November 11, 2019

Dear Jeffrey,

Thank you for your participation in the IONS Discovery Lab to assess a short-term exposure of FLFE. Your participation helps you gain scientific data about the effectiveness of your workshop and helps us answer big research questions like: How are we interconnected? How do we access information and energy from beyond spacetime? Can understanding these two things help us be better people?

This report presents a snapshot of the participants who received 30 minutes of FLFE exposure and how that may or may not have impacted brain waves, heart waves, and cognitive function. We also collected information about the participant's sense of interconnectedness, extended human capacities, and well-being. Information about each of these factors and their importance are included to help give you a context for the results.

You may use the information from this internally to help improve your event. You may also display the results of this report publicly (e.g. on websites or marketing materials) according to the DATA USE AGREEMENT if you choose to. Please feel free to contact us if you have any questions about the use of this language.

We hope you find this report useful. Please feel free to reach out to me if you have any questions. We look forward to providing you the report for the 90-day event in a few weeks also.

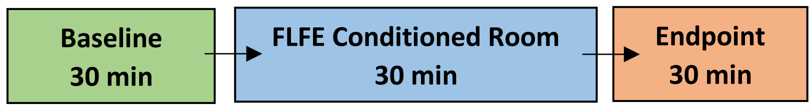
Sincerely,

Helané Wahbeh

Director of Research

Project #3 EMF Mitigation plus Brain Optimization – In-Lab Intervention

Project Summary: Thirteen participants were recruited by the IONS team to participate in the study activities. Participants came to the IONS EarthRise Campus. They completed baseline measures, then had 30 minutes of FLFE, then repeated the measures.



Recruitment: The IONS staff recruited 13 adult volunteers to participate in the study. Participants received an incentive of $100 as compensation for their travel and assessment time. Participants were recruited through IONS website and Craigslist. Inclusion criteria included 18+ years old, being able to commute, not being pregnant, to be generally healthy, not be taking any medication (e.g. psychotropic), not have any metallic implants (e.g. pacemaker, prosthesis) and have never had any abnormal heart rhythms or epileptic episodes (mainly for data quality purposes).

Baseline: Upon arrival at the IONS EarthRise Campus, participants were given an opportunity to hydrate. They then completed the IONS Discovery Lab core measures. They were then connected to physiological equipment: 64-channel EEG (electroencephalography) and ECG (electrocardiography). Physiological measures were recorded during 3 conditions: breath-counting, a simple arithmetic task (i.e. 3-forward counting), and listening to classical music. Each condition lasted approximately 5 minutes. We then administered a battery of cognitive tasks including the Rey Auditory-Verbal Learning Test (AVLT), the WMS-3 Letter-Number Sequencing Subtest, the Controlled Oral Word Association (COWA) CFL PRW Verbal fluency, and the STROOP task.

Intervention: After the baseline measures, the EMF Mitigation and Brain Optimization was turned on for 30 minutes. Participants listened to a neutral podcast during this time and remained connected to physiological equipment.

Endpoint: Immediately after 30-min FLFE service, the participants repeated the same measures that they did at baseline (i.e. physiology during 3 baseline conditions and cognitive tasks). All measures were acquired in the same space.

Analyses: All measures were analyzed for differences from before to after the exposure to the conditioned space.

General Summary: Significant differences were found in the EEG power spectrum between before and after the FLFE exposure. Mainly in the alpha frequency band (8-13 Hz) in all baseline conditions (in almost all electrodes, see below for more details). Furthermore, significant differences were also found during the arithmetic task and while listening to classical music in the beta (13-30 Hz) and gamma (30-100 Hz) frequency bands, in similar scalp areas (see below). There were no changes in heart rate variability or heart coherence measures from before to after the 30-minute FLFE session. The cognitive tasks showed a decrease in delayed memory and an increase in executive function with interference.

How to interpret the report?

-Most outcomes are presented as average (mean) values for your group with the standard deviation which is how spread out the values were around the average. For example, if you look at the sample result below, you will see that the average value for the self-transcendence scale before the workshop was 10.0 with range of 8.3 (10.0-1.7) to 11.7 (10.0+1.7). The standard deviation gives you a sense of how variable the responses were for that measure.

EXAMPLE

Measure	**Pre Mean (SD)**	**Post Mean (SD)**	***P*- value**
Cloninger self-transcendence scale (0-15)	10.0 (1.7)	12.8 (2.0)	0.01*

-You can also look at the average values and see if they went up or down after your workshop. For example, if the pain scores went from 5.0 before to 2.0 after, you would understand that participants had a reduction of pain from the workshop. In our self-transcendence example above we see that the score increased by 2.8 points towards greater self-transcendence which is in the direction that we would like.

-If the measure was completed before and after your event, you will see a *p*-value calculating the statistical difference between the pre- and post-values. You want to see this value be below 0.05 which will be marked with an asterisk*. This means that statistically speaking there is a 95% likelihood that the difference you are seeing actually does exist and is not due to chance. The $p = 0.05$ is the common cut-off used for scientific studies. The lower the *p*-value, the more confident you can be in the change. In the self-transcendence example above, we see a *p*-value of 0.01. This means that we are 99% sure that the difference between the pre- and post-values are not due to chance.

What if none of my measures have a *p*-value less than 0.05?

If the values are moving in the right direction but the *p*-value is greater than 0.05 that may also mean that you did not have enough participants for statistical power to detect a change in the pre-post values in this specific round. The more participants you have taking the measures, the more confident you can feel of the results you are seeing. It may also mean that your workshop does not affect that factor in the way we are measuring it.

Who is Your Group?

In Table 1, you will find demographic information (age, gender, race, education, relationship status) about your group, their general health, and how many participants were currently meditators. These values help you understand the characteristics of the participants who attended your event and completed the measures. It also helps you see if these demographic measures change from event to event.

Thirteen participants completed the study.

Table 1. Participant's demographic information

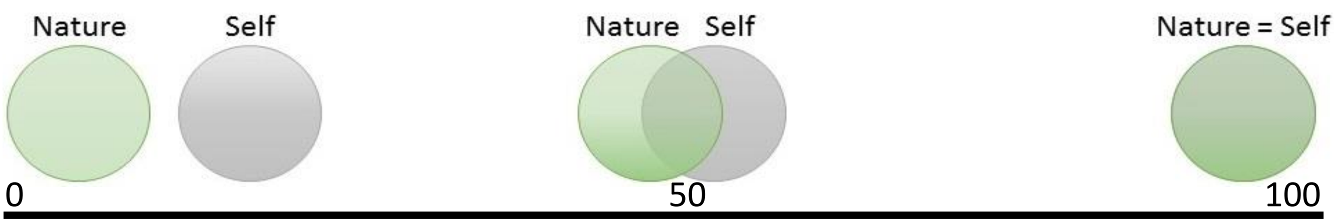
Measure	**Category**	**Average ± Standard Deviation**	
Age	Years	46 ± 14	
Education	Years	17 ± 3	
		Number of Participants	**Percent**
Gender	Male Female Other	4 9	31 69
Race	American Indian Asian/Pacific Islander Black or African American Hispanic White/Caucasian Other	 2 11	 15 85
Relationship	In a relationship Not in a relationship	7 6	54 46
Overall Health	Poor Fair Good Very good Excellent	0 0 5 7 1	0 0 38 54 8
Meditators	Yes	7	54

Interconnectedness

A self-transcendence questionnaire and questions on how interconnected the participants felt with Nature and with Others were the measures used to explore your participants' perceived sense of interconnection with themselves, others, and nature.

The Cloninger self-transcendence scale explores participants' experience of the spiritual aspects of themselves and their perception of how integrated they are with the universe. Self-transcendence refers to the identification of the self and the universe conceived as a unitive whole.[1] The scale asks 15 questions with higher scores reflecting greater self-transcendence.

Self/nature: Nature connectedness is the extent to which individuals include nature as part of their identity.[2] Connectedness to nature is measured with a self-report scale that ranges from zero, which is visually represented by two separate circles and denotes no connection of the self to nature, to 100, which is visually represented by overlapping circles and denotes complete connection of self to nature.



Interconnection of self and nature

Self/other: The impact social connectedness has on the psychology of individuals is not simply an external feature that provides context for individual behavior but a capacity to be internalized as a part of a person's social identity. Positive psychological consequences are often the result that individuals with a sense of meaning, purpose, and belonging feel and that come from a social environment comprised of others (communities, families).[3] We measure this with a self-report scale that ranges from zero (not at all connected; *others and self-circles are separate*) to 100 (completely connected to others; *others=self*).

Interconnection of self and other

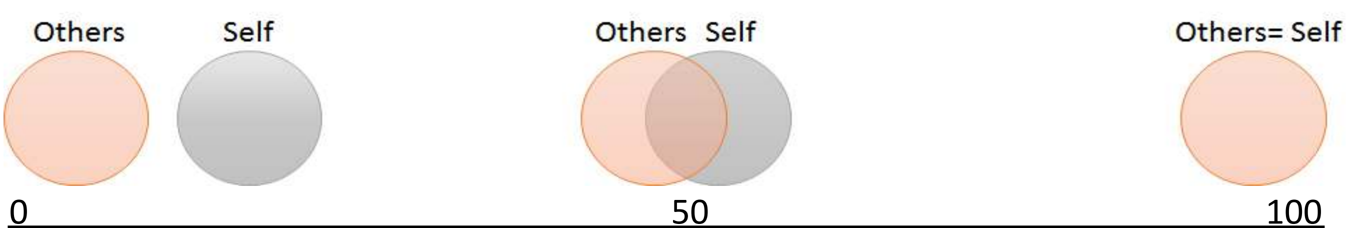


Table 2. Interconnectedness

Measure	Mean (SD)
Cloninger self-transcendence scale (0-15)	11.8 (2.8)
How interconnected are you with nature? (0-100)	73 (25.1)
How interconnected are you with others? (0-100)	68 (29.9)

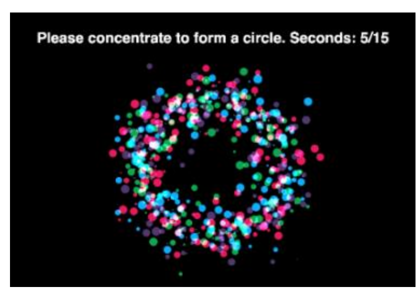
Revealing Information and Energy from Beyond Spacetime

Five tasks were administered in regard to revealing information and energy from beyond spacetime. The tasks evaluate various aspects of receiving information from beyond the traditional senses. These abilities range from the commonly experienced intuition or hunches to more unique experience like remote viewing (the ability to know something about a place, object, or person without the use of the traditional five senses) and psychokinesis (the ability to move matter with mental effort alone).

Object Counting Task: The Object Counting Task investigates intuition. "Intuition is the ability to understand immediately without conscious reasoning and is sometimes explained as a 'gut feeling' about the rightness or wrongness of a person, place, situation, temporal episode or object."[4] The participant is presented with a picture of a jar containing items. The image is displayed very briefly such that they are not able to consciously count the number of items. The participant guesses how many items they believe are in the jar. The participants are shown different images at their pre- and post-assessments. The values recorded in the Table 3 are the deviations from the correct answer for each jar with smaller scores being more accurate.

Time estimation: People's perceptions of time are changed during altered states of consciousness such as meditation.[5] Time perception can be measured in different ways. We can record how a person's ability to report how long a period of time is (interval length estimation) or perceive when a certain amount of time has passed (perceived speed of time passage). The time estimation task evaluates the participant's perceived passage of time. The participant is asked to estimate 10 seconds. The participant pushes a button to start the task and then pushes it again when he/she thinks 10 seconds have passed. The values recorded in Table 3 are the deviation from the actual time passed.

Remote viewing: Remote viewing is a mental faculty that allows a perceiver to describe or give details about a target that is inaccessible to normal senses due to distance, time or shielding. For this task, a blank frame is displayed in the center of the screen, and 5 photos are displayed below it. The participant chooses which of the 5 images they think will appear in the blank space. The participant completes 10 trials. The values listed in Table 3 represent the percent correct.



Bubble task: The bubble task is a psychokinetic task. Small bubbles are moving on the screen and the participant is asked to concentrate to make the bubbles form a circle for 15 seconds. The participants then relax for 15 seconds. The movement of the bubbles to form a circle is linked to a random number generator. The normal function of the random number generator results in a value of zero for this task. If the participant is able to affect the random number generator, then their values would deviate away from zero in either a positive or negative direction. The values listed in Table 3 represent the deviation from zero. Greater numbers represent a greater psychokinetic effect.

Table 3. Tasks

Task	Mean (SD)
Intuition: Object count	365.8 (240.1)
Time estimation	0.37 (2.5)
Remote viewing	.15 (0.09)
Bubble task	0.0671 (0.1065)

Innovation and Well-Being

Innovation Creativity is the ability to develop new ideas and to discover new ways of looking at problems and opportunities. Innovation is the ability to apply creative solutions to those problems and opportunities in order to enhance people's lives or to enrich society. Creativity is measured using a self-reported scale of 0-100; 0= *not all creative* to – 100 = *very creative*.

Table 4. Creativity measure

Measure	Mean (SD)
How creative are you?	81.5 (15.6)

Well-Being Subjective well-being is defined as: Good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences.[7] Subjective well-being includes a reflective assessment on a person's life, a person's emotional states, and a sense of meaning and purpose in life[7] and can influence and be influenced by income level.[8] Physical health such as quality of sleep[9] and pain[10] can also influence a person's well-being. Many other concepts such as compassion shape who we are and our sense of well-being. An overall self-reported well-being scale is asked of each participant, 0 = *worst you have ever been* – 100= *best you've ever been.* Compassion is an emotional response when suffering is perceived and involves an authentic desire to help alleviate that suffering. Compassion is measured using 5 questions that participants respond on a scale of 1 = *strongly disagree* – 7 = *strongly agree.*

Table 5. Well-being measures

Measure	Mean (SD)
Overall well-being *(0-100; 100 = best)* Sense of well-being, taking into account your physical, mental, emotional, social, and spiritual condition over the past 24 hours	64.0 (15.8)
Positive emotion (0-1.0; 1.0 is most positive)	0.95 (0.13)
Negative emotion (0-1.0; 1.0 is most negative)	0.46 (0.40)
Compassion (7 is most compassionate)	5.6 (1.7)
Sleep quality (0-10; 0 is best sleep) last night	4.2 (2.7)
Pain (0-10; 0 is no pain) last 24 hours	2.6 (2.3)

EEG

Overview

The brain is an enormously complex biological system that uses a multidimensional space for information processing, representation, and transfer. Cognitive functions (including perception, memory, language, emotions, behavior monitoring/control, and social cognition) are supported or implemented by the electrical activity from cortical neurons that "fire" together in networks. The resulting brain oscillations - or brain waves - reflect these electric fluctuations occurring in the brain and can be measured with the electroencephalography (EEG). These cognitive processes and their associated neural oscillations are fast, dynamic, and temporally sequenced. Therefore, high temporal-resolution techniques such as EEG are well-suited to capture this information. Furthermore, EEG is useful because it is more sensitive than behavioral measures such as introspective self-report. The most familiar classification of the brain waves is the frequency domain: such as:

- **Delta (1-4 Hz)** oscillations tends to be the highest in amplitude and the slowest waves. It is normal as the dominant rhythm in infants up to one year, in **deep sleep** stages, and in **motivational processes** (i.e. reward system).

- **Theta (4-8 Hz)** oscillations are often linked to **attention** (especially for the detection of objects in space during exploratory movements and spatial navigation)[11], **memory, drowsiness, emotional regulation, and meditation**.

- **Alpha (8-13 Hz)** oscillations are usually best seen in the back of the brain (i.e. occipital lobe) with eyes closed and relaxed, but they also are highly involved in inhibitory mechanisms and high brain functions such as **attention, perception, working memory (i.e. short-term memory), mental representations of objects and events.**

- **Beta (13-30 Hz)** oscillations are most commonly observed in relation to **sensorimotor** behavior by decreasing during the preparation and execution of **voluntary movements**, and bursting after the termination of the act.[12] The brain responds the same way when one observes or imagines the movement, even when it is not accompanied by any muscular.[13] That is how it becomes possible to control a robotic hand using mere imagination. While it is strongly established that alpha band activity plays an important role in attentive behavior, studies have also shown that beta band activity also serves as a carrier for **attentional activation** by facilitating **alertness** or **arousal** that allows us to perceive stimuli, even when they are presented very briefly.[14]

- **Gamma (30-50 Hz or higher)** oscillations are associated with the construction of **object representation**. It entails the binding of separate parts of the same object through bottom-up processes, and the activation, retrieval, or rehearsal of an internal representation through top-down process.[15] Because the power in gamma band increases during complex and attention-demanding tasks, induced gamma activity is often interpreted as the neural substrate of **cognitive processes**. It is known that different properties of objects or events are encoded and processed in different parts of the brain, and it may be thanks to gamma oscillations that we perceive **coherent representations**. It has also been related to the integration of sensory and motor processes during movement.[15] Furthermore, **meditation** induces synchronization and increased amplitude in gamma band activity.[16] [17]

EEG conditions

Figure 1-7 below are topographical maps of the EEG power spectrum for each baseline conditione, in each frequency band, showing PRE and POST the 30 min of FLFE exposure. These figures offer a vizualization of where the power spectrum activity is distributed at the surface of the scalp. Warm and cold colors indicate higher or lower amplitudes, respectively, of the power spectrum averaged across the group (n = 13). See scales for more details. The large red dots in the plot on the right show the electrodes where the EEG activity is (statistically) significantly different between the two sessions, in that frequency band. Note that all maps show a view from above, with the participant's nose at the top and ears on the left and right sides. Therefore, the top represents the frontal area, whereas the bottom represents the occipital area (i.e. back of the head). All topographical maps were obtained using paired t-tests and permutation statistics. "False Discovery Rate" (i.e. FDR; p-value < 0.05) correction for multiple comparisons was applied to control the expected proportion of false "discoveries".

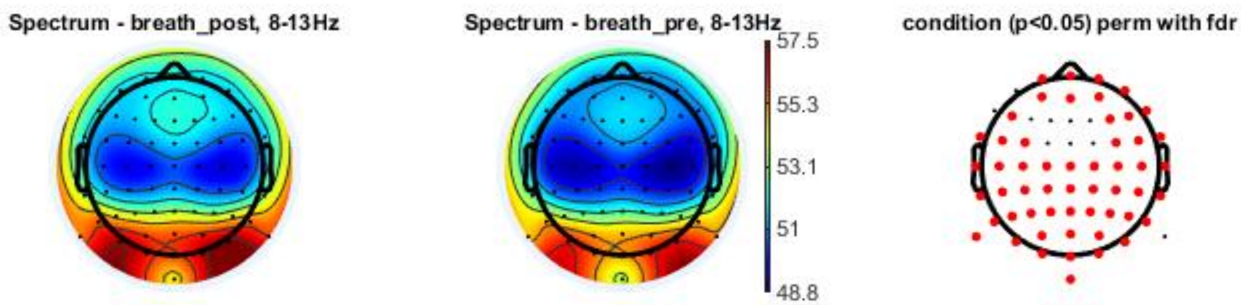


Figure 1: breath-counting PRE vs POST in the alpha frequency band (8-13 Hz)

Figure 1 shows the mean power spectrum activity in the alpha frequency band, when subjects were breath-counting for 5 minutes. Almost all electrodes are significant except in the mid-frontal and frontal left areas. *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

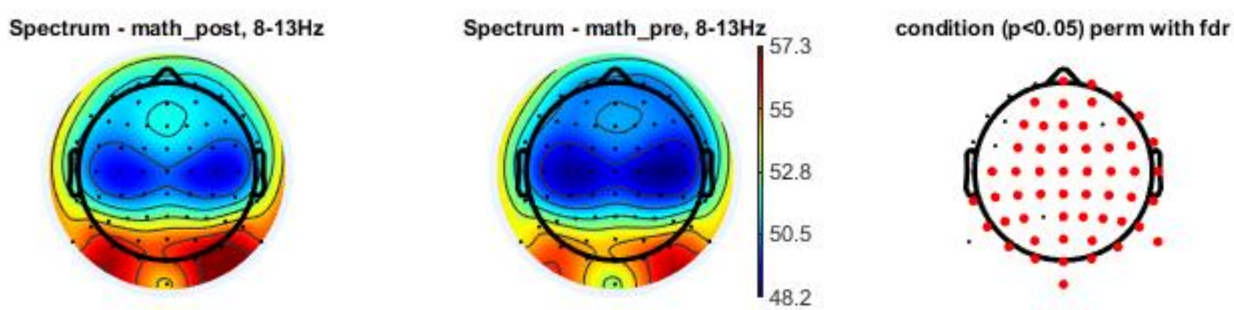


Figure 2: math PRE vs POST in the alpha frequency band (8-13 Hz)

Figure 2 shows the mean power spectrum activity in the alpha frequency band, when subjects were counting in their head for 5 minutes (3-forward counting in PRE and 4-forward counting in POST). Almost all electrodes are significant except in the left frontal area (and three other electrodes). *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

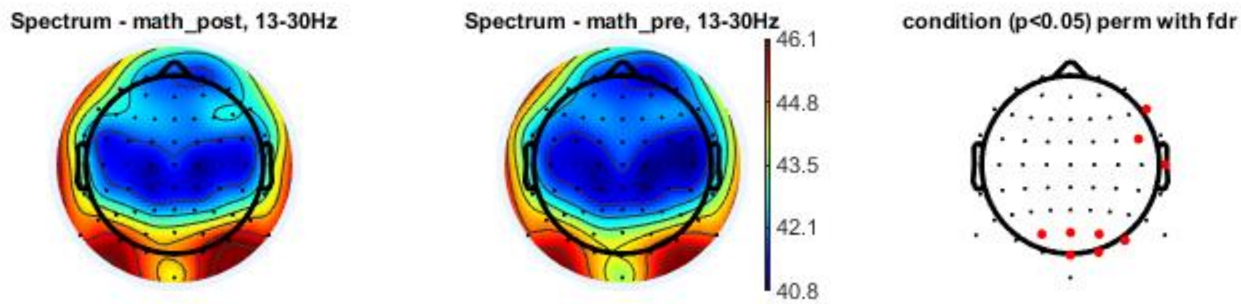


Figure 3: math PRE vs POST in the beta frequency band (13-30 Hz)

Figure 3 shows the mean power spectrum activity in the beta frequency band, when subjects were counting in their head for 5 minutes (3-forward counting in PRE and 4-forward counting in POST). Significant differences were found in the right temporal and occipital areas. *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

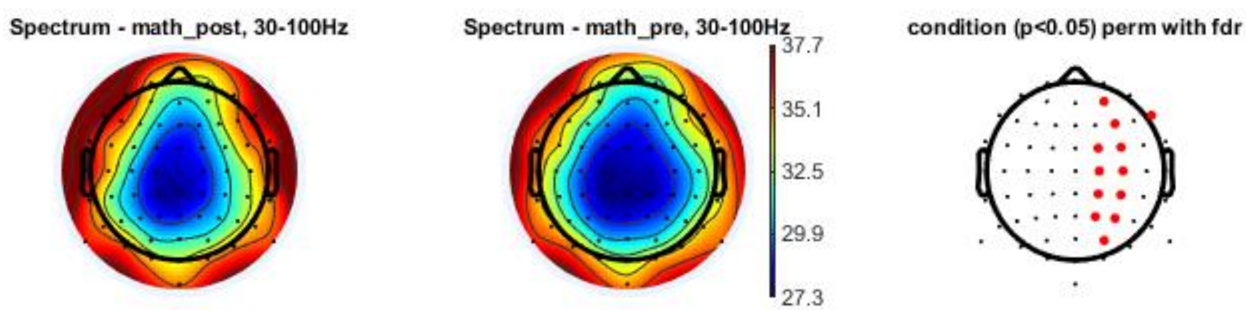


Figure 4: math PRE vs POST in the gamma frequency band (30-100 Hz)

Figure 4 shows the mean power spectrum activity in the gamma frequency band, when subjects were counting in their head for 5 minutes (3-forward counting in PRE and 4-forward counting in POST). Significant differences were found on the right medial side of the scalp. *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

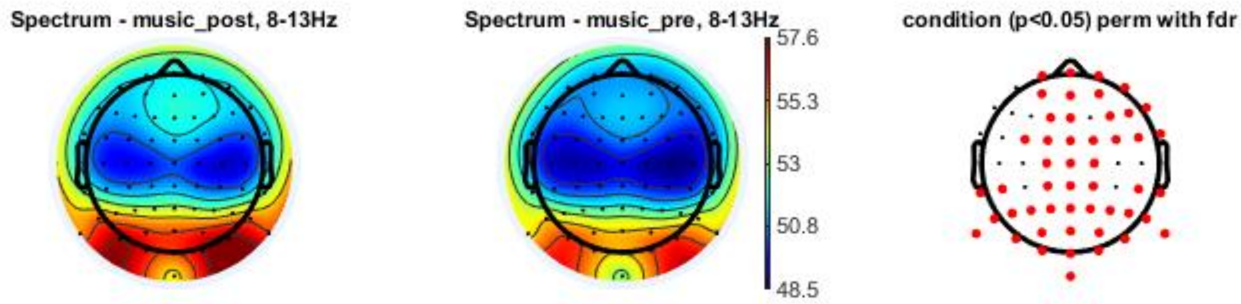


Figure 5: music PRE vs POST in the alpha frequency band (8-13 Hz)

Figure 5 shows the mean power spectrum activity in the alpha frequency band, when subjects were listening to classical music for 5 minutes. Significant differences were found almost everywhere except in the parietal area bilaterally and in the left fronto-temporal area (and one electrode in the mid-frontal area). *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

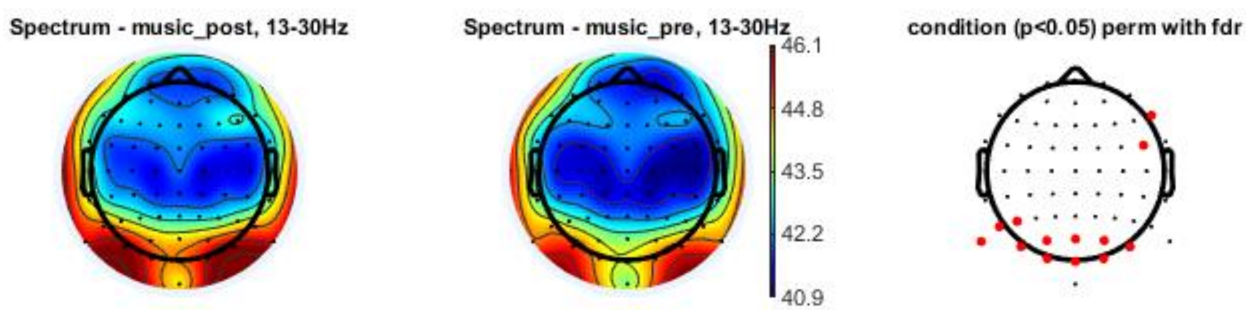


Figure 6: music PRE vs POST in the beta frequency band (13-30 Hz)

Figure 6 shows the mean power spectrum activity in the beta frequency band, when subjects were listening to classical music for 5 minutes. Significant differences were found in the occipital area (dominant on the left side) and in the right fronto-temporal area. *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

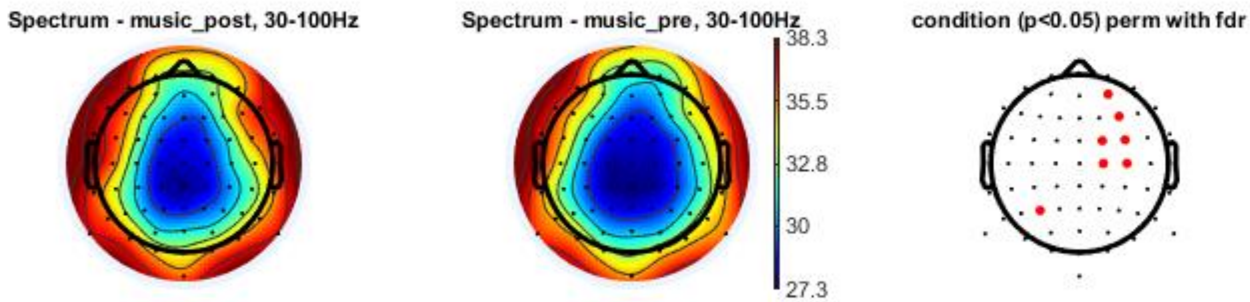


Figure 7: math PRE vs POST in the gamma frequency band (30-100 Hz)

Figure 7 shows the mean power spectrum activity in the gamma frequency band, when subjects were listening to classical music for 5 minutes. Significant differences were found in the right fronto-temporal (medial) area, and in one electrode in left parietal area. *Left plot is after FLFE; middle plot is before FLFE; right plot shows which electrodes recorded a significant difference between before and after in this frequency band.*

Summary: Significant differences were found between before and after the FLFE exposure mainly in the alpha frequency band (8-13 Hz) in all baseline conditions (in almost all electrodes). Furthermore, significant differences were also found during the simple arithmetic task and while listening to classical music in the beta (13-30 Hz) and gamma (30-100 Hz) frequency bands, in similar scalp areas.

Heart Rate Variability (HRV)

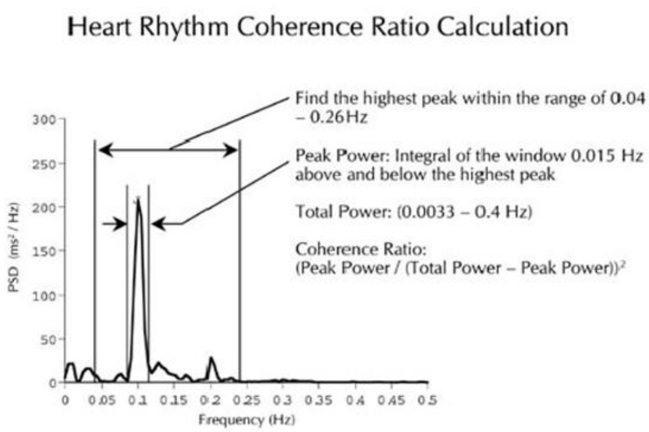
Heart rate variability is the change in the time intervals between adjacent heartbeats that may be used to predict future health outcomes. It is the primary measure used to assess physiological or personal coherence. Reduced HRV has been correlated with disease onset and mortality as it reflects reduced regulatory capacity of the body to adaptively respond to challenges like exercise or stressors. The most commonly used HRV analysis methods are done in the frequency domain (i.e. power spectrums) or in the time domain (i.e. statistical measures of variance in the interbeat intervals). Importantly, McCraty (2017) observed that specific emotional states are reflected in HRV rhythm patterns as opposed to changes in variability. Emotions such as appreciation or compassion are associated with a more coherent rhythm, as opposed to emotions such as anxiety, frustration or impatience (McCraty 2017). Self-induced positive emotions increase the coherence in bodily processes, which is reflected in the pattern of the heart's rhythm. This shift in the heart rhythm plays in turn an important role in facilitating higher cognitive functions, creating emotional stability and facilitating states of calm. Over time, this establishes a new inner-baseline reference that organizes perception, feelings, and behavior.

As part of the expanded HRV report, we evaluated time domain, frequency domain, and non-linear domain parameters of HRV. Please see Appendix 1 for averages and standard deviations for each of these measures and Appendix 2 for a legend of all the measures included. There were no differences in any of these measures from before the 30-minute FLFE intervention to after the 30-minute intervention.

Heart Coherence

We also calculated heart coherence as described by Rollin McCraty and Heart Math.[18] First, the maximum peak is identified in the 0.04–0.26 Hz range. The peak power is then determined by calculating the integral in a window 0.030 Hz wide, centered on the highest peak in that region. The total power of the entire spectrum is then calculated (Total Power: (0.0033- 0.4Hz). The coherence ratio is then formulated as: (PeakPower / (Total Power − Peak Power)) (see Figure 1).

Figure 8. Heart Coherence Calculation



There were no differences in coherence in any of the conditions evaluated before or after the FLFE exposure.

Condition	Pre-FLFE Mean (SD)	Post-FLFE Mean (SD)	*p*-value
Breath Counting	0.0015 (0.0024)	0.0016 (0.0027)	0.36
Math	0.0021 (0.0037)	0.0013 (0.0028)	0.97
Music	0.001 (0.0021)	0.0009 (0.001)	0.86

Cognitive Tasks

Participants completed cognitive tasks aimed to evaluate memory, working memory, verbal fluency and executive function.

Memory was tested with the Rey Auditory-Verbal Learning Test. The Rey Auditory-Verbal Learning Test (AVLT) is an easily administered test that measures immediate memory span, provides a learning curve, reveals learning strategies, elicits retroactive and proactive interference tendencies and tendencies to confusion or confabulation on memory tasks, measures both short-term and longer-term retention following interpolated activity and allows for a comparison between retrieval efficiency and learning. It consists of five presentations with recall of a 15-word list, one presentation of a second 15-word list, and a sixth recall trial, which altogether take 10-15 minutes. Retention was also examined after 30 minutes. The score for this task includes the number of words recalled from the fifth trial, the total number of correct words from trials 1-5, and the number of words recalled after 30 minutes divided by the number of words recalled at the fifth trial.

Working memory was evaluated with the WMS-3 Letter-Number Sequencing Subtest. Letter-Number Sequencing is a rigorous test of working memory and attention, processing speed and visual spatial working memory. Participants are verbally given a string of numbers and letters in scrambled order and asked to repeat them back to the administrator in increasing numerical and alphabetical order.

The trials begin with 3 letters and numbers and then increase by one letter/number each trial as the participant gets the trials correct. The task ends when the participant gets two trials incorrect. The score for this task includes 1 point for each correct trial.

Verbal fluency was evaluated with the Controlled Oral Word Association verbal fluency task. The COWA consists of three word-naming trials. Verbal fluency is sensitive to frontal lobe dysfunction. The participant is asked to name as many words as they can think of that begin with a specific letter of the alphabet in one minute. The COWA score is the total number of correct words the participant names.

Executive Function was evaluated with the Stroop task. The Stroop is a test of attention and selective processing based on findings that it takes longer to call out the color names of colored patches than to read words, and even longer to read printed color names when the print ink is in a color different than the name of the color word. The test is sensitive to people who have difficulty concentrating, including difficulty in warding off distractions. The Stroop includes a page of printed words. The words are the names of colors that are also printed in a colored ink. For the first task, participants are asked to read the word that is printed on the page as quickly as they can (Word Trial). For example, when the participant sees Blue Red Orange on the page, they would say "Blue, Red, Orange". For the second task, participants are asked to name the color ink that the word is printed in as quickly as they can (Color Trial). For example, when the participant sees Blue Red Orange on the page, they would say "Orange, Blue, Red". The stroop score incudes the time in seconds it takes the participant to complete a whole page of each trial, the number of errors they made, and the number of corrected errors.

The means, standard deviations, and *p*-value for the statistical test comparing the pre- to post-values are in table 6. There were two values that were significantly different from before to after the 30-minutes of FLFE. The 30-minute delay retention of the memory task showed a significant reduction in score, meaning that participants recalled less words of the list after the 30-minutes of FLFE. Conversely, participants scored significantly better on the color interference trial of the Stroop task after the FLFE. This suggests that FLFE exposure improved executive function in real-time but decreased memory retention over the longer term (30-minutes). We should also note that the post-FLFE 30-minute delay was the last task done after an intense laboratory visit and participants could have been fatigued.

Table 6: Cognitive tasks

Cognitive Category	Task	Pre-FLFE Mean (SD)	Post-FLFE Mean (SD)	*p*-value
Memory	Rey Auditory-Verbal Learning Test Immediate Recall	11.15 (3.08)	11.54 (2.82)	0.15
	Total Trials 1 through 5	47.08 (11.05)	47.08 (12.45)	0.86
	30-minute Retention	0.92 (0.23)	0.59 (0.35)	0.002*
Working Memory	Letter Number Sequencing	11.92 (2.33)	11.92 (2.02)	0.94
Verbal Fluency	COWA	49.08 (12.93)	49 (13.65)	1.00
Executive Function	Stroop: Word Trial			
	Time	80 (8.78)	84.85 (13.8)	0.25
	Errors not corrected	0.08 (0.28)	0.15 (0.55)	0.95
	Corrected errors	0.85 (1.63)	0.69 (0.85)	0.97
	Stroop: Color Trial			
	Time	183.36 (36.13)	168.92 (49.23)	0.01*
	Errors not corrected	0.54 (1.2)	0 (0)	0.08
	Corrected errors	1.38 (1.76)	1.62 (1.45)	0.48

* A Wilcoxon sign rank test was used since all variables were not normally distributed.

References

1. Cloninger CR, Przybeck TR, Svrakic DM, Wetzel RD. *The Temperament and Character Inventory (TCI): A guide to its development and use.* St. Lous, MO: Center for Psychobiology of Personality, Washington University; 1994.
2. Schultz PW. Inclusion with nature: The psychology of human-nature relations. *Psychology of sustainable development*: Springer; 2002:61-78.
3. Haslam SA, Jetten J, Postmes T, Haslam C. Social identity, health and well-being: An emerging agenda for applied psychology. *Applied psychology: an international review.* 2009;58(1):1-23.
4. McCrea SM. Intuition, insight, and the right hemisphere: Emergence of higher sociocognitive functions. *Psychol. Res. Behav. Manag.* 03/03 2010;3:1-39.
5. Berkovich-Ohana A, Dor-Ziderman Y, Glicksohn J, Goldstein A. Alterations in the sense of time, space, and body in the mindfulness-trained brain: a neurophenomenologically-guided MEG study. *Front. Psychol.* 2013;4:912.
6. Neal JA, Bergmann Lichtenstein BM, Banner D. Spiritual perspectives on individual, organizational and societal transformation. *Journal of organizational change management.* 1999;12(3):175-186.
7. OECD. OECD Guidelines on Measuring Subjective Well-being. Paris: OECD Publishing; 2013.
8. Jebb AT, Tay L, Diener E, Oishi S. Happiness, income satiation and turning points around the world. *Nature Human Behaviour.* 2018/01/01 2018;2(1):33-38.
9. Jean-Louis G, Kripke DF, Ancoli-Israel S. Sleep and quality of well-being. *Sleep.* 2000;23(8):1115-1121.
10. Gureje O, Von Korff M, Simon GE, Gater R. Persistent pain and well-being: a World Health Organization study in primary care. *JAMA.* 1998;280(2):147-151.
11. Knyazev GG. Motivation, emotion, and their inhibitory control mirrored in brain oscillations. *Neurosci. Biobehav. Rev.* 2007;31(3):377-395.
12. Nam CS, Jeon Y, Kim Y-J, Lee I, Park K. Movement imagery-related lateralization of event-related (de) synchronization (ERD/ERS): motor-imagery duration effects. *Clin. Neurophysiol.* 2011;122(3):567-577.
13. Neuper C, Scherer R, Wriessnegger S, Pfurtscheller G. Motor imagery and action observation: modulation of sensorimotor brain rhythms during mental control of a brain–computer interface. *Clin. Neurophysiol.* 2009;120(2):239-247.
14. Hanslmayr S, Aslan A, Staudigl T, Klimesch W, Herrmann CS, Bäuml K-H. Prestimulus oscillations predict visual perception performance between and within subjects. *Neuroimage.* 2007;37(4):1465-1473.
15. Tallon-Baudry C, Bertrand O. Oscillatory gamma activity in humans and its role in object representation. *Trends in cognitive sciences.* 1999;3(4):151-162.
16. Lutz A, Greischar LL, Rawlings NB, Ricard M, Davidson RJ. Long-term meditators self-induce high-amplitude gamma synchrony during mental practice. *Proc Natl Acad Sci U S A 15534199.* Nov 16 2004;101(46):16369-16373.
17. Braboszcz C, Cahn BR, Levy J, Fernandez M, Delorme A. Increased Gamma Brainwave Amplitude Compared to Control in Three Different Meditation Traditions. *PLoS One.* 2017;12(1):e0170647.
18. McCraty, R., & Shaffer, F. (2015). Heart Rate Variability: New Perspectives on Physiological Mechanisms, Assessment of Self-regulatory Capacity, and Health risk. Global advances in health and medicine, 4(1), 46–61. doi:10.7453/gahmj.2014.073

APPENDIX 1: Means and Standard Deviations for HRV parameters

Measure	Before FLFE Mean (SD)	After FLFE Mean (SD)	*p*-value
N	13	13	
PNSindex	-0.524 (0.798)	-0.471 (0.920)	0.88
SNSindex	1.095 (1.476)	0.935 (1.372)	0.78
Stressindex	15.061 (7.069)	13.910 (6.294)	0.67
MeanRRms	882.908 (118.416)	879.681 (125.697)	0.95
SDNNms	33.784 (15.637)	35.377 (16.006)	0.80
MeanHRbpm	69.064 (8.742)	69.446 (9.100)	0.91
SDHRbpm	2.661 (1.289)	2.802 (1.290)	0.78
MinHRbpm	63.353 (8.497)	63.339 (8.359)	1.00
MaxHRbpm	76.689 (9.411)	79.556 (11.789)	0.50
RMSSDms	29.091 (15.131)	31.427 (16.354)	0.71
NNxxbeats	33.538 (40.634)	44.385 (43.741)	0.52
pNNxx	10.173 (11.114)	13.990 (14.039)	0.45
HRVtriangularindex	8.511 (2.971)	9.052 (4.012)	0.70
TINNms	171.256 (82.655)	189.436 (84.683)	0.58
VLFpeak_FFTHz	0.037 (0.003)	0.037 (0.003)	1.00
LFpeak_FFTHz	0.082 (0.021)	0.080 (0.019)	0.77
HFpeak_FFTHz	0.218 (0.043)	0.226 (0.043)	0.65
VLFpow_FFTms2	95.437 (119.616)	125.883 (190.644)	0.63
LFpow_FFTms2	940.763 (1021.316)	935.951 (1092.585)	0.99
HFpow_FFTms2	389.122 (366.308)	402.490 (331.721)	0.92
VLFpow_FFTlog	3.588 (1.441)	3.835 (1.303)	0.65
HFpow_FFTlog	5.388 (1.189)	5.394 (1.301)	0.99
VLFpow_FFT	6.173 (3.853)	8.625 (6.866)	0.27
LFpow_FFT	56.404 (19.801)	56.256 (19.379)	0.98
HFpow_FFT	37.370 (21.362)	35.029 (23.046)	0.79
LFpow_FFTnu	60.409 (21.735)	62.370 (22.805)	0.82
HFpow_FFTnu	39.534 (21.708)	37.532 (22.807)	0.82
TOTpow_FFTms2	1425.967 (1156.018)	1465.127 (1286.423)	0.94
LF_HF_ratio_FFT	4.896 (6.464)	3.720 (3.459)	0.57
VLFpeak_ARHz	0.038 (0.006)	0.038 (0.004)	1.00
LFpeak_ARHz	0.098 (0.024)	0.092 (0.019)	0.49
HFpeak_ARHz	0.211 (0.037)	0.211 (0.052)	0.97
VLFpow_ARms2	114.779 (144.675)	135.740 (177.455)	0.74
LFpow_ARms2	880.772 (978.035)	1420.189 (1861.217)	0.36
HFpow_ARms2	384.543 (388.828)	543.067 (692.047)	0.48
VLFpow_ARlog	3.934 (1.251)	4.125 (1.217)	0.70
LFpow_ARlog	5.976 (1.131)	6.161 (1.056)	0.67

HFpow_ARlog	5.375 (1.221)	5.472 (1.325)	0.85
VLFpow_AR	7.687 (4.117)	8.839 (5.561)	0.55
LFpow_AR	55.187 (19.402)	57.124 (16.651)	0.79
HFpow_AR	37.070 (21.189)	33.925 (19.675)	0.70
LFpow_ARnu	60.167 (21.952)	63.198 (20.000)	0.72
HFpow_ARnu	39.773 (21.933)	36.679 (20.004)	0.71
TOTpow_ARms2	1380.793 (1147.549)	2099.878 (2473.001)	0.35
LF_HF_ratio_AR	4.473 (5.650)	3.825 (3.598)	0.73
EDRHz	0.235 (0.049)	0.232 (0.088)	0.91
SD1ms	20.602 (10.716)	22.257 (11.584)	0.71
SD2ms	42.527 (20.439)	43.844 (20.917)	0.87
SD2_SD1_ratio	2.191 (0.777)	2.166 (0.744)	0.93
ApEn	1.086 (0.104)	1.070 (0.090)	0.68
SampEn	1.587 (0.224)	1.534 (0.234)	0.56
D2	1.658 (1.489)	1.785 (1.424)	0.83
DFA1	1.116 (0.322)	1.106 (0.319)	0.94
DFA2	0.314 (0.080)	0.347 (0.120)	0.42
RP_Lmeanbeats	9.870 (1.780)	12.100 (5.550)	0.18
RP_Lmaxbeats	151.154 (88.061)	151.077 (64.404)	1.00
RP_REC	26.112 (4.388)	29.275 (7.920)	0.22
RP_DET	97.122 (0.946)	97.376 (1.281)	0.57
RP_ShanEn	3.003 (0.182)	3.114 (0.282)	0.25
MSE_1	1.587 (0.224)	1.534 (0.234)	0.56
MSE_2	1.743 (0.175)	1.627 (0.173)	0.10
MSE_3	1.620 (0.240)	1.512 (0.202)	0.23
MSE_4	1.659 (0.330)	1.469 (0.311)	0.14
MSE_5	1.540 (0.247)	1.439 (0.365)	0.42
MSE_6	1.470 (0.379)	1.297 (0.293)	0.21
MSE_7	1.305 (0.260)	1.216 (0.345)	0.47
MSE_8	1.168 (0.287)	1.207 (0.316)	0.74
MSE_9	1.081 (0.208)	1.010 (0.334)	0.52
MSE_10	0.938 (0.228)	0.949 (0.317)	0.92
MSE_11	0.888 (0.203)	0.893 (0.417)	0.97
MSE_12	0.818 (0.215)	0.830 (0.219)	0.89
MSE_13	0.888 (0.309)	0.693 (0.262)	0.10
MSE_14	0.788 (0.229)	0.635 (0.269)	0.13
MSE_15	0.676 (0.167)	0.670 (0.281)	0.95
MSE_16	0.686 (0.266)	0.670 (0.384)	0.90
MSE_17	0.561 (0.203)	0.592 (0.305)	0.76
MSE_18	0.498 (0.206)	0.591 (0.277)	0.34
MSE_19	0.539 (0.230)	0.529 (0.259)	0.92
MSE_20	0.499 (0.190)	0.543 (0.318)	0.67

APPENDIX 2: HRV Legend

PNS index	PNS index - Parasympathetic nervous system activity compared to normal resting values
SNS index	SNS index - Sympathetic nervous system activity compared to normal resting values
Stress index	Stress index - Square root of Baevsky's stress index
Mean RR (ms)	RR [ms] The mean of RR intervals
SDNN (ms)	STD RR (SDNN) [ms] Standard deviation of RR intervals
Mean HR (bpm)	HR [1/min] The mean heart rate
SD HR (bpm)	STD HR [1/min] Standard deviation of instantaneous heart rate values
Min HR (bpm)	Min & Max HR [1/min] Minimum and maximum HR computed using N beat moving average (default value: N = 5)
Max HR (bpm)	Min & Max HR [1/min] Minimum and maximum HR computed using N beat moving average (default value: N = 5)
RMSSD (ms)	RMSSD [ms] Square root of the mean squared differences between successive RR intervals
NNxx (beats)	NNxx [beats] Number of successive RR interval pairs that differ more than xx ms (default value: xx= 50)
pNNxx (%)	pNNxx [%] NNxx divided by the total number of RR intervals
HRV triangular index	HRV triangular index- The integral of the RR interval histogram divided by the height of the histogram
TINN (ms)	TINN [ms] Baseline width of the RR interval histogram
SDANN (ms)	SDANN [ms] Standard deviation of the averages of RR intervals in 5-min segments
SDNNI (ms)	SDNNI [ms] Mean of the standard deviations of RR intervals in 5-min segments
VLFpeak_FFT (Hz)	Peak frequency [Hz] VLF, LF, and HF band peak frequencies
LFpeak_FFT (Hz)	Peak frequency [Hz] VLF, LF, and HF band peak frequencies
HFpeak_FFT (Hz)	Peak frequency [Hz] VLF, LF, and HF band peak frequencies
VLFpow_FFT (ms2)	Absolute power [ms2] Absolute powers of VLF, LF, and HF bands
LFpow_FFT (ms2)	Absolute power [ms2] Absolute powers of VLF, LF, and HF bands
HFpow_FFT (ms2)	Absolute power [ms2] Absolute powers of VLF, LF, and HF bands
VLFpow_FFT (log)	Absolute power [log] Natural logarithm transformed values of absolute powers of VLF, LF, and HF bands
LFpow_FFT (log)	Absolute power [log] Natural logarithm transformed values of absolute powers of VLF, LF, and HF bands
HFpow_FFT (log)	Absolute power [log] Natural logarithm transformed values of absolute powers of VLF, LF, and HF bands
VLFpow_FFT (%)	Relative power [%] Relative powers of VLF, LF, and HF bands
LFpow_FFT (%)	Relative power [%] Relative powers of VLF, LF, and HF bands
HFpow_FFT (%)	Relative power [%] Relative powers of VLF, LF, and HF bands
LFpow_FFT (n.u.)	Normalized power [n.u.] Powers of LF and HF bands in normalised units
HFpow_FFT (n.u.)	Normalized power [n.u.] Powers of LF and HF bands in normalised units
TOTpow_FFT (ms2)	Total power
LF_HF_ratio_FFT	LF/HF - Ratio between LF and HF band powers
VLFpeak_AR (Hz)	AR spectrum estimates
LFpeak_AR (Hz)	AR spectrum estimates
HFpeak_AR (Hz)	AR spectrum estimates

VLFpow_AR (ms2)	AR spectrum estimates
LFpow_AR (ms2)	AR spectrum estimates
HFpow_AR (ms2)	AR spectrum estimates
VLFpow_AR (log)	AR spectrum estimates
LFpow_AR (log)	AR spectrum estimates
HFpow_AR (log)	AR spectrum estimates
VLFpow_AR (%)	AR spectrum estimates
LFpow_AR (%)	AR spectrum estimates
HFpow_AR (%)	AR spectrum estimates
LFpow_AR (n.u.)	AR spectrum estimates
HFpow_AR (n.u.)	AR spectrum estimates
TOTpow_AR (ms2)	AR spectrum estimates
LF_HF_ratio_AR	AR spectrum estimates
EDR (Hz)	EDR** [Hz] ECG derived respiration
SD1 (ms)	SD1 [ms] In Poincaré plot, the standard deviation perpendicular to the line-of-identity
SD2 (ms)	SD2 [ms] In Poincaré plot, the standard deviation along the line-of-identity
SD2_SD1_ratio	SD2/SD1 - Ratio between SD2 and SD1
ApEn	ApEn - Approximate entropy
SampEn	SampEn - Sample entropy
D2	D2** - Correlation dimension
DFA1	DFA, alpha1 - In detrended fluctuation analysis, short term fluctuation slope
DFA2	DFA, alpha2 - In detrended fluctuation analysis, long term fluctuation slope
RP_Lmean (beats)	RPA: Recurrence plot analysis - Lmean [beats] Mean line length
RP_Lmax (beats)	RPA - Lmax [beats] Maximum line length
RP_REC (%)	REC [%] Recurrence rate
RP_DET (%)	DET [%] Determinism
RP_ShanEn	ShanEn - Shannon entropy
MSE_1	MSE - Multiscale entropy for scale factor values = 1; 2; : : : ; 20 [6]
MSE_2	Multiscale entropy
MSE_3	Multiscale entropy
MSE_4	Multiscale entropy
MSE_5	Multiscale entropy
MSE_6	Multiscale entropy
MSE_7	Multiscale entropy
MSE_8	Multiscale entropy
MSE_9	Multiscale entropy
MSE_10	Multiscale entropy
MSE_11	Multiscale entropy
MSE_12	Multiscale entropy
MSE_13	Multiscale entropy
MSE_14	Multiscale entropy
MSE_15	Multiscale entropy
MSE_16	Multiscale entropy

MSE_17	Multiscale entropy
MSE_18	Multiscale entropy
MSE_19	Multiscale entropy
MSE_20	Multiscale entropy