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Effects Of Physical Activity On The Aging Of Motor And Perceptual Inhibition

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Abstract:

Aging has a detrimental effect on behavioral inhibition (a core executive function), but physical activity (PA) appears to moderate this decline. However, different types of inhibition exist and for which the influence of aging and PA may differ.

PURPOSE: To evaluate the influence of age and regular PA on the performance of different cognitive tasks that separate perceptual and motor inhibition.

METHODS: Fifty adults participated in the study. Twenty-six young (Y, 20±2 yrs) and 24 older (O, 72±3 yrs) were classified as physically active (A) or sedentary (S), according to measures of past (Historical Leisure Activity Questionnaire, hours/week and METs-h/week) and present (Actigraph GT1M, steps/day and time spent/day in moderate to vigorous PA) PA. They performed the tasks developed by Nassauer and Halperin (2003), which assessed perceptual and motor inhibition. Performance in the inhibition tasks was assessed by Reaction Time (RT in ms) and response accuracy (% of correct responses) as a function of condition (no conflict vs. perceptual or motor conflict).

RESULTS: Overall, older were slower than young adults, and active people were faster than sedentary people. Preliminary results showed a differential effect of PA as a function of age and type of inhibition. Concerning motor inhibition, there was no effect of PA for the young groups ($p > 0.05$). However, in the motor conflict condition, the OA group was significantly more accurate (95%) than the OS group (91%), although there was no significant RT difference ($p = 0.09$) between the 2 groups (693±154 ms vs. 734±84 ms, for OA and OS respectively). Concerning perceptual inhibition, there was no effect of PA for the 2 groups of older ($p > 0.05$). However, for the same accuracy level, YA were significantly ($p < 0.05$) faster (485±64 ms) than YS (550±69 ms) in the perceptual conflict condition, although there was no RT difference in the no-conflict condition (350±24ms vs. 357±26 ms, for the YA and YS respectively).

CONCLUSION: The effects of PA on inhibition appears to be moderated by both age and type of inhibition measured, deserving future research to understand the functionality of this dissociation.

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