

Final Scientific Report April 2019
Project "Mind to Mind: Brain Dynamics of Distant Focused Intention for
Consciousness Expansion" (ID A-04205)

Original Main Objectives, Methodology and Procedure

Objectives

- 1- To evaluate the impact of distant focused intention on brain activity in both sender and receivers, in a control group, where only Reiki is sent to receivers who are just relaxing.
- 2- To evaluate the impact of distant Focused Intention on brain activity of both participants. In which, only the receiver will experience their own multimodal neurofeedback output.
- 3- To evaluate the impact of distant Focused Intention and multimodal Neurofeedback on brain activity of both participants. The Reiki sender will experience his own multimodal neurofeedback environment output and the receivers will also experience their own multimodal neurofeedback output.
- 4- To verify possible correlations in brain activity between senders and receivers in all groups.
- 5- To assess at the end of each experimental session whether the receivers and sender reached an altered state of consciousness by applying a measuring scale.

Methodology:

Design:

We will have 3 experimental groups with 45 participants (15 in each group) and one Reiki practitioner for all groups. All participants will be healthy adults with ages between 18 and 30. The Reiki Practitioner will be designated, for practical reasons the Sender, all the other participants in all 3 groups will be designated as Receivers. The participants in the role of receivers will be randomly selected from a pool of volunteers, namely students from University of Lisbon, and should have no prior experience with Reiki, Neurofeedback and/or other meditative practices (for this purpose they will be questioned prior to their potential participation if they have any experience with these techniques). The sender will be recruited from a pool of local (Lisbon) Reiki practitioners possessing the third level of the traditional Usui Reiki method and with 2

years or more of practice. The same practitioner will participate in the experimental settings of the 3 groups. The groups will be the following: In the first group which we will call the control group (E1), the sender, will only send Focused Intention using the Reiki method and the receivers will be in a neutral relaxed state. The second group, which we will call Single Reiki/Neurofeedback group (E2), the sender, will send focused intention using the Reiki method to a receiver that is in another room, in the dark, being exposed to their own neuro-physiological rhythms with the neurofeedback system. In the third group, the Double Reiki/Neurofeedback group (E3), the sender will send their focused attention while experiencing their own neurofeedback system and the receivers will also be exposed to their own neuro-physiological rhythms with the neurofeedback system. Each complete session will last for 45 minutes, with a focused intention session of 20 minutes. All participants will have their brain activity recorded and all the receivers and the sender will be requested to fill out the Altered States of Consciousness scales.

Procedure:

The sender will seat in a comfortable chair and a standard 32 channel EEG cap (Electro-Cap International) will be placed in their heads and the sensors impedance will be checked. At about the same time each receiver will be met in another room by another researcher. The same type of EEG cap will be placed in their head, sensors checked for impedance. The sender and receiver will never have met nor will have direct physical proximity before the experience will take place. Both sender and receivers will be told to relax and to follow instructions. The session will consist for all participants, of a baseline measurement of 90 s with eyes open, 90 s with eyes closed, 20 minutes with eyes closed during the experimental procedure. All the receivers and the sender will be asked to fill in the Altered States of Consciousness scale after every experiment. Since Sender and receiver will be apart, the researchers will have to previously establish the necessary conditions to make sure that both experiments occur at the same time with a synchronized recording of data. At the beginning of each session and before the procedure each participant will be given an explanation of the procedure and will be asked to fill the consent form. The sender will be given only the first name and gender of the receiver in the other room. After the instruction to start the procedure the sender will imagine the first symbol, a spiral with a straight line associated with the words Choku Rei (see annexed picture), and with focused intention will send it to the receiver,

repeating it 3 times, after that another symbol with a face like pattern and the words Sei He Ki (see annexed picture) will be imagined, sent and the words repeated 3 times, lastly a third symbol, a geometrical figure with several entwined straight lines associated with the words Hon Sha Ze Sho Nen or Dai Ku Myo (see annexed picture), will also be imagined, sent and repeated 3 times. All the symbols will be repeated through out the 20 minute measurement period until the senders are told to stop. Statistical analyses with SPSS and sLoreta neuro-imaging software will be used to analyse the collected data.

Materials:

Brain Products' ActiCHAMPS amplifier of 32 channels of EE + 8 Bipolar channels and with GSR, Acceleration, 4x Bipolar electrodes and Respiration belt.

A set of 32 ACTIVE electrodes with 2 caps and channels of electrophysiology for EEG, sEMG, ECG, and EOG, 3 channels of peripheral parameters like GSR, BVP, temperature, and respiration. Equipped with an oximetry input that also allows for trigger interfacing.

-Multimodal Neurofeedback Environment

qEEG amplifier decoder to midi/audio/video interface.

-Two laptops to record EEG output

-Altered states of consciousness (ASC) Scales: APZ (Dittrich, Simões et al,1986)

-Software for data analysis:

Online/live monitoring qEEG

power spectral density [4Hz-200Hz] live/online recording/interacting

- Standardized Low-resolution Electromagnetic Tomography – sLoreta (source Localization)

Changes to the Original Methodology, Materials and Procedure

Due to the fact that the expected materials for data collection were not available at LIMMIT laboratory, a new set of materials had to be purchased to accomplish the project objectives. This contributed to a substantial delay (5 months) to the data collection schedule, since a portion of the material had to come from abroad. The materials were as follows:

EEG

An Electroencephalographic system “Mitsar- EEG”, consisting of two amplifiers Mitsar-EEG 201 with 21 channels (only 19 were used) with impedance check of electrodes, a sampling frequency of 500 Hz per channel and a bandwidth between 0,16 to 70 Hz, with a 16-bit capacity. Adjacent were two EEG connection cables and two dongles.

One litre jar of electro-Gel.

An EEG Studio Software package from Mitsar installed in two laptops ASUS x553M with 8GB of memory, an Intel Bay M Quad-Core and Windows 8, to collect the data.

Electro-cap

To collect the electrical information from the brain activity a ECI Electro-Cap Electrode system with 19 channels within the 10-20 international system.

The left and right prefrontal sensors (Fp1, Fp2), two left frontal and two right frontal sensors (F7, F3; F4, F8), two left temporal and two right temporal sensors (T3, T5, T4, T6), one left and one right parietal sensors (P3, P4), one left occipital and one right occipital sensors (O1, O2), two left and right central sensors (C3, C4) and 3 Z sensors (FPZ,FZ,CZ).

For impedance purposes, 4 ear external reference electrodes and sponge disks for participants comfort in prefrontal area.

Because of these differences in materials and because of difficulties with logistics the neurofeedback procedure previously planned had to be abandoned. This also resulted in alterations to the methodology regarding the EEG data collection. In these regards instead of 3 experimental groups, there were 4. Aside from the experimental or Intention Group and Control Group for the receivers, another control group for the sender was introduced (to test the same subject against himself) and a suggestion group, designated as placebo group, where participants were told someone was sending them good intentions. These alterations were as following:

Participants

A total of 41 participants were tested, 40 were in the role of Receiver and 1 participant, a Reiki practitioner with more than two years of experience, was the Intention Sender. The ages of the subjects ranged from 18 and 37 years old and the Sender was 67. Participants were distributed in 4 experimental groups. With 6 female and 7 male participants plus the Reiki practitioner as Sender of intention in Group 1 (Intention Group), 8 females and 6 male participants in Group 2 (Control Group) and 7 females and 6 male participants in Group 3 (Placebo Group). Lastly in Group 4 (Sender Solo), there was only 1 participant, the Reiki practitioner as Sender. Receiver participants were recruited among the student population at Faculdade de Medicina of the University of Lisbon and the wider community. The sender was recruited within the Portuguese Reiki Association. All participants also answered the APZ Questionnaire and the receivers performed several cognitive performance tests (attention, memory and induction) as it was established in the original design.

Design and Procedure

The participants were distributed in the groups as follow: Group 1, designated as Intention Group, the Sender at an 800 meters distance, sent focused intention during 20 minutes to 13 receivers (one in each session). All participants had their brain activity registered with a Quantitative Electroencephalograph (QEEG) apparatus. The receivers were exposed to the

focused intention. In Group 2, designated as Control Group, 14 participants in the role of receiver (one in each session), were not exposed to focused intention, also had their brain activity registered with a QEEG apparatus, while in a relaxed state for 20 minutes. In Group 3, designated as Placebo Group, 13 participants (one in each session) were not exposed to focused intention, however right before and after the 20-minute relaxed state task, participants were informed (suggested) that there was a person in another room sending them good intentions, so they could have good results in the performance tests. These participants also had their brain activity registered with a QEEG apparatus. Group 4, designated as Sender Solo, the Reiki practitioner sent focused intention to an empty room at 800 meters distant in 12 sessions, with a 20-minute Reiki task in each session over several days. The practitioner was not aware the room was empty. His brain activity was registered with a QEEG apparatus in each session.

Changes in the team

There were also significant changes to the team, both original assistants in the project proposal, decided to leave the team, this represented an unplanned assistant's recruitment process. There were several recruitment periods, and several assistants helped with data collection although Carlos Siopa and Vania Tavares remained the main project assistants, with Vania Tavares doing so in a voluntary mode since at the time she was receiving an exclusive grant from FCT.

Results

Since the data analysis was done in different stages and focusing in different measures. We have final results for the APZ Questionnaire and Cognitive performance, and preliminary results for brain activation areas and for brain activity for the Intention Group and the Sender.

Final Results

APZ Sender

All the answers given by the sender in the APZ questionnaire were uploaded to a SPSS database file and statistical descriptive analysis was done. The results showed items

number 29, 70, 77, 97 and 116 had the highest “yes” answer. Only questions 29 and 70 fall into the criteria for a primary scale, they belong to the RV scale. The other 3 questions (77, 97, 116) do not fall in any scale. Given this result we then proceeded to execute an Intraclass Correlation Coefficient in SPSS to verify the internal consistency and reliability of the answers. The Alpha Coefficient found was .896, suggesting a high internal consistency. Although these questions can’t be attributed to any primary scale, they present the same theme: the connection to a higher power or force. Question 77 reads: “had the impression of being connected to a superior force.” Question 97 reads: “Was in communication with a superior power”. And question 116 reads: “Felt close to a superior power”.

Receivers

After data collection of all the answers given by receivers in all the groups in the APZ questionnaire, they were uploaded to a SPSS database file and statistic descriptive analysis was done. This analysis showed questions number 7, 13, 32, 133, 147 got the higher number of “yes” answers. Questions 7, 13 and 147 belong to the AO scale with 22 ‘yes’ answers for question 7; 21 for question 13 and 20 for question 147. As for questions 32 and 133, they belong to the the AA scale with 21 “yes” answers for both questions. Overall, however, participants did not fall consistently in any specific scale. More detailed results are presented on the scientific paper accompanying this report.

Preliminary Results

Results for brain activation area showed for the Sender activation on frontal and occipital areas both consistent with the task the sender is performing, which are focused attention and imagining symbols. As for the receivers, the activation areas are more dispersed, although both frontal areas, occipital and temporal areas appear highlighted. Given, these are very broad areas, Dr. Hugo Ferreira, who has been supervising the EEG data analysis, suggested a more detailed analysis which is expected to be done in the future.

As for the brain activity for the Sender and the Receivers in the Intention Group, preliminary results indicated a predominance of the Alpha band. These results will be presented in the next scientific paper in development at the moment.

Conclusion

This project had several challenges to its development. Although every project has its own challenges, these in particular impacted both the experimental design and the outputs.

LIMIT Laboratory came short in providing certain conditions to the project development, such as a lack of a permanent team, previous materials and insulated experimental rooms. On my part there were also personal challenges, such as financial and health, that impacted the project. I would like to point out the scientific support Dr. Hugo Ferreira provided mostly for the data analysis.

Other factors to highlight were the conditions of the rooms where the data was collected; both rooms were near busy and sometimes noisy corridors. Some of the cognitive measurements, especially the inductive reasoning test may have not been appropriate for the level of education of the participants.

Overall the experiments logistics may have had some impact. Exterior noise and the experimenter's presence and the extended duration of the task, could account for some fatigue impacting the results.

Also, we had a small number of participants, if we had a higher number; maybe the results could have been more expressive.

In future studies a shielded environment for participants, greater cognitive tests robustness and shorter task duration should be factors to consider, as well as a neuropsychology test to establish a prior mental state baseline to compare to posterior cognitive tests results.

Despite the multitude of challenges this was a rewarding experience and it was a privilege to be able to achieve some results, hopefully more in the near future, which bring further insight about the human intention process.