Resource management across brain regions supports auditory and visual-spatial processing in older age: An ERSP Study

Melanie Turabian
Carleton University, Ottawa, Ontario, Canada

Kathleen Van Benthem
Carleton University, Ottawa, Ontario, Canada

Chris Herdman Dr.
Carleton University, Ottawa, Ontario, Canada

Abstract

Investigating how the brain integrates multi-modal information is critical for understanding the deleterious effects of age on performance for tasks that integrate visual and auditory stimuli (e.g., driving or flying). We report on how auditory processing was impacted by age during the encoding and maintenance phases of a visual-spatial task using electroencephalography in a sample of 10 older (50-80 years) and 10 younger (18-32 years) participants. Event-related spectral perturbation analyses reveal how both the online processing and memory stages of visual-spatial working memory tasks affected auditory processes differentially across the age groups. Results reveal that older age may restrict the resources available for online processing of auditory information, particularly in brain regions that are also normally lateralized for visual-spatial tasks. Our findings point to the importance of designing interfaces, such as those found in aircraft or automobiles, that support optimal performance and accommodate normal age-related changes in neural processes.