

Sustained attention is integral to advanced cognitive processes; however, it declines with age. Both cognitive training and non-invasive transcranial direct current stimulation (tDCS) altering cortical excitability in the human brain have yielded inconsistent results in attenuating cognitive aging in the elderly. Furthermore, prior studies with synchronized application of anodal tDCS and cognitive training to induce plasticity effects for optimization of intervention efficacy nevertheless obtained heterogeneous results, which might at least partially be due to stimulation parameter differences between studies. To optimize tDCS effects with simultaneous cognitive training on vigilance decrement in older adults, a systematic evaluation of different tDCS protocols for sustained attention improvement in older adults, with respect to target regions and stimulation intensity, is required.