REVIEW ARTICLE

New research on the adoption and transformation of Chinese writing

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A major study has been released on the emergence in East Asia of the logographic, or logo-syllabic, writing systems inherited from Chinese writing, attending primarily to the adaptations and innovations implemented in Korea, Vietnam, Japan and by speakers of the Tai languages of Southern China and Northern Vietnam. It contributes to our understanding of the fundamental mechanisms, of how speakers of different languages transformed the character script. The book points to overarching research problems concerning the relationship between language and writing, how aspects of this relationship are based on universal principles of learning exemplified in bilingual literacy. The research questions presented by the author will ultimately help us better understand literacy learning and the nature of reading and writing ability in general.

Keywords: Literary Sinitic, spoken vernacular, linguistic typology, morpheme, syllable

关键词：：文言、白話、語言類型學、語素、音節

Sinography: The Borrowing and Adaptation of the Chinese Script by Zev Handel (2019) is the most recent assessment of the research on the historical changes in Chinese writing as it came to be used for literary purposes by speakers of the Chinese languages up until the 20th Century and in parallel how it was adopted by the neighboring non-Chinese cultures. The focus on the latter, Korean, Vietnamese, Japanese and Zhuang, is the most far-reaching as no other study to date has attempted a comprehensive analysis of similar proportions. In turn, returning to the source, the complete accounting of the adoption and modification of the Chinese characters throughout East Asia will present new opportunities to better understand the relationship, today and in history, between the same Chinese languages and the Chinese character system. Students from other fields, the cognitive

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science of language and literacy among the first, will take great advantage to make serious contact with the book's findings. The relevant sub-field is continuing work on language contact and bilingualism in literacy learning.

Each of the languages and cultures is taken in turn with separate chapters. What brings all the examples and analyses together is a unifying schema for comparing the unfolding of the independent writing systems, in two parts:

- a method of comparing the systems that follows from a proposal for prioritizing explanation, and
- a single analytical framework devised for the two broad categories under which the receiving cultures borrowed and then repurposed the Chinese characters – phonological adaptation and semantic adaptation, with their respective subcategories.

Innovation by bilingual writers extended this adaptation with the creation of new language-specific graphs.

The proposal for thinking about explanation is that linguistic typology, the grammatical patterns (including the patterns of phonology) of each language, is a determining factor in understanding how speakers of each language, literate in Classical Chinese, tried to solve the problem of orthographic representation. Saying that an aspect of language-script change is a determining factor does not mean that it's the most important factor or even that it came to be the decisive one in culminating decisions of national language policy. But it does point to a more basic, also unifying, concept: that writing depends on, must be aligned to some important degree with, the spoken language – this correspondence being a requirement for all full writing systems.

The single analytical framework for comparing the adaptations carried out in the four languages under the categories of phonological and semantic, as it happens, can make reference to a single source: in the ways that Chinese writers themselves previously adapted the characters during their evolution. This is the main idea of Chapter 2, how the overall method was the same (outlined in Chapter 1), differing in important ways, in the details of application, for the turn of each borrowing language-culture. "[The] basic techniques used to extend logograms in order to generate a complete writing system capable of representing any linguistic utterance are an inherent feature of logograms. Or, perhaps it would be more accurate to say that they are inherent in the human cognitive perception and manipulation of logograms" (Handel 2019: 46).

Examples from the chapters present a series of tests, or research questions. Does the centrality of the typology factor live up to expectations? Might its failure to consistently predict similar or contrasting tendencies stand as clear cut counter-evidence to the writing-depends-on-language hypothesis? Another

possibility is that one or another (outlying) version of the writing-depends-on-language hypothesis is not correct. For example, pulling the threads together from the chapters on Korean and Japanese, are the parallels consistent with shared typological features? Then, how should we contrast these parallels to strong contrasting tendencies in Vietnamese? Another hypothetical test asks: do the design features of the traditional Zhuang script pattern more like Vietnamese Nôm, representing a corresponding contrast to Korean and Japanese vernacular scripts? If the Zhuang script and Chữ Nôm do reveal correlations in counter-position to the Korean and Japanese scripts, could these contrasts be mainly attributed, or not, to cultural influences and learning between speech communities ("could be" presenting itself as a simpler explanation in this case)?

Chapter 1 gives a reason for why the study of the early Sinitic writing of the bordering countries is important. The scripts that emerged were the result of the intuitions of writers calling upon the resources of their dual-language mental grammar, implicit knowledge and acquired metalinguistic reflection based on the prior learning of the system and logic of Chinese writing. Previous to deliberate language-writing system planning and standardization in the cultures where this occurred, the vernacular systems evolved spontaneously. Nevertheless, in the extensive internal variation and irregularity of the early vernacular scripts there also appeared linguistic/orthographic features that were systematic. It is the unplanned and non-standardized emergence of design in each case that is interesting from a scientific point of view. In describing it researchers need to consider what the nature of the common underlying competencies are, some of them specifically linguistic and others cognitive-general.

The question that this line of research poses is why couldn't writing in Literary Chinese serve the communicative and expressive purposes of the bilingual writers? For example, why for the languages with a coinciding typology, such as isolating, and an extensively shared lexicon, could the option of direct borrowing plus semantically adapted logogram (native-language reading of characters preserving their form and meaning) not suffice? The question should be asked because the cost in time and effort of creating independent scripts often faced serious material disincentives. In the example of Vietnam, the development of Nôm (in the face of the long-standing opposition of hundreds of years, internal and external) points to a persistent and overriding motivation.

Korean writers, along with their peers across East Asia, inherited the same capabilities for semantic and phonological adaptation applied to Chinese writing over the many years of its own formation. These capabilities formed part of the same tool kit for building a native language-based writing system derived from the donor system. The set of devices most useful for the task depended on how and to what extent the grammatical patterns could match up in each case. Thus,

in the *hyangga*, poetry from the 8th century, noun and verb roots were written with semantically adapted logographs while suffixes and functional morphemes were written phonographically, or even used alphabetically to mark consonants. The latter also served in Korea as annotations for reading Chinese text.

The role that glossing played in the design of the Korean vernacular script reminds us of the continuity between the logic of the Chinese system and the vernacular systems. The device of phonographic glossing to encode the Korean grammar would have appeared as a solution already familiar to the literate Korean innovators because Chinese texts make use of characters as phonograms for transcribing foreign words and proper nouns. The innovation, then, was the use of phonographs systematically to provide a full version of the text in the Korean language.

The history that we are interested in is also divided by the before and after of the invention of *hangul* in 1443. Its initial use, as it came to be accepted, was to form part of a hybrid orthography, as in Japan: Sino-Korean roots in sinograms, native language morphemes in the phonological script. Only in the most recent years, in South Korea, have the sinograms fell into disuse, making the contrast between Japan and Korea on the one hand and Vietnam on the other even more sharp. Nôm never developed such a fully hybrid system.

Then in an interesting contrast, Chapter 3 explains, again pointing to a difference in linguistic pattern, how it came to be that Korea opted for the design of an alphabet as opposed to seeing the evolution of a syllabary as in Japan. It turns out that the more complex syllable structure of Korean from the beginning motivated the use of graphs to represent coda consonants. While the *kana* syllabaries, evolving from the phonographic use of sinographs, could easily serve the Japanese syllabic (moraic) inventory, a syllabary could not do the same for Korean.

In the Japanese and Korean derivations the typology-related explanation for phonological adaptations toward their use as phonograms is straightforward considering the need to spell out the extensive bound grammatical morphology. Conversely, Vietnamese did not need a solution for this category. That Nôm didn't evolve to incorporate a sub-system of phonologically adapted phonograms is in line with the grammar pattern contrast. This difference is related to a visible graphic contrast. Nôm writers and creators did not undertake a widespread abbreviation of characters as occurred in Japanese and Korean vernacular texts. The explanation offered by Handel is that as a whole Nôm remained logographic. Abbreviation in Japan and Korea was workable and desirable for the limited number of phonograms that came to form an integral component of the writing system. The opposite would be the case for Nôm characters that required an internal structure, with compound elements, signaling distinctions important for character recognition in reading. Then the virtual absence of semantically adapted

logograms (Chinese characters presented in form and for meaning, pronounced in the native language) in Nôm presents an interesting question given the productivity of this adaptation in Korean and Japanese.

Regarding the origins of the independent writing systems, the differences in approach to solving the problem of glossing Literary Sinitic texts presents another opportunity to test the typology factor, starting again with Vietnam. The account in chapter 4 begins with a history of the language in its contact with Chinese. The large scale migration of Chinese speakers into what is modern Northern Vietnam, creating a sizable bilingual speech community during the first millennium, resulted in the massive typological restructuring of the ancestor of the modern Vietnamese language (Phan 2013). The long-term convergence toward morphological and phonological patterns of the Sino-Tibetan languages of southern China sets the language contact situation of Vietnamese apart from that of Korea and Japan.

Did Nôm grow out of the glossing tradition in a manner parallel to that of Korean and Japanese? Evidence, still inconclusive, so far suggests that the traditions differed. For the latter, annotations served to reorder the syntax and supply the required free and bound grammatical morphology for producing a Japanese reading of the Literary Chinese text. In the case of Nôm, freed largely from the task of this kind of grammatical transformation of the texts, the interlineal annotation appears to have served a different function, one rather of explanation, clarification or translation (pp. 134–136).

Considering the contrasting practices of glossing leads to another language-related correlation, in this case one that all the speech communities shared in common, that is, one independent of typological difference. Poetic expression necessarily relies on the language-specific grammatical patterns of lines and stanzas, and would have been thwarted more so than any other genre by the misalignment between speech and Literary Sinitic. In vernacular poetry, "wording," in the broad sense, and linguistic/musical sound patterning comes to the foreground in respect to content, the opposite of expository discourse. Poetic language falls under the category of "verbal art" for this reason, its origin in the human vocal/verbal capabilities predating the invention of writing by thousands of years. The need for a closer alignment: "explains why the earliest fully formed vernacular texts known to us in Korea, Vietnam, and Japan are poems, and why they were not produced in a vacuum but in the context of the development of vernacular glossing" (p. 17). Literary texts in general, for all of these reasons, played an important role in the reform of Chinese writing during the first half of the 20th Century, and do the same for efforts that promote the normalization of vernacular writing today, where this is an active initiative by writers. The typology and writing-depends-on-language hypotheses would predict that the tendency to favor high

fidelity vernacular writing increases the more literary expression leans toward autochthonous poetic forms, less so as it leans toward the genres of prosaic narrative. A Literary Sinitic version of *Tale of Kieu* would be an example of low fidelity in this regard.[1]

Zhuang script is the only attempt by a group of Tai languages and variants to borrow and adapt the Chinese characters. With the extensive derivations and creation of a large number of new characters, a literate monolingual Chinese speaker would be able to guess the pronunciation of many characters but guess the meaning of only a few. Tracing the origins and history of the Old Zhuang Script will depend on the documentation of surviving texts among literate speakers and scribe-caretakers among a wide range of dialects and independent Tai languages of the border region, work still at an early stage. Parenthetically, the manuscripts count upon a unique circumstance among the other vernacular texts: traditional caretakers, today, still copy them and recite, in a special way, from them (Holm 2009). The most visible similarity with Nôm is the predominantly logographic design feature of adapted and new characters, on this feature following the model of Chinese writing.[2] Distinguishing the two neighboring scripts is the proliferation of invented characters. In contrast to Japan and Korea, and coinciding with Nôm, Zhuang appears to have avoided the creation of a sub-system of phonograms, all of which, if finally confirmed, is consistent with the typology hypothesis.

Citing Holm, chapter 7 presents strong evidence that Zhuang and Nôm were invented independently. Despite proximity, and taking into account direct cultural contact between communities along the border regions, resulting in some degree of interaction between the writing systems, this interesting finding is relevant to the book's general claim. Then, while Zhuang makes use of semantically adapted graphs to a limited but not insignificant degree, they are virtually unknown in Nôm. This and other potential differences will deserve future

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1. Studying the relationship between the literary genres and writing in the native language should not fail to recognize that prominent authors, celebrated at the time for their works in the vernacular, wrote extensively in Classical Chinese, the two traditions greatly appreciated and admired, in parallel, throughout the 19th Century and even early part of the 20th century (Nguyễn 1975). Modern Japanese writers during the same period were acclaimed for their *kanshi* 漢詩 (Sato 1998).

2. An adapted character preserves the graphic form of the borrowed Chinese character. While in isolation a literate speaker of Chinese would have recognized it as a valid character, in context (of a vernacular language text) adapted characters often could not have been decoded for meaning, depending on the type of adaptation. New characters are also graphic innovations and would normally only have been recognized and read for meaning by literate speakers of the vernacular language, especially in context.

research attention as the scripts are compared side by side. But the overall contrast on this score, between the two isolating languages, that share this type with the donor, on the one hand, and the two agglutinating, on the other hand, can still be taken as categorical.

On the problem of unravelling cultural influence in language/writing contact and linguistic factors, the comparisons among the vernacular languages/scripts suffer from a happy coincidence (or unhappy depending on one's point of view) of typology and potential for direct cultural influence. A clearer example than that between Vietnamese and Zhuang being that of the cultural influence of Korea upon Japan (p. 230). But then, stepping back, there are the two clearly contrasting "pathways": Chinese → Zhuang and Vietnamese -versus- Chinese → Korean and Japanese where the coincidence applies to one pathway but not the other. Perhaps from this point of view, the modern day conservation of the *kanji* in Japan might be a good candidate for the weight of history and culture.

The third major test of the book is presented as a proposal to undertake further study of the related Khitan and Jurchen scripts that recorded the extinct languages of the respective ancient literate cultures (writing of the latter assumed to be influenced by that of the former). Of agglutinative morphology, the hypothetical emergence of a separate subsystem of phonograms in parallel with a logographic script would be again consistent with the typology model. Reconstructing the early history of the Khitan language and script, and undertaking a comprehensive analysis from surviving examples, may not be possible, compounded by the special circumstances of language contact. Unlike bilingual Korean and Japanese writers who all started with a single literary language from China, Khitans and Jurchens had received the influence of a number of different literacies, including Uygur and Tibetan (pp. 268–269). But the Jurchen script itself is well documented and evidences the above mentioned hybrid design: logographs used for roots and phonograms for phonetic determinatives and grammatical morphemes. In this aspect, the resemblance to the Japanese and early native Korean systems is consistent with predictions. Other interesting differences appear, such as sinograms, in addition to undergoing extensive modification, being employed for native roots rather than borrowed Chinese vocabulary (the latter being scarce in the language).

Applications of the theoretical matrix that we have been examining extend to current research questions in the study of the Chinese languages. The analysis of the above case studies presents interesting lessons for better understanding the unplanned evolving adaptations of modern Chinese, Cantonese-specific, characters in Hong Kong, for one example, and the different process of development/promotion of a standardized script for Minnan 閩南 in Taiwan, for a second example. The same conceptual and practical problems discussed today in these

fields were faced by writers of the non-Chinese languages during the first half of the past millennium. The pending questions in the modern day are analogous to those of alignment and misalignment between the orthographic system of the "central" standard writing (then Literary Chinese) and the languages of the "periphery" of the time. In turn, the New Culture Movement following the 1911 Revolution, that gave rise to the great reform of language use and writing, studied the same conceptual and practical problems of vernacular writing during the years of the last dynasty. In particular, the example that came forward was that of literary production in the variant Baihua 白話 that eventually came to frame the new standard.

Back in the introductory chapter, a footnote makes reference to another important current discussion, in this case regarding the findings from comparative psycholinguistic research on reading in Chinese and in alphabetic systems. See Handel (2104) and Unger (2014) for part of this interesting exchange. Unger questions use of the term *logographic* for categorizing scripts in which graphic units correspond primarily to individual morphemes of the language, as is the case for Chinese, arguing that underlying processing networks for phonology and morphology do not differ when comparing knowledge of one orthography with another. The argument is that neurolinguistic research does not support underlying differences between Chinese writing and alphabetic writing. Unger's critique of the category of logographic appears to consist mainly in that the category overemphasizes the character-morpheme correspondence. Handel's position is that the underlying knowledge and skill of literacy in Chinese is described most clearly in terms of the link between graphs and their corresponding morpheme. Because individual characters and components of characters are directly associated with semantic values (a unique design feature of Chinese writing) they show evidence of mental representation and usage that is different from phonographic systems. This difference should be reflected, coincidentally, in the methods of orthographic borrowing by speakers of other languages.

It's important to begin by taking note of a point of agreement in this debate. A growing consensus in the research on the universals of reading recognizes linguistic and cognitive-general constraints that are common across literacy in all writing systems regardless of whether the unit of correspondence to the grapheme is phoneme, syllable and/or morpheme. Overall, a shared neural network subserves the reading process implementing the biologically inherited interfaces of natural language. The component domains of this linguistic competence network all interact with learned reading ability. The cognitive specialization that characterizes them, including phonology, cannot be overridden during reading by evolutionarily very recent abilities that put orthographic knowledge to use in reading and writing.

However, no aspect of this converging consensus in the field, in particular among researchers associated with the advances over the years in its formulation, puts into question important differences in access to and processing of language components from one kind of script to another. Specifically, studies have shown that in Chinese reading phonology is activated at the syllable level in silent reading as a constituent component of linguistic competence; that phonology cannot be by-passed (as some theories of a dedicated, unique to morpho-syllabic writing, direct pathway from visual processing of orthography to semantics have entertained). It is on this finding that the core concept of reading universals is based (Perfetti et al. 2013): phonology cannot be by-passed in silent text reading in the case of alphabetic and syllabic writing systems either. But no credible proposal ever suggested that the cognitive underpinnings, the neural networks supporting processing of written language in the two most distantly contrasting orthographies, would be the same in all respects. From the beginning of the work on comparative literacy, consistent differences in the details of access appeared (so-called "pathways," timing, etc.). Kuo et al. (2018) summarize the recent research on the variation in learning procedures that correspond to differences in knowledge structure and processing mechanism that set reading in Chinese apart from alphabetic reading. Comparisons of neuroimaging across writing systems have pointed to important evidence on this question. The respective competence domains and processing mechanisms that account for skilled reading correspond to graph-to-language mapping functions, which are not the same in all respects:

- high-quality whole-character representation, versus
- successful word reading even under conditions of varying quality of whole word orthographic representation in alphabetic literacy (Liu & Perfetti 2003).

In other words, the neural instantiation of the acquired structures and interfaces differs, correlating with contrasting performance profiles. The need to correctly describe the variation in how universal constraints are implemented in the language-writing interdependence is today a major point of consensus among researchers in the cognitive science of literacy. Comparative studies on the most distant contrast, alphabetic-morphosyllabic, or logographic, have made important progress in recent years precisely by not under-emphasizing the differences in processing and underlying mental representation (Wei et al. 2014).[3] From this

3. A clarification on terminology in Handel's (2014) reply might be useful for further discussion; that it isn't as important what things are called, but rather the concepts that terms refer to. Thus, logographic should be taken to mean the same as morphosyllabic or logo-syllabic (pp. 10–11).

point of view, Unger's objection could be taken as a version of the writing-depends-on-language hypothesis that takes a good idea too far.

Readers should not skip Chapter 8 that takes us far away from Chinese writing in East Asia. We will recall that the general claim of the study is that universal constraints are at work in how logographic, or morphosyllabic, scripts are modified by speakers of borrowing languages-cultures. The basic tool kit is supported by the relevant components of a cognitive architecture shared by all humans, then to be creatively deployed by speech communities. Variation (often significant and surprising) appears because not all tools are taken up each time; and the selected tools are not used in exactly the same way in each culture. The proposal in this chapter is to ask to what extent the Akkadian borrowing of the Sumerian script conforms to the patterns that we observed in the borrowing of Chinese characters. The question is complicated by the fact that despite a number of striking parallels between the Mesopotamian and East Asian language contact situations, Sumerian, the donor language-culture, differed dramatically from Chinese – SOV, agglutinating with case-marking and morphologically complex verbs. Akkadian, for its part, was also SOV. Sumerian writing like Japanese and Korean, was hybrid, by independent creation. Akkadian made use of its model, in ways we are familiar with already, the most notable component being that of a full-fledged syllabary. The parallel with the emergence in Japan of the *kana* has been what scholars in this field have called special attention to. Despite the differences in starting point, the comparisons with East Asia are compelling, and point to new opportunities for investigators.

One minor amendment I would propose to the chapter on Vietnam, regarding a political decision in the realm of literacy-related corpus planning. This review, with the following exception, does not address questions of implementation of national language and educational policy because the literacy teaching implications of linguistic research, especially on the scale of large multicultural nation-states do not follow a straight line. The extraordinarily complex practical factors to be considered in a national writing system policy go far beyond the findings of a scientific study like the one we are considering here. On the observation that absent any inherent impediment "to a regularized Chữ Nôm script serving as a standard Vietnamese orthography; had history taken a different path, this would have been the result" (Handel 2019: 156), I would substitute "would have" with "possibly might have."

The take-away conclusion of Chapter 9 opens the wide angle again, following Chapter 8, in recalling for us the four independent origins of writing in history. The Chinese origin, in its evolution coming to be the only survivor still in use deserves the attention it gets because of the completeness of the record spanning so many years. Among the East Asian languages that came to borrow, adapt and

reinvent the characters, only one has preserved them as an integral component of its system. Granting that the role of the *kanji* in writing has been progressively separated from "knowledge of its Chinese origins and textual practices" (p. 312), it remains a puzzle, for me at least, how Japanese culture has been able to preserve them. As chapter 5 notes, in Japan, vernacular writing emerged early and expanded during the formative period throughout the literate population on a scale far beyond that of Korea and Vietnam, at the same time conserving the *kanji* while they eventually eroded from use in Korea and Vietnam. This makes double the deserving of attention that the characters receive across the scientific disciples. This should be so, independent of what one's position might be on the related language/literacy policy questions. Importantly, the latter should not bias us in discussions and research on their properties from the linguistic, historical, cognitive-general and learning points of view.

The four inventions of writing emerged from iconic and ideographic symbol systems evolving toward fully-formed writing for representing the full range of spoken language, including its sound system. The mechanisms of extension outlined in the chapters were of the kind that could provide enough flexibility and combinatorial capability for the level of completeness that was required. But as the examples in each chapter showed, their early defect consisted in the increase of ambiguity, requiring new techniques for disambiguation. As a consequence, all four early systems coincided on the logo-syllabic type. If they came to be borrowed, the same universal processes would constrain the changes, under the additional constraint of the grammatical structure of each receiving spoken language. The repurposing by the borrowing languages recapitulated the two basic processes by which the lender scripts were formed: phonetic and semantic extension, mirroring the basic mechanisms invented by the lender for solving the problem of ambiguity. The different implementations depended on the patterns of grammar (p. 311). This is the unified theory that the book proposes: to bring together the study of the universal mechanisms of adaptation/reinvention and the study of linguistic typology.

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