An fNIRS Hyperscanning Study on Brain-Brain Interactions of a Dyad during a Joint Sentence Reading Task

Erdinc Isbilir
Middle East Technical University, Ankara, Ankara, Turkey

Murat Perit Cakir
Middle East Technical University, Ankara, Turkey

Fred Cummins
University College Dublin

Hasan Ayaz
Drexel University

Abstract: Existing studies in cognitive neuroscience predominantly focus on a single participant's behavioral and brain responses. Lack of an interactive context for joint action particularly limited social neuroscience studies to simulated social contexts. Advances in portable brain imaging technologies have made it practical to simultaneously monitor the brain activity of two or more people in an interactive context to investigate neural correlates of social interaction. In this study, the relationship between behavioral synchrony and inter-brain coherence is investigated during simultaneous reading of matching and mismatching sentences in different auditory conditions. A dual-fNIRS hyperscanning setup was used to obtain simultaneous recordings of hemodynamic activity from the prefrontal cortices of the participants while they jointly read-aloud the sentences displayed on their screens. The results suggest that the level of inter-brain coherence in the right superior cortex tends to increase depending on the level of behavioral synchrony among the participants.