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Cross - modal shifting attention in healthy aging: an ERP study.

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Behavioral and electrophysiological studies suggest that a decreased ability to inhibit distracting information accompanies aging. We tested young (age 20-40) and elderly (age 65-90) participants in focused and shifting attention tasks while recording event-related potentials from 33 scalp electrodes. We presented visual and auditory stimuli simultaneously. Subjects responded to infrequent stimuli in one modality while ignoring the other modality (FOCUS task) or switched their attention between modalities following a bimodal cue (SHIFT task). Subjects performed well on all tasks. Relative to the FOCUS task, reduced Late Positive Complex (LPC) amplitudes, decreased accuracy, and increased RTs to targets were found in both modalities of the SHIFT task. Both groups, particularly the elderly, found the auditory task more difficult than the visual task. The LPC of both groups was effectively abolished to unattended auditory targets during both FOCUS and SHIFT conditions, implying that irrelevant auditory information did not interfere with the visual task. The LPC to unattended visual targets was also abolished in both groups during the FOCUS condition; however, elderly subjects did generate an LPC to unattended visual targets during the SHIFT condition. These ERP and behavioral results show that young and elderly subjects gated irrelevant information when task demands are not high (FOCUS), but that elderly subjects did not gate when attention demands increase in a difficult task. The LPC to targets in both modalities showed a greater frontal scalp distribution in elderly than in young subjects. The LPC elicited by unattended visual targets during the SHIFT condition in the elderly subjects displayed the same frontal distribution. These differences between young and elderly subjects are consistent with frontal activation in elderly subjects presented in a companion fMRI study.

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