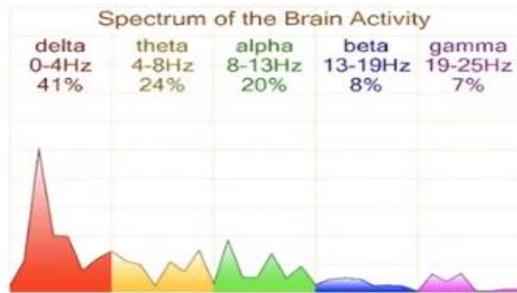
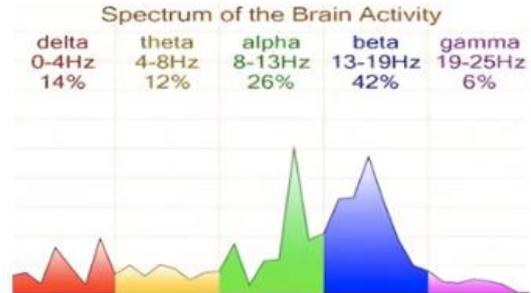


HRV and Brain Entrainment

Brainwave patterns vary depending on what state you are in. The slower the waves (lower frequency) the less alert we become. However, we don't wish to emulate sleep by using the lowest frequency (delta). Most practitioners who use these brain entrainment strategies agree that theta (4 – 7 Hz) is a healing state – and should be encouraged. One researcher believes that this is the state in which emotional trauma can be healed. Certainly hypnosis, certain drug therapies (like MDMA/LSD used clinically) would encourage that view. But we can achieve those states with practice using a form of biofeedback called Brain Entrainment. There are many apps that you can download to do this which change brain activity including binaural beats, holosync and braintap amongst others.



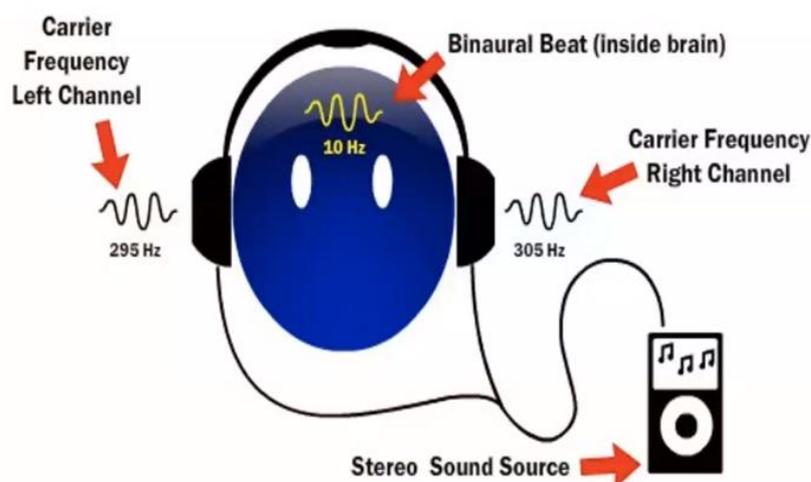
Before



After

How this works is via resonance phenomenon of **entrainment**, sometimes also known as the ‘frequency-following response’. Entrainment, if you remember, is the process of synchronization, where vibrations of one object will cause another to oscillate at the same rate (remember the tuning forks?)

“Continuous tones of subtly different frequencies (such as 100 and 108 cycles per second) are delivered to each ear independently via stereo headphones. The tones combine in a pulsing “wah wah” tone. These external rhythms can have a direct effect on the psychology and physiology of the listener. The brain effortlessly begins resonating at the same rate as the difference between the two tones, ideally in the 4-13 Hz. (Theta and Alpha) range, as in meditation. All you have to do is sit quietly and put on the headphones. The brain automatically responds to certain frequencies, behaving like a resonator.



You may not become immediately enlightened, but hemispheric synchronization helps with a whole host of problems stemming from abnormal hemispheric asymmetries. Problems, often resulting from stress or abuse in early life, include REM sleep problems, narcissism, anxiety, addictive and self-defeating behaviours. Communication between hemispheres correlates with flashes of insight, wisdom and creativity.”⁵⁰ Another home technology which can be used uses heart coherence.

The Heart and HRV

The strongest rhythmic electrical and magnetic fields in the body are produced by synchronous activity of heart muscle cells as we have said. As one of the main organs apart from the gut to be largely autonomically (i.e. automatically) driven, it has a large electromagnetic signal which is easily measurable as an ECG (electrocardiogram). Its purpose is to regulate the brain by producing a signal of coherent waves¹. The heart has its own nervous system which controls the heart rate in synchrony with the breath. We are used to thinking that our heart rate is regular like a metronome. But in fact if that were the case we are likely quite unwell! It should vary with the breath in and out. See the diagram overleaf.

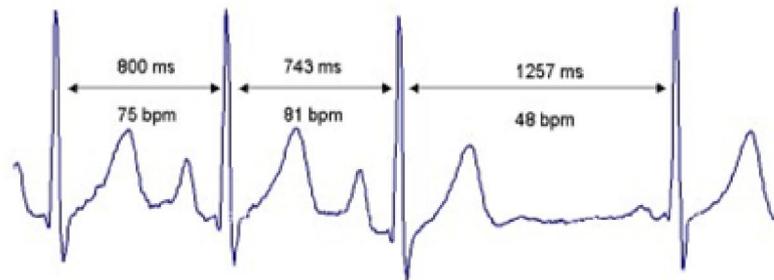


Figure 1: Heart Rate Interval Variation

Note that the interval between heart beats varies – i.e. speeds up when we breathe in (sympathetic activation) and slows down when we breathe out (parasympathetic activation). This is normal and desirable – it’s a measure of adaptability and connection between heart and brain. Now, if we measure the *change* in interval between beats and plot that against time, it forms a pattern of sinusoidal waves which we call heart rate variability (HRV). This can be measured simply by measuring blood flow in the finger or arm². This HRV measurement is acutely sensitive to the environment e.g. stress. When harmony reigns it is regular; this harmony is lost during stress.

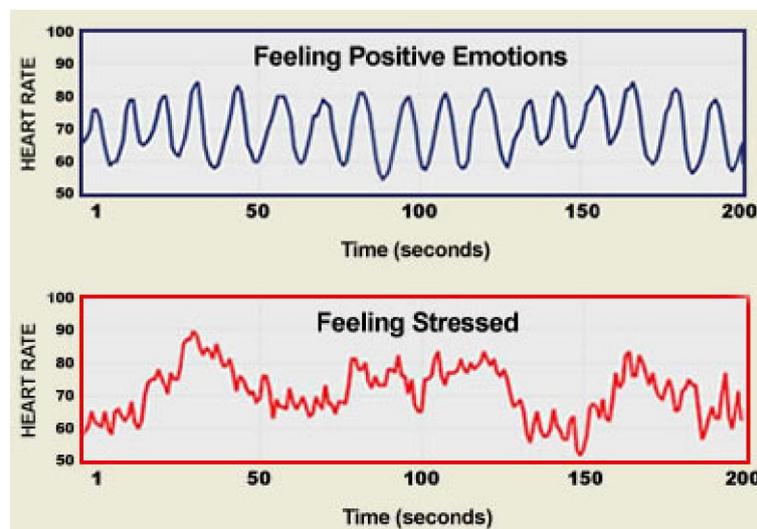


Figure 2: HRV as an Indicator of Emotional State

It is a great measure of what is termed ‘coherence’ or being in step with each other. Gregg Braden, author of *The Divine Matrix* describes it as “harmonizing the heart and the brain through its heart-brain

¹ According to biophysicist James Oschman, the heart is in fact a bidirectional scalar field antenna. Due to the double helical muscular structure of the ventricles it is able to generate electromagnetic waves which interact with our body to co-ordinate its functions. This is largely unknown to medical science which sees the heart as a material pump only.

² There are many simple phone apps which do this. Simply type HRV into your search engine to get some examples. They measure blood flow in the finger held to the camera!

coherence". That this exists as a field that is measurable and can be *changed by intention* is now no longer the radical notion that it was when he published that book.ⁱ

Whilst the electrical signal (ECG) is the most well known it is not the strongest. While this is readily detected via surface electrodes, the heart's *magnetic* field can be recorded up to several feet from the body surface as an **MCG (magnetocardiogram)**. Magnetic fields produced by the heart appear to carry information that can also be detected by other persons or animals. An example of the informational potential (bioeffectiveness) of these heart fields is cardiac-induced **entrainment**, or frequency locking, detected when the R-waves of one subject's ECG become precisely synchronised with the ECG alpha waves of another subject at a distance of up to 5 feet.

Heart Rate Variability (HRV) and Emotion

Heart fields may also encode psycho-emotional information, as indicated by the 75% accuracy rate in detecting discrete emotional states from patterns of heart rate variability.

It is a most important signal that most doctors are unaware of and simply do not measure – yet it is probably the single *most important measure of health and longevity* there is. Notice that when feeling stressed³ the HRV is irregular and jagged; in a harmonious, positive frame the beautiful sine wave (above in the diagram) is seen. In my book *The Scar that Won't Heal*ⁱⁱ, I talked about it extensively so I won't repeat here but do consider getting yours measured – it no longer requires specialist equipment but just a free or low cost app on your smart phones or device.

According to Gregg Braden, the heart has its own nervous system consisting of sensory neurites. Work by the HeartMath Institute has investigated this system that allows the heart to pick up information just like the brain (in fact ahead of the brain). It's linked to the heart coherence we looked at in Chapter 3. So could the heart also be a 'mind' too? That's a very interesting question and I refer you to the detailed data from HeartMath Institute which shows that people can synchronise with the shifting magnetic rhythms of the earth, albeit unconsciouslyⁱⁱⁱ. Those that don't are likely disconnected physiologically from the earth that gave them life and are doing a great deal of damage to themselves and others. The head of The HeartMath Institute Rollin McCraty warns us against becoming disconnected from our connection with earth energy and our hearts.

The heart and the brain are in direct communication but it's 90% from *heart to brain* rather than the other way round. When our heart is in coherence we gain more mental clarity, flow and a sense of wonder and connectedness. And with these modern tools which help us to see our HRV and brainwaves, we can enhance the connection (see my separate sheet on HRV and brainwave entrainment apps available from my website www.alchemytherapies.co.uk/documents).

ⁱ Braden, Greg (2006). *The Divine Matrix; Bridging Time, Space, Miracles and Belief*. Hay House

ⁱⁱ Worby, P. (2018). *The Scar that won't Heal*. Createspace.

ⁱⁱⁱ HeartMath Institute. Study Shows Geomagnetic Fields and Solar Activity Affect Human Autonomic Nervous System Functions accessed <https://www.heartmath.org/articles-of-the-heart/study-new-analysis-technique-support-group-synchronization-magnetic-fields/>

³ Note stress can be subconscious so not obvious to the person feeling it e.g. you're in a work or relationship situation out of your control which you've got used to but your body responds autonomically anyhow.