Title	Distinctive effects of regularity and consistency in orthography-phonology mapping in a logographic writing system: an ERP study
Author(s)	Law, SP; Yum, YNC; Lau, DKY; Su, IF; Mo, KN
Citation	The 6th Annual Conference of the Society for the Neurobiology of Language (SNL 2014), Amsterdam, The Netherlands, 24-29 August 2014. In Conference Abstracts, 2014, p. 208-209
Issued Date	2014
URL	http://hdl.handle.net/10722/210563
Rights	Creative Commons: Attribution 3.0 Hong Kong License

E23 DISTINCTIVE EFFECTS OF REGULARITY AND CONSISTENCY IN ORTHOGRAPHY-PHONOLOGY MAPPING IN A LOGOGRAPHIC WRITING SYSTEM: AN ERP STUDY

Sam-Po Law[1], Yen Na Yum[1], Dustin Lau[2], I-Fan Su[1], Kwan Nok Mo[1];

[1]Division of Speech and Hearing Sciences, University of Hong Kong, Hong Kong SAR,
[2]Department of Chinese and Bilingual Studies, the Hong Kong Polytechnic University, Hong Kong SAR

In alphabetic scripts, phonological regularity and consistency of print-to-sound mapping are not clearly separable. In contrast, these variables are operationally distinct in Chinese. About 80% of Chinese characters are phonograms, containing a semantic radical that provides a clue to the meaning of the character and a phonetic radical providing a clue to the pronunciation (e.g. 趾 zi2 'toe' has a semantic radical 足 meaning 'foot' and a phonetic radical 止 zi2). The orthographyphonology mapping in Chinese can be characterized in terms of regularity defined as the congruence between the pronunciation of a phonogram and that of its phonetic radical, and consistency indexing the proportion of orthographic neighbors that share the same pronunciation as the phonogram. The distinction is evidenced by their independent effects and interaction based on behavioural measures of accuracy and response latency (Lee et al., 2005). Previous ERP studies, however, have focused almost exclusively on the consistency effect, and might have also confounded consistency with regularity (Lee et al. 2006, 2007; Hsu et al., 2009). In the current investigation, regularity and consistency were contrasted in an event-related potential (ERP) study using a lexical decision task and a delayed naming task with native Chinese readers. We predict that the two variables have different neural correlates. In particular, the regularity effect may emerge earlier and last longer than the consistency effect. This is because a skilled reader may be able to immediately segment the character into radical components and access the corresponding phonological forms, i.e. the whole character and the phonetic radical. The consistency effect appears only when the phonetic radical spreads activation to phonograms containing it. The phonograms then access their phonological representations, which compete with one another. The longer duration of regularity effects is the result of sustained activation by orthographic forms in the stimulus, which is not the case with consistency effects. ERP results showed that effects of regularity occurred early after stimulus onset and were long-lasting. Regular characters elicited larger N170, smaller P200, and larger N400 compared to irregular characters. In contrast, significant effects of consistency were only seen at the P200 and consistent characters showed a greater P200 than inconsistent characters. Thus, both the time course and the direction of the effects indicated that regularity and consistency operated under different mechanisms and were distinct constructs. Additionally, both of these phonological effects were only found in the delayed naming task and absent in lexical decision, suggesting that phonological access was non-obligatory for lexical decision. In short, our findings differ importantly from alphabetic scripts in that regularity/consistency effects mainly occur in the N400 and late positive complex (LPC) (Rugg & Curren, 2007; Van Patten & Luka, 2012), and have thus captured a fundamental difference between logographic and alphabetic writing systems, that is, addressed phonology vs. inherently assembled phonology. Moreover, the comparison between lexical decision and delayed naming has demonstrated that access to phonological information from print is not automatic and subject to task demands.