As there are no spaces between words in Chinese, native Chinese speakers often disagree on the divisionof the continuous string of characters within a sentence into words. We suggest that the Chinese people segment sentences into words according to complex cognitive representations: psychological words (i.e., representing the phrase "economic development" as a single word). Two studies were conducted. In the first study, we explored the effect of the grades on Chinese word segmentation. We used 63 sentences as materials, with each sentence having one subtype phrase embedded as the target area. Five groups were selected, ranging from third graders to college students. The results suggest: (1) there is over 50 percent inconsistency for all grades in parsing the sentences into words when using the dictionary as a standard of word segmentation; (2) these discrepancies increased as the grades increased; (3) the length of psychological words (numbers on character in the psychological word) increased with age; (4) readers of all ages tended to segment multiple words as one word and rarely segmented single words as multiple words; and (5) target-area analysis showed that the number of phrases segmented as a single word increased as the grades increased, and the number of phrases segmented correctly decreased as the grades increased. In the second study, we explored whether psychological words were easier to process than dictionary-defined words. We used a highlighting manipulation to create four conditions: normal text, text with highlighting to mark words, text with highlighting to mark psychological words, and text with highlighting to mark non-words. Only the target areas were manipulated. The results showed that psychological words were more easily processed than either words or non-words. Compared to the normal (unhighlighted) text condition, both the nonword and word conditions, when highlighted, disrupted Chinese reading.

The Processing of Semantic Radicals in Chinese Character Identification:

Evidence from ERP Studies

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According to Weekes and Chen (2004) and Chen et al. (2006), semantic knowledge encoded in the radical (subcomponents) influences Chinese character identification. A series of three investigations addressed the effects of semantic radical properties on the time course of character processing during: (1) orthographic processing by using a lexical decision task manipulating semantic radical combinability (neighbourhood density); (2) semantic processing by manipulating semantic radical consistency and character transparency using a semantic categorisation task; and (3) the effect of semantic radical characteristics on name production by examining the extent of semantic processing when character orthography is controlled in a picture-word interference task.

These investigations were conducted with native Mandarin speakers residing in the United Kingdom using behavioural and event-related potential methods. Results suggest that: (1) semantic radical combinability has an effect on post lexical processing; (2) effects of semantic radical consistency are limited to opaque characters at an early stage of lexical access, specifically at the recognition potential and during post lexical processing at the N400; and (3) semantic radical effects are task-dependent and rely on the depth of semantic processing.

The findings are discussed with respect to existing models of Chinese character recognition.

The data support multi-level models of orthographic-semantic processing in Chinese that assume two kinds of representation: a radical level and a character level. It is argued however, that the present findings challenge these models, as they cannot account for observed interactions between the effects of semantic radical consistency and character transparency. To explain the present results, cognitive models of Chinese character identification need to assume direct mappings between semantic radicals and the semantic system.

P200 Indexes Phonologic Processing in Chinese Word Recognition

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Whether P200 indexes phonological processing in word recognition remains a controversy. The present study is based on a previous work of the researchers (Zhang, Q., Zhang, J.X., & Kong, L. An ERP study on the time course of phonological and semantic activation in Chinese word recognition. *International Journal of Psychophysiology* 2009, doi:10.1016/j.ijpsycho.2009.04.001), which examined whether P200 is modulated by the degree of phonetic relatedness in Chinese word recognition. Participants did a semantic judgment task on a pair of words. Each pair was either homophonic or rhymed non-homophonic or unrelated as control. Results showed that both the homophonic and rhymed pairs elicited a significantly larger P200 than the controls. The homophonic P200 was larger than the rhymed P200, though the difference was non-significant. P200 topographies were also different for the homophone vs. control and rhymed vs. control comparisons, with the former showing larger areas of brain activation than the latter. The homophone vs. rhymed comparison revealed a P200 topography difference in left frontal areas. The results suggest that P200 is an index of phonological processing that can be modulated by the degree of phonetic relatedness in Chinese word recognition.

The Relationship Between the ERP Rhyming Effect and the Naming Latency of Chinese Native Speakers in Taiwan

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Phonological awareness skills have been found to be a good predictor for later reading ability. Therefore, finding an on-line electrophysiological index of phonological processing along with behavioral data would potentially provide more convergent data to aid in the early identification of those who have difficulty in reading. To address this issue, we examined the ERP rhyming effect exhibited by native Chinese speakers in Taiwan while they made rhyme judgments to visually