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## SPECTRAL COHERENCE AND GRANGER CAUSALITY OF EEG SIGNALS DURING DISTANT INTENTION

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**Background:** In a distant Reiki treatment, the practitioner focuses his attention and intention on the receiver and “sends”, by visualizing, a set of symbols associated with words with the intention of wellbeing towards the receiver. There is great interest in understanding the brain changes that occur in Reiki practitioners engaged in healing. Particularly, can they influence brain states of receivers?

**Aims:** This study explores whether intention from a distant Reiki healer directed to individual receivers affects the spectral signatures of the brain activity for the sender and/or the receivers. We also pose the question: is there any kind of brain synchrony between sender and receivers during a distant intention task?

**Method:** A total of 13 participants (mean age =  $23.9 \pm 6$ , 6 female) were recruited as receivers, with 1 common intention sender (male, age 67), a Reiki practitioner with over 2 years of experience. Quantitative electroencephalography (EEG) was collected from sender and receivers for 13 sessions of distant healing (800 meters away) using a 19-channel cap. After initial baselines with eyes closed and open, the sender sent Reiki to the receivers during 20 minutes with the intention that they would have good performance in the cognitive tests. Receivers then performed a series of attention, memory and inductive reasoning tasks.

**Results:** Spectral analysis for the Cz channel showed a significant increase in alpha power during eyes closed baseline and intention task. While the sender showed a consistent alpha peak at 10 Hz for all session tasks, the receivers had greater variability in alpha, both in frequency and magnitude. Only 3 out of 13 receivers showed an increase in alpha power in the task vs baseline with eyes closed. Intersession spectral coherence for the sender was highest at 9 and 10 Hz during the intention task. However, no significant coherence between sender and receiver was found. Finally, Granger causality was tested between the task time series of sender and receivers (20 min., Cz channel). Using a 1% confidence level and a maximum lag of 0.1 seconds, for 7 out of 13 sessions the sender time series values provided statistically significant information about future values of the receiver.

**Conclusions:** The Reiki practitioner in this study showed a reliable alpha spectral signature at 10 Hz in the intention task. These preliminary results provide a promising insight into the measurable results of intention at a distance and the degree of causality between practitioner and receiver.

**Keywords:** EEG; Alpha waves; Coherence; Granger causality; Intention.

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