

Research Project

OCloSpEx: Effects of open- and closed-skill sports on executive function

Project funded by own resources

Project title OCloSpEx: Effects of open- and closed-skill sports on executive function

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Project start 01.08.2018

Probable end 30.07.2019

Status Completed

Background: Executive functions (i.e. top-down mental processes for achieving internal goals) have become a prominent target of intervention studies due to their association with learning abilities, academic performance and mental health. Whereas previous studies investigating chronic effects of exercise on executive function have focused on closed-skill sports, potential benefits of open-skill sports have largely been ignored. Moreover, the neurophysiological mechanisms underlying exercise-induced benefits in children and adolescents still remain unclear.

Purpose: The study aims to compare neurophysiological indices of executive control between children with regular engagement in open-skill sports, closed-skill sports and peers with no regular sports participation. It is expected that the open- and closed-skill sports groups show higher executive control than the inactive group. Additionally, it is hypothesised that executive control is higher in the open-skill compared to the closed-skill sports group.

Method: Children with at least two years of regular participation in an open- (karate, judo and fencing) or closed-skill sport (running, cycling and swimming) are recruited from local sports clubs. Additionally, age-matched peers with no regular participation in sports are included. Based on a priori calculations of sample size, 38 participants (114 in total) per group are required to reach 80 % statistical power. All recruited participants complete questionnaires on intelligence, socioeconomic status and psychopathology. Additionally, two cognitive tests are administered and event-related potentials are recorded simultaneously via electroencephalography. Moreover, submaximal fitness and motor skills are assessed. Cognitive processes related to resource allocation (P300), conflict detection (N200) and working memory (CNV) are compared between groups. Subsequently, associations between these neurophysiological indices, fitness and motor skills are examined.

Financed by

University funds

Add publication

Published results

4605848, Ludyga, Sebastian; Möhring, Wenke; Budde, Henning; Hirt, Nick; Pühse, Uwe; Gerber, Markus, Neurocognitive processes mediate the relation between children's motor skills, cardiorespiratory fitness

and response inhibition: Evidence from source imaging, 0048-5772 ; 1469-8986, Psychophysiology,
Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

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