LANGUAGE AND COGNITIVE PROCESSES
2009, 24 (7/8), 929–946

Psychology Press
Taylor & Francis Group

Processing the Chinese language: An introduction

Xiaolin Zhou
Centre for Brain and Cognitive Sciences and Department of Psychology; Key Laboratory of Machine Perception and Intelligence, Ministry of Education; and Key Laboratory of Computational Linguistics, Ministry of Education, Peking University, Beijing, China

Zheng Ye
Centre for Brain and Cognitive Sciences and Department of Psychology, Peking University, Beijing, China

Him Cheung and Hsuan-Chih Chen
Department of Psychology, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, China

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

The Chinese language possesses linguistic properties that are distinct from those of the most widely studied European languages. Given such uniqueness, research on the neurocognitive processing of Chinese not only contributes to our understanding of language-specific cognitive processes but also sheds light on the universality of psycholinguistic models developed on the basis of these European languages. In this Introduction, we briefly review neurocognitive studies on the processing of Chinese in the past ten years, summarizing existing findings concerning lexical, sentential, and discourse processing in Chinese.

Keywords: Chinese; Lexical processing; Sentence processing; Discourse processing; Event-related potential; Functional magnetic resonance imaging.

Ten years ago, the senior editors of this issue edited a special issue on the processing of East Asian languages for *Language and Cognitive Processes* (Chen & Zhou, 1999). Since then there have been exponential developments in the neurocognitive study of Chinese, Japanese, and Korean. These developments can be observed in the scope, quality, and quantity of

Correspondence should be addressed to Dr Xiaolin Zhou, Department of Psychology, Peking University, Beijing 100871, China. E-mail: xz104@pku.edu.cn

© 2009 Psychology Press, an imprint of the Taylor & Francis Group, an Informa business
http://www.psypress.com/lcp DOI: 10.1080/01690960903201281

research, and also in the variety of techniques employed, including eye tracking, event-related potential (ERP) recording, and functional magnetic resonance imaging (fMRI). The present volume presents only a biased, restricted sample of these new developments. In this introduction, we review briefly studies from the last ten years on the lexical processing of Chinese characters and compound words, and studies on sentence and discourse processing. These studies form the foundation for other aspects of research on Chinese, including bilingualism and brain imaging.

LEXICAL PROCESSING

Word recognition

Given the uniqueness of the Chinese logographic writing system, cognitive and neural processes underlying the recognition of Chinese characters are among the first to attract psychologists to the Chinese language. The starting point of this field was the issues framed according to the dual-route model of reading (Coltheart, 1978): to what extent phonological mediation plays a role in constraining semantic activation in reading Chinese and how sub-lexical processing of radicals in Chinese characters contributes to phonological activation of whole characters. The widely accepted, intuitive thinking before and in the 1980s was that Chinese characters are recognised predominantly through direct mapping between orthographic information and lexical semantic representation. In the 1990s, a few psychologists, among them Perfetti and his colleagues, were influenced by findings in reading alphabetic words (Lesch & Pollatsek, 1993; Lukatela & Turvey, 1991, 1994; Van Orden, 1987; Van Orden, Johnston, & Hale, 1988) and began to argue for a 'universal role' of phonology in reading (Perfetti, Tan, Zhang, & Georgi, 1995). According to these authors, phonological information in Chinese, as that in alphabetic scripts, is activated earlier than semantic information and access to lexical semantics depends almost exclusively on phonological activation (Perfetti & Zhang, 1995; Perfetti & Tan, 1998; Tan, Hoosain, & Siok, 1996). These arguments, however, hinged upon data that were mostly not replicable (see Chen & Shu, 2001; Xie & Zhou, 2003; Zhou & Marslen-Wilson, 2000a). Moreover, the priority of phonology in lexical processing of Chinese was challenged by case studies which showed that brain-damaged patients suffering from phonological deficits could be intact in understanding the meaning of visually presented words (e.g., Han & Bi, 2009), and that brain-injured anomic individuals with largely preserved reading abilities could produce legitimate responses to pseudo-characters, similar to normal individuals (Law, Weekes, Wong, & Chiu, this issue 2009).

More reliable evidence suggests that access to semantics in skilled reading of Chinese is constrained by both phonology and orthography operating

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

interactively and that phonology has no inherently privileged role over orthography in driving semantic activation (Zhou & Marslen-Wilson, 1999a, 2000a, this issue 2009). For example, it has been shown in an eye movement tracking study that, while there is no evidence for early phonological activation in reading Chinese text containing orthographic errors, phonology helps readers recover from the disruptive effects of errors, as revealed by measures sensitive to the later-stage lexical processing (Feng, Miller, Shu, & Zhang, 2003). This suggestion is also supported by recent event-related potential (ERP) studies on the processing of orthographic and phonological information during sentence comprehension (Meng, Tian, Shu, Jian, & Zhou, 2008; Meng, Tian, Jian, & Zhou, 2007). Nevertheless, the controversy drags on (Ziegler, Tan, Perry, & Montant, 2000; but see Chen, Vaid, & Wu, this issue 2009), with evidence partly coming from studies using the Stroop interference paradigm (Guo, Peng, & Liu, 2005; Saalbach & Stern, 2004), which lacks ecological validity as a means of revealing the role of phonology in normal reading. Other studies switched to investigate lexical access in spoken word production (Wong & Chen, 2008, in press). Recent fMRI studies also investigated neural correlates of semantic and phonological processing (Booth et al., 2006; Xue et al., 2005, see Tan, Laird, Li, & Fox, 2005 for an early meta-analysis) and orthographic processing (Liu et al., 2008) during Chinese word recognition, with activations observed in the left inferior frontal cortex, the parietal lobule, the cingulate cortex and the fusiform gyrus. Furthermore, some related issues that were investigated include the role of the left fusiform gyrus in learning Chinese characters (Deng, Booth, Chou, Ding, & Peng, 2008; Dong et al., 2008; Xue, Chen, Jin, & Dong, 2006) and the neural differentiation between nouns and verbs (Li, Jin, & Tan, 2004; Tsai et al., 2009) and between concrete and abstract words (Zhang, Guo, Ding, & Wang, 2006).

Sublexical processing of phonetic and semantic radicals

Most Chinese characters are composed of semantic and phonetic radicals and the sublexical processing of these radicals plays an important role in the recognition of whole characters (Tsang & Chen, this issue 2009). Semantic radicals provide clues to the semantic category of whole characters. Phonetic radicals, which are usually meaningful characters by themselves, provide clues to the pronunciations of whole characters (i.e., encoding phonological information at the sub-character level). However, due to the evolution of the writing system, both functions are not complete, with only about one third of complex characters having the same pronunciations as their phonetic radicals. Earlier studies in 1980s demonstrated that both regularity (i.e., whether the whole character is pronounced the same as its phonetic radical) and consistency (i.e., whether a set of characters having the same phonetic

radical are pronounced the same) influence phonological activation and the naming speed of these characters (Fang, Horng, & Tzeng, 1986). Zhou and Marslen-Wilson (1999a) demonstrated further that regularity and consistency affect the role of phonological activation in constraining semantic activation of the whole characters. Regularity and consistency of sub-lexical phonological encoding continue to be topics of research in the last ten years. For example, recent ERP studies observed the phonetic consistency effect on N170 and P200 (Hsu, Tsai, Lee, & Tzeng, 2009) and gender differences in using sub-lexical phonological information (Hsiao & Shillcock, 2005; Hsiao, Shillcock, & Lee, 2007). Moreover, consistent with previous behavioural studies (Zhou & Marslen-Wilson, 1999b), it has been reported that the semantic information of the embedded phonetic radical is activated, as revealed in the ERP responses between 50 to 100 ms after perceiving a complex character (Lee, Tsai, Huang, Hung, & Tzeng, 2006) and that at least for low-frequency words, the phonological representation of the phonetic radical can be automatically activated, as reflected by the higher activation in the bilateral fusiform gyri, the posterior superior temporal gyrus and inferior parietal regions (Peng et al., 2004).

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

The representation and processing of compound words

A third line of research, focusing on the morphological processing of Chinese polymorphemic words, was initiated in the 1990s (Zhang & Peng, 1992; Zhou & Marslen-Wilson, 1994, 1995, 2000b; Zhou, Marslen-Wilson, Taft, & Shu, 1999) but has continued to flourish in the last ten years. The Chinese language has an impoverished morphological system, with most words being compound words, composed of two or more constituent morphemes. Earlier studies asked how compound words are represented in the mental lexicon and how their lexical knowledge is accessed in visual or auditory word recognition. These issues continue to be investigated, but from more perspectives such as speech production (Chen & Chen, 2006, 2007; Janssen, Bi, & Caramazza, 2008). Moreover, recent studies examined the role of semantic composition (Bai, Bornkessel-Schlesewsky, Wang, Hung, Schlesewsky, & Burkhardt, 2008; Mok, this issue 2009), the role of frequency in compound word processing (Myers, Huang, & Wang, 2006) and the importance of morphological awareness in the development of reading abilities (Chen, Hao, Geva, Zhu, & Shu, 2009).

SENTENCE PROCESSING

Word category

To understand 'who-did-what-to-whom', we need access to at least two types of information, namely, character and action. These two types of knowledge

correspond roughly to nouns and verbs respectively in word category. In many European languages, word category is indicated by affix and can be detected about 150 ms after affix-onset (e.g., Friederici, Pfeifer, & Hahne, 1993; Hagoort, Wassenaar, & Brown, 2003; Neville, Nicol, Barss, Forster, & Garrett, 1991). In Chinese, however, a primary question is whether and when the category of an incoming word can be identified, given that this language lacks explicit means to indicate category information. In their recent ERP studies, Zhou and colleagues (Jiang & Zhou, 2009; Ye, Luo, Friederici, & Zhou, 2006) investigated this issue in syntactic structures with different complexity. They found that Chinese comprehenders could detect violations of word category about 50 ms after word-onset when listening to simple structures, and about 350 ms after word-onset when reading complex structures. The processing of word category in Chinese, as in some European languages, is reflected as an anterior negativity in ERPs. However, different from these European languages, the anterior negativity in Chinese is not followed by a P600, which is associated with syntactic reanalysis (e.g., Friederici, Hahne, & Mecklinger, 1996; Hahne & Friederici, 1999). Instead, the early negativity is accompanied by a later N400 effect, which is more likely to reflect difficulties of semantic integration. These results suggest that the processing of word category may be universal itself, but the consequence of the failed phrase construction seems to be language-specific. On the other hand, it was found that the Broca's area in the brain plays a role in processing the violation of word category during Chinese sentence reading (Wang et al., 2008) and the acquisition of a specific word category, the classifier, may have profound cognitive consequences on mental representation, thought and online sentence comprehension (Gao & Malt, this issue 2009; Jiang, Tan, & Zhou, 2009; Saalbach & Imai, 2007).

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Grammatical relations

To establish grammatical relations between arguments, readers may use linguistic information such as word order and grammatical agreement. In English and German, readers tend to analyse an ambiguous first argument as a subject (e.g., Bader & Meng, 1999; King & Just, 1991; Lee, 2004; Schriefers, Friederici, & Kühn, 1995). Similar preference of subject-initial order has been observed in Chinese (Wang, Schlesewsky, Bickel, & Bornkessel-Schlesewsky, this issue 2009). As compared with subject-initial sentences, object-initial sentences give rise to a negative ERP effect, demonstrating processing costs in constructing argument structure. Thus, preference of the subject-initial order is likely to be a common strategy in sentence processing across languages. Its universal existence is further confirmed by studies of aphasic patients (Law, 2000; Law & Leung, 1998, 2000). Chinese aphasic patients showed behavioural patterns similar to those

of English aphasic patients when reading subject-initial and object-initial sentences. Aphasic patients of both languages tended to interpret an ambiguous first argument as subject and consequently, performed better for subject- than object-initial sentences.

On the other hand, Chinese comprehenders may employ language-specific processes to parse grammatical agreement. Jiang et al. (2009) investigated temporal neural dynamics of binding noun phrases and the universal quantifier *dou* (all, every), which denotes that the properties being described are true for every member in a set of objects. They observed that a sustained positivity is elicited between 400 and 1100 ms on the universal quantifier which does not match the number of objects indicated by the preceding noun phrase. Moreover, Zhang and Zhang (2008) investigated the processing of aspect markers which are used to indicate whether an event is looked at from an outside or inside perspective (e.g., the perfective markers *le* and *yijing*, the imperfective markers *zhe* and *zhengzai*). They found that a left posterior negativity is elicited between 200 and 400 ms if disagreements appeared between aspect markers (e.g., the perfective marker *le* co-occurring with the imperfective marker *zhengzai*). In both cases, the ERPs in response to grammatical mismatches in Chinese are different from the left anterior negativity observed for tense, gender, or number disagreement in some European languages (Coulson, King, & Kutas, 1998; De Vincenzi et al., 2003; Deutsch & Bentin, 2001; Gunter, Friederici, & Schriefers, 2000; Gunter, Stowe, & Mulder, 1997; Newman, Ullman, Pancheva, Waligura, & Neville, 2007).

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Thematic assignment

At the second stage of sentence comprehension, the processing system may consider lexical properties such as animacy to establish a relationship between thematic roles (who-did-what-to-whom). Animacy distinctions between arguments facilitate the comprehension of sentences with non-canonical word order (Caramazza & Zurif, 1976; Chen, West, Waters, & Caplan, 2006; Traxler, Morris, & Seely, 2002). But the impact of animacy has been shown to be language-specific rather than universal. In English (Weckerly & Kutas, 1999), which prefers a subject-initial order, the processing system tends to assign the first argument as actor and expects it to be animate. A mismatch between the animacy and the expected thematic role (e.g., when the first argument is inanimate) immediately gives rise to an N400 effect, which reflects the difficulty of semantic integration. In German (Bornkessel & Schlesewsky, 2006) and Turkish (Demiral, Schlesewsky, & Bornkessel-Schlesewsky, 2008), because the processing system relies more on case marking, it has little expectancy on the thematic role and the animacy of

the first argument. As a consequence, the animacy information has no impact on the processing of the first argument.

Chinese can be seen as more like English than German in that it prefers the subject-initial order and does not have morphological case marking. However, in their recent study, Philipp, Bornkessel-Schlesewsky, Bisang, and Schlesewsky (2008) found no effect of animacy on the first argument but an N400 effect on a later position where it became obvious that the first inanimate argument was the actor. In other words, here the ERP patterns in Chinese mirrored those in German rather than those in English, suggesting that the animacy information does not initially influence the thematic interpretation but later on it plays an important role when two (or more) arguments must be integrated to establish a coherent relationship between thematic roles.

Is syntax prior to semantics?

A central question in the study of sentence processing is the relationship between syntactic and semantic processes. Two main classes of psycholinguistic models have been proposed to account for behavioural results, namely syntax-first models and interactive models. Syntax-first models (Fodor, 1983; Frazier & Fodor, 1978) assume that syntactic processes temporally and functionally precede semantic processes, while interactive models (Bates & MacWhinney, 1987; MacDonald, Pearlmutter, & Seidenberg, 1994; Marslen-Wilson & Tyler, 1980; Taraban & McClelland, 1998) assume that syntactic and semantic processes already interact at an early stage. Syntax-first models seem to be better supported by a series of ERP studies in English and German (Friederici, 2002). Friederici and colleagues found that the building of phrase structure takes place between 100 and 300 ms (e.g., Friederici et al., 1993, 1996; Hahne & Friederici, 1999; Neville et al., 1991), earlier than lexical access and semantic integration which show up between 300 and 500 ms (e.g., Chwilla, Brown, & Hagoort, 1995; Holcomb & Neville, 1991; Kutas & Hillyard, 1980; McCallum, Farmer, & Pocick, 1984; Van Petten, 1993). Moreover, semantic integration could be blocked when initial syntactic processing processes fail (Hahne & Friederici, 2002). However, the priority of syntactic processes is only partially supported in Chinese.

Consistent with studies in English and German, ERP studies in Chinese found that syntactic processes start earlier than semantic processes (Ye et al., 2006; but see Yang, Wang, Chen, & Rayner, in press, for inconsistent evidence from Chinese readers' eye movements). These two types of linguistic processes are independent from each other in an early stage (between 150 and 250 ms) but interact in a later stage (between 250 and 400 ms). But semantic processes would not be blocked when syntactic processes fail. Combined syntactic-semantic violations elicit an N400 effect which is similar or even larger than that elicited by pure semantic violations (Ye et al., 2006; Yu &

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Zhang, 2008), indicating that the processing system is dealing with difficulties in semantic integration.

Syntactic ambiguity

Psycholinguistic models also diverge on how many representations are constructed and maintained during the incremental processing of ambiguous sentences. Serial parsing models (e.g., Frazier, 1987) assume that only the structurally simplest analysis is maintained if a structure has more than one interpretation. If the new input does not support the preferred interpretation, the processing system will conduct reanalysis to reach the complex alternative. In contrast, parallel parsing models (e.g., McRae, Spivey-Knowlton, & Tanenhaus, 1998; Spivey & Tanenhaus, 1998; Tyler & Marslen-Wilson, 1977) assume that all syntactic alternatives are activated, competing for selection as the final interpretation. Although the processing of syntactic ambiguity is extensively examined in English (e.g., Altmann, 1998; Bornkessel, Fiebach, & Friederici, 2004; Mason, Just, Keller, & Carpenter, 2003; Novais-Santos, Gee, Shah, Troiani, Work, & Grossman, 2007), it has been rarely explored in Chinese. Using a syntactically ambiguous construction, Hsieh, Boland, Zhang, and Yan (this issue 2009) found Chinese readers maintain two candidate interpretations during online processing. They do not conduct reanalysis to get the more complex interpretation when the new input is inconsistent with the simpler one. In other words, this finding is in line with parallel parsing models.

DISCOURSE PROCESSING

Semantic and referential processes beyond sentences

Sometimes readers not only need to integrate a word with sentential context, but also need to integrate it with background information at a discourse level. In this integrative process, different types of information, such as discourse focus (whether the discourse structure foregrounds a particular protagonist), pragmatic inference and type of anaphoric expression, may come into play (Marslen-Wilson, Tyler, & Koster, 1993). For example, when encountering the word 'hamburger' in a sentence 'Mary ordered a hamburger', readers need to reactivate the related information (e.g., Mary was described as a vegetarian) provided by preceding sentences to see whether the incoming word is consistent with discourse context. Similar to English readers (e.g., Albrecht & O'Brien, 1993; Cook & Myers, 2004; Ehrlich & Rayner, 1983; O'Brien, Shank, Myers, & Rayner, 1988), Chinese readers showed longer first-pass reading time when the incoming word fitted well with the sentential context but not with the discourse context, indicating

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

that the textual information is immediately retrieved and integrated with new information (Wang, Chen, Yang, & Mo, 2008; but see Mo & Zhao, 2003).

If the textual information is ambiguous, for example, when one pronoun has two possible antecedents (e.g., Ronald told Frank that *he* had a positive attitude towards life . . .), Chinese readers tend to link the ambiguous pronoun with the first-appearing antecedent (Chen, Cheung, Tang, & Wong, 2000; Yang, Gordon, Hendrick, & Hue, 2003). In English, referential processes on discourse level could be affected by verbs' semantic properties such as the implicit causality. For example, the sentences 'David praised Linda because he . . .' sounds less normal because the implicit causality of the verb confines the pronoun to the second (object) rather than the first (subject) antecedent (Guerry, Gimenes, Caplan, & Rigalleau, 2006; Koornneef & Van Berkum, 2006). However, this may not be the case in Chinese (Bai, Zhang, & Yan, 2005; Sun, Shu, Zhou, & Zheng, 2004). In an ERP study, Li, Jiang, Tan, and Zhou (2009) found that in the 300–400 ms time window post-onset of the pronoun, a frontal negativity effect was elicited on the bias-inconsistent pronoun relative to the bias-consistent pronoun regardless of the type of the verb-based implicit causality. In the 450–750 ms time window, a posterior positivity effect (P600) was elicited on the inconsistent pronoun in the object-biased sentence and a posterior negativity effect was elicited on the inconsistent pronoun in the subject-biased sentence. These findings suggest that (1) the implicit causality of the verb is used immediately to constrain pronoun resolution; and (2) the processing of the different types of causality bias is subserved by partly different neural mechanisms.

Prosodic processing

Prosodic properties of speech may denote lexical, sentential or discourse meanings and can be as effective as overt lexical cues in controlling how the listener resolves syntactic ambiguity in spoken language comprehension (Marslen-Wilson, Tyler, Warren, Grenier, & Lee, 1982). Disruption of local prosodic structures can have detrimental effects on utterance comprehension (Tyler & Warren, 1987). Similar to many other languages, Chinese uses pitch accent to indicate the information state of sentence or discourse constitutes. Speakers usually accentuate the focus or new information and leave background or given information unaccented. On the other hand, differing from non-tonal languages, Chinese uses pitch contours to distinguish lexical meanings (e.g., hua1 [flower] vs. hua4 [picture]). To investigate prosodic processing in Chinese, Yang and colleagues carried out a series of studies with the ERP technique (Li, Hagoort, & Yang, 2008; Li, Yang, & Hagoort, 2008; Li, Yang, & Ren, 2009). They found that Chinese listeners can rapidly identify the semantic consequence of accentuation. They observed an N400 effect for

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

the new information being inappropriately unaccented (Li et al., 2008) and a mismatch negativity for the old information being unexpectedly accented (Li et al., 2009). Moreover, the processing of tone started about 90 ms earlier than the processing of accentuation. Although the processing of pitch accent overlaps with the processing of pitch contour in time course, they did not interact with each other during Chinese sentence comprehension (Li et al., 2008).

On the other hand, little is known to what extent prosodic information constrains neurocognitive processes of written language processing. While prosodic information in the spoken language is conveyed through acoustic variations, prosodic information in the written language can be conveyed through punctuation, which has been under electrophysiological investigation in some European languages (Steinhauer, 2003; Steinhauer & Friederici, 2001). In a recent ERP study, Luo and Zhou (2009) asked whether a particular prosodic constraint in Chinese, the rhythmic pattern of the verb–noun combination, affects sentence reading and whether neural markers of rhythmic pattern processing are similar to those of prosodic processing in the spoken domain. In Chinese, the rhythmic pattern refers to the combination of words with different lengths, with some combinations (e.g., the [2 + 1] pattern; numbers in brackets stand for the number of syllables of the verb and of the noun respectively) disallowed and some combinations (e.g., [1 + 1] or [2 + 2]) preferred. The authors manipulated the well-formedness of rhythmic pattern as well as the semantic congruency between the verb and the noun and found that the abnormal rhythmic pattern evoked an N400-like effect and a late positivity effect in semantically congruent sentences; these effects were reduced or eliminated in semantically incongruent sentences. In addition, the abnormal rhythmic pattern elicited an earlier positivity effect in semantically incongruent sentences, which was reduced in semantically congruent sentences. These findings suggest that information concerning rhythmic pattern is used rapidly and interactively to constrain semantic access/integration during Chinese sentence reading.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

CONCLUSION

The Chinese language has linguistic properties that are distinct from those of many Indo-European languages. Given these unique properties, research on the processing of Chinese language contributes to our knowledge of language-specific cognitive processes and sheds light on the universality of psycholinguistic models developed on the basis of European languages. Clearly, the present review is incomplete, both in terms of the topics covered and in terms of the publications cited. We have restricted ourselves to lexical, sentence, and discourse processing given that they are the driving

force behind the neurocognitive study of the Chinese language. The present special issue is also heavily biased, in that most studies included are on lexical processing of written Chinese, using mostly behavioural measures. There are other innovative studies on the Chinese language in the field (e.g., Cheung & Chen, 2004; Cheung, Chen, Creed, Ng, Wang, & Mo, 2004; Cheung, Chen, & Yeung, 2009; Schirmer, Tang, Penney, Gunter, & Chen, 2005; Ye, Zhan, & Zhou, 2007; Ye & Zhou, 2008, in press-a, in press-b; Zhu, Zhang, Wang, Xiao, Huang, & Chen, 2009), using different techniques and covering new topics. We are sure that in another ten years the neurocognitive study of the Chinese language will have a totally new look.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

REFERENCES

Albrecht, J. E., & O'Brien, E. J. (1993). Updating a mental model: Maintaining both local and global coherence. *Journal of Experimental Psychology: Learning, Memory and Cognition*, *19*, 1061–1070.

Altmann, G. T. M. (1998). Ambiguity in sentence processing. *Trends in Cognitive Sciences*, *2*, 146–152.

Bai, C., Bornkessel-Schlesewsky, I., Wang, L., Hung, Y.-C., Schlesewsky, M., & Burkhardt, P. (2008). Semantic composition engenders an N400: evidence from Chinese compounds. *Neuroreport*, *19*, 695–699.

Bai, X., Zhang, X., & Yan, G. (2005). The eye movement research on the time course of verb's implicit causality in pronoun resolution. *Psychological Exploration*, *25*, 19–23.

Bader, M., & Meng, M. (1999). Subject-object ambiguities in German embedded clauses: An across-the-board comparison. *Journal of Psycholinguistic Research*, *28*, 121–143.

Bates, E., & MacWhinney, B. (1987). Competition, variation and language learning. In B. MacWhinney (Ed.), *Mechanisms of language acquisition* (pp. 157–194). Hillsdale, NJ: Lawrence Erlbaum Associates.

Booth, J. R., Lu, D., Burman, D. D., Chou, T.-L., Jin, Z., Peng, D.-L., Zhang, L., Ding, G.-S., Deng, Y., & Liu, L. (2006). Specialization of phonological and semantic processing in Chinese word reading. *Brain Research*, *1071*, 197–207.

Bornkessel, I. D., Fiebach, C. J., & Friederici, A. D. (2004). On the cost of syntactic ambiguity in human language comprehension: An individual differences approach. *Cognitive Brain Research*, *21*, 11–21.

Bornkessel, I., & Schlesewsky, M. (2006). The extended argument dependency model: A neurocognitive approach to sentence comprehension across languages. *Psychological Review*, *113*, 787–821.

Caramazza, A., & Zurif, E. B. (1976). Dissociation of algorithmic and heuristic processes in language comprehension: Evidence from aphasia. *Brain and Language*, *3*, 572–582.

Chen, T. M., & Chen, J. Y. (2006). Morphological encoding in the production of compound words in Mandarin Chinese. *Journal of Memory and Language*, *54*, 491–514.

Chen, J. Y., & Chen, T. M. (2007). Form encoding in Chinese word production does not involve morphemes. *Language and Cognitive Processes*, *22*, 1001–1020.

Chen, H.-C., Cheung, H., Tang, S. L., & Wong, Y. T. (2000). Effects of antecedent order and semantic context on Chinese pronoun resolution. *Memory and Cognition*, *28*, 427–438.

Chen, H.-C, & Shu, H. (2001). Lexical activation during the recognition of Chinese characters: Evidence against early phonological activation. *Psychonomic Bulletin and Review*, *8*, 511–518.

Chen, H.-C., Vaid, J., & Wu, J.-T. (2009). Homophone density and phonological frequency effects in Chinese visual word recognition. *Language and Cognitive Processes*, *24*(7/8), 967–982.

Chen, H.-C., & Zhou, X. (Eds.). (1999). Processing East Asian languages [special issue]. *Language and Cognitive Processes*, *14*(5/6).

Chen, E., West, W. C., Waters, G., & Caplan, D. (2006). Determinants of bold signal correlates of processing object-extracted relative clauses. *Cortex*, *42*, 591–601.

Chen, X., Hao, M. L., Geva, E., Zhu, J., & Shu, H. (2009). The role of compound awareness in Chinese children's vocabulary acquisition and character reading. *Reading and Writing*, *22*, 615–631.

Cheung, H., & Chen, H.-C. (2004). Early orthographic experience modifies both phonological awareness and on-line speech processing. *Language and Cognitive Processes*, *19*, 1–28.

Cheung, H., Chen, H.-C., Creed, N., Ng, L., Wang, S. P., & Mo, L. (2004). Relative roles of general and complementation language in theory-of-mind development: Evidence from Cantonese and English. *Child Development*, *75*, 1155–1170.

Cheung, H., Chen, H.-C., & Yeung, W. (2009). Relations between mental verb and false belief understanding in Cantonese speaking children. *Journal of Experimental Child Psychology*, *104*, 141–155.

Chwilla, D. J., Brown, C. M., & Hagoort, P. (1995). The N400 as a function of the level of processing. *Psychophysiology*, *32*, 274–285.

Coltheart, M. (1978). Lexical access in simple reading tasks. In G. Underwood (Ed.), *Strategies of information processing* (pp. 151–216). London: Academic Press.

Cook, A. E., & Myers, J. L. (2004). Processing discourse roles in scripted narratives: The influences of context and world knowledge. *Journal of Memory and Language*, *50*, 268–288.

Coulson, S., King, J. W., & Kutas, M. (1998). Expect the unexpected: Event-related brain responses to morphosyntactic violations. *Language and Cognitive Processes*, *13*, 21–58.

Demiral, S. B., Schlesewsky, M., & Bornkessel-Schlesewsky, I. (2008). On the universality of language comprehension strategies: Evidence from Turkish. *Cognition*, *106*, 484–500.

Deng, Y., Booth, J. R., Chou, T.-L., Ding, G.-S., & Peng, D.-L. (2008). Item-specific and generalization effects on brain activation when learning Chinese characters. *Neuropsychologia*, *46*, 1864–1876.

Deutsch, A., & Bentin, S. (2001). Syntactic and semantic factors in processing gender agreement in Hebrew: Evidence from ERPs and eye movements. *Journal of Memory and Language*, *45*, 200–224.

De Vincenzi, M., Job, R., Di Matteo, R., Angrilli, A., Penolazzi, B., Ciccarelli, L., & Vespignani, F. (2003). Differences in the perception and time course of syntactic and semantic violations. *Brain and Language*, *85*, 280–296.

Dong, Q., Mei, L., Xue, G., Chen, C., Li, T., Xue, F., & Huang, S. (2008). Sex-dependent neurofunctional predictors of long-term maintenance of visual word learning. *Neuroscience Letters*, *430*, 87–91.

Ehrlich, K., & Rayner, K. (1983). Pronoun assignment and semantic integration during reading: Eye movements and immediacy of processing. *Journal of Verbal Learning and Verbal Behavior*, *22*, 75–87.

Fang, S.-P., Horng, R.-Y., & Tzeng, O. (1986). Consistency effects in the Chinese character and pseudo-character naming tasks. In H. S. R. Kao, & R. Hoosain (Eds.), *Linguistics, psychology, and the Chinese language* (pp. 11–21). Center of Asian Studies, University of Hong Kong.

Feng, G., Miller, K., Shu, H., & Zhang, H. (2003). Rowed to recovery: The use of phonological and orthographic information in reading Chinese and English. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *27*, 1079–1100.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Fodor, J. A. (1983). *The modularity of mind: An essay on faculty psychology*. Cambridge, MA: MIT Press.

Frazier, L. (1987). Sentence processing: A tutorial review. In M. Coltheart (Ed.), *Attention and performance XII: The psychology of reading* (pp. 559–586). Hove, UK: Lawrence Erlbaum Associates.

Frazier, L., & Fodor, J. A. (1978). The sausage machine: A new two-stage model of the parser. *Cognition*, *6*, 291–325.

Friederici, A. D. (2002). Towards a neural basis of auditory sentence processing. *Trends in Cognitive Sciences*, *6*, 78–84.

Friederici, A. D., Hahne, A., & Mecklinger, A. (1996). Temporal structure of syntactic parsing: Early and late event-related brain potential effects elicited by syntactic anomalies. *Journal of Experimental Psychology: Learning, Memory and Cognition*, *22*, 1–31.

Friederici, A. D., Pfeifer, E., & Hahne, A. (1993). Event-related brain potentials during natural speech processing: Effects of semantic, morphological and syntactic violations. *Cognitive Brain Research*, *1*, 183–192.

Gao, M. Y., & Malt, B. C. (2009). Mental representation and cognitive consequences of Chinese individual classifiers. *Language and Cognitive Processes*, *24*(7/8), 1124–1179.

Guerry, M., Gimenes, M., Caplan, D., & Rigalleau, F. (2006). Hoe long does it take to find a clause? An online investigation of implicit causality in sentence production. *Quarterly Journal of Experimental Psychology*, *59*, 1535–1555.

Guo, T., Peng, D., & Liu, Y. (2005). The role of phonological activation in the visual semantic retrieval of Chinese characters. *Cognition*, *98*, B21–B34.

Gunter, T. C., Friederici, A. D., & Schriefers, H. (2000). Syntactic gender and semantic expectancy: ERPs reveal early autonomy and late interaction. *Journal of Cognitive Neuroscience*, *12*, 556–568.

Gunter, T. C., Stowe, L. A., & Mulder, G. (1997). When syntax meets semantics. *Psychophysiology*, *34*, 660–676.

Hahne, A., & Friederici, A. D. (1999). Electrophysiological evidence for two steps in syntactic analysis: Early automatic and late controlled processes. *Journal of Cognitive Neuroscience*, *11*, 193–204.

Hahne, A., & Friederici, A. D. (2002). Differential task effects on semantic and syntactic processes as revealed by ERPs. *Cognitive Brain Research*, *13*, 339–356.

Hagoort, P., Wassenaar, M., & Brown, C. M. (2003). Interplay between syntax and semantics during sentence comprehension: ERP effects of combining syntactic and semantic violations. *Journal of Cognitive Neuroscience*, *15*, 883–899.

Han, Z. Z., & Bi, Y. C. (2009). Reading comprehension without phonological mediation: Further evidence from a Chinese aphasic individual. *Science in China Series C – Life Sciences*, *52*, 492–499.

Holcomb, P. J., & Neville, H. J. (1991). Natural speech processing: An analysis using event-related brain potentials. *Psychobiology*, *19*, 286–300.

Hsiao, J. H., & Shillcock, R. (2005). Foveal splitting causes differential processing of Chinese orthography in the male and female brain. *Cognitive Brain Research*, *25*, 531–536.

Hsiao, J. H., Shillcock, R., & Lee, C. Y. (2007). Neural correlates of foveal splitting in reading: Evidence from an ERP study of Chinese character recognition. *Neuropsychologia*, *45*, 1280–1292.

Hsieh, Y., Boland, J. E., Zhang, Y., & Yan, M. (2009). Limited syntactic parallelism in Chinese ambiguity resolution. *Language and Cognitive Processes*, *24*(7/8), 1227–1264.

Hsu, C. H., Tsai, J. L., Lee, C. Y., & Tzeng, O. J. L. (2009). Orthographic combinability and phonological consistency effects in reading Chinese phonograms: An event-related potential study. *Brain and Language*, *108*, 56–66.

Janssen, N., Bi, Y. C., & Caramazza, A. (2008). A tale of two frequencies: Determining the speed of lexical access for Mandarin Chinese and English compounds. *Language and Cognitive Processes*, *23*, 1191–1223.

Jiang, X., Tan, Y., & Zhou, X. (2009). Processing the universal quantifier during sentence comprehension: ERP evidence. *Neuropsychologia*, *47*, 1799–1815.

Jiang, X., & Zhou, X. (2009). Processing different level of syntactic hierarchy: An ERP study on Chinese. *Neuropsychologia*, *47*, 1282–1293.

King, J. W., & Just, M. A. (1991). Individual differences in syntactic processing: The role of working memory. *Journal of Memory and Language*, *30*, 580–602.

Koornneef, A. W., & Van Berkum, J. J. A. (2006). On the use of verb-based implicit causality in sentence comprehension: Evidence from self-paced reading and eye tracking. *Journal of Memory and Language*, *54*, 445–465.

Kutas, M., & Hillyard, S. A. (1980). Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science*, *207*, 203–205.

Law, S.-P. (2000). Structural prominence hypothesis and Chinese aphasic sentence comprehension. *Brain and Language*, *74*, 260–268.

Law, S.-P., & Leung, M.-T. (1998). Sentence comprehension in Cantonese Chinese aphasic patients. *Aphasiology*, *12*, 49–63.

Law, S.-P., & Leung, M.-T. (2000). Sentence processing deficits in two Cantonese aphasic patients. *Brain and Language*, *72*, 310–342.

Law, S.-P., Weekes, B. S., Wong, W., & Chiu, K. (2009). Reading aloud pseudo-characters by individuals with acquired dyslexia: Evidence for lexically mediated processes in reading Chinese. *Language and Cognitive Processes*, *24*(7/8), 983–1008.

Lee, M.-W. (2004). Another look at the role of empty categories in sentence processing (and grammar). *Journal of Psycholinguistic Research*, *33*, 51–73.

Lee, C. Y., Tsai, J. L., Huang, H. W., Hung, D. L., & Tzeng, O. J. L. (2006). The temporal signatures of semantic and phonological activations for Chinese sublexical processing: An event-related potential study. *Brain Research*, *1121*, 150–159.

Lesch, M. F., & Pollatsek, A. (1993). Automatic access of semantic information by phonological codes in visual word recognition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *19*, 285–294.

Li, P., Jin, Z., & Tan, L. H. (2004). Neural representations of nouns and verbs in Chinese: an fMRI study. *Neuroimage*, *21*, 1533–1541.

Li, X., Hagoort, P., & Yang, Y. (2008). Event-related potential evidence on the influence of accentuation in spoken discourse comprehension in Chinese. *Journal of Cognitive Neuroscience*, *20*, 906–915.

Li, X., Jiang, X., Tan, Y., & Zhou, X. (2009). *Differential effects of the verb-based implicit causality upon pronoun resolution: An ERP study.* Manuscript submitted for publication.

Li, X., Yang, Y., & Hagoort, P. (2008). Pitch accent and lexical tone processing in Chinese discourse comprehension: An ERP study. *Brain Research*, *1222*, 192–200.

Li, X., Yang, Y., & Ren, G. (2009). Immediate integration of prosodic information from speech and visual information from pictures in the absence of focused attention: A mismatch negativity study. *Neuroscience*, *161*, 59–66.

Liu, C., Zhang, W.-T., Tang, Y.-Y., Mai, X.-Q., Chen, H.-C., Tardif, T., & Luo, Y.-J. (2008). The visual word form area: Evidence from an fMRI study of implicit processing of Chinese characters. *Neuroimage*, *40*, 1350–1361.

Lukatela, G., & Turvey, M. T. (1991). Phonological access of the lexicon: Evidence from associative priming with pseudohomophones. *Journal of Experimental Psychology: Human Perception and Performance*, *19*, 166–178.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Lukatela, G., & Turvey, M. T. (1994). Visual lexical access is initially phonological: 1. Evidence from associative priming by words, homophones, and pseudohomophones. *Journal of Experimental Psychology: General*, *123*, 107–128.

Luo, Y., & Zhou, X. (2009). *ERP evidence for the online processing of rhythmic pattern during Chinese sentence reading*. Manuscript in preparation.

MacDonald, M. C., Pearlmutter, N. J., & Seidenberg, M. S. (1994). The lexical nature of syntactic ambiguity resolution. *Psychological Review*, *101*, 676–703.

Mason, R. A., Just, M. A., Keller, T. A., & Carpenter, P. A. (2003). Ambiguity in the brain: what brain imaging reveals about the processing of syntactically ambiguous sentences. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *29*, 1319–1338.

Marslen-Wilson, W. D., & Tyler, L. K. (1980). The temporal structure of spoken language understanding. *Cognition*, *8*, 1–71.

Marslen-Wilson, W. D., Tyler, L. K., & Koster, C. (1993). Integrative processes in utterance resolution. *Journal of Memory and Language*, *32*, 647–666.

Marslen-Wilson, W. D., Tyler, L. K., Warren, P., Grenier, P., & Lee, C. S. (1982). Prosodic effects in minimal attachment. *Quarterly Journal of Experimental Psychology*, *45A*, 73–87.

McCallum, M. C., Farmer, S. F., & Pocick, P. V. (1984). The effects of physical and semantic incongruities on auditory event-related potentials. *Electroencephalography and Clinical Neurophysiology*, *59*, 477–488.

McRae, K., Spivey-Knowlton, M., & Tanenhaus, M. (1998). Modeling the effects of thematic fit (and other constraints) in on-line sentence comprehension. *Journal of Memory and Language*, *37*, 283–312.

Meng, X., Tian, X., Jian, J., & Zhou, X. (2007). Orthographic and phonological processing in Chinese dyslexic children: An ERP study on sentence reading. *Brain Research*, *1179*, 119–130.

Meng, X., Tian, X., Shu, H., Jian, J., & Zhou, X. (2008). ERP correlates of the development of orthographical and phonological processing during Chinese sentence reading. *Brain Research*, *1219*, 91–102.

Mo, L., & Zhao, D. M. (2003). Role of senence boundaries and buffer time in priming the integration of background information. *Acta Psychologica Sinica*, *35*, 323–372.

Mok, L. W. (2009). Word-superiority effect as a function of semantic transparency of Chinese bimorphemic compound words. *Language and Cognitive Processes*, *24*(7/8), 1039–1081.

Myers, J., Huang, Y.-C., & Wang, W. (2006). Frequency effects in the processing of Chinese inflection. *Journal of Memory and Language*, *54*, 300–323.

Neville, H. J., Nicol, J., Barss, A., Forster, K. I., & Garrett, M. F. (1991). Syntactically based sentence processing classes: Evidence from event-related brain potentials. *Journal of Cognitive Neuroscience*, *3*, 151–165.

Newman, A. J., Ullman, M., Pancheva, R., Waligura, D. L., & Neville, H. (2007). An ERP study of regular and irregular English past tense inflection. *Neuroimage*, *34*, 435–445.

Novais-Santos, S., Gee, J., Shah, M., Troiani, V., Work, M., & Grossman, M. (2007). Resolving sentence ambiguity with planning and working memory resources: Evidence from fMRI. *Neuroimage*, *37*, 361–378.

O'Brien, E. J., Shank, D. M., Myers, J. L., & Rayner, K. (1988). Elaborative inferences during reading: Do they occur on-line? *Journal of Experimental Psychology: Learning, Memory and Cognition*, *14*, 410–420.

Peng, D., Ding, G., Perry, C., Xu, D., Jin, Z., Luo, Q., Zhang, L., & Deng, Y. (2004). fMRI evidence for the automatic phonological activation of briefly presented words. *Cognitive Brain Research*, *20*, 156–164.

Perfetti, C. A., & Tan, L. H. (1998). The time course of graphic, phonological, and semantic activation in Chinese character identification. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *24*, 101–118.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Perfetti, C. A., Tan, L. H., Zhang, S., & Georgi, M. C. (1995). Why semantics lags behind phonology in word identification. In J. D. Moore & J. F. Lehman (Eds.), *Proceedings of the 17th Annual Conference of the Cognitive Science Society* (pp. 683–687). Mahwah, NJ: Lawrence Erlbaum Associates.

Perfetti, C. A., & Zhang, S. (1995). Very early phonological activation in Chinese reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 24–33.

Philipp, M., Bornkessel-Schlesewsky, I., Bisang, W., & Schlesewsky, M. (2008). The role of animacy in the real time comprehension of Mandarin Chinese: Evidence from auditory event-related brain potentials. *Brain and Language*, *105*, 112–133.

Saalbach, H., & Imai, M. (2007). The scope of linguistic influence: Does a classifier system alter object concepts? *Journal of Experimental Psychology: General*, *136*, 485–501.

Saalbach, H., & Stern, E. (2004). Differences between Chinese morphosyllabic and German alphabetic readers in the Stroop interference effect. *Psychonomic Bulletin and Review*, *11*, 709–715.

Schirmer, A., Tang, S.-L., Penney, T. B., Gunter, T. C., & Chen, H.-C. (2005). Brain responses to segmentally and tonally induced semantic violations in Cantonese. *Journal of Cognitive Neuroscience*, *17*, 1–12.

Schriefers, H., Friederici, A. D., & Kühn, K. (1995). The processing of locally ambiguous relative clauses in German. *Journal of Memory and Language*, *34*, 499–520.

Spivey, M. J., & Tanenhaus, M. K. (1998). Syntactic ambiguity resolution in discourse: Modeling the effects of referential context and lexical frequency within an integration-competition framework. *Journal of Experimental Psychology: Learning Memory and Cognition*, *24*, 1521–1543.

Steinhauer, K. (2003). Electrophysiological correlates of prosody and punctuation. *Brain and Language*, *86*, 142–164.

Steinhauer, K., & Friederici, A. D. (2001). Prosodic boundaries, comma rules, and brain responses: the closure positive shift in ERPs as a universal marker for prosodic phrasing in listeners and readers. *Journal of Psycholinguistic Research*, *30*, 267–295.

Sun, Y., Shu, H., Zhou, X., & Zheng, X. (2004). The effect of implicit verb causality on pronoun processing. *Psychological Science (Chinese)*, *24*, 39–41.

Tan, L. H., Hoosain, R., & Siok, W. W. (1996). Activation of phonological codes before access to character meaning in written Chinese. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *22*, 865–882.

Tan, L. H., Laird, A. R., Li, K., & Fox, P. T. (2005). Neuroanatomical correlates of phonological processing of Chinese characters and alphabetic words: A meta-analysis. *Human Brain Mapping*, *25*, 83–91.

Taraban, R., & McClelland, J. R. (1998). Constituent attachment and thematic role assignment in sentence processing: Influence of context-based expectations. *Journal of Memory and Language*, *27*, 597–632.

Traxler, M., Morris, R. K., & Seely, R. E. (2002). Processing subject and object relative clauses: Evidence from eye movements. *Journal of Memory and Language*, *47*, 69–90.

Tsai, P. S., Yu, B. H. Y., Lee, C. Y., Tzeng, O. J. L., Hung, D. L., & Wu, D. H. (2009). An event-related potential study of the concreteness effect between Chinese nouns and verbs. *Brain Research*, *1253*, 149–160.

Tsang, Y.-K., & Chen, H.-C. (2009). Do position-general radicals have a role to play in processing Chinese characters? *Language and Cognitive Processes*, *24*(7/8), 947–966.

Tyler, L. K., & Marslen-Wilson, W. D. (1977). The on-line effects of semantic context on syntactic processing. *Journal of Verbal Learning & Verbal Behavior*, *16*, 683–692.

Tyler, L. K., & Warren, P. (1987). Local and global structure in spoken language comprehension. *Journal of Memory and Language*, *26*, 638–657.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Van Orden, G. C. (1987). A ROWS is a ROSE: Spelling, sound, and reading. *Memory and Cognition*, *15*, 181–198.

Van Orden, G. C., Johnston, J. C., & Hale, B. L. (1988). Word identification in reading proceeds from spelling to sound to meaning. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *14*, 371–385.

Van Petten, C. (1993). A comparison of lexical and sentence-level context effects in event-related potentials. *Language and Cognitive Processes*, *8*, 485–531.

Wang, L., Schlesewsky, M., Bickel, B., & Bornkessel-Schlesewsky, I. (2009). Exploring the nature of the 'subject'-preference: Evidence from the online comprehension of simple sentences in Mandarin Chinese. *Language and Cognitive Processes*, *24*(7/8), 1180–1226.

Wang, S., Chen, H.-C., Yang, J. M., & Mo, L. (2008). Immediacy of integration in discourse comprehension: Evidence from Chinese readers' eye movements. *Language and Cognitive Processes*, *23*, 241–257.

Wang, S., Zhu, Z., Zhang, J. X., Wang, X., Xiao, Z., Xiang, H., & Chen, H.-C. (2008). Broca's area plays a role in syntactic processing during Chinese reading comprehension. *Neuropsychologia*, *46*, 1371–1378.

Weckerly, J., & Kutas, M. (1999). An electrophysiological analysis of animacy effects in the processing of object relative sentences. *Psychophysiology*, *36*, 559–570.

Wong, A. W. K., & Chen, H.-C. (2008). Processing segmental and prosodic information in Cantonese word production. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *34*, 1172–1190.

Wong, A. W. K., & Chen, H.-C. (in press). What are effective phonological units in Cantonese spoken word planning? *Psychonomic Bulletin and Review*.

Xie, D., & Zhou, X. (2003). Earlier phonological activation in semantic activation in reading Chinese? A replication study. *Acta Psychologica Sinica, Special Issue*, 14–22.

Xue, G., Chen, C., Jin, Z., & Dong, Q. (2006). Cerebral asymmetry in the fusiform areas predicted the efficiency of learning a new writing system. *Journal of Cognitive Neuroscience*, *18*, 923–931.

Xue, G., Dong, D., Chen, K., Jin, Z., Chen, C., Zeng, Y., & Reiman, E. M. (2005). Cerebral asymmetry in children when reading Chinese characters. *Cognitive Brain Research*, *24*, 206–214.

Yang, C. L., Gordon, P. C., Hendrick, R., & Hue, C. W. (2003). Constraining the comprehension of pronominal expressions in Chinese. *Cognition*, *86*, 283–315.

Yang, J., Wang, S., Chen, H.-C., & Rayner, K. (in press). The time course of semantic and syntactic processing in Chinese sentence comprehension: Evidence from eye movements. *Memory and Cognition*.

Ye, Z., Luo, Y., Friederici, A. D., & Zhou, X. (2006). Semantic and syntactic processing in Chinese sentence comprehension: Evidence from event-related potentials. *Brain Research*, *1071*, 186–196.

Ye, Z., Zhan, W., & Zhou, X. (2007). The semantic processing of syntactic structure in sentence comprehension: An ERP study. *Brain Research*, *1142*, 135–145.

Ye, Z., & Zhou, X. (2008). Involvement of cognitive control in sentence comprehension: Evidence from ERPs. *Brain Research*, *1203*, 103–115.

Ye, Z., & Zhou, X. (in press a). Conflict control during sentence comprehension: fMRI evidence. *Neuroimage*.

Ye, Z., & Zhou, X. (in press b). Executive control in language processing. *Neuroscience and Biobehavioral Reviews*.

Yu, J., & Zhang, Y. (2008). When Chinese semantics meets failed syntax. *Neuroreport*, *19*, 745–749.

Zhang, Q., Guo, C.-Y., Ding, J.-H., & Wang, Z.-Y. (2006). Concreteness effects in the processing of Chinese words. *Brain and Language*, *96*, 59–68.

Zhang, B. Y., & Peng, D.-L. (1992). Decomposed storage in the Chinese lexicon. In H.-C. Chen & O. J. L. Tzeng (Eds.), *Language processing in Chinese*. Amsterdam: North-Holland.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009

Zhang, Y., & Zhang, J. (2008). Brain responses to agreement violations of Chinese grammatical aspect. *Neuroreport*, *19*, 1039–1043.

Zhou, X., & Marslen-Wilson, W. (1994). Words, morphemes and syllables in the Chinese mental lexicon. *Language and Cognitive Processes*, *9*, 393–422.

Zhou, X., & Marslen-Wilson, W. (1995). Morphological structure in the Chinese mental lexicon. *Language and Cognitive Processes*, *10*, 545–600.

Zhou, X., & Marslen-Wilson, W. (1999a). Phonology, orthography, and semantic activation in reading Chinese. *Journal of Memory and Language*, *41*, 579–606.

Zhou, X., & Marslen-Wilson, W. (1999b). The nature of sublexical processing in reading Chinese characters. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *25*, 819–837.

Zhou, X., & Marslen-Wilson, W. (2000a). The relative time course of semantic and phonological activation in reading Chinese. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *26*, 1245–1265.

Zhou, X., & Marslen-Wilson, W. (2000b). Lexical representation of compound words: Cross-linguistic evidence. *Psychologia*, *43*, 47–66.

Zhou, X., & Marslen-Wilson, W. D. (2009). Pseudohomophone effects in processing Chinese compound words. *Language and Cognitive Processes*, *24*(7/8), 1009–1038.

Zhou, X., Marslen-Wilson, W., Taft, M., & Shu, H. (1999). Morphology, orthography, phonology in reading Chinese compound words. *Language and Cognitive Processes*, *14*, 525–565.

Zhu, Z., Zhang, J. X., Wang, S., Xiao, Z., Huang, J., & Chen, H.-C. (2009). Involvement of left inferior frontal gyrus in sentence-level semantic integration. *Neuroimage*, *47*, 756–763.

Ziegler, J. C., Tan, L. H., Perry, C., & Montant, M. (2000). Phonology matters: The phonological frequency effect in written Chinese. *Psychological Science*, *11*, 234–238.

Downloaded By: [Zhou, Xiaolin] At: 20:55 2 September 2009