Investigating the interaction between motor imagery and motor consolidation on motor sequence learning.

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Background

Multiple factors facilitate **motor learning**. A focus was placed on the role of **action observation** (Buccino & Riggio, 2006), **motor imagery** (MI, imagining a movement without performing any physical movement (Bouguetoch et al., 2020; Mulder et al., 2004), and **motor consolidation** (the unconscious process of reinforcing previously encoded skills in an individual's memory (Debas et al., 2010)). Understanding these methods require knowing their effects, interactions, and limitations.

Hypotheses

Hypothesis 1: Participants in the **motor imagery condition** will show a **greater level of motor learning** after the experimental resting period than participants in the control condition.

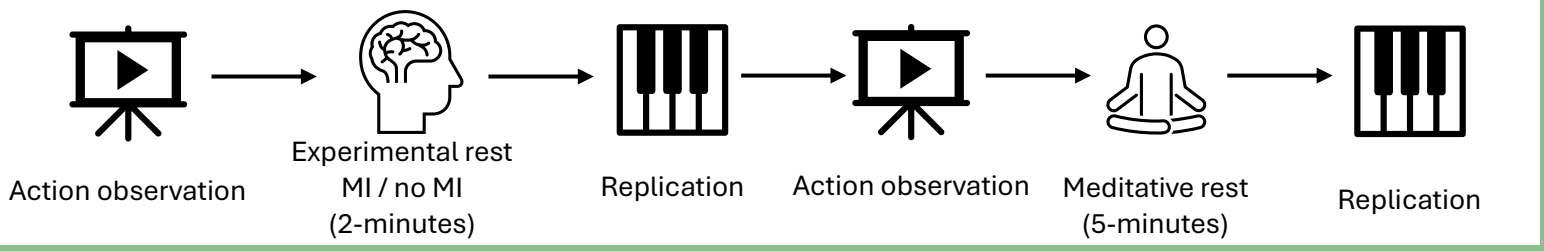
Hypothesis 2: Participants in **both conditions** will experience **increased motor learning** after the **meditative rest** period.

Hypothesis 3: Participants in the **motor imagery condition** will experience **greater improvements in motor learning** after both the **experimental rest** period and the **meditative rest** period than participants in the control condition.

Methodology

Participants	**20** participants **over 18** who considered themselves to be **non-ambidextrous**. Randomly allocated into **MI condition** or **control condition.**
Conditions	MI condition **took part in an MI task** during the experimental rest period. The control condition **did not take part in an MI task** during the experimental rest period.
Task	Participants completed a 5-minute **online questionnaire** comprising 14 questions investigating **bimanual activity** and **motor imagery**. Then participants took part in a 10-minute **practical experiment**.
Analysis	Two **two-way ANOVAs** were run to investigate variants across conditions caused by the MI and consolidation.

Practical experiment

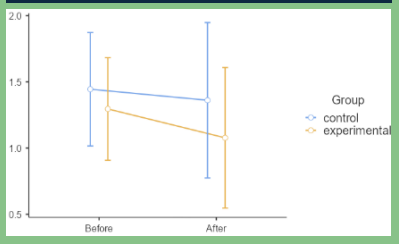


Results

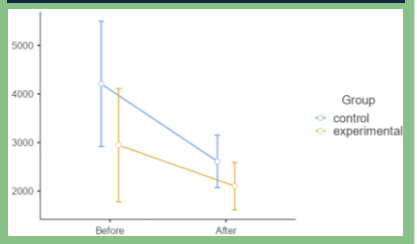
There was found to be a **non-significant different** between for the **degree of error** both for participants in the MI condition and for participants in the control condition.

Conversely, there was found to be a **significant decrease** in **reaction time** for participants in the MI condition and for participants in the control condition.

Degree of error



Reaction time



Discussion

The **non-significant difference between** the **degree of error** across both conditions may indicate there are limitations in how complex a task can be for effective MI to take place.

As there was a **significant decrease** in **reaction time** across both conditions, it may suggest consolidation aids with motor learning.

To further examine the full capacity of these motor learning strategies, **future research** should allow **more time blocks of MI**. Additionally, future research should have **a third condition** in which participants **do not take part in the meditative rest period**, to analyse if the **decrease in reaction time** was due to the meditative rest.

References

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Buccino, G., & Riggio, L. (2006). The role of the mirror neuron system in motor learning. *Kinesiology*, *38*(1.), 5–15. https://doi.org/796.012:577.1:576.8.095

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