

Restoring the complexity of locomotion in older people through arm-in-arm walking

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Introduction: The loss of complexity with advancing age has been documented in the field of locomotion, and is predictive of the propensity to fall ². It has been shown that two systems in close interaction tend to match their levels of complexity³. And we hypothesized that this matching of complexities could allow a restoration of complexity in the elderly. Then our aim was to study the effects of the prolonged interaction of two systems of different complexities: a healthy system and a system lacking in complexity.

Methods: 24 participants were involved in the experiment. They were divided into two groups, experimental (1) and control (2), The experiment lasted four weeks, with three sessions per week, and three walking duo sequences of 15 minutes per sessions, and solo sequence A post-test (solo sequence) was performed two weeks after the end of the experiment.

Results: The results present evidence for the presence of a complexity matching effect in synchronized walking conditions. This result has important implications, especially for rehabilitation purposes. This experiment shows that the prolonged experience of complexity matching, with a healthy system, could allow restoring the complexity of deficient systems.

Conclusion: Synchronized walking, between older participants and the experimenter, is dominated by a complexity matching effect. Complexity matching results in an attunement of complexities between the two participants, and an attraction of the complexity of the older participant towards that of the younger. A prolonged experience of complexity matching results in a perennial restoration of complexity in older people.