Anterior-shift of the N400 effect in aphasic patients with severe reading comprehension deficits

Chih-Ting Chang, Hsin-Chi Wu, Chia-Ju Chou, Jong-Ling Fuh, Chia-Ying Lee

Institute of Linguistics, Academia Sinica

This study aims to investigate how the severity of reading comprehension deficits modulates the topographic distribution of predictability on N400. Aphasic patients were split into high and low ability groups based on scores of reading comprehension subtest in Chinese Concise Aphasia Test (CCAT). These aphasic patients, along with their age-matched controls, were asked to read sentences that either ended with highly predictable words or unexpected but plausible words. The controls revealed a typical centro-parietal distributed predictability effect on N400 (300 to 600 msec). In aphasic data, the N400 effect of predictability moved from a central maximum in a restricted time window (300 to 500 msec) for high ability aphasics to a frontal maximum in a more prolonged time window (400 to 700 msec) for low ability aphasics. The severity-related anterior-shift of the N400 effect might imply the aphasics with mild to severe comprehension deficits utilize different mechanisms for reading comprehension. To be more specific, the aphasics with poor reading comprehension may be less efficient in semantic retrieval and integration of contextual information during sentences comprehension. Therefore, they tend to utilize a more elaborated/effortful semantic retrieval mechanism to compensate their failures in automatic lexical retrieval of the ending words and thus showed the frontal distributed predictability effect on N400.

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