

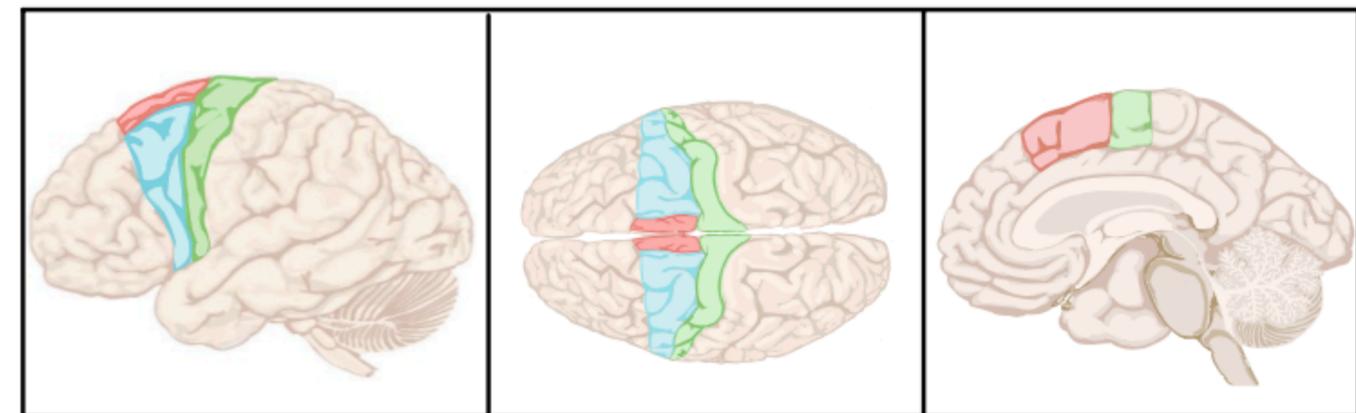
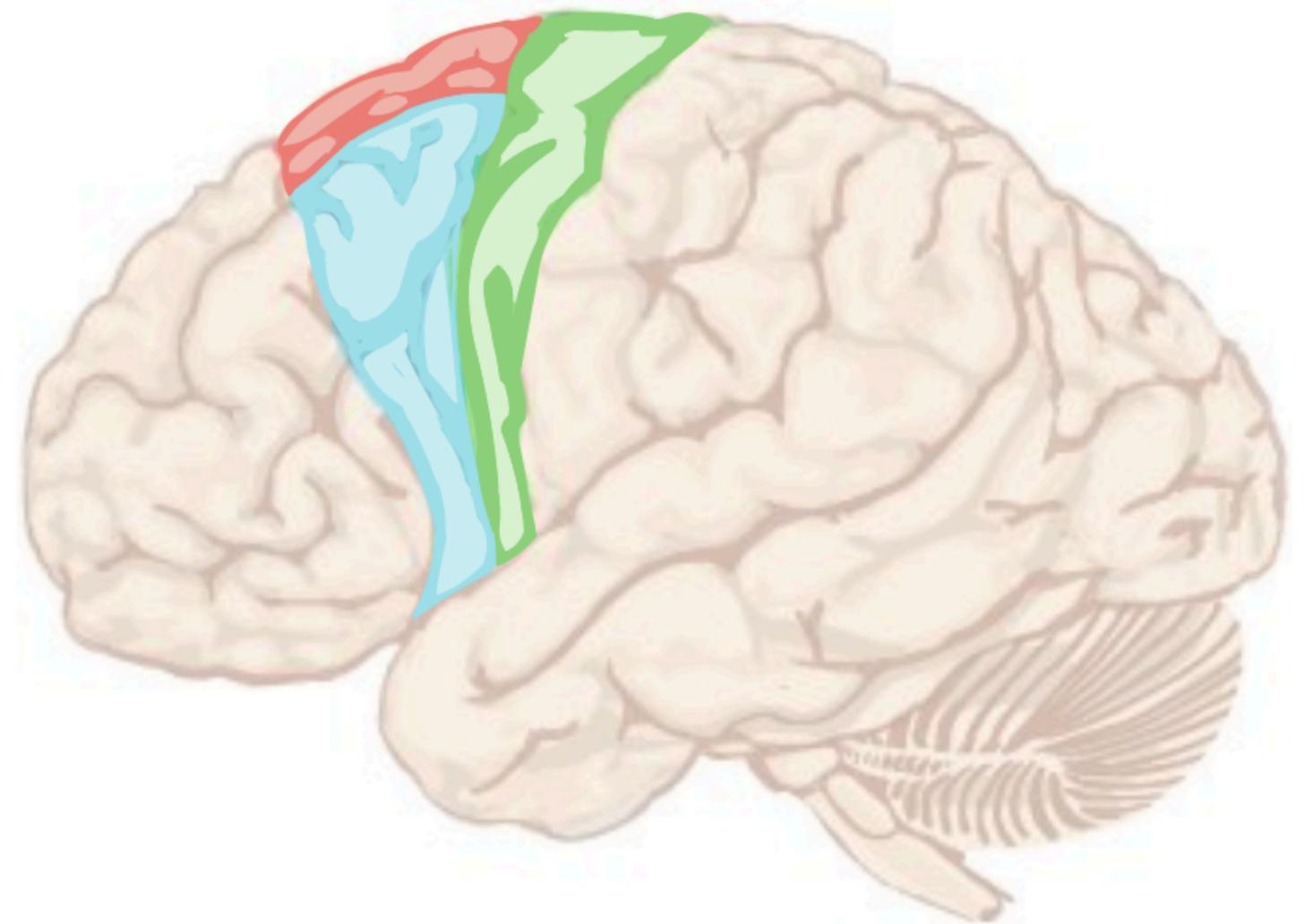


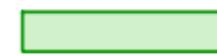
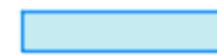
NEUROTRAINING
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The Motor Cortex



Motor Cortex Divisions



-  Primary Motor Cortex
-  Pre Motor Cortex
-  Supplementary Motor Area

The Motor Cortex - more than just movement?



Neuroscience & Biobehavioral Reviews
Volume 68, September 2016, Pages 602-610



Review article

The role of the supplementary motor area for speech and language processing

[Ingo Hertrich](#)  , [Susanne Dietrich](#), [Hermann Ackermann](#)

[Show more](#) 

- “Apart from its function in speech motor control, the supplementary motor area (SMA) has largely been neglected in models of speech and language processing in the brain.”

Motor Cortex & Anxiety

> [Biol Psychiatry](#). 2001 Sep 1;50(5):377-82. doi: 10.1016/s0006-3223(01)01210-0.

Motor cortex excitability correlates with an anxiety-related personality trait

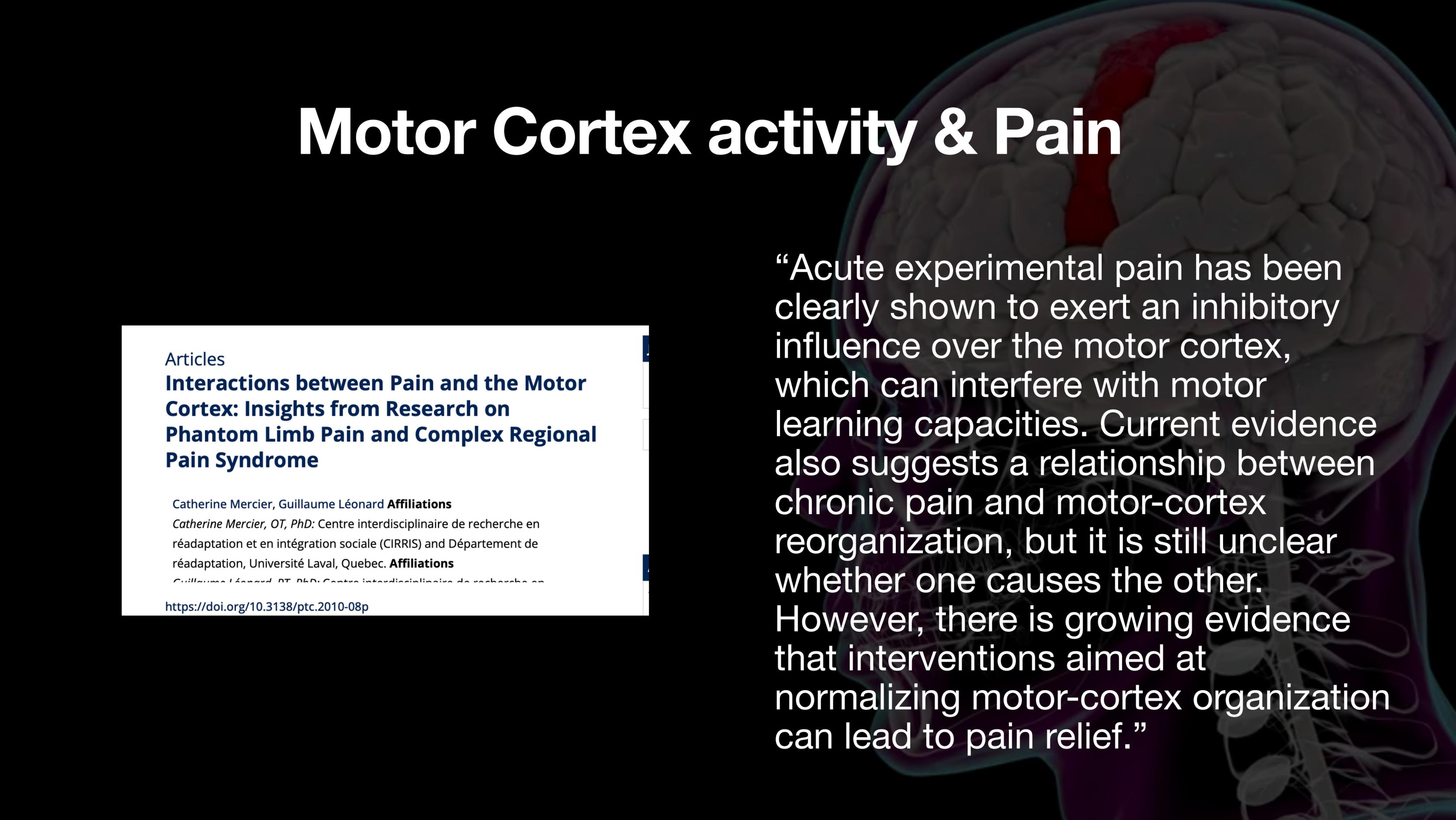
E M Wassermann ¹, B D Greenberg, M B Nguyen, D L Murphy

Affiliations + expand

PMID: 11543742 DOI: [10.1016/s0006-3223\(01\)01210-0](#)

“We found lowered motor evoked potential (MEP) threshold to transcranial magnetic stimulation (TMS) and decreased intracortical inhibition in OCD.”

Motor Cortex activity & Pain



Articles

Interactions between Pain and the Motor Cortex: Insights from Research on Phantom Limb Pain and Complex Regional Pain Syndrome

Catherine Mercier, Guillaume Léonard **Affiliations**

Catherine Mercier, OT, PhD: Centre interdisciplinaire de recherche en réadaptation et en intégration sociale (CIRRS) and Département de réadaptation, Université Laval, Quebec. **Affiliations**

Guillaume Léonard, OT, PhD: Centre interdisciplinaire de recherche en

<https://doi.org/10.3138/ptc.2010-08p>

“Acute experimental pain has been clearly shown to exert an inhibitory influence over the motor cortex, which can interfere with motor learning capacities. Current evidence also suggests a relationship between chronic pain and motor-cortex reorganization, but it is still unclear whether one causes the other. However, there is growing evidence that interventions aimed at normalizing motor-cortex organization can lead to pain relief.”

Functions Of Motor Cortex Areas

Supplementary Motor Area

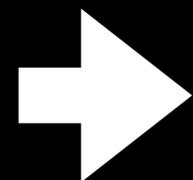
- Temporal Organisation
- Inhibition
- Bilateral Coordination
- Mental Rehearsal
- Self-generated movements

Pre Motor Cortex

- Movement Preparation
- Visuo-Motor Coordination
- “Mirror-Movements”
- Planned sequenced motor skills

Primary Motor Cortex

- Speed
- Force
- Direction



All 3 areas will overlap in certain functions

Interaction between the Prefrontal Cortex & Motor Cortex

Prefrontal Cortex
CEO



Initial thought of movement

Motor Association Cortex
Planner & Choreographer



Motor Planning &
Coordination



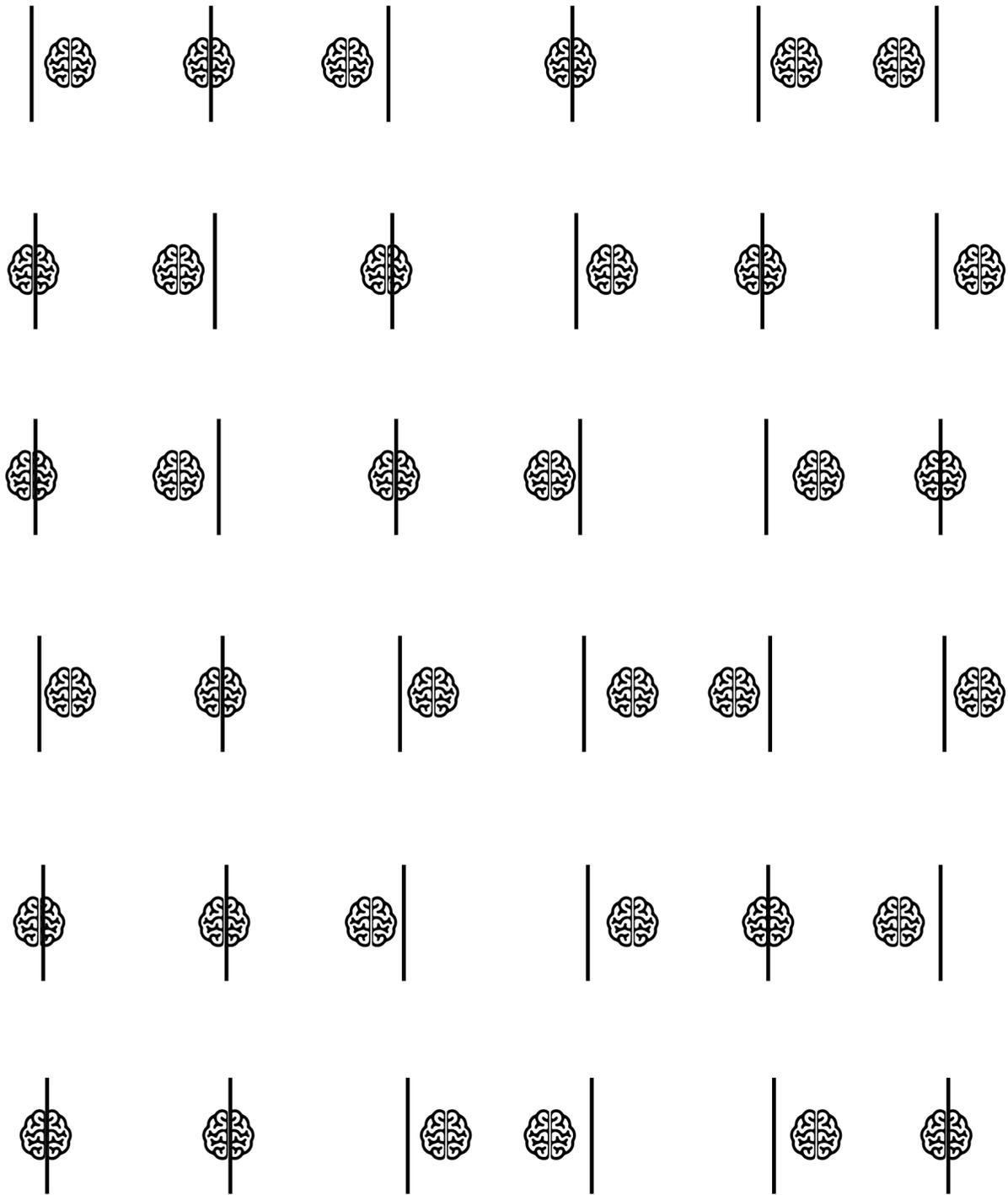
Primary Motor Cortex:
Commander



Movement Execution



Coordination Chart



Coordination Chart

Progression Models:

- Variation 1: Upper Body (Eg. Clapping)
- Variation 2: Lower Body
- Variation 3: Alternating Upper/Lower Body
- Variation 4: Mirror the directions
- Variation 5: Cross body
- Variation 6: Verbally call out opposite directions
- Variation 7: Sport Specific Movements
- Variation 8: Loading/Intensity