Long-term sequence training alters movement representations in sensorimotor network

Patrick Beukema\textsuperscript{1,2}, Timothy Verstynen\textsuperscript{2,3}

\textsuperscript{1}Center for Neuroscience, University of Pittsburgh, \textsuperscript{2}Center for the Neural basis of Cognition, \textsuperscript{3}Carnegie Mellon University

Reprint: www.psy.cmu.edu/~coxlab/posters/Beukema_SFN16.pdf

**Motivation**

- Sequential skill acquisition is associated with binding distinct movements into one.

- It is unknown how sequential learning affects the representations of movements.

**Methods**

**Dataset**

- Participants: Neurologically healthy adults (n=18, age = 21.5±3.6 female)
- Finger movement sequence production task with fractal images
- 1300 task per movement (86,000 trials)

- Functional MRI data acquired pre and post-training
- Scan Parameters: 8 runs/session, TR=2000ms, MR 3.0, 64 slices, 2mm³

**Representational Similarity Analysis**

- Parallel task analysis (77% active)
- Pre-trained task analysis  (94% active)

**Decoding Within Motor Network**

- Hand structure in sensorimotor cortex matches previous results.
- RDMs are highly correlated throughout motor control network.
- Training group shows increased RDM correlation in high level motor planning regions.
- Follow-up analyses will examine finger specific binding within motor control network.

**References**


Funding: Pennsylvania Department of Health's Commonwealth Universal Research Enhancement Program #5AP41006E2201
NSF Career: #1351748