

Hemispheric dominance of metaphor processing for Chinese-English bilinguals: DVF and ERPs evidence

Xichu Zhu^{a,b}, Hongjun Chen^a, Susannah C.S.A. Otieno^b, Fengyu Cong^c, Paavo H.T. Leppänen^b

^a School of Foreign Languages, Dalian University of Technology, Dalian, China

^b Department of Psychology, University of Jyväskylä, Jyväskylä, Finland

^c School of Biomedical Engineering, Faculty of Electronic Information and Electrical Engineering, Dalian University of Technology, Dalian, China

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Abstract: Figurative language such as metaphor has aroused the interest of researchers for centuries as metaphors are pervasive in our daily life. However, the studies investigating the lateralization of metaphor processing have gained conflicting findings. The hemispheric dominance of second language metaphorical processing is even less clear and only scarcely studied. This study investigated whether metaphors are predominantly processed in the right or left hemisphere when using Chinese and English metaphors in Chinese-English speakers. The role of familiarity in processing of metaphorical and literal expressions in both the first and second language was studied with brain-event-related potentials using a divided-visual-field paradigm.

Twenty-five Chinese-English bilinguals participated in this experiment. They were asked to perform plausibility judgments for Chinese (L1) and English (L2) familiar and unfamiliar metaphorical and literal sentences. The behavioral results show that participants consume longer time when understanding unfamiliar metaphoric sentences than unfamiliar literal sentences, which are both longer than familiar literal and familiar metaphorical sentences in both languages. Moreover, it takes longer to understand English expressions than Chinese in all sentence conditions which shows a L1 advantage. Meanwhile, the EEG results obtained using parameter-free cluster permutation statistics suggest a different pattern of brain responses for metaphor processing in L1 and L2, and that both metaphoricity and familiarity influence the brain response pattern of both Chinese and English metaphor processing. However, the brain responses were distributed bilaterally across hemispheres, suggesting no clear evidence for lateralization of processing of metaphorical meanings.

The results obtained using parameter-free cluster permutation statistics suggest a different pattern of brain responses for metaphor processing in L1 and L2, and that both metaphoricity and familiarity influence the brain response pattern of both Chinese and English metaphor processing. However, the brain responses were distributed bilaterally across hemispheres, suggesting no clear evidence for lateralization of processing of metaphorical meanings. This is inconsistent with the Graded Salience Hypothesis and Fine-Coarse Semantic Coding Theory, which posited a right hemisphere advantage of non-salient and coarse semantic processing.