SweetWater Health™
Results from SweetBeat iPhone App During Craniosacral Session

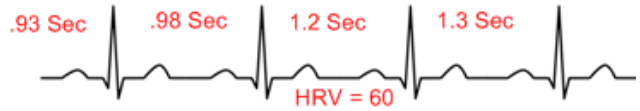
BeatHealthy™

Miroval AZ, March 2014

The Science of HRV

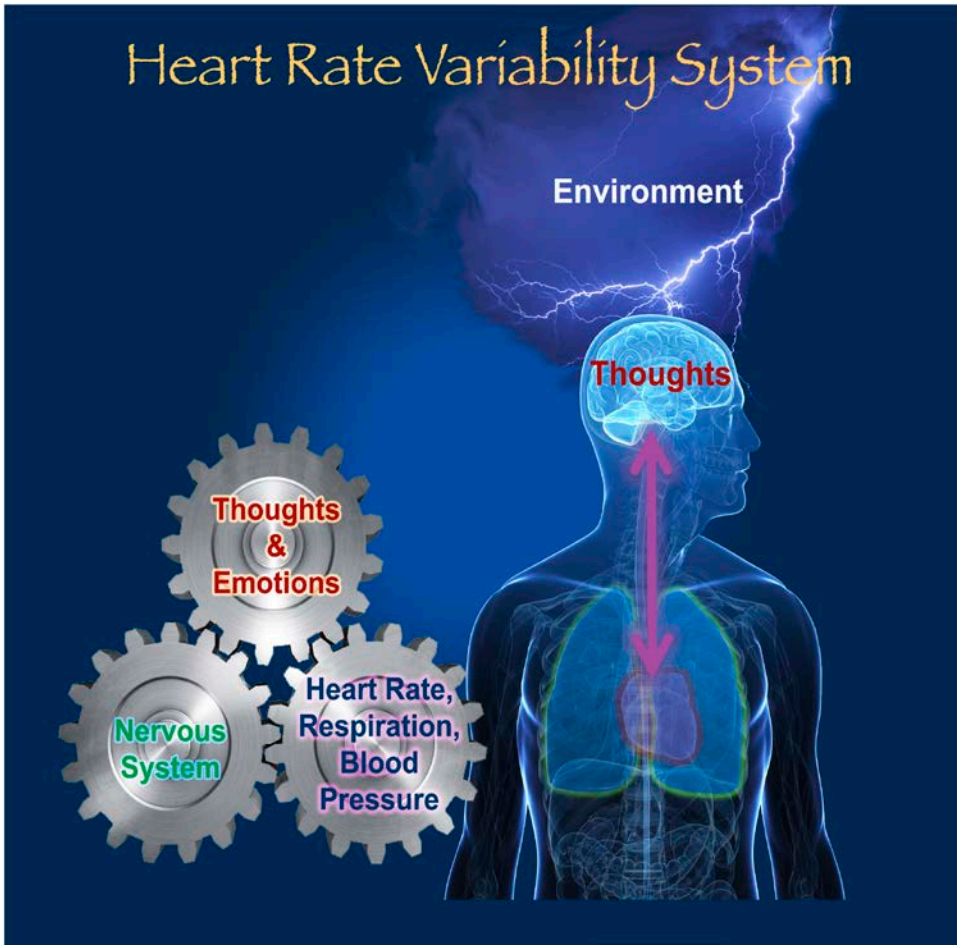
- **What is Heart Rate Variability (HRV)?**
- **HRV is the variation in time between each heart beat**

This illustration shows an unhealthy Heart Rate Variability with constant 1 sec intervals between beats



This illustration shows a healthy heart rate variability with variation between beats

- **This variation in time between beats is caused by a "tug of war" between the sympathetic nervous system speeding the heart up and the parasympathetic slowing it down**
- **HRV has been researched for more than 30 years**

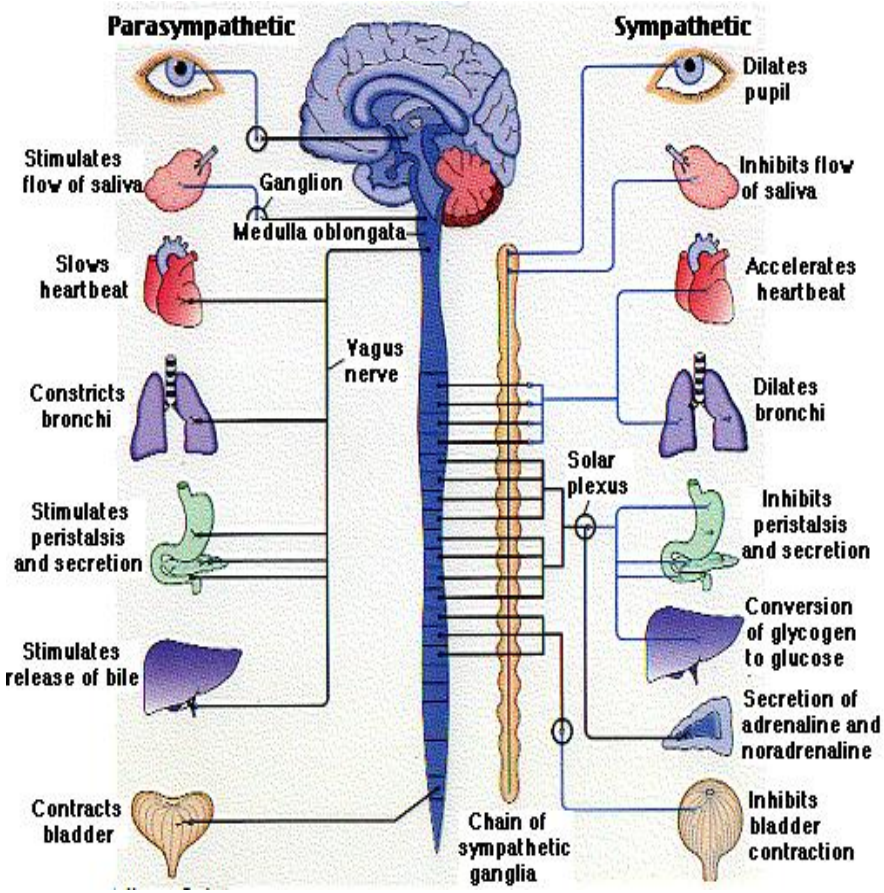


SweetWater Health HRV Parameters

- The variation between heart beats can be analyzed in many ways
- The SweetBeat iPhone app analyzes it in 2 ways:
  - Statistical analysis of the heart beat time series:
    - HRV
      - HRV is a reflection of Vagal Tone (see next slide)
      - HRV is a number 0-100
      - **A high HRV is desirable**
  - Frequency Analysis:
    - Low Frequency (LF, associated with sympathetic activation)
    - High Frequency (HF, associated with parasympathetic activation)
  - So the 3 parameters SweetBeat measures:
    - HRV
    - LF
    - HF

HRV and Vagal Tone

- The Vagus Nerve is the 10th of 12 paired cranial nerves and controls parasympathetic innervation of the heart and acts to lower the heart rate.
- Vagal innervation is the mediator of HRV and therefore HRV is an indication of Vagal Tone
- The higher the HRV, the stronger the Vagal Tone
- Higher HRV is an indication of an individuals ability to “put the brakes on stress” by mediating the sympathetic control over the nervous system and heart rate.



SweetWater Health
HRV and Vagal Tone

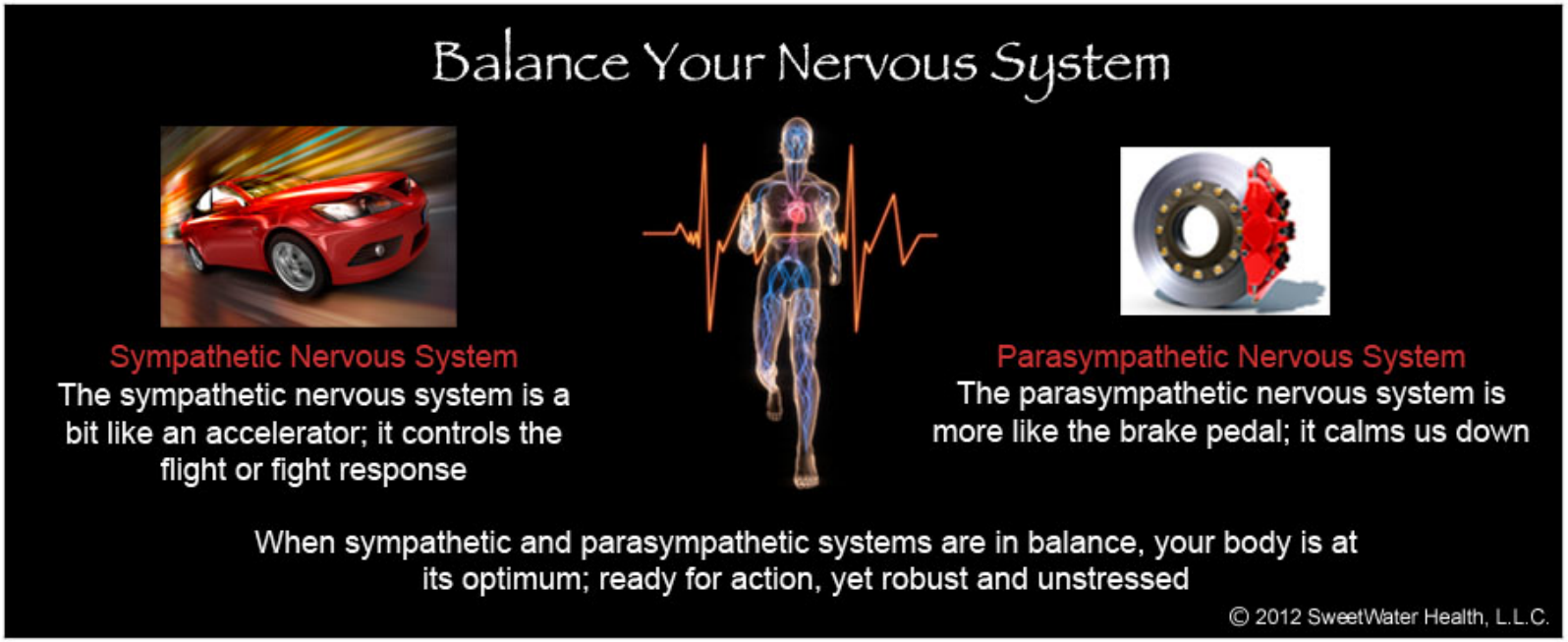
- HRV is an indication of your resilience – the ability of the nervous system to ***respond*** and ***recover*** from physical or psychological stressors
- IMPORTANT: HRV has a circadian rhythm
- IMPORTANT: HRV measured values depend on length of measurement
  - So measure HRV at same time of day for same length of time for comparison
- HRV is age and gender dependent
- HRV may change day to day with your biorhythm or due to emotional or physical stress
  - HRV associated with willpower in several studies
- Chronic low HRV is an indication of systemic health (psychological or physical) issues
- There are over 5,000 papers on HRV in the NIH database alone

LF, HF and the Autonomic Nervous System

The Autonomic Nervous System (ANS) has two branches:

- Sympathetic
- Parasympathetic

LF is the measure of the Sympathetic Branch
HF is the measure of the Parasympathetic Branch



Average HRV Ranges

- In order to fully appreciate the results from the Craniosacral Session, it is important to understand average values for HRV, LF and HF

Gender	Age	Average SweetBeat HRV
Male	10-29	72.29827
Female		67.68875
Male	30-49	62.51162
Female		60.47521
Male	50-69	52.91486
Female		55.733
Male	70-99	52.91486
Female		52.91486

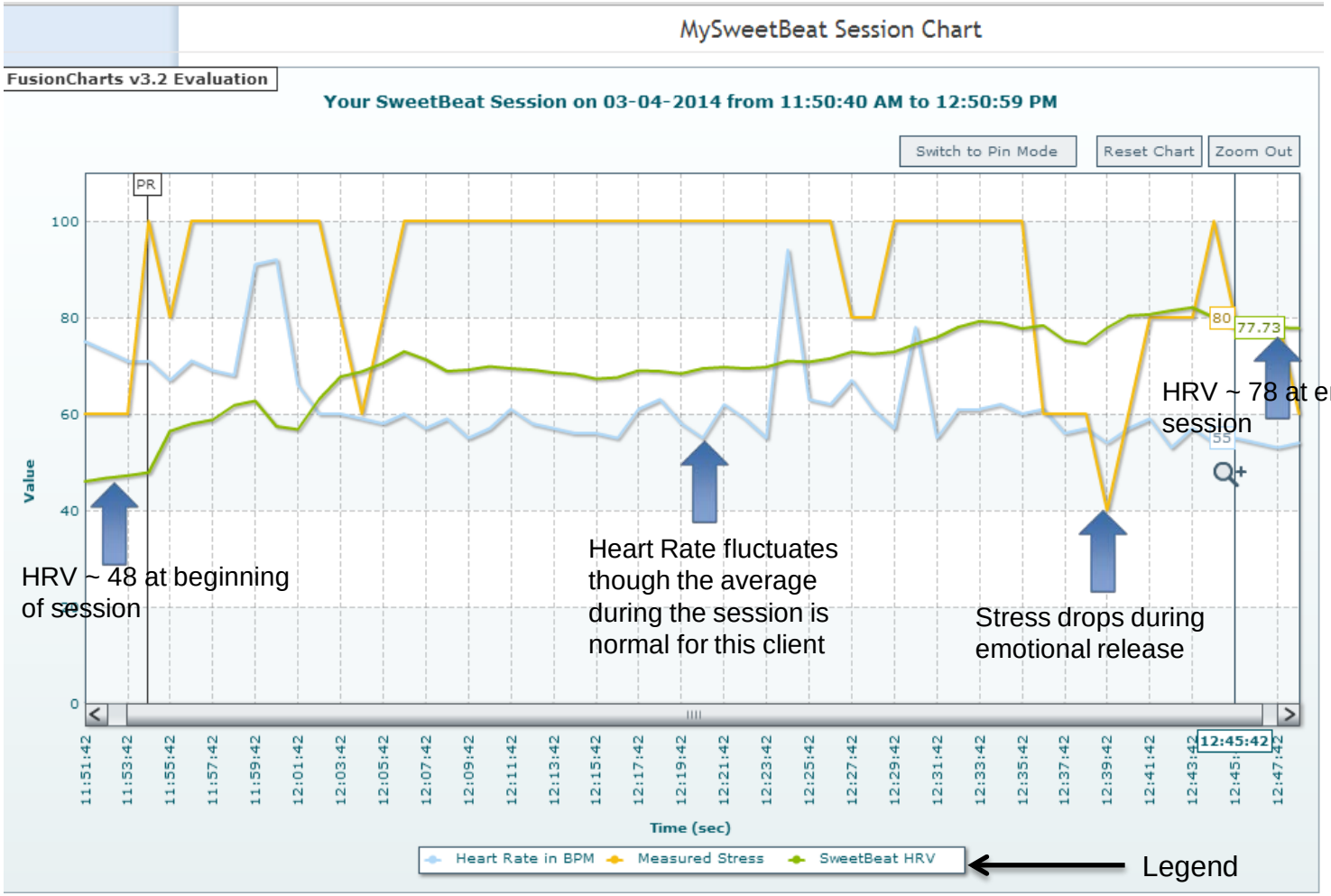
- Source: http://www.sciencedirect.com/science/article/pii/S0735109797005548
- Values based on 24 hour measurements
- HRV represents rMSSD scaled to a value between 0 – 100 and is SweetBeat specific

- The Craniosacral Session measured a 52 year old woman. From the charts below this equates to:
  - Average HRV = 55.733
  - Average LF = 330
  - Average HF = 156

		Age 20's	Age 30's	Age 40+
Average LF	Male	1480	678	212
	Female	804	336	330
Average HF	Male	925	314	131
	Female	528	311	156

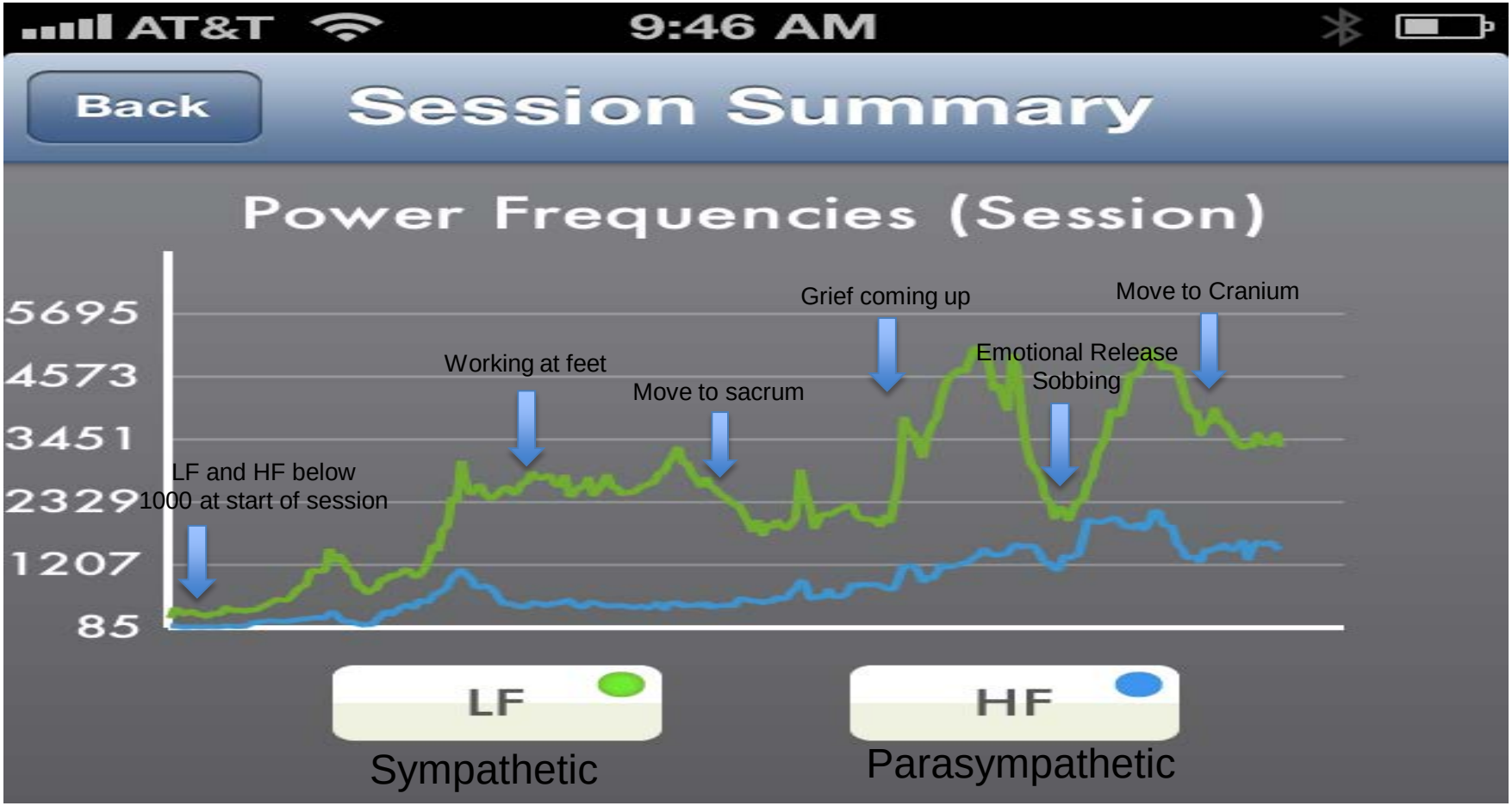
- Source:
- http://www.anti-aging.gr.jp/english/pdf/2010/7_94.pdf
- Values based on 5 minute measurements

HRV, Stress, Heart Rate During Craniosacral Session



LF, HF Power During Cranio Sacral Session

- LF and HF "Power" is a measure of the amplitude of electrical signal in the nervous system



Summary

- Significant Increase in Power in both Sympathetic and Parasympathetic
  - LF: 800 rising to around 5000 then ending at 3500
  - HF: 400 rising to around 2000 then ending at 1500
- HRV increase significantly from 48 to 78
- Stress and LF (Sympathetic) decrease significantly during emotional release
- HF (Parasympathetic) increased immediately after emotional release
- HRV, LF, HF parameters increase significantly above the average values for age and gender
  - Heart Rate spikes though remains steady *on average* throughout session
- Research indicates that repeated increase of HRV, LF, HF results in new and higher baseline values
  - Neurons that fire together wire together
- Based on this information Craniosacral Therapy appears to be an excellent venue for improving Autonomic Function*
- Thank you!

* More research needed and encouraged to verify