

Imagining our hands, feet and our whole body



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1. Background & Aim

- **Motor Imagery:** imagining an action without physical execution of the movement¹
- Measures of Motor Imagery vary according to the **degree of awareness** required to solve a task: more **implicit** vs more **explicit** measures¹⁻²
- **Dissociations** have been reported between **implicit** vs **explicit** measures³
- **Confounding factors** need to be controlled for²: such as using Visual Imagery instead of Motor Imagery strategies to solve the task.
- Motor Imagery is **often explored** in **hands** (e.g., Hand Laterality Task⁴), the **whole body** (e.g. Full Body Rotation Task⁵), and **less often** in **lower body parts** (e.g., Foot Laterality Task⁶)
- Anatomical, functional, and sensory differences⁷⁻⁹ in these body districts suggest that our **action-related representations of these body districts might not be the same** and we can test this using **implicit** and **explicit** measures

Research Question 1
Are there differences between hands, feet, and the whole body in more **implicit** motor imagery tasks?

Research Question 2
Are there differences between hands, feet, and the whole body in more **explicit** motor imagery tasks?

2. Methodology

I. Sample

- **60 healthy participants** (age, $M = 26.68$, $SD = 8.22$) without sensory, neurological or psychiatric impairments

II. Measures

- **Screening Questionnaire** to ensure eligibility requirements are met
- **General Questionnaire** to describe sample characteristics
- **Limb Laterality Preference**¹⁰ for Hands and Feet
- **Implicit Association Test (IAT)**¹¹ – **Action representations** for Hands, Feet and Whole Body. Outcome: D Score¹¹⁻¹² from -2 to 2 , with $|.15| >$: no association, $|.15| -|.35|$: weak association, $|.35| -|.65|$: medium association, $|.65| <$: strong association

Implicit Association Test - Action Hands		Implicit Association Test - Action Feet		Implicit Association Test - Action Whole Body	
Category	Items	Category	Items	Category	Items
Self		Self		Self	
Other		Other		Other	
Moving	Waving, Writing	Moving	Kicking, Stepping	Moving	Walking, Running
Not Moving	Resting, Relaxing	Not Moving	Resting, Relaxing	Not Moving	Resting, Sitting

- **Mental Motor Chronometry (MMC)** for Hands² and adapted for Feet and Whole Body. Outcome: Strength of Isochrony¹⁵ (Isochrony: correlation between Reaction Times of Motor Imagery & Motor Execution) through Fisher's r to z transformation¹⁶⁻¹⁷



- **Vividness of Visual Imagery (VVI)** for Hands¹³⁻¹⁴ and Feet and Whole Body. Outcome: Vividness score (1-5), the higher the score, the higher the image clarity

3. Results

Research Question 1
Are there differences between hands, feet, and the whole body in more **implicit** motor imagery tasks?

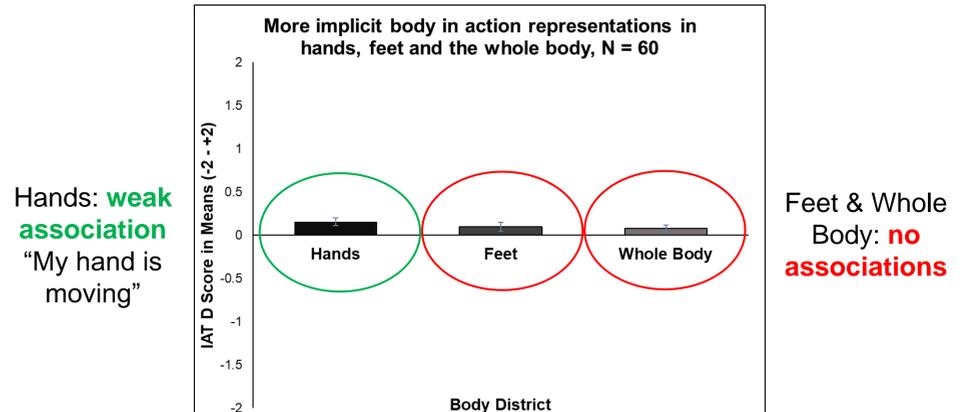


Figure 1. IAT D Score Means and SEs

A one-way repeated measures ANOVA revealed no main effect of body district [$F(2, 118) = .89$, $p = .41$, $\eta_p^2 = .01$]

Research Question 2
Are there differences between hands, feet, and the whole body in more **explicit** motor imagery tasks?

I. Vividness of Visual Imagery (VVI)

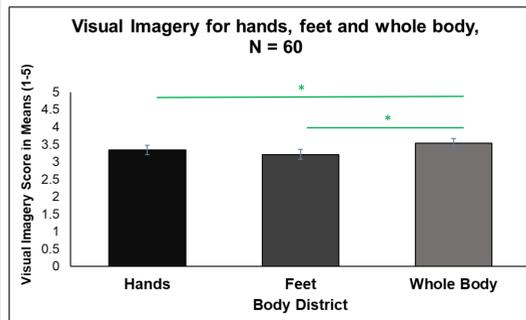
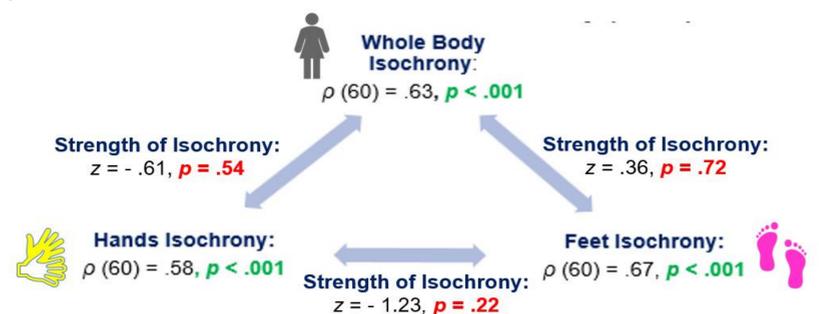


Figure 2. VVI Score Means and SEs

A one-way repeated measures ANOVA revealed a significant main effect of body district [$F(1.80, 106.07) = 9.67$, $p < .001$, $\eta_p^2 = .14$]

II. Mental Motor Chronometry (MMC)

- Isochrony was **present** in each body district
- Strength of Isochrony **did not differ** between the body districts



4. Discussion

- Our findings suggest that **Motor Imagery does not vary between body districts and across tasks (implicit or explicit)**
- This finding is **not due to Visual Imagery differences**, as the visual imagery data indicate clearer imagery for the whole body compared to hands and feet
- The **dissociation between the Visual Imagery & Motor Imagery** results could be explained by (a) the **different imagery ability components** involved in the **Visual Imagery (image generation)** and **Motor Imagery (image maintenance)**¹ and/or (b) the **dissociation between Body Schema (Motor Imagery) and Body Structural Description (Visual Imagery)**¹⁸

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