FRONTOPARIETAL INTERACTIONS UNDERLAY VISUOSPATIAL ORTHOGRAPHIC PROCESSES IN CHINESE READING

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As a logographic writing system, Chinese reading encompasses the processing of visuospatial orthographic properties. Our study aimed to investigate the functional correlates supporting visuospatial orthographic processes as compared to semantic and phonological processes in Chinese reading. We conducted a functional MRI single-character reading study in Chinese, in which 35 right-handed native Chinese young adults were asked to make orthographic judgments (i.e., whether the orthography of a character contains a radical "又", such as a target "对"), phonological judgments (i.e., whether the phonology of a character contains the vowel of "ong", such as "红, /hong2/"), and semantic judgments (i.e., whether the meaning of a character is an animal, such as "狗, dog"). Stimuli were visually presented in separate task-specific (orthographic, phonological, semantic) activation blocks that were alternated with rest-fixation blocks. Our results revealed that visuospatial orthographic processes in Chinese reading, as compared to semantic processing, involved stronger right hemisphere engagement. Stronger left vOTC-SPG-MFG functional connectivity was found for orthographic relative to semantic processing, and it was associated with reduced regional engagement, which suggests that processing visuospatial orthographic processes in Chinese rely on functional interactions among regions rather than on regional processes taking place in each of them. In conclusion, our study tackles one of the main specificities of Chinese writing code, holding important implications for current models highlighting visuospatial orthographic processes and the brain networks supporting it in Chinese reading.