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The relationship between heart-brain dynamics, positive emotions, coherence, optimal health and cognitive function

This presentation will discuss the background and overview of clinical and behavioral outcome results of a new approach to self-regulation and stress management that has a wide range of health enhancement applications. These include improved access to intuition and cognitive functioning such as focus and attention, memory and increased self-regulation. Recent research has seen the emergence of a new understanding of how the heart and brain interact in a dynamic relationship that regulates many aspects of cognition and emotional experience. Over the past several decades, several lines of evidence have established that the heart contains intrinsic neural and hormonal systems and functions as an important information-encoding and processing center. The heart's complex circuitry enables it to sense, regulate, and remember. Neurological signals originating in the heart directly modulates and influences numerous brain activities. We have found that sustained positive emotions facilitate an emergent shift in global psychophysiological functioning, which is marked by a distinct change in the rhythm of heart activity. This global shift generates a state of optimal functioning.

The ability of the brain and nervous system to synchronize electrical activity is the basis of what we call consciousness, our ability to perceive, feel, focus, learn, reason and perform at our best. Disruption of this system can be caused by stress.

It is well established that stress interferes with mental processes such as memory, concentration, judgements and decision making.

About the heart-brain connection

There is more information going from the heart to the brain than the other way around, and this information influences regions in the brain that affect decision making, creativity and especially emotions.

The general idea is that the body is a downward system, but 85-90% of all neural fibres carry information from the body to the brain, and a major part of this information comes from the heart via the nervus vagus.



A ganglion is a group of neurons wired in a functional unit outside of the brain. The Intrinsic Ganglia in the human heart are connected in the same manner as in for example the amygdala. The ganglia in the human heart are interconnected, and consisting of many different types of neurons, like for example local circuit neurons. These neurons are known to be important in the hippocampus for encoding and decoding of long term memory. It has been proven now that heartneurons also have long and short-term memory. The heart needs functional memory to do it's job right, fast reactions are impossible if a signal has to be sent to the brain first for approval.

Carl Eislyy: 'It is not possible to localise memory to a neuron or a section of neurons; certain area's and brain centre's are needed for coding and decoding, but memories themselves are distributed throughout the brain and nervous system.'

So why would we draw a line at our throat and say memory does only take place in the brain?

The neurons of the heart are localised around the main vessels, all interconnected. 20% of these neurons has to do with mechanical information (pressure etc), the other 80% is sensitive to chemical substances (hormones, neurotransmitters). This information gathers in the little brain in the heart, where it is integrated and used for local decision making.

The Intrinsic neurosystem of the heart is also directly connected with skin, lungs and other organs.

The heart of braindead or comatose patients responds to touch by changing the heartrate. Energetic changes in the quantumfield, for example sending love, causes the same reaction.

The vast sensory network in the heart consists of different types of neurons. Chemoreceptor neurons show a specific pattern for every different type of neurotransmitter or hormone.

The HeartRateVariability is the beat to beat variability in our heartrate that creates the heartrhythm. When we are in harmony with ourselves, the heartrhythm shows us fluent waves, when we are frustrated, the waves get edgy, spiky.

The Heart Rhythm (HR) directly influences our physical and mental performance by it's synchronization with the thalamus. When these two branches of our nervous system are in sync, brain function is facilitated, when they're not, it is inhibited.

Receiving mixed signals cost you energy, it's like pushing the brakes and the gaspedal of a car at the same time.



A self-induced sincere positive feeling can change our HR into fluent waves again. Taking care of ourselves is the best way to change our emotions. When we are more coherent, it reflects in our HR and facilitates cortical function. We can force ourselves into this coherent HR by for example, paced breathing.

Coherence in the body means: individual systems working in a harmonious way.

All systems have to be coordinated in time and space, and it takes a quantumcoherence understanding to see how the body does that.

The definition of living systems is now about quantumcoherence.

HeartRhythm information is sent from the heart to the thalamus, where it is synchronizes electrical activity, influences cortex.

Desynchronization of frontal cortex makes us choose inappropriate behaviors, etc.

Learning to maintain our coherence has a lot of benefits: increased ability to self-regulate, 40% improvement in long-term memory, 24% improvement in short-term memory, increased ability to focus, increased ability to process information, increased reaction times, higher test scores.

Heart Coherence is an optimal state in which the heart, mind and emotions are operating in-sync and balanced. Physiologically, the immune, hormonal and nervous systems function in a state of energetic coordination.

By training you can get you respiration, heart rate variability and for example blood pressure rhythm to cohere, to fire at the same rate.

Coherence is a higher order function than relaxation. Relaxing has to do with being away from our selves, while coherence is about being present. Choosing to be more from the heart.

Heartmath techniques induce this coherent physical and mental state and allow us to be able to shift to a coherent state whenever you want.

Clinical studies show that being in this coherent state has a lot of benefits:

- 1) Blood Pressure in Hypertensive Employees (HP), 20% reduction in diastolic and systolic blood pressure
- 2) Diabetes (LifeScan division of J&J), 30% increase in quality of life metrics; 1,1% reduction in HbA 1c in Type 2 diabetes
- 3) Congestive Heart Failure (Stanford Hospital), 14% improvement in functional capacity
- 4) Heart Arrhythmias (Kaiser Permanente), 75% of patients had significantly fewer episodes of atrial fibrillation and 20% were able to stop medication altogether



- 5) Asthma (Robert Wood Johnson Medical School), over 50% of patients experienced a decrease in airway impedance, symptom severity and medication consumption

The Electrophysiology of Intuition

Dean Radin (1997): 'Sometimes if a future event is sufficiently important, novel, or emotional, it may precipitate a change in the present physiological state that is consistent with the future reaction.'

If a future event is sufficiently important, it can influence your body in a way that it is prepared for the event.

The study performed by the Institute of HeartMath shows that there is a visibly significant deviance in the HRV when an emotional stimulus is about to be shown, around 4,5 seconds before it is actually shown. The first place for a reaction to be seen in the brain is in the frontal cortex.

The process of heartbeat evoked potential analysis traces the electric potential throughout the nervous system. It takes about a $\frac{1}{4}$ sec for the blood pressure wave from the heart to reach the brain. Right in sync with the heartbeat you can see an effect throughout the whole brain. This is the energetic-magnetic communication between heart and brain, which has a synchronizing effect on the brain. Only after which the afferent signals from the heart arrive to the brain.

Information from the heart is modulated in the frontal cortex, also the first place to have a quantum effect.

When we're in coherence, we're more attuned to our heart; women showed a much stronger effect than the men in being attuned to their heart.

When overlaying results from EEG Event Potentials and Beat-to-beat Heart rate before an emotional stimulus, we see a shift in HR 4,5 sec pre-stimulus, and a positive shift in ERP 1,5 sec pre-stimulus.

Intuition is heart first, the heart sends a message to the brain, the brain responds and triggers the body, and once we have a body response we feel it (mostly in our gut), and then comes consciousness.

Intuition in science is explained by 'unconsciously stored information'.

This study shows results with tests about future events of which the brain wouldn't be able to have gathered unconscious information.



These effects suggest that intuitive processes have access to a field of information that is not limited by the boundaries of time and space.

Such intuitive experiences suggest that some aspect of our perceptual apparatus is continuously scanning the future. This would imply that the time symmetries commonly described by quantum physicist might also occur at macroscopic scales and in the realm of the human heart and brain.

Basically all the great poets and artist, who talk about the heart's wisdom, the heart's intuition, have been right all along.

This intuition is not meant to win the lottery with, it is just for your own emotional process, for coherence in your life and relations.

The Energetic Heart connection

The heart radiates a rhythmic electromagnetic field with every heartbeat that energetically affects those in our environment, whether we are conscious of it or not.

We experience this when we are affected by each other's moods, attitudes and feelings.

This electromagnetic field of the heart is 5000 times stronger than that of the brain, and measurable up to 3 feet away from the body.

This field is modulated by our emotions.

When we measure these fields, there is a great correlation between heartmagnetic field, the HR and our emotional state.

An example: a mother's brainwave is synchronised with her baby's heartbeat when she pays attention to him, but without touching him. Distraction from the baby takes the synchronization away.

In a same kind of experiment, two people stand five feet apart, and subject two's brainwaves synchronise with the heartbeat of subject 1.

The hearth rhythms of dog and boy synchronise when love is sent, while they are in separate rooms. A horse and her rider also show the same synchronisation in coherence.

Even oral leukocytes from a test person rise in electromagnetic output when the test person experiences big shifts in emotions.

The global coherence initiative is a science based initiative to unite millions of people in heart-focused care and intention -to shift global consciousness from instability and discord to balance cooperation and enduring peace. www.glcoherent.org

We are affected in a lot of processes by the rythms of planet earth.



- Rhythms in the Earth's Magnetic Field are associated with:
- Changes in brain and nervous system activity
- Performance of tasks (sports, memory, energetic sensitivity)
- Synthesis of micronutrients in plants and algae
- Traffic violations and accidents
- Mortality from heart attacks and vascular disease
- Depression and suicide
- Strokes

And this rhythm does not only affect us, we also affect the Earth's Rhythm. Geosynchronous Operational Environmental Satellites show a change in the Earth's Geomagnetic Field right at the time of the attack on September 11th. Also the pattern in the days after the attack is irregular and distressed.

The ionosphere around our planet, that protects us from the solar wind etc., is a plasma layer of highly charged ions. There are a series of resonant frequencies between the ionosphere and the planet, called the Schuman Resonances, which start at 7.8 Hz, the exact frequency of human -brainwave. The rest of the frequencies overlap with other human brainwave or heart wave activity.

An intention from a coherent heart goes out like a radio wave and resonates with the earth's geomagnetic field to create more coherence in the environment.

Collective amplification of focussed Heart Coherence occurs in groups with social and emotional resonance (people who like each other), and creates a self-reinforcing field of emotional energy which amplifies and increases beneficial effects.

When we become more coherent ourselves, we can create social coherence, and lead the world to be globally coherent.

