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Brainwave profiles of efficient versus inefficient working memory retrievals in healthy older adults

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Abstract

General slowing of mental processing speed is hallmark of brain and cognitive aging. Thus far it has been limited understanding in neural mechanisms underlying mental states during fluctuations between efficient versus inefficient cognitive performance within individual older adults. Here we examined electrophysiological responses during visual working memory retrieval trials that are fast versus slow reactions. Wireless EEG along with accuracy and reaction times were recorded during a modified delayed match-to-sample task in 17 cognitively normal older adults (age 65-95) from North America. Compared to trials that are faster than averaged (mean 584 ms), the late positive potentials during trials that are slower than average (mean 747 ms) showed increased responses to memory nonmatch distractors than those to object matching memory targets in frontal sites, as previously reported in older brains. Interestingly, the brainwaves during efficient and accurate memory retrievals resemble those typically seen in younger adults.