

Detection and correction of acoustically deviant speech in persons with aphasia

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This project investigates the functional source of low-level speech production deficits in aphasia by assessing the extent to which persons with aphasia (PWA) are sensitive to deviations in their own speech. Fifteen PWA (three with apraxia of speech) and fifteen age-matched controls participated in a magnetoencephalography (MEG) study. While neural activity was recorded in the MEG, participants produced 200 repetitions of three monosyllabic words and listened to playback of their recorded audio. To assess sensitivity to deviations, we compared the auditory M100 response to canonical productions with the response to productions that deviated from typical vowel acoustics. To assess correction ability, we measured within-trial formant movement toward the acoustic median, a change that served to lessen acoustic deviation. For both groups, auditory activity was greater during the production of more deviant utterances, though this was largely limited to the left hemisphere in controls and the right hemisphere in PWA. Behavioral correction was also intact: both groups exhibited vowel centering, significantly decreasing variability over the syllable. The hemispheric shift of modulatory responses in PWA is suggestive of plasticity in the neural mechanisms that underlie this sensitivity, and may also enable the intact behavioral correction seen in PWA.