

# Beyond Dyads: The Impact of Physical Synchrony on Inter-Brain Synchrony during Large Group Interactions

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## Background

- Shared intentions among group members [1], facilitated by perception-action linkages [2], may promote feelings of team affiliation and social cohesiveness [3, 4].
- In-group bonding strengthens an individual's commitment to and identification with the group [5], enabling personally costly behaviours that benefit the in-group [6] while punishing rivaling out-groups [7, 8, 9].

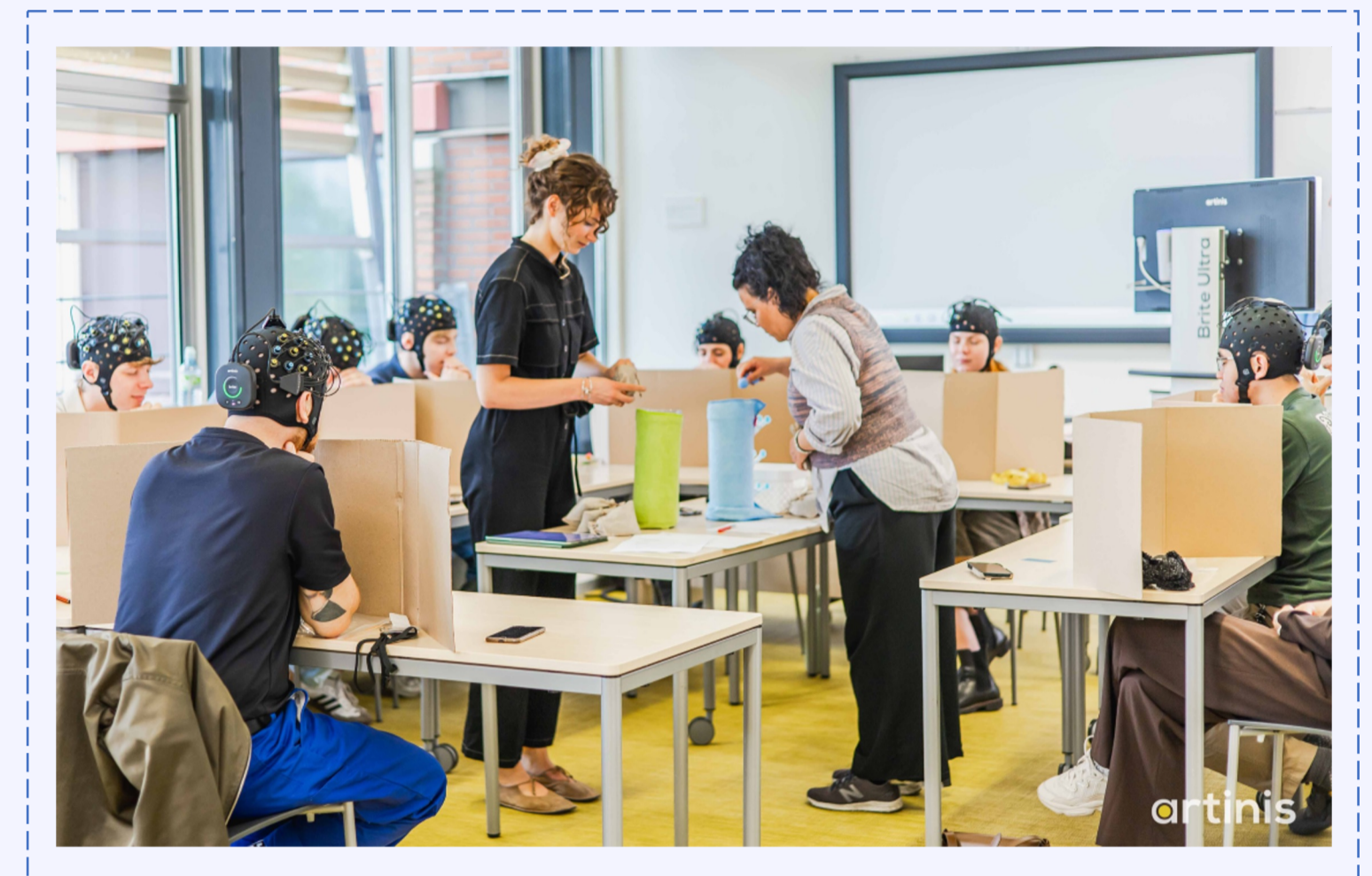
What is the influence of physical synchrony on IBS during inter-group conflict?

## Design

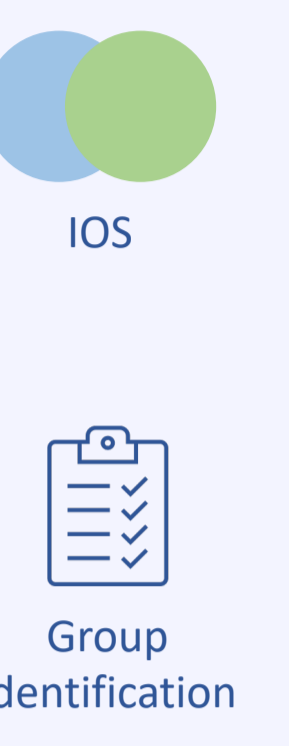
Physical synchrony as social bonding manipulation



Inter-group conflict game

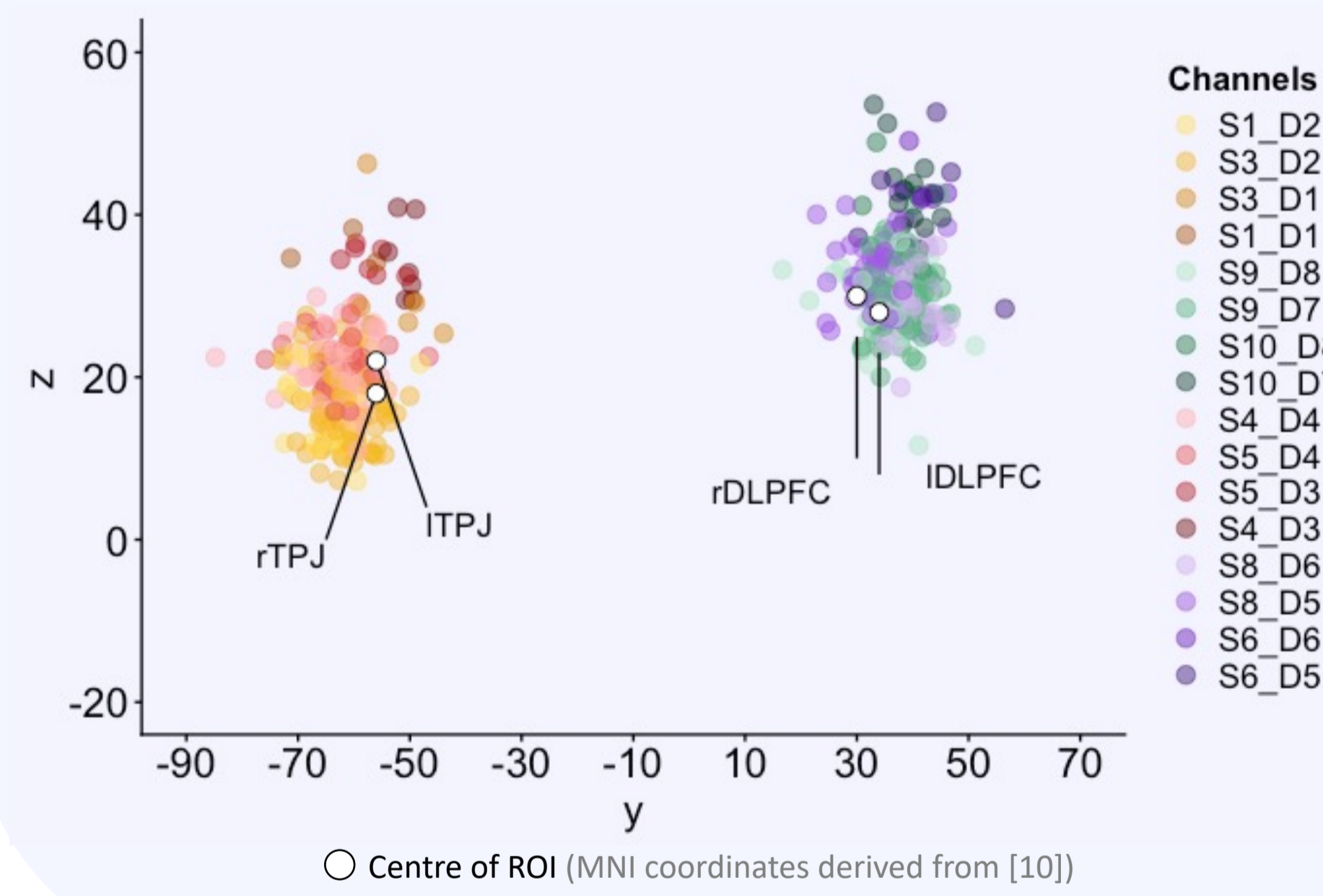


- Groups of eight individuals (N = 112)
- Teams of four individuals: physically synchronized or asynchronous

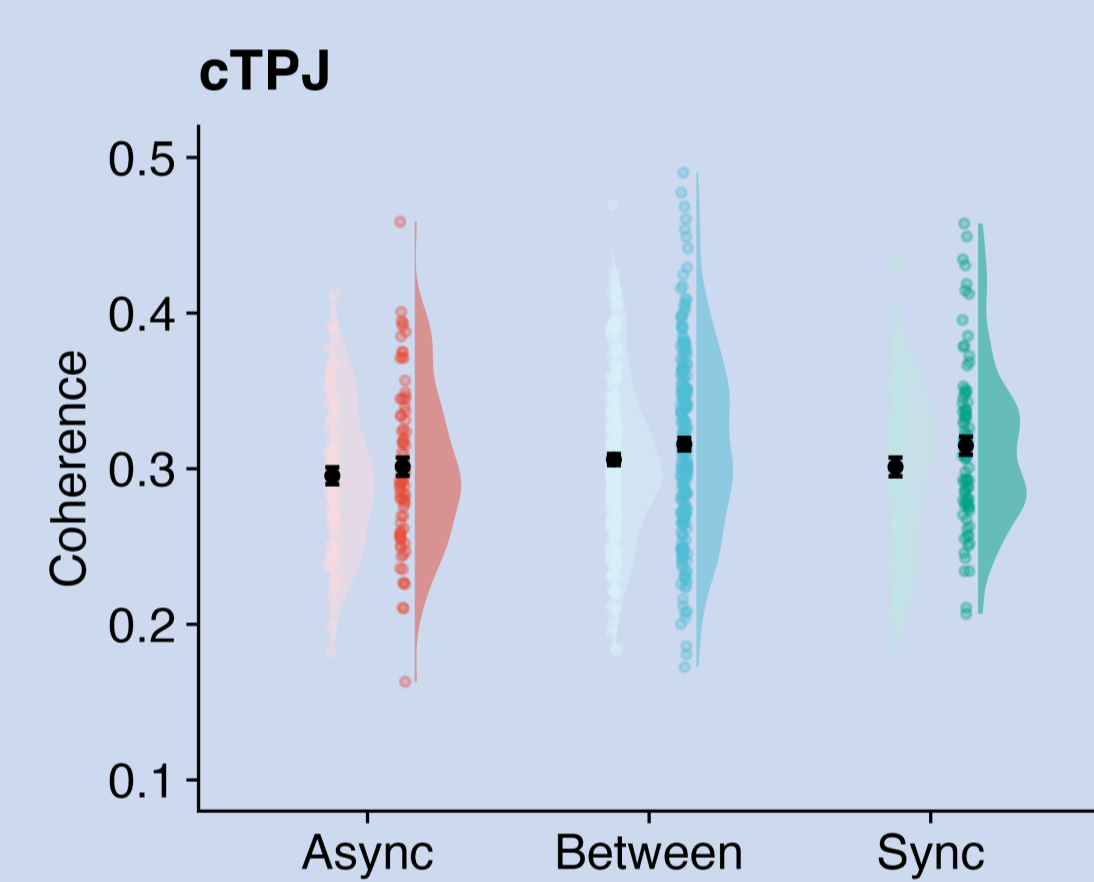
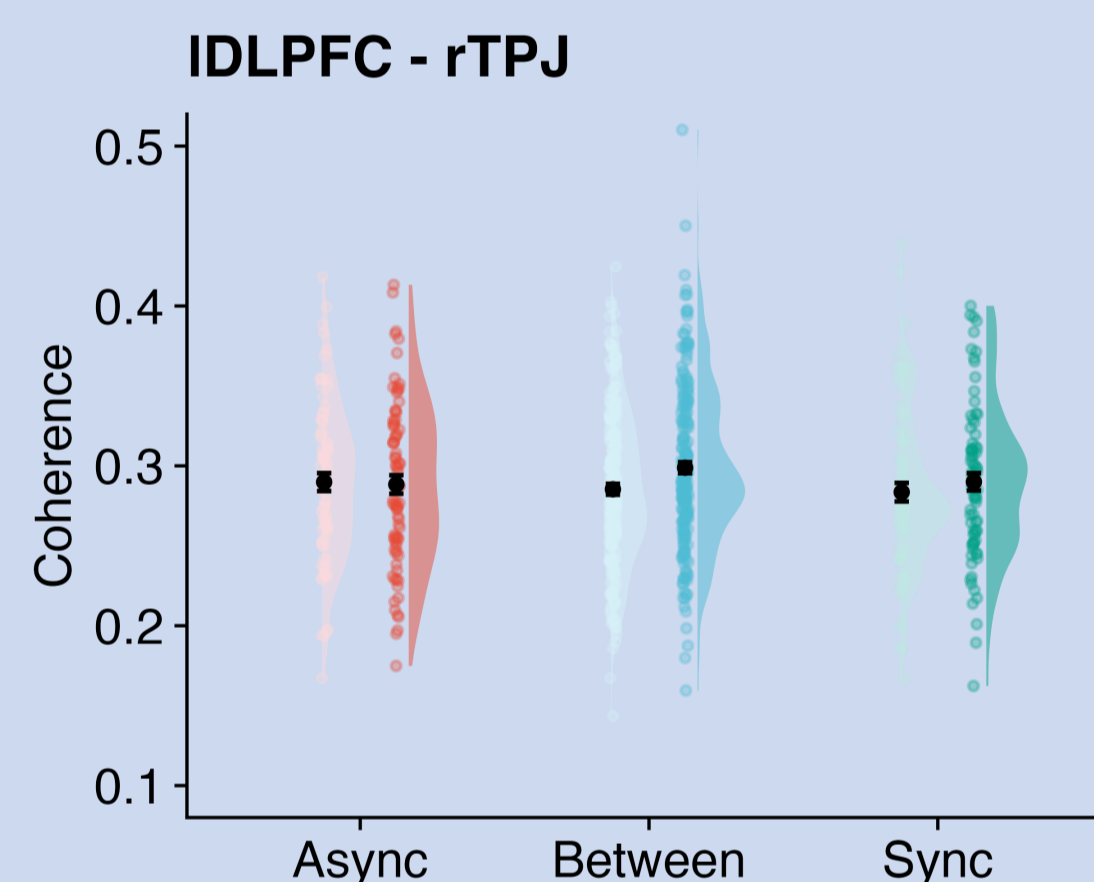
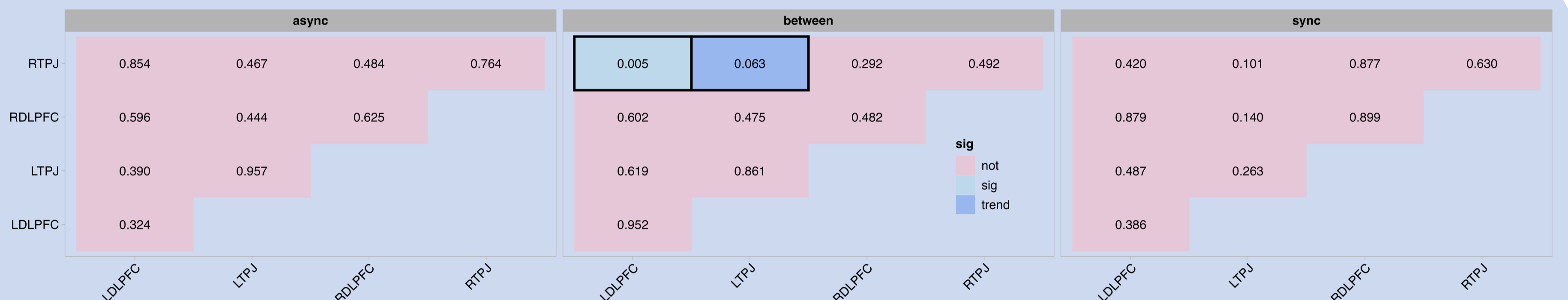


## fNIRS

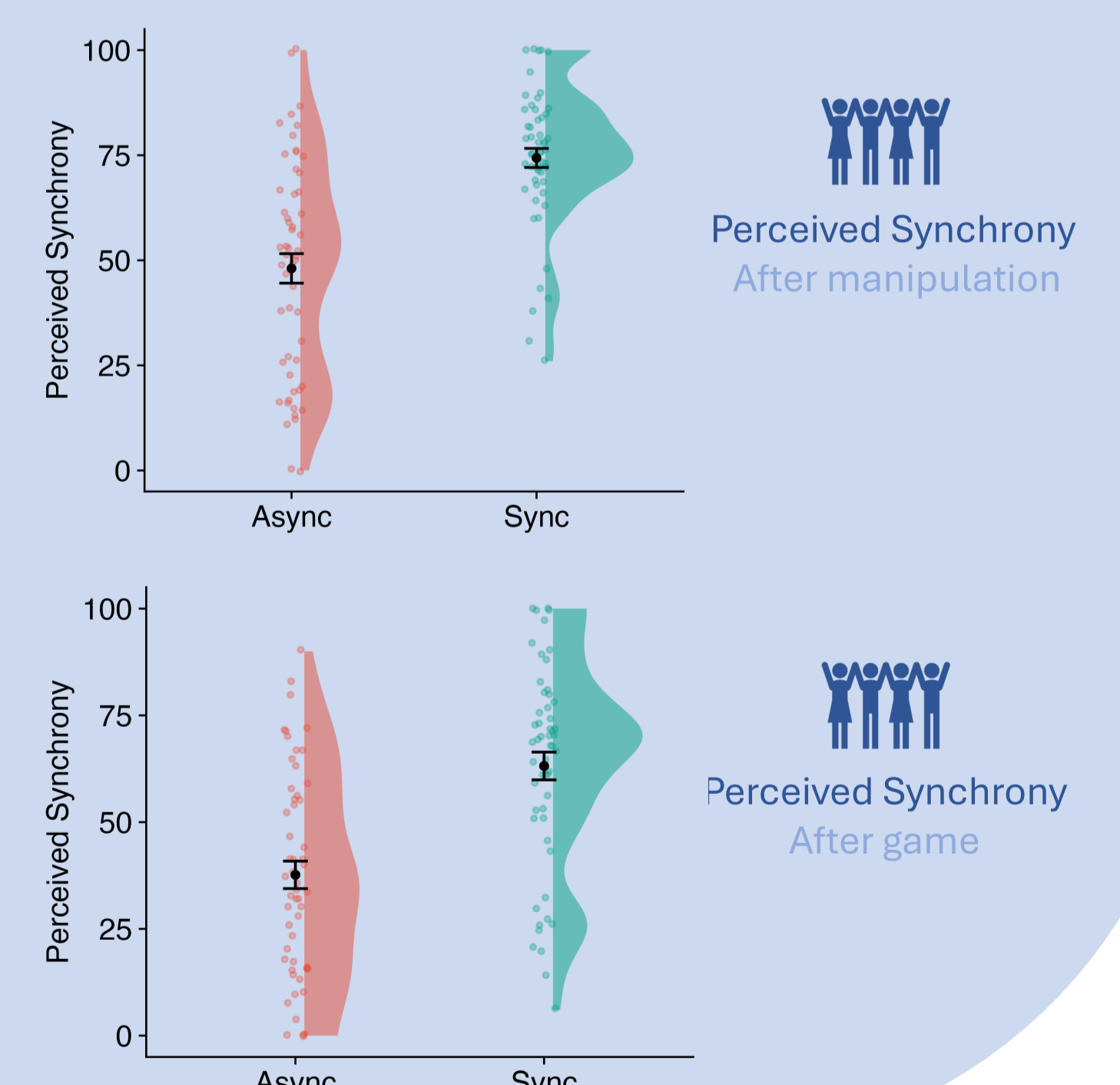
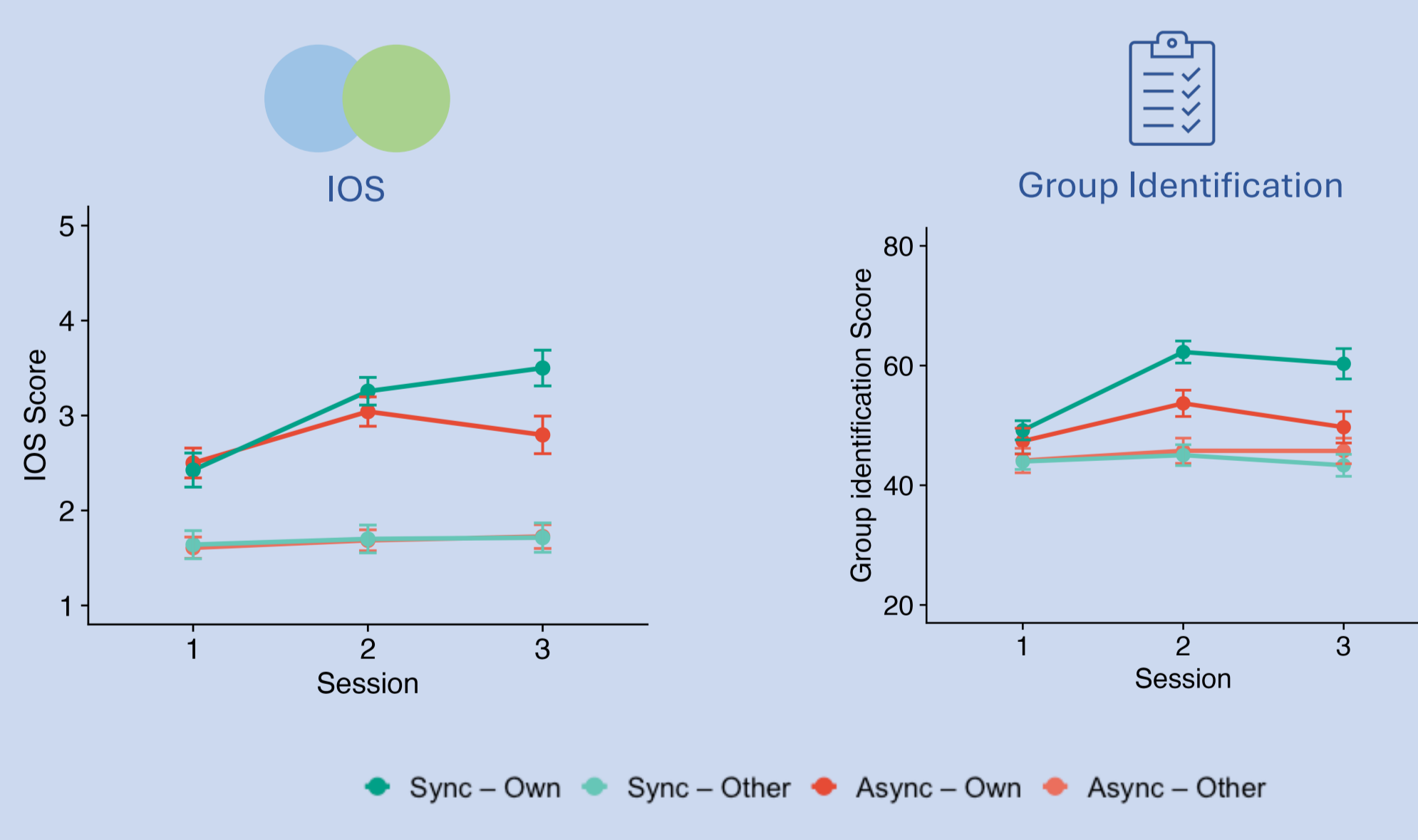
- Artinis Brite Ultra Hyperscanning System
- Bilateral DLPFC & TPJ
- 16 long + 2 short distance channels
- Individual channel of interest approach using photogrammetry based co-registration



## fNIRS results



## Behavioural results



## Analysis

- Random Permutation Test (real vs. pseudo)
- Wavelet Transform Coherence (WTC)
- Frequency of Interest: 0.2 – 0.1 Hz
- (Generalized) Linear Mixed Models (G)LMM



## Conclusion

- Dividing a group in teams increases perceived closeness and group identification. For synchronized teams, this effect is stronger and persists after a competitive inter-group conflict game.
- Physically synchronized and asynchronous individuals do not differ in subsequent inter-brain synchrony levels.
- Between-group dyads show higher inter-brain synchrony levels than pseudo dyads, however, interbrain synchrony levels did not differ across conditions.

