

Detection of Brain-to-Brain Synchrony for Improved Psychotherapy

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Current models to treat mental disorders mainly include cognitive behavioral therapy (CBT), however, a main limitation of CBT is that it has no way to determine or measure the therapeutic alliance between the clinician and the patient. Previous studies have shown that for two people interacting with each other, there is a neural association that develops between them. This idea can have great implications in the field of psychotherapy. The detection of brain synchrony between a patient and a therapist can show how engaged they are with each other during a therapy session. Although psychotherapy is an established field and treatment for mental disorder alleviation, technologies that allow the accurate detection of a large array of biologically generated signals are relatively new and constantly being renovated. The most advanced technology used currently for standard protocol during clinician-patient interaction in therapy sessions is simply a voice recorder. Devices and methods such as electroencephalography (EEG), facial pattern recognition, and electrodermal detection are used almost exclusively for scientific research. The implementation of these methods into psychiatry and other mental health-related fields has limitless potential in improving the efficacy of clinician-patient interactions. While it would traditionally take several sessions for a clinician to understand the individual needs of a new patient and to decide the most appropriate methods of therapy, using these technologies would give the clinician a far greater idea of how to approach the patient even by the second session. The product we developed aims to capitalize upon the concepts of social interaction and hyperscanning to be able to detect and measure the therapeutic alliance between the clinician and the patient by detecting brain to brain synchrony signals via EEG. This provides the greatest ecological validity due to its non-invasiveness and its ability to be used in a typical social face-to-face therapist-patient interaction.