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Neural correlates of speech and non-speech processing: Role of language experience in brain activation

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In adults, neural responses to the acoustic properties of native and non-native speech sounds differ. Recent magnetoencephalography (MEG) studies indicate that two regions of the brain, the superior temporal area and inferior parietal area (Broca's), in both the left and right hemispheres, may contribute to how the adult brain responds to the acoustic properties of speech. The aim of the present study was to investigate neural activation in adults when listening to native and non-native speech, and to non-speech analogs of speech. We used MEG to examine activation of the superior temporal and inferior parietal areas. Native speakers of Finnish were presented with Finnish (/pa/ and /ta/) and Chinese (/t "looped c" "superscript h" i/ and /"looped c" i/) syllables, and sine-wave replicas of /pa/ and /ta/, in a passive oddball paradigm. Our analysis examines the properties of localized neural activities to determine how activation of sensory and motor speech areas differs for speech and non-speech, and the role of language experience in brain activation.