



Non-Invasive Scanning and Subtle Energy Testing Lab Effect of Cognomovement on the Brain of One Participant as Seen with P300 Brain Mapping

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Co-Investigator: Mary D. Clark, Ph.D., Managing Director (Bio in Appendix B)

Co-Investigator: Stephen "Kit" Taylor, D.C., D.A.B.C.N. (Bio in Appendix C)

Abstract: Brain mapping measurements were performed on one relatively healthy older female participant before and after a 40-minute Cognomovement session performed by the Sponsor. Sponsor provided equipment needed to performed the Cognomovement session. The brain mapping equipment used for this project was the P300 QEEG Brain Mapping System, a non-invasive commercially available device that is FDA cleared for use in routine clinical and research settings. We concluded that there is definitely a marked overall improvement in the pre and post testing. Neurologically, there are several indicative findings that help in giving guidance to further therapeutic procedures. We are very impressed with Cognomovement therapeutics. As joint motion is the majority of neuro-receptive potentiation, to see its effects so clearly in the supra-cranial regions speaks volumes. The Absolute Power and the Theta hyperactivity results, in conjunction with the coherence network graphs, P300 Eyes Closed and Eyes Open, we conclude that the neuroactivity is evoking subconscious responses that were greatly decreased after the Cognomovement session.

Goal: This is a pilot project using brain mapping to assess any differences in brain function after a Cognomovement session.

Statement of Work: Brain mapping measurements were performed on one relatively healthy older female participant before and after a 40-minute Cognomovement session performed by the Sponsor.

Equipment: Sponsor provided equipment needed to performed the Cognomovement session. The brain mapping equipment used for this project was the P300 QEEG Brain Mapping System (<https://psy-tek.com/testing/brain-mapping-qeeg/>), a non-invasive commercially available device that is FDA cleared for use in routine clinical and research settings.

Participants Selection: The participant was selected by the Sponsor.



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Procedure and Methodology

Once a potential participant was identified by the Sponsor, an appointment was set up to have the participant and the Sponsor come to the lab for the testing. Once at Psy-Tek Labs, the participant had the opportunity to ask questions and when all questions were answered the participant signed the consent form. Next, the technician ran the following brain scan tests:

- P300 Eyes Closed Auditory ERP (provides measures of cognitive response)
- Eyes Opened Focused Test (EEG measurement of brain wave patterns)
- Flanker Test (Eriksen flanker test provides a measure of cognitive control)
- 2 Trail Making Tests (provides a measure of visual control and task switching)

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Results

Participant

Female, 68. She indicated she had some minor seizures in the past.

Screening Scores

The table below show results for Performance Assessments, Evoked Potentials and State:

BEFORE		
Performance Assessments		
Physical Reaction Time	360 (±45) ms	270–388 ms
Trail Making Test A	90 sec	69–118 sec
Trail Making Test B	109 sec	66–128 sec
Evoked Potentials		
Audio P300 Delay	324 ms	297–385 ms
Test/Retest Change	-	±11 ms
Audio P300 Voltage	11.1 µV	6–15 µV
Test/Retest Change	-	±2 µV
State		
CZ Eyes Closed Theta/Beta (Power)	↑ 2.1	0.6–1.5
F3/F4 Eyes Closed Alpha (Magnitude)	↑ 0.7	0.9–1.1
AFTER		
Performance Assessments		
Physical Reaction Time	352 (±95) ms	270–388 ms
Trail Making Test A	61 sec	69–118 sec
Trail Making Test B	91 sec	66–128 sec
Evoked Potentials		
Audio P300 Delay	N/A	297–385 ms
Test/Retest Change	-	±11 ms
Audio P300 Voltage	2.3 µV	6–15 µV
Test/Retest Change	-	±2 µV
State		
CZ Eyes Closed Theta/Beta (Power)	0.6	0.6–1.5
F3/F4 Eyes Closed Alpha (Magnitude)	1.2	0.9–1.1

Performance Assessments:

Physical Reaction Time: Decreased. It is a measure of speed in response to an audible odd tone. This relies on different pathways than the Auditory P300, so physical reaction time may be different than the brain speed. The present result indicates a better coordination between the brain, the auditory cortex and the motor cortex.



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Trail Making Test A & Test B Times: A standard measure of brain function and includes measures of psychomotor and visual scanning. Both times decreased. Improvement in coordination between the psychomotor cortex and visual scanning

Evoked Potentials:

Audio P300 is a measure of brain response speed and attentional resources. P300 slowing and/or a reduction in voltage signal changes in cognitive function.

Audio P300 Delay: No data after.

Audio P300 Voltage: Decreased substantially. This is a clear indication that of a change in cognitive function

All four parameters above indicate an improvement in brain coordination and that the brain improve its cognitive functions.

State:

CZ Eyes Closed Theta/Beta (Power): Decreased. Theta and Beta frequency bands are affected by cortical arousal and can give insight into how the brain functions. In some people high Theta/Beta ratios at CZ may present as inattention, while others may benefit from cortical arousal. Researchers have shown that calculating the relative power ratio Theta/Beta at CZ can be used to determine slow-wave disorders, ADHD, interpersonal detachment with qualitative aspects of autistic or Asperger's behavior.

This ratio was above the normal range before the session and decreased to the lowest value in the normal range after the session. The initial value above the normal range indicates mental agitation that can lead to lower attention levels. The low normal range value indicates substantial decrease in mental agitation and, coupled with the previous results, confirm a better functioning and coordination of the brain after the session.

F3/F4 Eyes Closed Alpha (Magnitude): Increased. Large differences in Alpha power between the left-front and right-front of the brain have been associated with depression and/or anxiety. Researchers also discovered that calculating F3/F4 relative power ratio in the Alpha band means processing information in a positive way for an increase while a decrease in the ratio indicated a more negative processing mode.

The value before the session was below the normal range and increased to be slightly above the range after the session. This is an indication of higher arousal of cognitive functions (in a positive way) related to the frontal cortex (including analyzation and decision making)

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P300 Z Scores



These scalp topographical maps were computed from the 19 EEG channels recorded by the P300 brain mapping system (frontal part of the brain at the top (electrode sites FP1 and FP2) and back of the head at the bottom of each circle (electrode sites O1 and O2). Absolute Power is the brainpower available within a particular frequency band at each electrode site, in other words, the strength of the frequency band (in microvolts squared) at each site. It is expressed as a comparison with standardized values obtained from the average of a population including thousands of people with the same age and sex as the subject (the Z value). The Z value (or Z score; see the color key on the upper right of the



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figure above) is expressed as the difference between the mean score of a population and the patient's individual score divided by the standard deviation of the population. It indicates how "deviant" a subject's score is from the norm. It tells us whether there is deficient or excessive activity in a given frequency band for a given electrode site (or group of electrode sites), such as excessive Theta activity at T3 and T5 (colored red in the Before diagrams under Theta). One standard deviation (SD) above the norm is yellow, two SD above the norm is orange, and three SD is red. '0' is the normal mean located within the green region (light green). One SD below the norm is light blue, two SD below is darker blue, and three SD is darkest blue. It is very rare to see a Z score greater than +3 or less than -3 as 99.8% of the population Z scores are within this range. Thus, the software uses +3 as the maximum excessive value (red color in the color key) and -3 as the minimum deficiency (darkest blue color in the color key).

For our participant, the Power in most of the sites are hyper-activated in the Theta band before the session and came down significantly after the session. Theta being associated with subconscious function; something might have been "brewing" in the subconscious mind of this participant before the session which disappeared after the session.

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Coherence

P300 Eyes Closed Z Scores

Band Ranges

Theta: 4.5–7.5 Hz
 Alpha: 8.0–13.0 Hz
 Beta: 13.5–20.0 Hz

Color Key



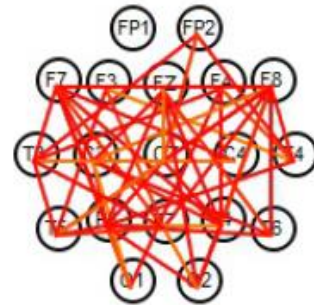
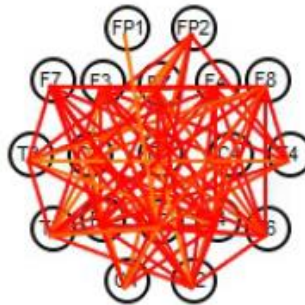
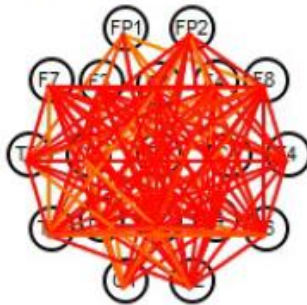
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ALPHA

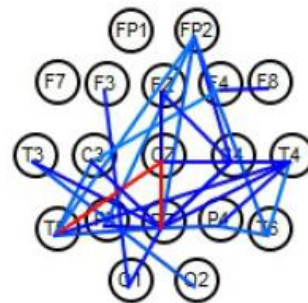
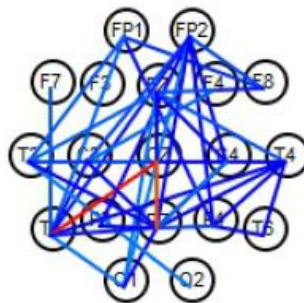
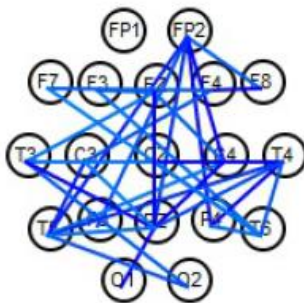
BETA

Session 1
(Before)

Z-Scores above 2.0 and below -2.0



Session 2
(After)



The coherence diagrams above show a perspective where we are looking down at the top of the head from above (FP1 and FP2 are on the forehead while O1 and O2 are at the back of the head). EEG coherence can be defined as the normalized cross-power spectrum per frequency of two signals recorded simultaneously at different sites of the scalp. It is a measure of the synchronization between the two signals and may be interpreted as an expression of their functional interaction. Coherence reflects how stable the phase relationship is between two electrode sites. Coherence quantifies the degree of interaction or communication, shared information, between brain sites. Hypercoherence is when brain sites are not functioning in efficient interdependent fashion, they have too much “cross-talk”, they are overly connected or locked together. Hypocoherence is called poor inter-site interaction and is associated with diminished cognitive efficiency. The red lines between two sites



Non-Invasive Scanning and Subtle Energy Testing Lab

indicate hypercoherence while blue lines reflect hypo-coherence. Beta brain waves are normally dominant in a person awake, alert, with normal level of consciousness and brain function. Alpha become dominant in a person with eyes closed, calm, aware and quietly alert. Theta brain waves show up in deep relaxation, meditation and mental imagery. The participant was awake with eyes closed during these measurements and so the most relevant results are those presented in the Alpha (relaxation) and Theta bands.

Discussion

There is definitely a marked overall improvement in the pre and post testing. Neurologically, there are several indicative findings that help in giving guidance to further therapeutic procedures. We are very impressed with Cognomovement therapeutics. As joint motion is the majority of neuro-receptive potentiation, to see its effects so clearly in the supra-cranial regions speaks volumes. The Absolute Power and the Theta hyperactivity results, in conjunction with the coherence network graphs, P300 Eyes Closed and Eyes Open, we conclude that the neuroactivity is evoking subconscious responses and further in knowing the neurological pathways, we suspect that temporal mandibular (TMJ) challenges. These could be obvious or small and undetectable to the untrained examiner. It is the ophthalmic branch of the trigeminal nerve, cranial nerve number 5, which also has branches to the maxilla and mandible. We suspect that the participant was not only exhibiting mental/emotional disturbances but physical discomfort as well. For further confirmation we suggest to include bi-lateral blood pressure measurements (taken on both arms), a simple sensory stimulus response (pinwheel or even a stimulated eye blink, side to side as these and balance should all show a degree of improvement

Conclusion

In conclusion, there is definitely a marked overall improvement in the pre and post testing. Neurologically, there are several indicative findings that help in giving guidance to further therapeutic procedures. We are very impressed with Cognomovement therapeutics. As joint motion is the majority of neuro-receptive potentiation, to see its effects so clearly in the supra-cranial regions speaks volumes. The Absolute Power and the Theta hyperactivity results, in conjunction with the coherence network graphs, P300 Eyes Closed and Eyes Open, we conclude that the neuroactivity is evoking subconscious responses that were greatly decreased after the Cognomovement session.



Non-Invasive Scanning and Subtle Energy Testing Lab

APPENDIX A

Gaétan Chevalier, Ph.D.,

Biographical Sketch

Dr. Gaétan Chevalier received his Ph.D. from the University of Montréal in Atomic Physics and Laser Spectroscopy in 1988. After 4 years of research at UCLA in the field of nuclear fusion, he became professor and Director of Research at the California Institute for Human Science (CIHS) in 1993 where, for 10 years, he conducted research projects on human physiology and electrophysiology as well as being Director of the Life Physics Department and Research Director. Dr. Chevalier is currently Lead Faculty at CIHS, Visiting Scholar in the Department of Family Medicine and Public Health at UCSD, and he has been Director of Research at Psy-Tek Labs since June 2010.



Non-Invasive Scanning and Subtle Energy Testing Lab

APPENDIX B

Mary D. Clark, Ph.D.,

Biographical Sketch

Mary D. Clark, Ph.D. is a licensed psychologist in Arizona, and is a licensed marriage family therapist and licensed educational psychologist in California. She maintains both a private practice and a healing practice in Encinitas, California. Mary is a Certified Energy Healing Instructor, a Senior Certified Energy Healer, and past coordinator of the Energy Healing Certification Program for the central and western states. She has practiced and taught Energy Healing for over 10 years,



Non-Invasive Scanning and Subtle Energy Testing Lab

APPENDIX C

Dr. Stephen “Kit” Taylor, D.C., D.A.B.C.N.



Dr. Stephen “Kit” Taylor is a world-renowned Chiropractic /Neurologist with years of experience working with all levels of athletes. His expertise centers on the physical rehabilitation of injuries and illnesses.

He was Past President of the Board of Neurological Examiners of the American Chiropractic Association (ACA), and an Instructor of Neurology at several Universities in the United States and New Zealand.

As a Vietnam Veteran, Kit went into medicine as a result of his own health challenges received in that war. He’s a leader in the development of new technologies to assist others in their own healing, daily function and performance.

Kit has worked with members of the Denver Broncos, Dallas Cowboys, many professional boxers, professional runners, baseball players, weekend warriors and young developing athletes.

As a compelling public speaker, Kit has delivered many seminars focusing on healing, which emphasizes the “needs of the individual”, which is the foundation for Functional Medicine. He has also built and maintained several Multi-Discipline Family Clinics in Colorado and New Mexico throughout his career.

He has been at the forefront of bringing physicians and healers working together, targeting for the best outcome of the individual patient.