

Project:

Handlungsrepräsentationen und Automatisierung durch Handlungsvorstellungstrainings

Action representations and automatization after action imagery practice

Background and research questions: Action imagery practice (AIP) designates the systematic and repetitive use of action imagery (the imagination of movements without their actual execution) with the aim to improve performance. Two series of experiments are planned to investigate what drives AIP effects. It will be examined whether AIP is limited or in some cases superior compared with action execution practice (AEP). Some evidence indicates that AIP differs from AEP in the type of representations which are acquired. AEP results in effector-dependent movement representations, whereas AIP results in effector-independent representations. Movement representations might therefore be more flexible after AIP than after AEP, resulting in more transfer to similar movements. This is where Series 1 steps in, by testing effector-dependence using the crossed hands transfer paradigm with bimanual movements. Further, effector-dependent and effector-independent motor representations may lead to action automatization even after AIP. In Series 2, movement automatization after AIP will be investigated with the dual-task paradigm.

Methods: The serial reaction time task will be used in the experiments. Participants will react to a series of stimuli without knowing that the stimuli appear in a predetermined order (implicit sequence learning). Afterwards they will be tested in the practiced sequence and other sequences (e.g., mirrored, shifted). Differences between sequence performance in the posttest will indicate learning effects and the type of representation (effector-dependent, effector-independent motor, effector-independent visual-spatial). In Series 2, dual-task conditions will be added in the posttest. Differences between single-task and dual-task performance indicate dual-task costs which are assumed to be lower if the sequence has been automatized (less interference). In both series, intensive practice over several days is planned to achieve effector-dependent representations and automatization.

Scientific innovation: AIP is widely used in sports and has recently been applied to motor rehabilitation. However, little is known about the underlying processes and representations. Particularly automatization has not been investigated in AIP yet. Results from this project will significantly enhance the understanding of AIP and contribute to a solid theoretical and empirical basis for applications of AIP in various fields, such as sports, music, and rehabilitation with neurological patients.

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