

# **Interhemispheric transfer predicts error monitoring disruption in executive functioning and bimanual coordination tasks for younger but not older adults: Implications for healthy aging of white matter pathways.**

D. Yi, S.D. Marion, T. Arentsen, S. Panos, H. Schroeder, & W.S. Brown

## **Objective**

Evoked potential interhemispheric transfer time (EP-IHTT) has been used as a marker of white matter integrity and efficiency. It is known that the size of the anterior Corpus Callosum (CC) declines with age but little is known about the functional implications of these structural changes. The current study investigated the relationship between IHTT and error monitoring on frontally-mediated tasks in healthy younger and older adults.

## **Participants and Methods**

36 adults (18 younger, Mage=27.9; 18 older, Mage=72.1) were administered standardized tasks of executive functioning from the D-KEFS and the computerized Bimanual Coordination Task (cBCT). EP-IHTT was calculated by identifying peak latencies from event-related potentials obtained during unilateral trials of a bilateral field advantage task.

## **Results**

Results indicated that older adults made significantly more errors than younger adults on D-KEFS tasks. Poorer error management was significantly correlated with EP-IHTT for younger ( $r = .54, p < .05$ ) but not older adults. Similarly, older adults were more biased when completing cBCT trials requiring interhemispheric control, yet EP-IHTT was related to increased cBCT directional error bias only in younger adults ( $r=.55, p<.05$ ).

## **Conclusions**

These data suggest that older adults are less likely to monitor errors when completing executive functioning and bimanual coordination tasks, the latter of which indicates at least subtle anterior CC dysfunction. The fact that speed of sensorimotor transfer was predictive of error management for younger but not older adults is consistent with previous literature showing that the anterior CC may decline more rapidly than the posterior CC in healthy older adults.

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*Dahyun Yi, MA, Graduate School of Psychology, Fuller Theological Seminary, 262 N. Los Robles Ave. APT 333, Pasadena, CA 91101, United States. E-mail: dahyunyi@gmail.com*