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Processing Lexical Semantic Information in Seond Language Shaped Native Langauge by Event-Related fMRI

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Purpose : The purpose of the present functional magnetic resonance imaging (fMRI) investigation was to examine the modulation of neural activity with respect to language translation. Materials and Methods : Nine right-handed normal, bilingual healthy volunteers participated in the experiment. The stimuli consisted of gray presentations of 50 Korean words and 50 words of foreign origin and 50 English words and 50 English words shaped Korean. The words were presented for 1000 ms, replacing a baseline of a fixation cross-hair present throughout the interstimulus interval. A 1.5T VISION system (Siemens Corps., Iselin, NJ) was used to acquired T2* weighted transverse EPI images (TR/TE/FA = 3000ms/60ms/90°, FOV=240 x 240mm^2). The acquired data were applied to SPM99 for the pre-processing such as realignment, normalization and spatial smoothing. Results : Greater response to the presentation of English words shaped Korean words than to the other types were obtained in the right occipital-temporal lobe and the left inferior frontal cortex related to language related processing network. In contrast, our high-proficient bilinguals show slight difference in the same areas for reading other three types. Discussion : The main finding of this study was that greater activation in the right occipital-temporal lobe and the left inferior frontal areas was observed with the presentation of the L2 shaped L1 compared to other types, L1, semi-L1 (Korean words of foreign origin), L2 during reading each word. High-proficiency bilinguals as our subjects, the nature of other three types as L2, L1, semi-L1 (words of foreign origin) reading system may attributable to the indolence of the one-step language conversion. Acknowledgment : This study was supported by a grant of the Seoul R&BD Program, the Korea Health 21 R&D Project, Ministry of Health & Welfare, Republic of Korea. (02-PJ3-PG6-EV07-0002) and a grant of the 2005 Nuclear R&D Plan Program, Ministry of Science & Technology, Korea.

Keywords : Event-Related fMRI, Lexical Semantic Information, Bilingual's Brain Activity