PROJECT SUMMARY

This project investigates the psycholinguistic processing of Chinese characters in reading, i.e., mental activation and recognition of characters as lexical items. Specifically, it examines how readers make use of the information from the phonological and semantic character components of characters, and the influence of various linguistic factors on processing times in recognizing characters – i.e., in character lexical access, or mentally accessing characters or words from the mental lexicon during reading. The present research addresses the debate in psycholinguistic studies as to whether the process of reading and recognizing Chinese words and characters is primarily phonological, or primarily semantic and orthographic, in nature, by means of reaction time studies in which subjects identify or name characters preceded by a masked, subperceptual prime.

Intellectual Merit

This project will show how a standard psycholinguistic model of word recognition, originally developed for alphabetic languages, can apply to a more complex writing system such as Chinese. As such, it can inform linguists and psychologists about the nature of lexical processing in deep orthographic systems, and specifically, how lexical recognition in a logographic script compares to alphabetic systems. The design offers much improved controls compared to past studies of Chinese for various linguistic factors controlled for as statistical covariates for greater analytical precision (e.g., as in Balota et al., 2004). These controls, better sample sizes, and the use of principled, quantifiable semantic controls for the first time in such studies of Chinese lexical processing, represent significant methodological improvements, and greater statistical power and reliability, over past studies. Thus, the experimental results can show more clearly how and to what degree readers use semantic and phonological information in the script. The semantic controls are derived from linguistic surveys, and these semantic indices will be made available online to psycholinguists and the academic community. This research will also bear more generally upon studies of reading and studies of writing systems, by showing how the dual route model, with only minor modification, can capture the similarities and differences between deep and shallow orthographies, and between alphabetic and logographic systems.

Broader Impacts

The empirical results of this research, and the resulting cognitive linguistic extensions, can in turn yield pedagogical applications in teaching Chinese as a first language or second language, specifically, on reading and writing instruction of Chinese characters. Given the advantages of explicit knowledge of phonological and radical patterns for Chinese children learning to write (e.g., Shu & Anderson, 1999), this research can elucidate the cognitive mechanisms involved in learning to write Chinese, or for adults learning Chinese as a second language. Specific proposals for pedagogy can be developed regarding the teaching of character reading and writing to learners of Chinese as a first or second language, including: explicit instruction in the semantic and phonetic character components as learning aids and learning strategies; balancing semantics and phonology in instruction according to the relevance of semantic and phonological processing; giving more or less weight to components of differing semantic or phonological transparency; and the relevance of semantic categories in teaching characters and words. Applications for computer recognition of text are also possible, e.g., weighting components in recognition algorithms according component type, position, frequency, semantic transparency, and phonological transparency; and recognition of novel characters.