

# **A Preliminary Analysis of Motor Learning Generalization in the Mirror Drawing Task**

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Generalization is fundamental to learning in most instances of life, in which learning environments can never be exactly the same. Despite its importance, there is little known about how the knowledge learned in one specific environment is transferred to another environment, and whether the generalization strategy differs depending on the degree of environmental difference and the type of knowledge to be transferred. Here, we proposed an experimental design for investigating the generalization of motor learning. In this task, the subjects performed a number of variations of the mirror drawing task (generalization task: e.g., writing letters with pen). Then, the subjects underwent an intensive program of mirror drawing task with simple shapes using a computer mouse (practice session). They repeated this process during the task. We found that intensive practice led to an increase in performance scores and a decrease in the time taken to complete the generalization task, yet in a discontinuous manner rather than gradual. Moreover, increases in mirror drawing scores took place mostly in the early stage of practice sessions, but not as significant in the later stage. However, the decrease in the time taken occurred in the later stage of the practice sessions, which reduced the performance time in the generalization task. We suggest that this experimental paradigm is superior to the conventional sequence learning task in that the paradigm is applicable to a wider range of generalization contexts. In addition, we attempted to build a computational model that explains the experimentally observed motor generalization.

Keywords: generalization, motor learning, mirror drawing, computational modelling

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