

Neural self-other integration in Joint Improvisation

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Problem

Effective coordination is based on **anticipation & adaptation**. This requires the constant monitoring of your own and the other's movement. Little is known about the **neural integration and segregation of self and other generated movement**. Our frequency tagging paradigm is providing the possibility to disentangle the perceptual and motor processes assigned to tracking self and other.



Objectives

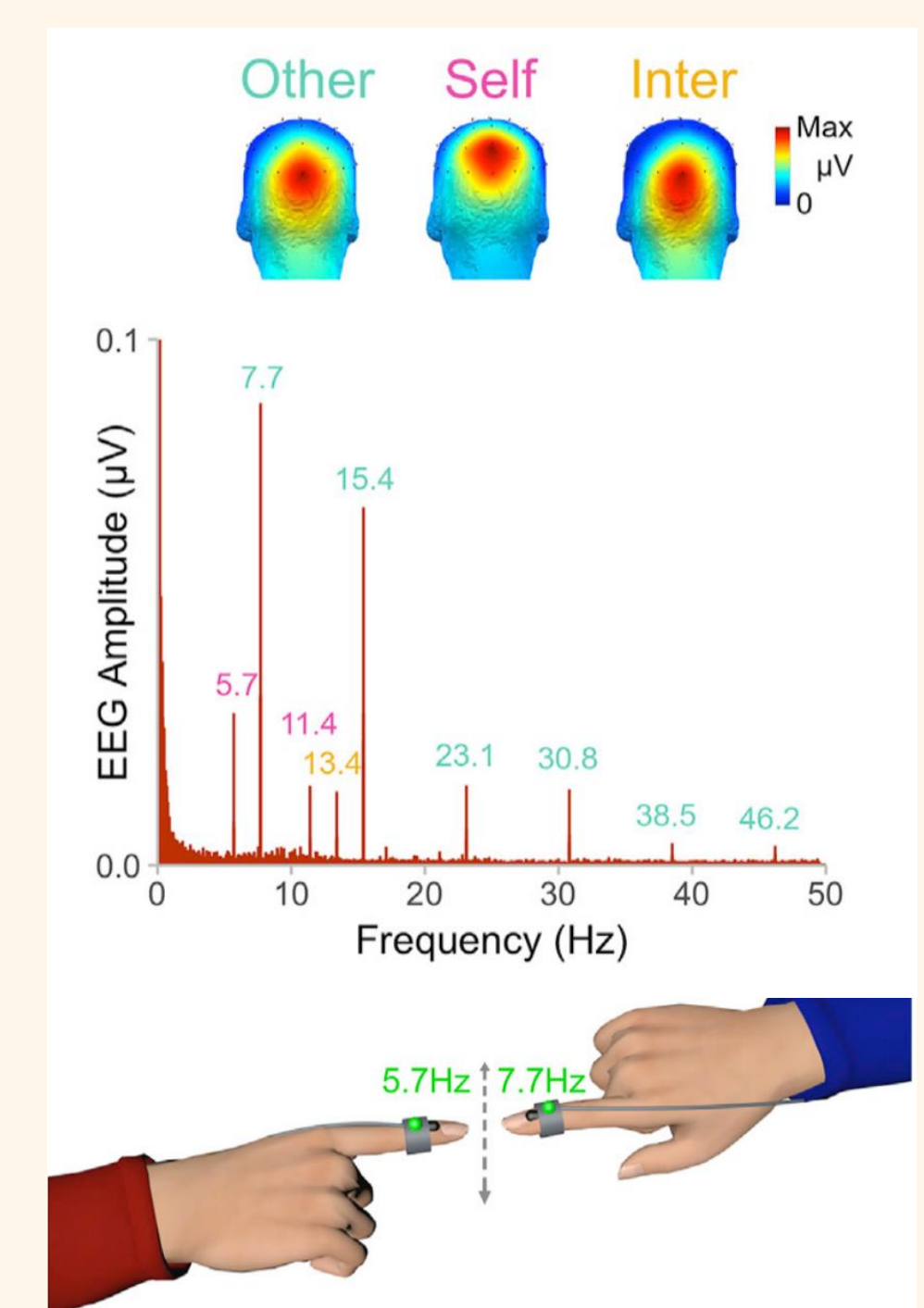
- Reproduce Varlet et al. (2020)
- Extend the movement dynamics of the task
- Explore Individual differences with links to social bonding and personality

Frequency tagging

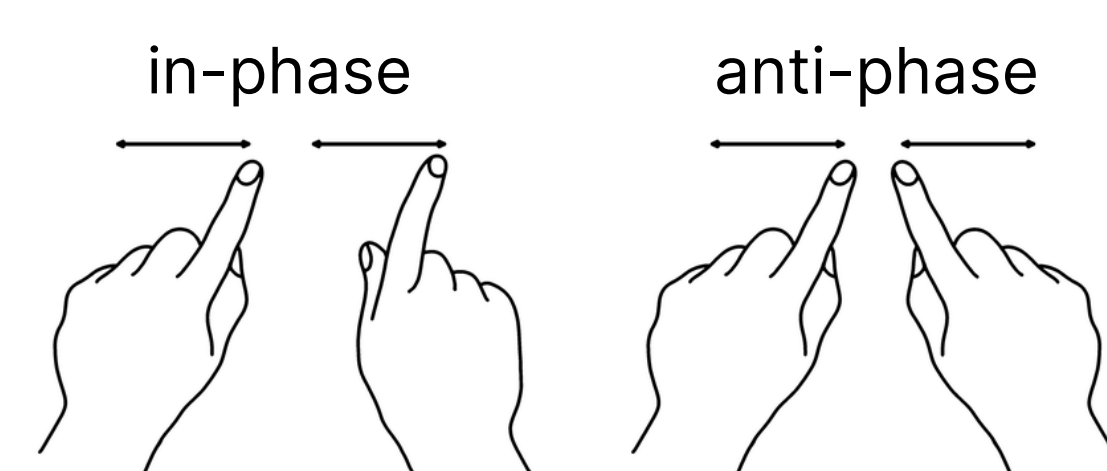
Finger movement is LED tagged

Each person's finger is equipped with a flickering LED at its own frequency (5.7 & 7.7 Hz)

This results in a strong SSVEP



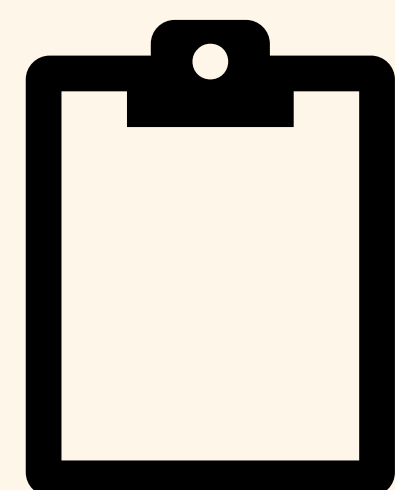
Task: Improvise novel movement patterns together by varying tempo and speed



Design

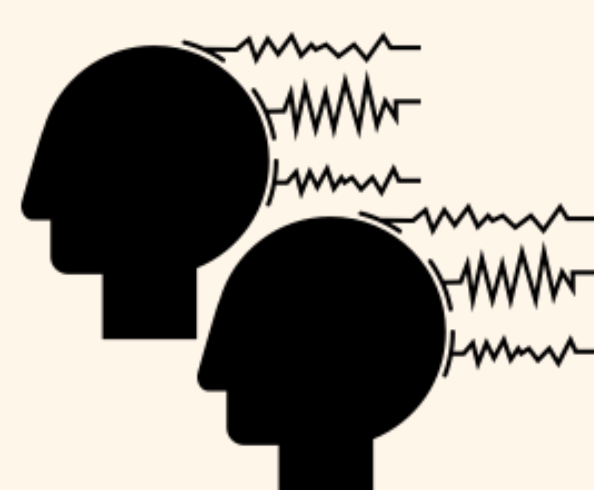
Questionnaires

- Self-in-Other overlap (IOS)
 - pre and post measures
- Social mentalities scale (SMS)
- BFI-short
- EQ-short
- GOLD-MSI



Dual EEG

64 channel
BrainVision mobile system
SSVEP at 5.7, 7.7, 13.4 Hz



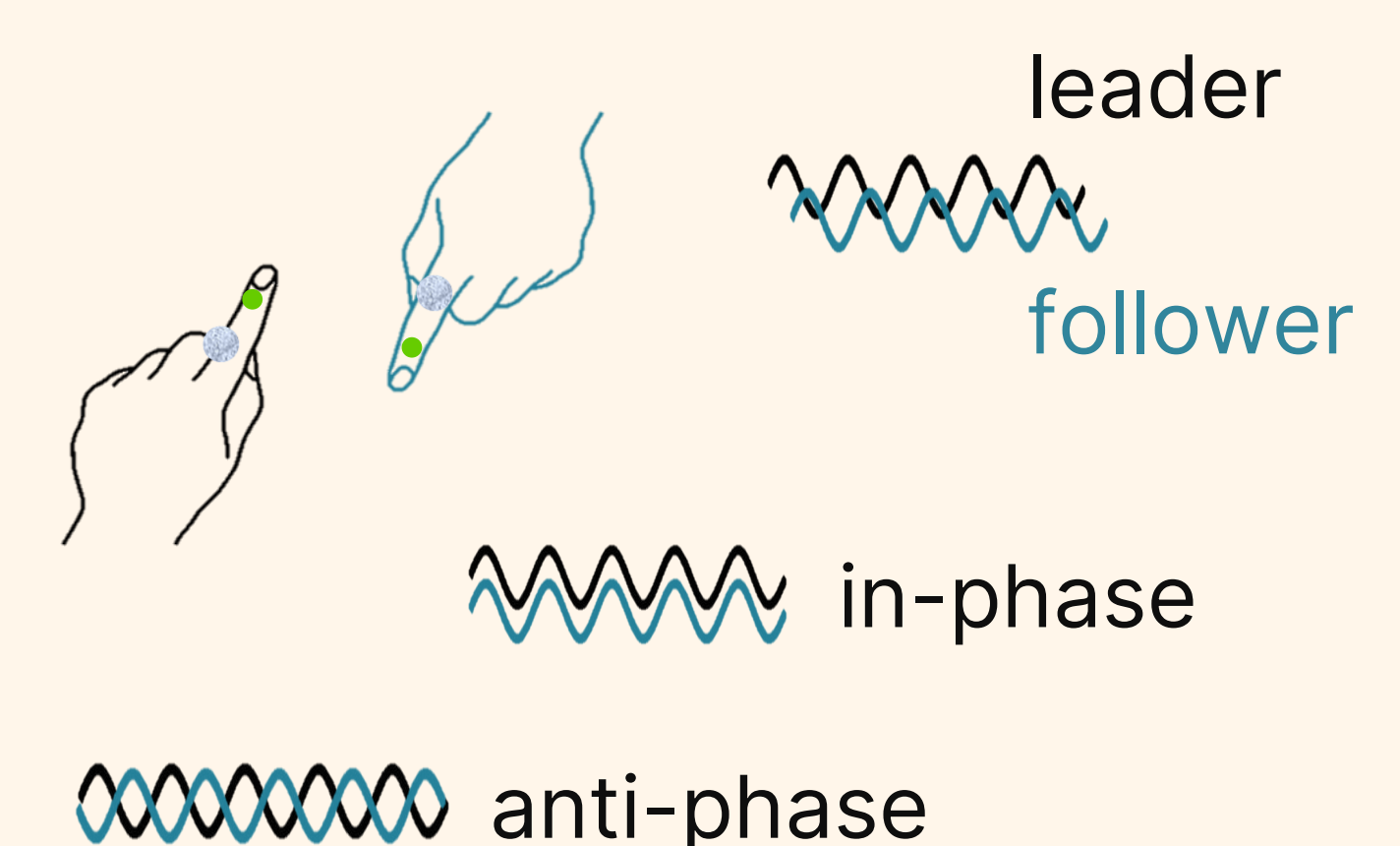
Conditions

2 coordination modes:
in-phase; anti-phase
3 leadership conditions:
leader; follower; joint



Movement tracking

Single reflective marker
Qualysis MoCap



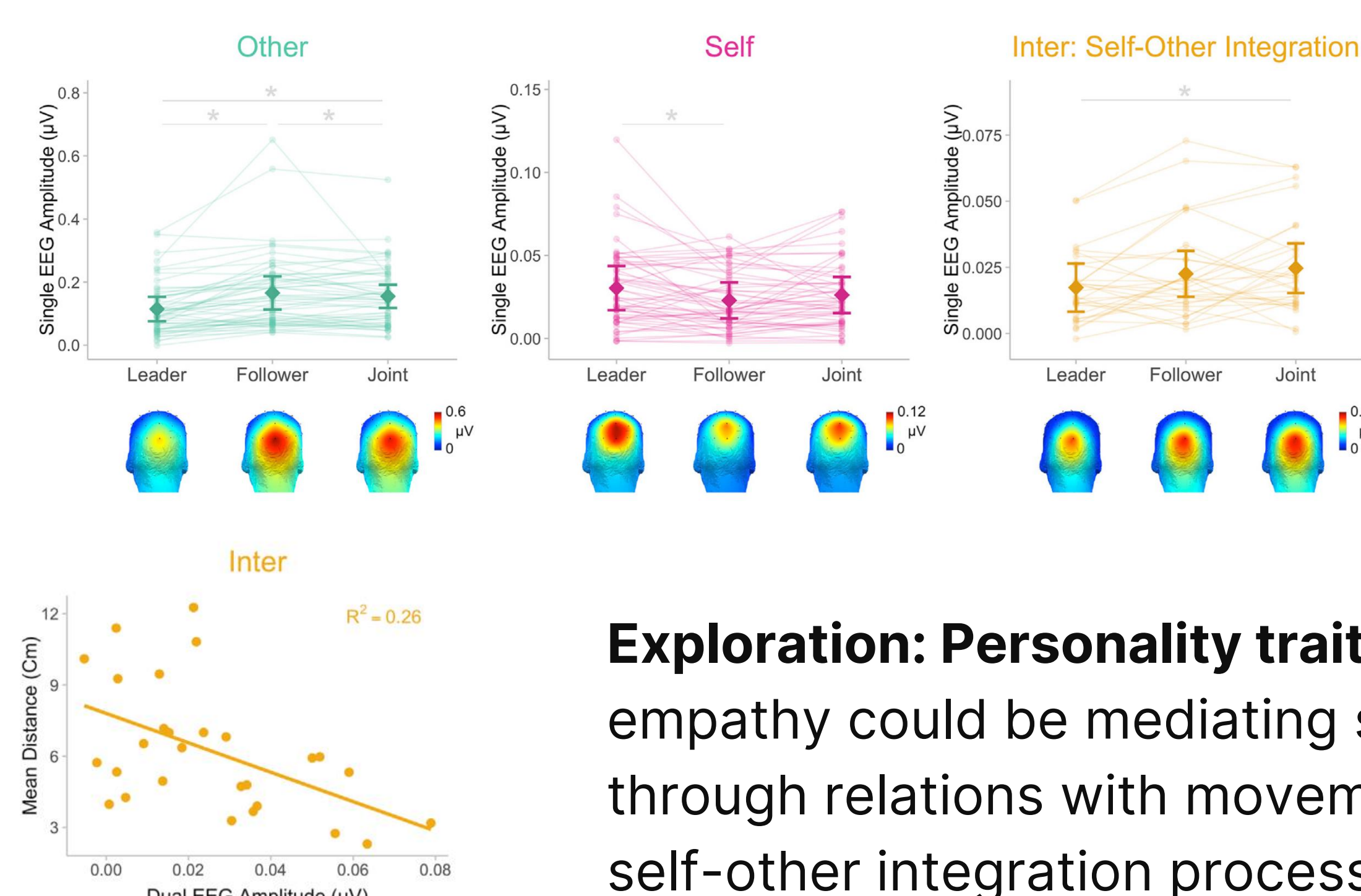
Predictions

The strength of movement tracking, as measured by the peak amplitude of the tag frequency, is **modulated by leadership roles** in the interaction

Neural self-other integration **correlates with movement synchrony**

Anti-phase coordination might require stronger tracking of 'other' and less (or different) 'integration'

Stronger movement coordination results in **larger IOS overlap**



Exploration: Personality traits associated with empathy could be mediating social bonding effects through relations with movement synchrony and self-other integration processing