



## Editorial Special Topic: Enhancing Brain and Cognition via Physical Exercise

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The interest in the influence of physical activity and exercise on our daily life is constantly growing. In the past decade, this has inspired a multitude of investigations on the potential cognitive and brain health benefits that engaging in physical activity may have on practitioners. It is well known that athletes have been reported to be better than naive people in skills related to their practice of preference, which however mainly indicates the effectiveness of the training programs. However, the present Special Issue addresses the issue to which physical exercise (aerobic and non-aerobic exercise; acute and chronic effects) and biomarkers of physical fitness (for example, cortical thickness, connectivity in brain networks, amplitude and/or latency in ERP components) are associated with enhanced cognition across the life-span in healthy and pathological populations.

The Special Issue comprises five original research articles and two mini reviews elaborated by 35 authors from various countries. These contributions present state-of-the art, theory-driven approaches to the study of physical activity and

exercise to promote cognition and performance across the life-span.

Peven et al. (2018) showed that moderate-to-vigorous physical activity in bouts < 10 min in duration may have significant cognitive benefits in older adults.

Dupuy et al. (2018) demonstrated that both moderate- and high-intensity exercise enhance cognitive performance during and following acute intermittent exercise.

ten Brinke et al. (2018) revealed that a 6-month aerobic training program may promote cognitive outcomes in older adults with mild subcortical ischemic vascular cognitive impairment by improving aerobic fitness capacity and maintaining cortical thickness.

Raine et al. (2018), relying on a large aggregated dataset, demonstrated that aerobic fitness in childhood may be particularly beneficial to the allocation of attentional resources, as indexed by P3 amplitude as well as response accuracy and intra-individual variability.

Donnegan et al. (2018) showed that one bout of Ashtanga yoga, as a form of exercise comprising physical activity and open-monitoring meditation, does not enhance creativity performance.

Soga et al. (2018) examined both the acute and long-term effects of resistance training on the three core facets of executive function (inhibitory control, working memory and cognitive flexibility). This review highlights that benefits seem to be most pronounced for inhibitory control in both the acute and long-term exercise paradigms.

Last, Loprinzi and Frith (2018) suggested that exercise may be a putative strategy to help prevent Parkinson's disease and treat the memory impairments associated with this pathology.

The included articles cover multiple aspects of the ongoing research and allow an appreciation of the difficult task ahead in fully-understanding the complexity of how to enhance brain and cognition via physical activity across the life-span.

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