

Reading ability shapes the lexicality effect on N400

Yu-Lin Tzeng, Yu-Chen Huang, Chia-Ying Lee

Institute of Neuroscience, National Yang-Ming University

This study aimed to examine how reading ability shapes the processing of orthographic information in Chinese by measuring the lexicality effect on N400. College students and the children from 3rd to 6th grades were invited to perform a pronounceable judgment task on a set of stimuli which consisted of real characters (RC), pseudo-characters (PS, a novel combination of a semantic radical and a phonetic radical with legal orthographic structure) and non-characters (NC, illegal combination of strokes and radical position). Children were divided into high, median and low reading based on their scores of the Chinese Character Recognition Test. Adults data revealed the typical graded lexicality effect on N400 (PS>RC>NC), especially on the centro-posterior sites. Children with median and low reading ability showed reversed patterns of lexicality effect in frontal sites (NC>PS>RC). While children with high reading ability showed a similar pattern in frontal sites (PS and NC >RC), they showed an adult-like pattern in the posterior sites (PS>RC>NC). These results suggested that beginning readers tend to treat all types of stimuli as potential lexical items to look for their semantic representations. By learning to read a large number of Chinese characters, they gradually acquire the orthographic knowledge of Chinese characters and be able to showed adult-like lexicality effect on N400.

