

The “swinging” effects of morphemic ambiguity in lexical processing: Evidence from Korean

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Introduction

Korean uses both an alphabetic and a logographic script:

- **Hangul** – the native Korean alphabet (alphabetic syllabary)
- **Hanja** – borrowed Chinese characters incorporated into Korean according to Korean phonotactics (logographic)

As an **alphabetic** system, individual **Hangul** characters represent sounds (phonemes), and thus do not alone encode any semantic content.

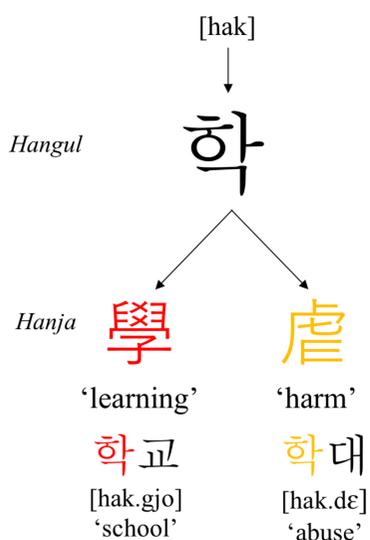
As a **logographic** system, individual **Hanja** characters represent a word or phrase, thereby directly encoding meaning.

All Korean words can be written in Hangul, but not all can be written in Hanja:

Native Korean	
ㄴ = n	ㄷ = u
ㄴ = n < [nun]	ㄴ < n
	눈 < 'eye'
Sino-Korean	
ㅌ = tɕ	ㅌ = tɕ
ㅌ = k < [tɕuk]	ㅌ < tɕ
	죽 < 'eye'
	卽 < 'eye'

Hangul characters combine differently to create 2,000 distinct syllables, of which native Korean words make full use, but Sino-Korean words use only 440 of the possible combinations. This means that:

- (1) the Korean lexicon can be divided into two sub-lexicons, one which is native Korean, and one which is Sino-Korean, as a result of this duality of writing systems, and



- (2) within the Sino-Korean lexicon, there is repeated use of the same syllable to represent different meanings in Sino-Korean.

The phonological route to word recognition is favoured by the alphabetic system, Hangul (Cho & Chen, 1999; 2005); flexible use of phonology in reading Korean, but the precise processing role of Hanja characters in Korean remains unclear.

Research Questions

- Is Hanja encoded in the mental representations of Sino-Korean words, and thus represented in the Korean mental lexicon?
- Assuming Sino-Korean and native Korean words are processed differently, how does the structure of the Korean mental lexicon reflect the semantic contributions of Hanja characters?

Experimental Design

Full word experiments

- Lexical decision task using mediated semantic priming, with two-syllable, bimorphemic Korean primes and targets.
- Primes were Sino-Korean words, containing a homographic morpheme with more than one meaning.
- Primes were presented either visually or auditorily, and participants were asked to respond to only the target items (in the case of visual presentation of primes).

Experimental conditions

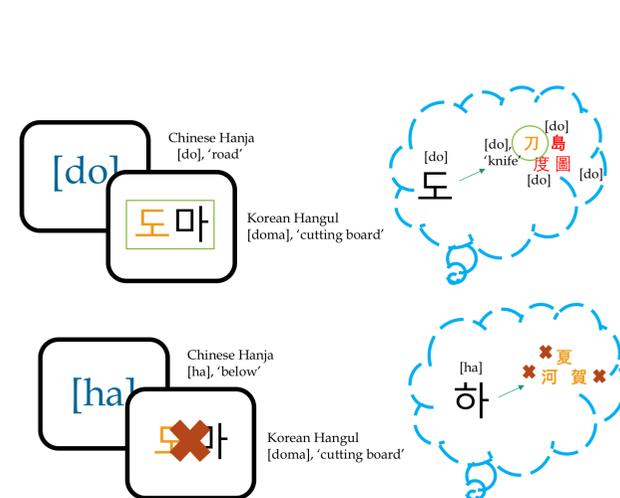
	Condition 1. Directly Related	Condition 2. Indirectly Related	Condition 3. Unrelated
PRIME	학대 [hak.dɛ] 'abuse'	학교 [hak.gjo] 'school'	액자 [ɛk.dza] 'frame'
TARGET	상처 [saŋ.tɕʰa] 'wound'	상처 [saŋ.tɕʰa] 'wound'	상처 [saŋ.tɕʰa] 'wound'

- 1 intramodal, visual-to-visual study; n = 189
- 1 cross-modal, audio-to-visual study; n = 197

Fragment experiment

- Lexical decision task with direct semantic priming, with auditory single morpheme (fragment) primes and two-syllable, bimorphemic Korean targets.

Experimental conditions



Results

Fragment experiment

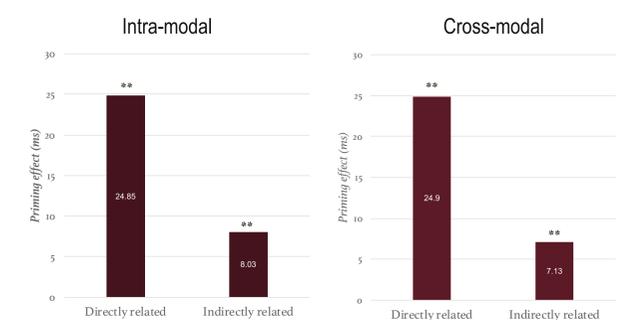
Sino-Korean morphemes alone facilitated semantic access, showing that a single morphemic fragment can activate a group, or cohort, of meanings.

Full word experiments

In both experiments, uniform priming was not observed in the Directly Related condition, where semantic access was expected (Meyer & Schvaneveldt, 1971);

- a subset of words showed priming effects in the Directly Related condition for both studies, which
- suggests variable status of Hanja in the lexicon.

An analysis with this subset of words revealed:

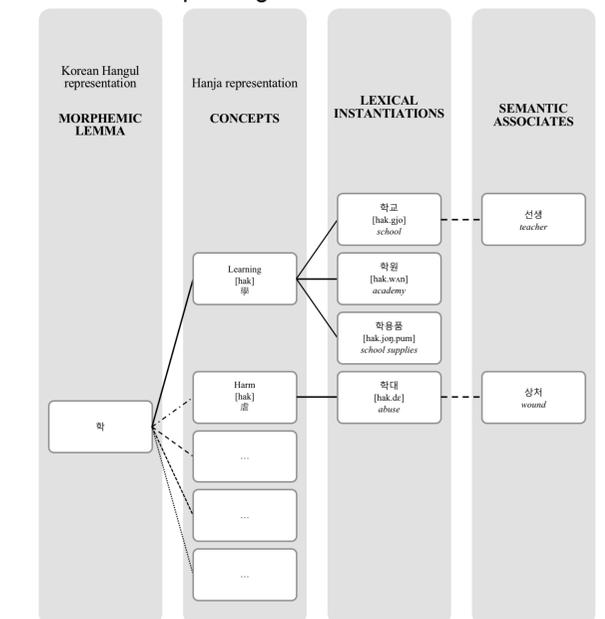


Discussion

- The extent to which Hanja plays an active role in Sino-Korean processing is highly dependent on the specific morpheme.
- Depending on the morpheme, the semantics of Hanja create implicit semantic networks that combine to form the Sino-Korean mental lexicon.

We propose a swinging lexical model (Abdel Rahman & Melinger, 2009) to account for non-categorical semantic relations ('learning' & 'harm')

The conceptual representations of Sino-Korean morphemes swing back and forth, the effects of which reverberate down to the lexical level, creating the observed priming effects.



Selected References

- Abdel Rahman, R. & Melinger, A (2009). Semantic context effects in language production: A swinging lexical network proposal and a review. *Language and Cognitive Processes*, 24, 713-734. Cho, J.-R., & Chen, H.-C. (1999). Orthographic and phonological activation in the semantic processing of Korean Hanja and Hangul. *Language and Cognitive Processes*, 14(5-6), 481-502. Cho, J.-R., & Chen, H.-C. (2005). Semantic and phonological processing in reading Korean Hangul and Hanja words. *Journal of Psycholinguistic Research*, 34(4), 401-414. Marslen-Wilson, W. D. (1987). Functional parallelism in spoken word-recognition. *Cognition*, 25, 71-102. Meyer, D. E. & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology*, 90, 227-234.

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