Early MEG markers for reading Chinese phonograms

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Studies using functional magnetic resonance imaging have indicated that activities in the left inferior frontal cortex and left temporoparietal regions are associated with orthographic neighborhood size. To elucidate the temporal dynamics of reading-related cortical activities, we manipulated two types of neighborhood properties for Chinese phonograms, phonetic combinability and consistency. By using source analysis techniques in combination with magnetoencephalography, the results demonstrated a combinability effect in the right fusiform gyrus at ~170 ms, which may reflect perceptual expertise in processing Chinese orthography. During 200 ms to 250 ms, the left anterior insula showed larger activity in reading small combinability characters than in reading large combinability characters, and the left inferior parietal cortex showed greater activity in reading low consistency characters than in reading high consistency characters. These results indicate that the left anterior insula cortex and left inferior parietal cortex may play important roles in the early stages of reading Chinese phonograms.