Differences in the Inter-brain Synchrony during Peer Interaction Between Adolescents with High and Low Interpersonal Competence: Evidence from EEG Hyperscanning.

Meng Yang
School of Psychology, Shenzhen University

Introduction

- **EEG Hyperscanning** has been widely used in the study of the brain activity of multiple individuals during social interaction.
- **Interpersonal competence** was considered as the individuals' ability to build and use networks of relationships, which focused on the ability of developing and maintaining relationships between individuals.
- **Inter-brain synchrony** could reflect the brain-to-brain coupling status of individuals, and was viewed to be an effective biomarker of the quality of social interaction and psychological connection.

The present research: examined differences in the inter-brain synchrony during peer interaction between adolescents with different levels of interpersonal competence.

Methods

Participants: high/low 27% range of the interpersonal competence questionnaire (ICQ-15) . 14 pairs of high interpersonal competence adolescents (Mage= 16.92) and their peers; 14 pairs of low interpersonal competence adolescents (Mage= 16.27) and their peers.
Task: cooperation and competition games

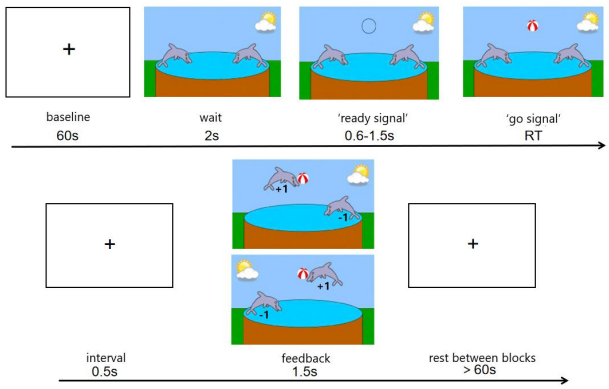

Figure 1. Experimental process, cooperation as example

Hyperscanning techniques were used to record the EEG from each pairs.

Analysis & Results

Preprocessing: ·band-pass filtered 1 - 40 H0z; 1000ms before to 3000ms after the onset of 'ready signal'; Interbrain phase-locking-value (PLV) index for estimating the interbrain synchrony between pairs.

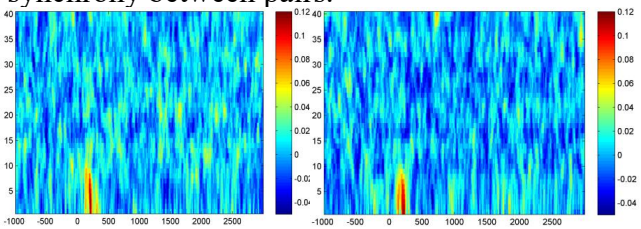

Figure 2. PLV values under cooperation (left) and competition (right) conditions .

ROI time-frequency: 0-0.5s delta & theta bands.

Results: 1) generally, the brain activation of the adolescent task was mainly in the frontal region and in low-frequency bands - delta and theta bands; 2) in delta and theta bands, adolescents with high interpersonal competence had higher inter-brain synchrony with their peers than low interpersonal competence adolescents. However, there was no differences between different game conditions (cooperation vs. competition).

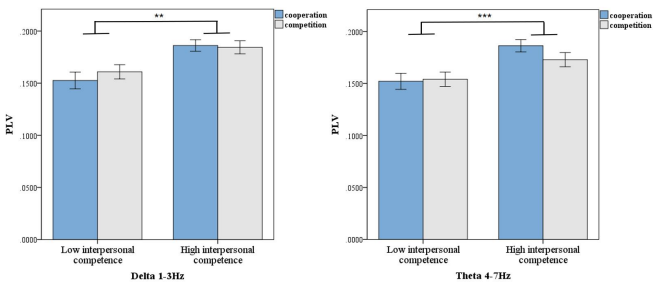

Figure 3. The Phase-locking values (PLV) in delta and theta bands under different conditions between high and low interpersonal competence adolescents

Discussion

The results provide neurological evidence that adolescents' interpersonal competences influence the quality of their interactions with peers and the closeness of their psychological connections.

Tencent meeting ID: 918 867 481
Time : 10:30-11:30 09/10/2021

Futher informations:1900482025@email.szu.edu.cn