

Abstract of thesis entitled

**Reading Chinese Sentences:  
The Relationship Between Syntactic and Semantic Processing**

Submitted by

***Wong Wei Wah***

for the degree of Master of Philosophy  
at the University of Hong Kong  
in August 2004

This thesis presents two experiments which aimed at examining whether an appropriate linguistic context facilitates ambiguity processing in Chinese, and how the brain processes syntax and semantics in native Chinese speakers.

The behavioural experiment intended to investigate a very prevalent phenomenon in Chinese linguistics—ambiguity of words due to high possibilities of combining characters together. Two variables were manipulated: ambiguity and context. In each trial, a linguistic context (biased or unbiased) was provided for the subject before the target sentence appeared. Subjects read the stimuli at their own pace and the reading times were recorded. Ambiguity effect was found delayed in the second and third character after the **Critical** one. However, no significant context effect was found in general. It is believed that the temporary ambiguous sentences used in this study could be resolved by subjects themselves. Therefore, external context is not necessary for resolving this ambiguity and lexical information as well as syntactic information are more important.

Previous studies on English syntactic processing using neuroimaging techniques reported frequent involvement of the left inferior frontal gyrus (Caplan et al., 1999; Kang et al., 1999; Stromswold et al., 1996; Wartenburger et al., 2004). However, some people argued that this region is not unique for syntactic processing but a network is engaged instead. As for semantic processing, researchers made many attempts using linguistic and non-linguistic stimuli. The brain regions involved are plenty and dispersed in the two hemispheres. The left



prefrontal cortex, especially the left middle frontal gyrus is commonly found activated in semantic studies. In Chinese, experiments at lexical level are prevalent but rare at sentential level. Studies on Chinese syntactic processing are scanty too. Therefore, syntactic and semantic judgement tasks were conducted using a non-invasive technique: functional Magnetic Resonance Imaging (fMRI).

The fMRI results did not corroborate totally with the existing literature. In the syntax condition, the left middle frontal gyrus and bilateral middle temporal gyrus were activated. In the semantics condition, right lateralisation was discovered and peaked in right middle frontal gyrus (BA9). The patterns suggested that Chinese syntactic and semantic processing are dissociated in the brain. While right prefrontal cortex is very likely to be associated with episodic memory retrieval, the hypothesis that the role of right parietal cortex is responsible for selective attention and semantic memory retrieval is still unclear and further investigation is needed.

To conclude, context does not appear to influence the parsing of syntactically ambiguous Chinese sentences. This is supported by the dissociated brain regions activated in syntactic and semantic conditions in the fMRI study.

(421 words)

