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Sommario/riassunto

Recent years have brought new insights to the understanding of Parkinson’s disease, impact of exercise and sound displays in rehabilitation and movement facilitation. There is growing evidence that auditory signals in the environment can provide a temporal template for movement and change the mode of motor control from intrinsic to extrinsic; habitual to goal-directed, enabling enhanced motor performance in patients. In addition, forced exercise rate studies show that exercising at the pace of healthy adults can have potential neuroprotective benefits for patients. Many research groups have explored the use of auditory cues (such as rhythmical auditory training) in improving gait and upper limb movement parameters. Cues are usually either intermittent (metronome) or continuous (dynamic sound displays). Similarly, dance based interventions suggest that patients benefit from additional sensory information (i.e. the temporal structure embedded in music and proprioceptive information from a dancing partner) that facilities movement. On the contrary, studies dedicated to auditory perception and motor timing report an impaired ability of patients to perceive and synchronise with complex rhythmical structures (i.e. causing an inability to play musical instruments). With the growth of modern technology and the increasing portability of hi-specification devices (such as smart phones), new research questions on the design of interventions are beginning to emerge as we strive for more efficient therapeutic approaches. In this Research Topic we

wanted to bring together top scientists from the movement disorder, motor control and sound related studies along with therapists. That way, we can engage in cross-disciplinary and challenging scientific debate about future rehabilitation avenues and frontiers for Parkinson's disease patients.