



PhD in Biomedical Sciences

Research Area: Health Science

Title: Strength training for gait rehabilitation in older adults: Insights from neuroscience

Recent scientific evidence suggests that an external focus of attention (vs. an internal focus of attention) promotes a greater number of motor solutions, which seems to derive from a functional variability inherent in the motor system. This non-linear variability is especially crucial in force and gait of older adults to maintain the movement systems functional capacity. Therefore, the present project's aim is to investigate the effects of strength training with different focus conditions (internal focus, distant external focus, proximal external focus) on plantar flexor force and consequently on gait in older adults. During four years, in three consecutive studies, the retention effect of focus of attention on non-linear force variability, the relationship between non-linear force and gait variability as well as the effect of focus of attention on this relationship in a strength training program are assessed. In addition, the respective subjacent neurophysiological mechanisms are expected to give further explanations.

Keywords: Locomotion; Falls Prevention; Attentional Focus; Dynamical Systems Theory; Fractals; Variability

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