

The neural signatures of leadership: two-brain directed synchronization during eye-contact

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Introduction

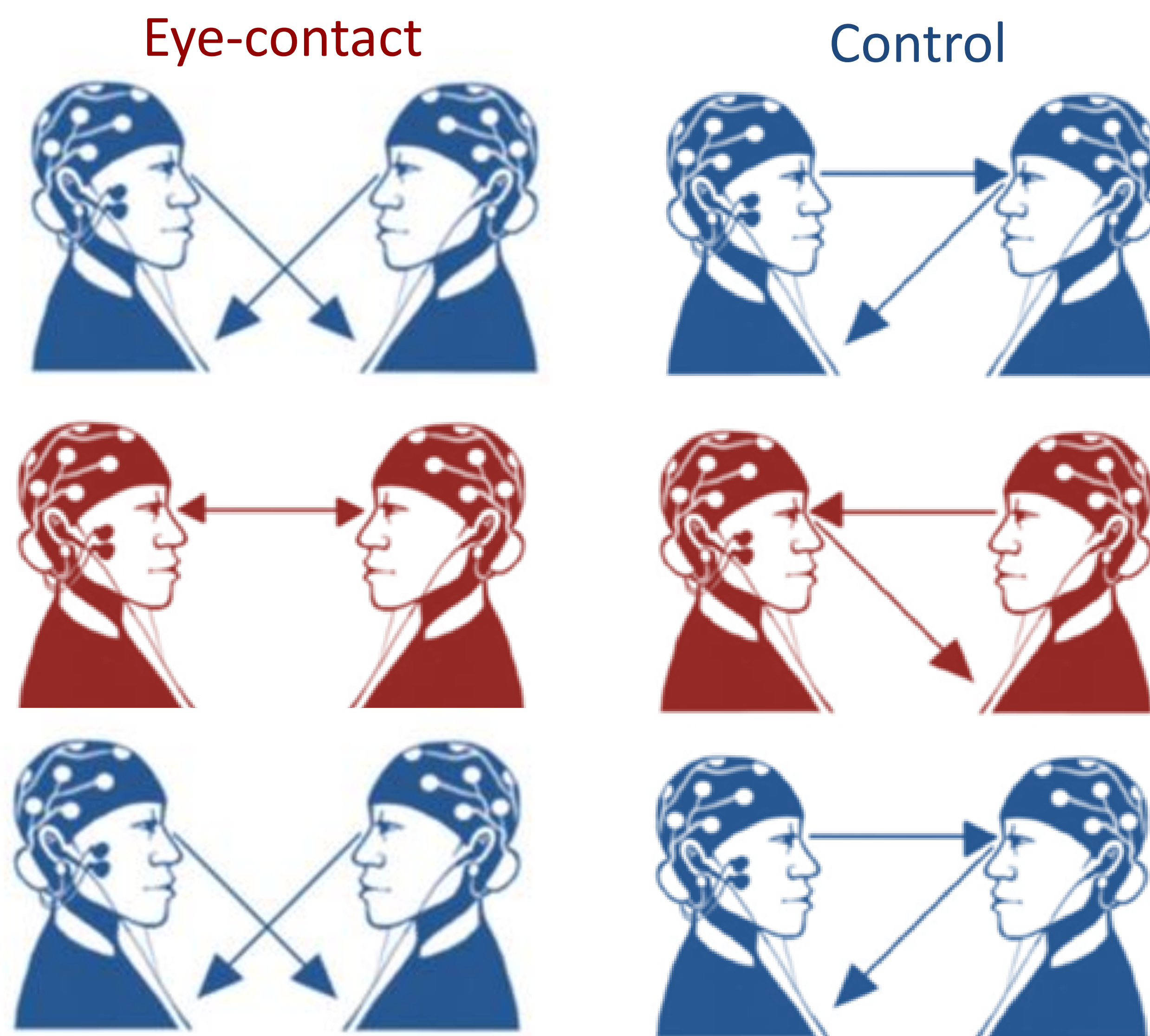
Here we investigate how eye-contact affects the frequency and direction of the synchronization within and between two brains and the corresponding network characteristics.

We also evaluate the functional relevance of eye-contact networks by comparing inter- and intra-brain networks of friends vs. strangers and the direction of synchronization between leaders and followers.

Methods

Participants

Eye-contact task



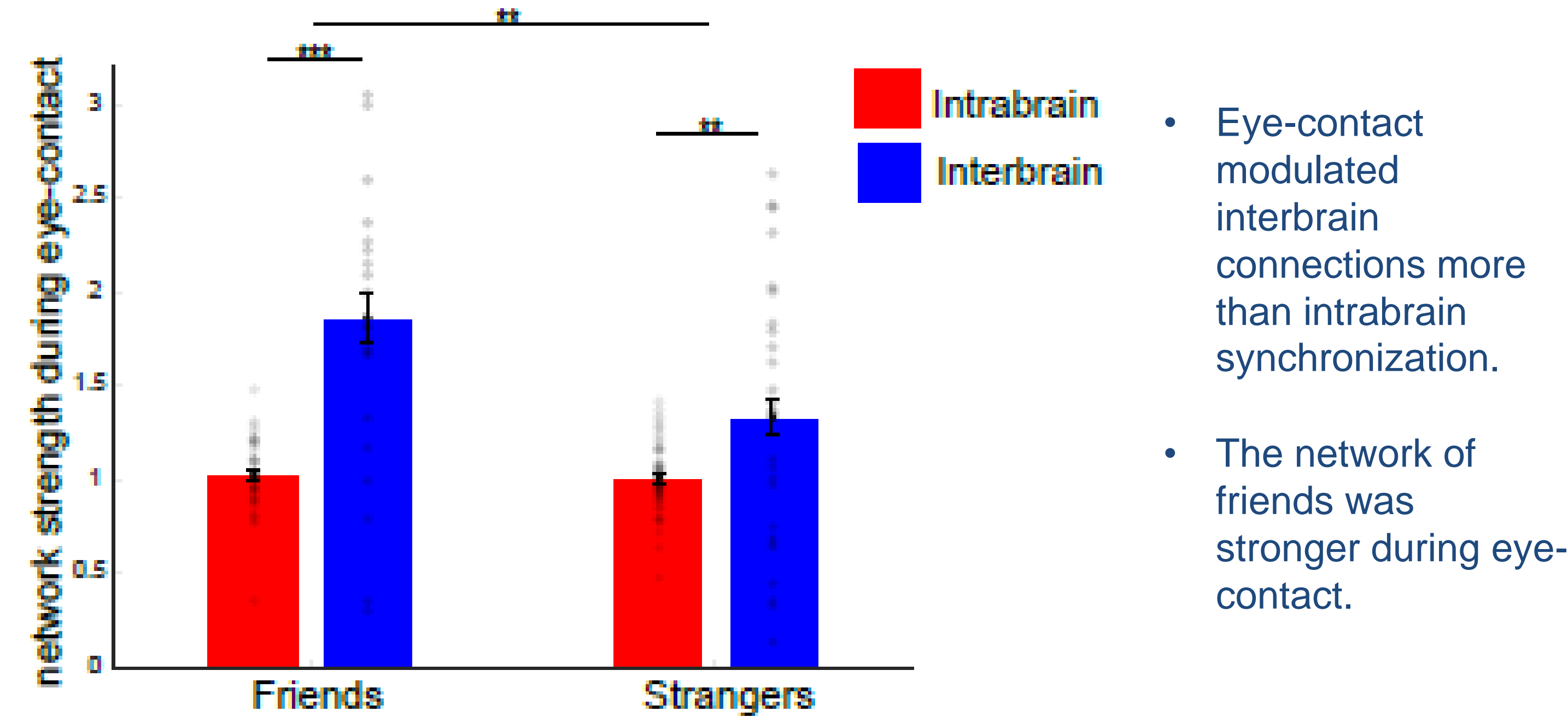
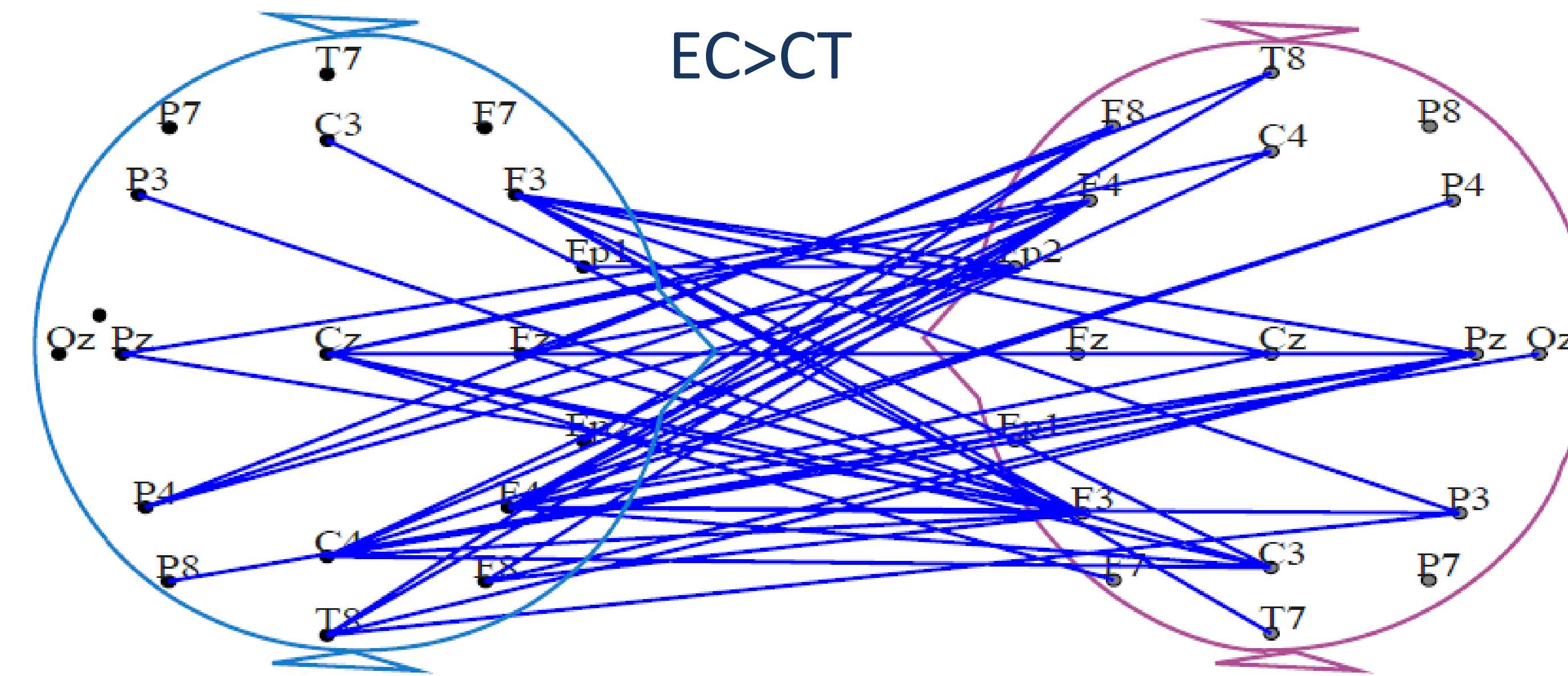
EEG recordings and preprocessing

Eye-tracking

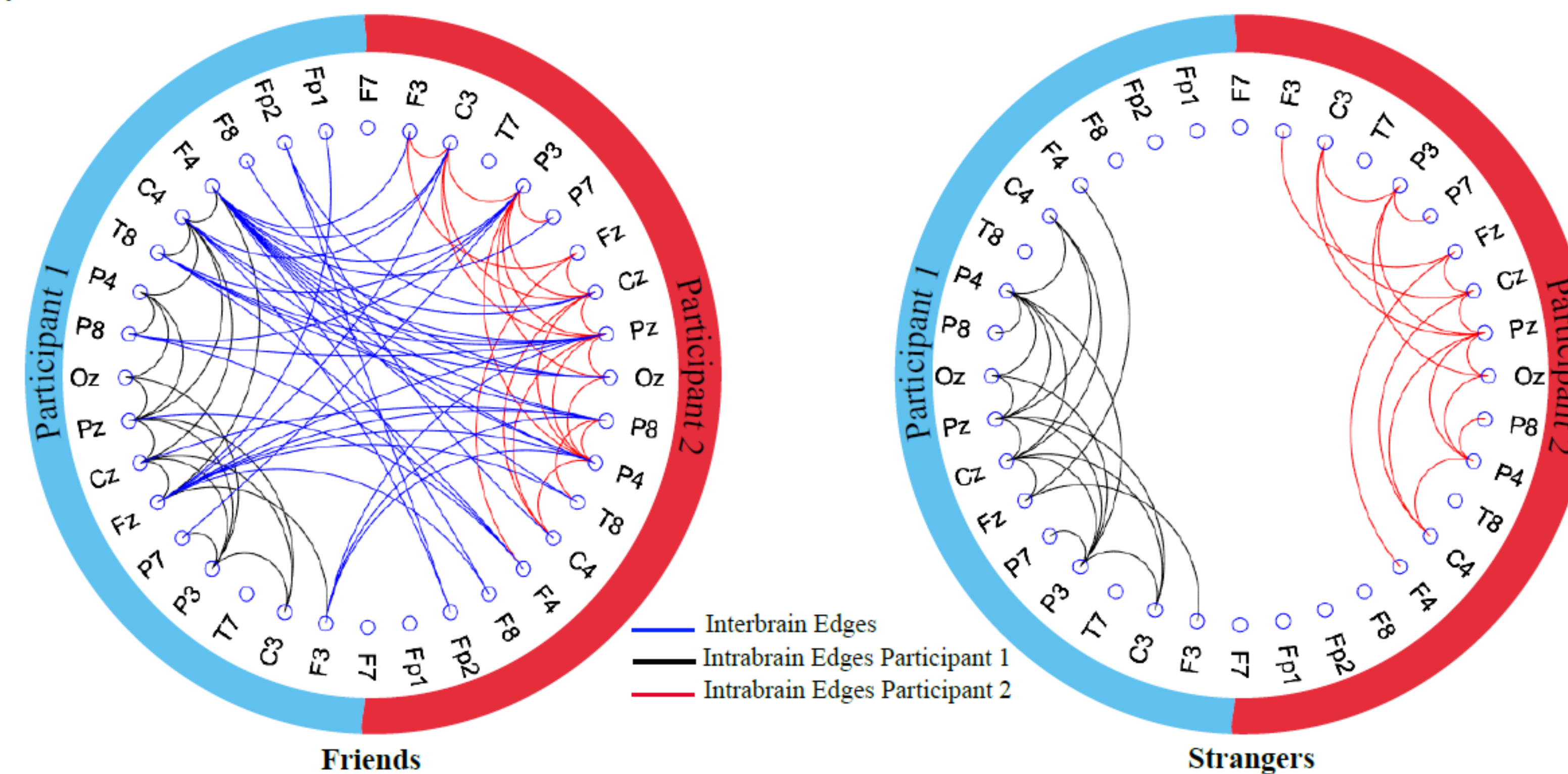
Undirected Phase Sync

Graph Theory: friendship and leadership

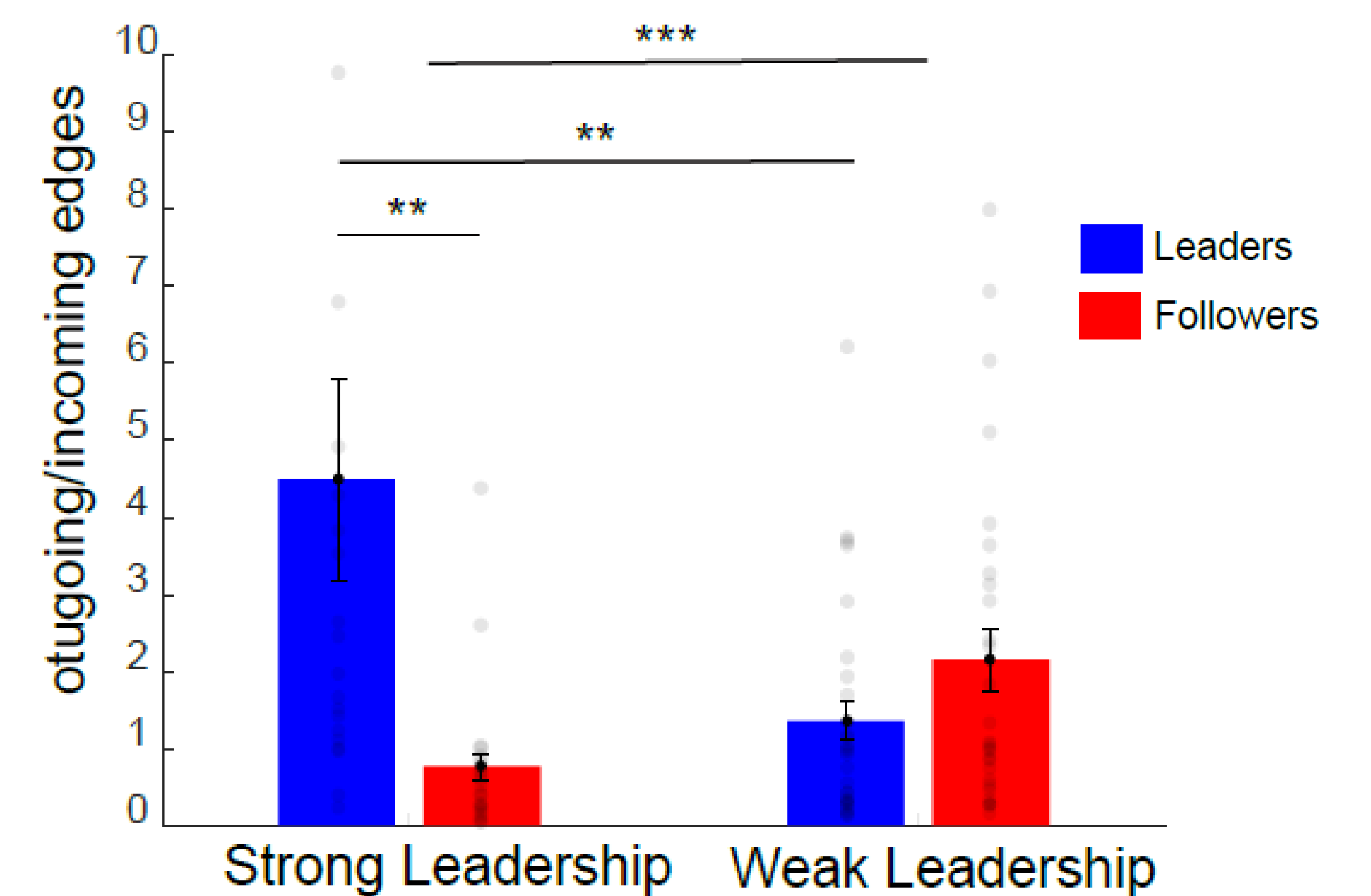
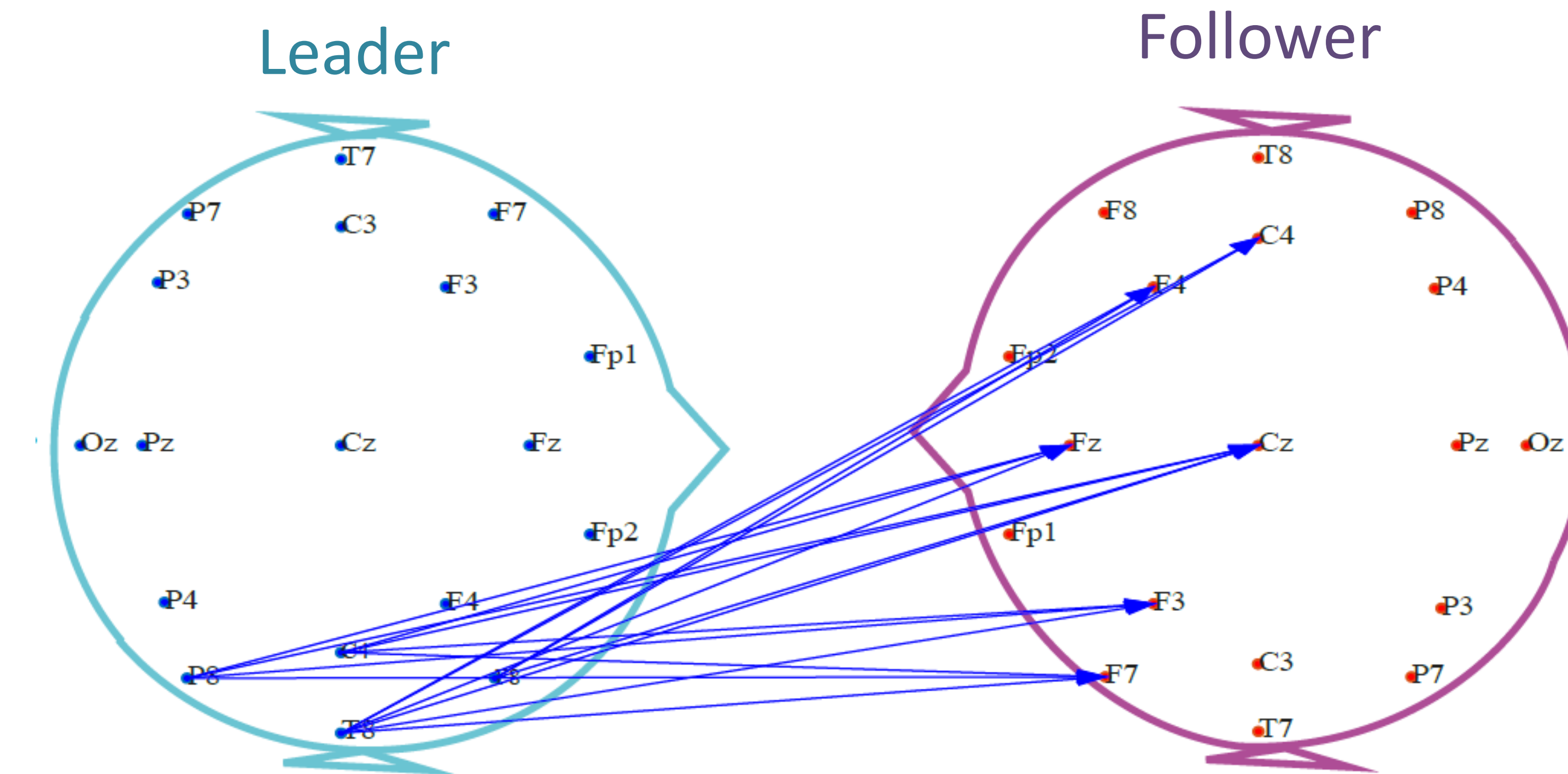
Eye-contact effects



- Eye-contact modulated interbrain connections more than intrabrain synchronization.
- The network of friends was stronger during eye-contact.
- Friends and strangers showed relatively similar network characteristics; but friends showed stronger networks with higher density.
- We found evidence of rich-club structure in both groups.



Leadership effects



Conclusion & Publication

Eye-contact affected synchronization between brains more than within brains, demonstrating that eye-contact is an inherently social signal.

Luft, C., Zioga, I., Giannopoulos, A., Di Bona, G., Civilini, A., Latora, V., & Mareschal, I. (2022). Social synchronisation of brain activity by eye-contact. *Communications Biology* (paper accepted).