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Reduced inter-hemispheric interference in ageing: Evidence from a divided field Stroop-like paradigm

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Abstract

One of the most important structural changes that occur in the brain during the course of life relates to the corpus callosum, the largest neural pathway that connects the two cerebral hemispheres. Whether the corpus callosum has an inhibitory or excitatory function in interhemispheric connection is still debated in the literature. It has been shown that the corpus callosum, and in particular its anterior sections, endures a process of degeneration in ageing. Hence, a primary question is whether such structural changes in the brain of older adults have functional consequences on inter-hemispheric communication. To investigate this question, we asked healthy older adults to perform a modified version of the classic Stroop paradigm in which the target and distracter were spatially separated. Across two experiments, we found that the Stroop effect was significantly reduced when the two stimuli were distributed in two different hemifields as opposed to the same single hemifield. This new finding suggests that age-related callosal thinning reduces inter-hemispheric interference by facilitating the two hemispheres to process information in parallel. The reduced inter-hemispheric interference found in older adults provides strong direct support for the excitatory theory of the corpus callosum.

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