

# The influence of Chinese character form on neighboring orthographic systems

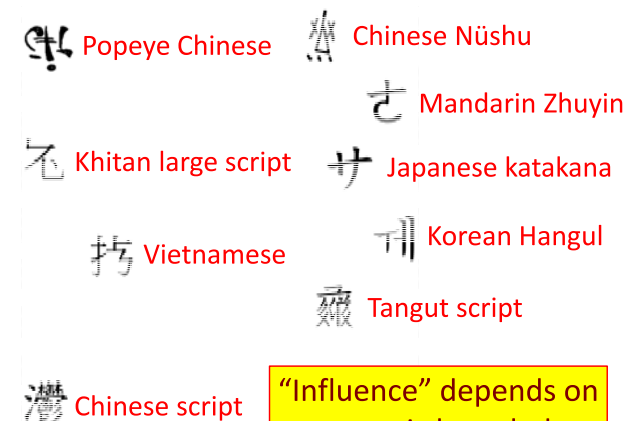
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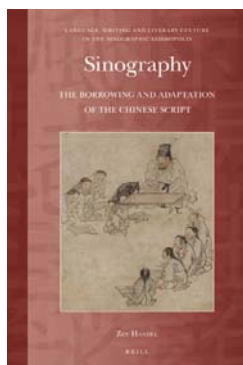


“Influence” depends on systematic knowledge

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## Knowledge of function

- I will *not* talk about this today
  - But see Galambos, Harbour, ...
- Also Handel (2019):

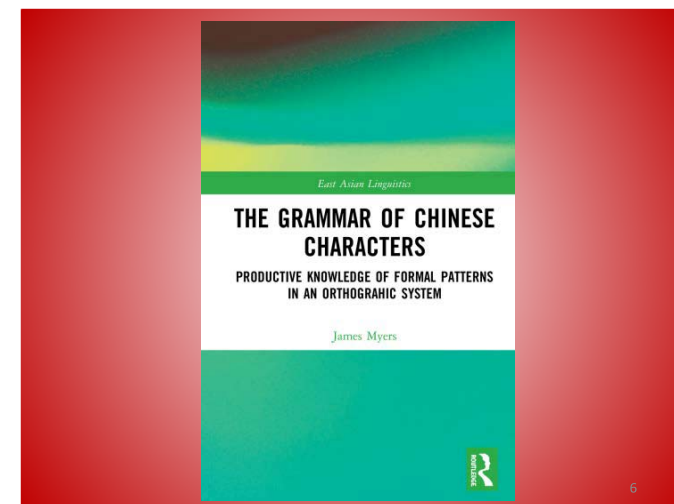


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## Knowledge of form

- Art history approach?
  - Too vague or superficial (cf. Saleh *et al.*, 2016)
- Memetics?
  - Gene analogies break down quickly (Edmonds, 2005)
- My approach: Areal orthographic patterns
  - Analogous to areal sound patterns (Blevins, 2017)
  - Spreading of rules of orthographic grammar
- Orthographic grammar?!
  - An old idea (e.g., graphemes: see history in Kohrt, 1986)
  - Including for Chinese script (Wang, 1983)
  - Chinese character grammar is productive, psychologically real, and structured like “real” grammar (Myers, 2019)

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## Standard objection

- “Writing is not language, but merely a way of recording language by means of visible marks.”  
- Bloomfield (1933, p. 21)
- Readers/writers know far more than they're taught
    - Implicit learning of French spelling (Pacton *et al.*, 2001)
    - Character emergence in Chinese kids (Chan *et al.*, 2008, Tsai & Nunes, 2003)
  - Language ≠ speech
    - Deaf sign languages are natural human languages
    - Direct equivalents of syntax, morphology, phonology, phonetics (Sandler & Lillo-Martin, 2006)
  - A modality-neutral human grammar inducer...?

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## Some terminology

- Morphology: interpreted formal patterns
  - The functional role of graphemes in encoding semantic classes, spoken morphemes, syllables, phonemes, phonological features
- Phonology: uninterpreted formal patterns
  - Constraints on the form and combination of graphemes, predictable grapheme changes that do not affect meaning or pronunciation
- Phonetics: articulation and perception
  - Physiologically universal, concrete, and gradient (cf. phonology: learned, abstract, and discrete)

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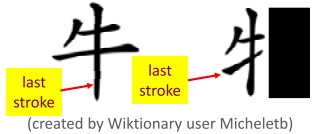
## Character phonology

- Doesn't care about interpretation
- Semantic radicals show “diagonalization”...
  - 土~地 牛~物
- ... and “dotting”:
  - 木~村 火~爛
- But so do constituents that aren't semantic radicals
  - 且~助 工~功
  - 采~彩 禾~和

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## Character phonetics

- Motivates but does not subsume phonology
- Diagonalization and dotting shorten movement from lower right of left constituent to upper left of next
- But they're conventionalized
  - Even in mechanical printing
- Also, stroke order serves them, not vice versa:



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## Stroke hooking

- Rightward hooks point at next-written strokes
  - But these must be crossed: a visually defined context
- Hooks are virtually obligatory in convex curves
- Left hooks favored by asymmetry and top contact



(other than 冂)	Asymmetrical	Symmetrical
<b>Top contact</b>	了可子手竹乎爭承予牙亨牙 糸子孑个爭	亦丁京于于
<b>No top contact</b>	事才水求寸事リ才隶	小

(First observed by Wang, 1983; see psycholinguistic evidence in Myers, 2019)

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## Stroke curving

- Vertical curved strokes are restricted to the left
  - Perhaps motivated by right wrist rotation
- But "left" is defined at the constituent level:
- And they are favored in narrow constituents

	Dominant axis*		
	Wide	Tall	Squarish
<b>Curved</b>		月 甩 周 有 舟 角	丹 用
<b>Straight</b>	冊 冂 岡 巾 內 向 兩 肉 市 雨	再 甬 高 商 喬	同 岡 冉 束

\*Wide = a horizontal line would cross more strokes than a vertical line; etc...  
(First observed by Wang, 1983; see psycholinguistic evidence in Myers, 2019)

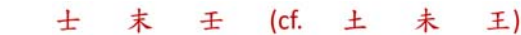
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## Stroke enlargement

- Lower and rightmost strokes enlarge
  - Perhaps due to final lengthening in left-to-right and top-to-bottom stroke order (cf. Cohen-Goldberg, 2017)



- But stroke groups and constituents also enlarge
- And there are lexical exceptions



(See psycholinguistic evidence in Myers, 2019)

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## Other patterns seem universal

- Universals needn't be borrowed (Blevins, 2017)
- Strokes interactions (Changizi et al., 2006; Morin, 2018)
  - Favor cardinal axes (horizontal and vertical)
  - Avoid mixing cardinal and oblique axes
- (Also seen in "Popeye Chinese")



- Binarity (minimal contrast)
  - "Reduplication" restricted to two copies per axis



(For reduplication templates, see psycholinguistic evidence in Myers, 2019)

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## Nüshu (Women's script)

- Represents syllables (roughly) in Xiangnan Tuhua (Hunan) (Van Esch, 2017; Zhao, 1998)
  - Some from specific Chinese characters 清 tshion<sup>44</sup> < 清
  - Inheritance doesn't require borrowing (Blevins, 2017)
- Orthographic phonology
  - Favors oblique strokes, maybe to look non-Chinese?
  - But this still yields right angles
  - Left-edge curving and hooking (inherited?)
  - Reduplication mostly doubling (universal/inherited?)



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## Zhuyin fuhao

- Represents Mandarin onsets, medials, rimes
  - Derived from specific Chinese characters
- Orthographic phonology
  - Mostly inherited
  - But hooking often lost and never added (less productive?)



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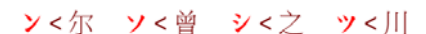
## Katakana

- Derived from specific Chinese characters
- "Aside from superficial differences in graphic form, [the] only difference [between kana and kanji] is the respective functions they perform within Japanese." - Hansell (2002, p. 166)
- Not so!

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## Katakana orthographic phonology

- Katakana vertical strokes generally curve everywhere *except* the left edge
- The system also makes contrasts in stroke *direction*, not just in stroke axis



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## Hangul

- Not derived from specific Chinese characters
- Its orthographic morphology is famously innovative

ㄱ g    ㄲ kk    ㅋ d    ㆁ tt  
 ㅏ a    ㅑ ae    ㅓ ya    ㅕ yae

- Yet its orthographic phonology is still strongly influenced by Chinese script

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## Hangul orthographic phonology

- Diagonalization and dotting (not due to stroke order)

ㄱ ~ ㅋ    ㄴ ~ ㄷ    ㄹ ~ ㄺ    ㅈ ~ ㅊ    ㅊ ~ ㅌ    ㅍ ~ ㅍ  
 ㅍ ~ ㅍ    ㅍ ~ ㅍ

- Stroke enlargement at bottom and right

ㅍ    ㅍ    ㅍ ~ ㅍ    ㅍ ~ ㅍ  
 ㅍ    ㅍ    ㅍ    ㅍ

- But also non-Chinese-like enlargement on left

ㅏ ~ ㅏ    ㅑ ~ ㅑ

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## Tangut script phonology

- Mostly not from specific Chinese characters (Gong, 1982)
- Favors oblique axes, but again crossing at 90° (Clauson's components via Galambos, 2016)

X ㄱ ㄲ ㄳ ㄴ ㄷ ㄸ ㄹ ㄺ ㄻ ㄼ ㄽ ㄾ ㄿ

- Doubling is usually horizontal, as in Chinese

𑖅 𑖆 𑖇 𑖈 𑖉 𑖊

- Hooking only in "convex" strokes

- But maybe merely borrowing of entire strokes?

𑖋 𑖌      𑖍 𑖎  
 ↑      ↑

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## More Tangut script phonology

- Stroke enlargement at bottom (few exceptions)

𑖏 𑖐 𑖑 𑖒 𑖓

- Curving at left edge (within Clauson's components)

𑖔 𑖕 𑖖 𑖗

- ... but not if "wide" (cf. Chinese curving) nor with top contact (cf. Chinese leftward hooking)

𑖘 𑖙 𑖚 𑖛 𑖜 𑖝 𑖞 𑖟 𑖠 𑖡 𑖢 𑖣 𑖤 𑖥 𑖦 𑖧 𑖨 𑖩 𑖪

- ... nor with crossing (plus a few exceptions)

𑖫 𑖬 𑖭 𑖮 𑖯      𑖰 𑖱 𑖲

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## Summary

	Nüshu	Zhuyin	Katakana	Hangul	Tangut
Diagonalization / dotting				Borrowed	
Hooking	Inherited	Avoided			Borrowed (as strokes?)
Curving	Inherited		Reanalyzed		Borrowed / reanalyzed
Enlarging				Borrowed / reanalyzed	Borrowed
Doubling	Inherited / universal			Universal	Universal

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## Conclusions

- Writing systems can be fruitfully analyzed with concepts from morphology, phonology, & phonetics
  - Particularly for highly complex systems like Chinese script
- Some rules of Chinese character phonology have been borrowed into other writing systems
  - Not solely due to universals or inheritance
  - Nor solely borrowing of constituents or strokes
  - Thus the rules were mentally active (at the time)
- Not all patterns were borrowed consistently
  - Perhaps due to attempts to look non-Chinese?
  - Other patterns may not have been sufficiently productive even within Chinese script

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