with literate peoples.

The same tendencies to view things in a relational, synthetic, and pragmatic context, or to view the world abstractly, analytically, and theoretically that respectively characterize East Asian and Western cognitive styles also describe oral and literate cultures.

LITERACY'S HIDDEN DYNAMICS

How can this fact be explained? As I mentioned above, it is too facile – indeed, simply wrong – to attribute these different cognitive styles to differences in literacy rates per se. Mass literacy is a recent phenomenon in the West and there is substantial evidence that functional, shop-based literacy prevailed through much of East Asia's history (Rawski 1979). Although doubts can be raised about the *quality* of literacy today in Asia (or for that matter in the West), there is no doubt that it is universal, or nearly so, in Japan and Korea and widespread in China.

One clue toward resolving the issue is found in the backgrounds of those who studied the so-called "literacy effect" on cognitive preferences. With one very important exception, all scholars – including those of the "Toronto school"² founded by Marshall McLuhan and the line of Russian psychologists that included Luria and Vygotsky – who argued that writing causes a shift from holistic to analytic thinking, *worked within an alphabetic tradition*. They assumed that what was true of alphabetic literacy was true of literacy in general.

Hence they were unprepared to deal with a study that looked outside that tradition and contradicted their claims of a general link between the acquisition of literacy and a transformation in cognitive preferences. This is the famous study by Scribner and Cole (1981) of the Vai, a West African people literate in a syllabic orthography, who did not show the characteristics claimed by the Toronto school and others for writing in general. Since the

study was designed specifically to test the cognitive facilitation hypothesis, many scholars associated with it were moved to temper their claims about the effects of literacy on thought, instead of drawing a conclusion, which in retrospect seems obvious, that it is not literacy per se that promotes this shift but *alphabetic* literacy.³

According to the earlier theory, which the Vai study contradicts, literacy in any script confers an ability to reflect on language as an abstract entity, apart from the medium with which it is naturally associated, namely speech. The verbal behavior that nonliterate accept as a concrete part of nature is found by literate people to be a *representation* of an underlying set of abstractions. The resulting metalinguistic awareness, by this argument, carries over into one's general cognitive disposition.

There are data to support this line of reasoning,⁴ but the element driving this cognitive facilitation, beyond what can be attributed to the raw literacy effect itself, is the need to *manipulate abstract units* that are obscured in speech but forced on literate users by alphabetic orthography. Syllabic writing makes no such demand, or does so minimally.⁵ Whereas all writing entails recognizing that language is not speech, alphabets go beyond this by requiring one to analyze speech sounds into small (but finite) components — phones — and to express these phones as phonemic abstractions (roughly, letters), which correlate with nothing in nature. Most alphabets also entail the depiction of *words* — abstractions on the macro level that, like phonemes, correspond to nothing in concrete speech.

By contrast, the trouble nonliterate or those literate in nonalphabetic orthography have identifying words and associating phonemes with letters is well documented and caused by the abstract nature of the operation.⁶ Herein also lies the major block to literacy in the West.⁷ Western children not only must learn the concept of representation. They are also making their first foray into the worlds of abstraction and analysis. This decidedly *unnatural* task introduces one to the possibility of abstraction in general and is reinforced whenever a pupil, who is schooled in phonics, spells a word, types it, or even visualizes it.

THE ANATOMY OF ASIAN ORTHOGRAPHY

Although there is some dispute, among nonspecialists at least, over how to classify the dominant character-based orthographies of East Asia, they clearly are not founded on alphabetic principles. As DeFrancis (1984, 1989) and others have shown, there is good reason to believe that Chinese characters are, more than anything else, a large syllabary. In Chinese writing each character is associated with a syllable sound. Due to the way they are formed, parts of a character sometimes give a hint of its pronunciation. But the representation is holistic. There is no discrete, fractional mapping of symbol to sound and nothing resembling the phonemic analysis required of alphabet users.

In Japanese as well, whether reading phonetic *kana* or *kanji* characters, the focus is entirely on syllables. *Kanji*, “Chinese characters” in Japanese, are associated with two types of sounds, depending on whether they represent a borrowed Chinese morpheme or an indigenous Japanese word. In the former case, a character is read as one syllable.⁸ In the latter case, the character functions logographically to represent the uninflected part of a native Japanese word. In neither case is there discrete modeling of sound. The *kana* systems themselves, derived from Chinese characters, are archetypal syllabaries, whose shapes have no relationship to the elements of the composite sounds they individually represent.

Consequently, when Chinese and Japanese learn to read, they do not *analyze* speech sounds much beyond the concrete level that people are equipped from birth to perceive.⁹ Nor is there a corresponding demand to *abstract* sound into phonemes or to relate the two systems of speech and writing on a higher abstract level. Finally, Chinese and Japanese readers are not made to identify *words* – abstract entities not distinguished in speech. The orthographies simply run the symbols together one after another in an unrelieved stream, in a manner characteristic of oral societies the world over.

Instead of fostering analysis and abstraction, Sinitic scripts require only that the user map vague units of meaning (morphemes) and concrete sounds (syllables) onto a large set of mostly opaque signs. Although complex in one sense – the number of symbols stretches into the thousands – the operation rarely gets past concrete, surface facts.

Even Korea’s *hangul* orthography, which is an alphabet by design, subverts the cognitive facilitation associated with Western alphabets by its practice of lumping *hangul* letters together into syllables, which is how they are taught, used, and perceived. The convention is obligatory. Even when all that is wanted is a single letter, the letter appears as a formatted syllable. Beyond *hangul*, Chinese characters still play a prominent role in the educational systems of both Koreas, where they are taught as an aid to understanding all-*hangul* texts.¹⁰ Moreover, mass *hangul* literacy is a recent phenomenon. For most of its five hundred years, *hangul* was used not as an orthography at all but as an aid to learning Chinese characters.

Vietnam, which uses an alphabet mostly of Western letters, may also be diluting the cognitive effects of alphabetic writing by its practice of grouping text into syllable-sized units. Unlike Korean *hangul*, which arranges letters of a written syllable horizontally and vertically within an imaginary square, Vietnamese *quoc ngu* puts its letters in serial order in the manner of Western alphabets. But it does not take the next step, adopted by most other alphabetic systems, of identifying words. Instead the orthography uses blank spaces between each syllable, letting the reader infer what “sounds” group with what others to form words – much as one does in speech.

Despite their move toward alphabetic writing, Korean and Vietnamese still emulate the area's dominant Chinese character-based orthography with its emphasis on concrete syllables and its neglect of language's more abstract components. Although alphabetic notations, which incorporate word division, have been devised for all four of these Asian languages, they play a subsidiary role and have no part in the literary life of East Asians. Thus there have been, until quite recently, few opportunities for the tutorial effects of alphabetic literacy to take root in countries of the "Chinese character cultural sphere."

The one exception has been — of all places — Tibet. Unlike other Asian writing systems, which are based on Chinese characters or to some degree modeled after them, Tibetan writing was adapted from an Indic script and is alphabetic. Its twenty-eight consonant forms have a default value of consonant + the vowel [a] but are treated as simple consonant letters, as evidenced by their use in clusters and in syllable final position, where the default [a] is ignored. Importantly, they are complemented by four separate vowel symbols, which is remarkable when you consider that vowels were not part of the Western alphabet for the first several hundred years of its evolution and are *still* not part of Semitic writing.

Paralleling this orthographic divide between East Asian syllabic writing and Tibetan alphabetic writing is a sharp distinction in the cognitive and philosophical traditions of East Asia and Tibet. Nakamura, in his comprehensive study of Asian thought, found "more points of similarity than points of difference" between Chinese and Japanese thinking, both of which he characterized as holistic, concrete, mystical, and particular (1964:347). Tibet, by contrast, has a tradition of analytic, abstract, logical, and universal thought that seems out of place in East Asia and more becoming the Western tradition.

WESTERN WRITING VERSUS THE SEMI-ORAL SOCIETY

It is argued that "oral society" means more than a lack of writing.¹¹ The term depicts a set of behaviors and mental outlook that differ markedly from the analytic, serial behavior commonly associated with literate society but which, I claim, are actually a product of *alphabetic* literacy. And to the extent that the alphabet is associated with a cognitive shift in the West, the use of nonalphabetic writing should also be seen as a contributor to the so-called "East Asian" style of thinking, which is hard to distinguish from oral societies.

The argument that orthography has a direct and enduring effect on a society's dominant patterns of thought is uncontroversial, and has formed the basis for hundreds of studies that impinge on communication theory, epistemology, anthropology, and even politics.¹² Given the universal acceptance of a dichotomy between oral and literate societies, and widespread agreement on the nature of the mechanism that effects these differences, it is surprising

that studies linking orthographic types to particular cognitive styles have met with little enthusiasm from mainstream intellectuals.¹³

One factor inhibiting acceptance of the view that particular orthographies affect cognitive dispositions in particular ways – beyond the present academic bias to treat all artifacts of Western civilization negatively, or where that is impossible, to ignore them entirely – has been the failure of those making this claim to demonstrate that the alphabet itself, and not orthography in general, facilitated the abstract “theoretic” thinking that is associated with Western civilization. Although support can be adduced from the specific nature of alphabetic literacy, a better case can be made by pointing to the counterexample of East Asia, whose writing lacks the alphabet’s abstract and analytic characteristics, and whose thought is characterized by the concrete, holistic patterns of oral culture.

Accepting this argument entails certain corollaries, beginning with the need to reject the notion of *intrinsic* Eastern and Western cognitive styles and embrace a simpler and more technically satisfying explanation: that East Asia’s dominant orthography fails to provide the developmental cues supportive of an analytic mindset. This may be good news to scholars who admire oral culture and blame the alphabet for its dehumanizing effects – people who, not coincidentally, also find comfort in the “harmonizing” ideal of the East. However, to many East Asians eager to elevate their accomplishments in scientific theory and abstract thinking to the same high level achieved in economic and aesthetic pursuits, such “sentimental egalitarianism” (Goody and Watt, 1968:67) will have little appeal.

Finally, those wishing to preserve the cognitive basis of Western culture must recognize the unique role the alphabet plays in creating and sustaining that foundation. Although there is no danger of the alphabet being replaced as the West’s orthography, its functionality has been eroded by the shift from reading toward graphics and multimedia, and by misguided efforts to replace phonics with “whole word” instruction.

This pedagogical practice, which puts Westerners on the same level as Chinese vis-à-vis their ability to apprehend and interact with orthography, replaces the alphabet’s abstract task of phoneme analysis with holistic word-shape recognition, on the premise that adult readers routinely perceive words and phrases, not letter-phonemes. This is only partly true: mature readers rely on multiple strategies to derive meaning from print, including a “direct access” method that bypasses phonology (initially) and “phonological recoding” that entails converting the symbols to a speech-based code (Hannas, 1997:154–164). The latter style is employed when a reader confronts novelty and depends on prior instruction in phonics.

The limitations of the whole word method and its failure as an instructional tool have led to a grudging return in American primary schools to traditional phonics as a matter of practical necessity. But there is more to the picture.

Learning the alphabet's grapheme-to-sound correspondences constitutes a child's first explicit introduction to analysis and abstraction — an opportunity that is not shared by members of nonalphabetic cultures. It is a wrenching experience that not all children adapt to in equal measure but one with implications that extend beyond literacy to the cognitive foundations of Western society.

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ENDNOTES

1. See Baum (1982), Capra (1985), Fung (1948), Havelock (1982), Herbig (1995), Logan (1986), Nakamura (1964), Needham (1954, 1969), Nisbett (2001, 2003), Qian (1985), Suttmeir (1989), and van Wolferen (1989).
2. This school of thought is represented today by Derrick de Kerckhove and David Olson.
3. Importantly, the Scribner and Cole study showed that Vai literate in an alphabetic script evidence some of the effects claimed for writing in general, in contrast to those literate in the syllabic orthography, whose cognitive preferences tended to mimic those of nonliterate.
4. See H. Innis (1950), L.S. Vygotsky (1962), Jack Goody (1968, 1986), George Miller (1972), Merald Wrolstad (1976), Brian Stock (1983), David Olson (1994), and Leonard Shlain (1999).
5. Users of syllabaries must sometimes map multiple sounds to one symbol to accommodate contextual variation (Sproat 2005), in the same way that Asians aggregate multiple "readings" to individual Chinese characters, whose realization depends on context. It hardly compares to the task performed by alphabet users, who consciously penetrate the syllable barrier – a cognitive leap that Gleitman (1973) suggests was done independently only once in history – sort the allophonic variation into classes, and relate these classes to a few dozen abstract entities.
6. See Gleitman and Rozin (1973), Read et al. (1986).
7. Pinker defines dyslexia as "a difficulty in reading that is often related to a difficulty in mentally snipping syllables into their phonemes" (1994:322).
8. Technically speaking some of these Sinitic readings are two syllables long in Japanese, the second syllable representing an original Chinese syllable-final consonant. Japanese

has only four such syllables and their vocalism is de-emphasized in speech, so that they function practically as single CVC syllables.

9. See Jurdant (1988).

10. Ko (1989), Yi (1989). Koreans call the need for prior knowledge of Chinese characters to read all-*hangul* texts “false *hangul*” to account for the dependence of educated Koreans on the Chinese symbols.

11. See the present writer’s *The Writing on the Wall*, pp. 143–147, for a discussion of the academic treatment of “oral societies.”

12. See, for example, the essays collected in Deborah Tannen, ed., *Spoken and Written Language: Exploring Orality and Literacy*.

13. The hostile reception accorded Logan’s, Havelock’s, and de Kerckhove and Lumsden’s separate efforts to link alphabetic literacy with Western thought contrasts with the popularity of Capra’s and Shlain’s books, which make the same essential claim but interpret the results of alphabetic literacy negatively. Capra blamed the alphabet for inhibiting a proper, holistic “Eastern” understanding of the universe. Shlain claims the alphabet disadvantages females, who are forced to think unnaturally in a linear fashion.

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