Interim Results of Study into NSI Heart Brain Integration

Summary

A two week trial of the NSI HeartBrain Integration protocol was conducted in clinic 31 January 2003 to 22 February 2003. Using the technology of the HeartMath institute to measure Heart Rate Variability, the results showed an 23.375% improvement in rhythm coherence for the 16 subjects who undertook the trial compared to a control group which improved 4.28%.

Discussion

Heart/Brain connection

Key words: *Heart rate Variability*
Coherence
Accumulated entrainment

The heart beat rate is subject to normal fluctuation. The ideal fluctuation is a rhythmic increase and decrease in heartbeat variability (HRV) which generates a repeated sine curve. HRV is defined as the variation of time between heart beats recorded over time. Actual HRV behaviour is typically a more random pattern, often with reduced amplitude, and marked by sharp spikes. The nature of the heart rate variability describes the particular rhythm of an individual's heart beat characteristics, and this has a number of effects on other body systems.

The heart beat generates a torus shaped field 60 times greater than the field of the brain. It is considered the primary oscillating mechanism in the body. All other oscillating systems function in accordance with the coherence or otherwise of the heart beat variability. That is, other body systems entrain to the heart's rhythm, be it regular or irregular. The ANS, for example, is a system comprising a regular oscillation between the parasympathetic and sympathetic nervous systems (PNS and SNS, resp.). Activation of the SNS is coincident with the increase in heart rate variability (i.e.. an increase in beats per minute [BPM]) By coincident is meant a simultaneous event within a greater system where there are loops of causation going both ways. The increase in BPM activates the ANS and the SNS increases the BPM. Activation of the PNS is coincident with a decrease in BPM.

The immune system is another with an oscillation pattern. Studies mapping the behaviour of the immune system and HRV, carried out by the HeartMath group in California, reveal the coincidence of the two. Various regular markers of enhanced immune function also show a significant relationship to a more regular HRV.

The neurocardiological function of the heart receives its information from the amygdala. In turn the amygdala receives it from the thalamus. The quality of incoming information modifies the HRV and this is then transmitted through the body neurologically (back to the amygdala, the brain stem, and to higher cortical centres), hormonally, and biophysically. An event with stressful associations feeds up to midbrain and brainstem centres to cue increased fight/flight responses, switch off digestive functioning, reduce cortical processing abilities, and raise "perceived" levels of stress. That is, the heart acts as an extension and amplifier of the limbic system of the body. It contains its own "perception" of an event. Corticol perception, therefore, is always post-perception.
To the extent that an event received as stressful inhibits corticol processing, there may be little or no

perceived perception at all. By contrast, an event viewed as congruent creates the neurocardiological, hormonal and biophysical environment for corticol facilitation.

HeartMath Freeze Framer

The Freeze Framer is a software programme developed by the HeartMath company based in California. The programme monitors Heart Rate Variability (HRV) in a stationary position. In other words, it records the regularity of heartbeat variations. The subject is a seated position with a finger monitor feeding the information into the programme which displays instantaneous HRV as well as generating data relating to overall levels of coherence taken over extended time periods.

Data pertaining to these extended periods is sorted through an algorithm for accumulated entrainment. Entrainment is an expression of coherence over time. The base period is approximately 9 seconds in duration. Fluctuation in heart beat variability are recorded in that time interval. A three level algorithm measuring coherence is then generated within this unit period (low level coherence, i.e.. incoherent HRV, medium level incoherence, and high level coherence). The accumulation of these units of time generates the algorithm for accumulated entrainment. This is then displayed as a bar graph displaying the amounts of five second intervals corresponding to these levels of coherence. An accumulated entrainment graph is then generated by according high level coherence (HLC) a score of +4, mid level coherence (MLC) +1, and low level coherence (LLC) –4.

From a base line of zero, a subject with consistently high levels of coherence may expect to reach a score of 100 within seven minutes. In order, however, to avoid the possible negative self-assessments of "negative" scores, the programme itself has no negative field: the base line is the lowest AE score one can register. LLC readouts only reduce the AE score if it is already positive. If zero, it remains at zero. For the purposes of this test, however, actual AE scores were calculated and are tabulated below.

Trial

Trial structure

16 clients were chosen for the trial. Their ages ranged from 16 to and 75, and include 6 males and 10 females. These were chosen at random and none had any clinical history of heart arrhythmia. They were told that they would be taking part in a free trial and that some of them would be receiving a 'placebo' treatment and some the NSI protocol. In order to reduce the clients expectations of outcomes, the protocol was simply referred to as "the new NSI protocol", and the words "neuro-spiritual" and "heart-brain" were not used in explanations. The subjects were made clear as to the reasons for this opacity. Although all 16 clients were known to the practitioner, none had had previous contact with the subject of heart beat variability nor been exposed to the Heart Math Freeze Framer.

The subjects were divided into two groups of 8. The control group (CG) of 3 males and 5 females were given a randomised set of procedures not corresponding to any known kinesiology protocol. Their HRV was taken in a seven minute session prior to treatment and then again at the conclusion of the treatment or other modality. No-one had visual access to the monitor at any stage during their session.

The second group (G2) were also tested for the HRV prior to treatment. They were then given the NSI Heart Brain protocol as a stand-alone protocol. No other techniques were used. Finally their HRV was retested.

Results of trial:

G2:

Subject no.	Pre-treatment			Post-treatment		
	LLC	MLC	HLC	LLC	MLC	HLC
S1	96	4	0	47	46	7
S2	100	0	0	31	69	0
S3	76	24	0	65	34	1
S4	11	69	20	12	47	41
S5	83	17	0	14	83	3
S6	31	60	9	4	58	38
S7	17	68	15	16	59	25
S8	94	6	0	71	29	0

where LLC = low level coherence
MLC = medium level coherence
HLC = high level coherence
All numbers are expressed as percentages. Figures may not add up to 100 due to rounding.

After seven minutes of monitoring, the accumulated entrainment scores (AES) for the eight subjects were as follows:

Subject no.	Pre treatment AES	Post Treatment AES	% change
S1	-380	-114	33.25
S2	-400	-55	43.12
S3	-280	-222	7.25
S4	+105	+163	7.25
S5	-315	+35	43.75
S6	-28	+194	27.75
S7	+15	+95	10.00
S8	-370	-255	14.37

CG

Subject no.	Pre-treatment			Post-treatment		
	LLC	MLC	HLC	LLC	MLC	HLC
S1	84	16	0	72	28	0
S2	12	76	12	17	69	14
S3	99	1	0	89	11	0
S4	26	75	0	21	78	1
S5	57	43	0	68	32	0
S6	46	54	0	30	70	0
S7	4	79	17	0	81	19
S8	92	8	0	71	29	0

where LLC = low level coherence
MLC = medium level coherence
HLC = high level coherence
All numbers are expressed as percentages. Figures may not add up to 100 due to rounding.

After seven minutes of monitoring, the accumulated entrainment scores (AES) for the eight subjects in the Control Group were as follows:

Subject no.	Pre treatment AES	Post Treatment AES	% change
S1	-320	-260	+7.50
S2	+76	+57	-2.37
S3	-395	-345	+6.25
S4	-29	-2	+2.12
S5	-185	-240	-6.87
S6	-130	-50	+10.00
S7	+131	+157	+3.25
S8	-360	-255	+13.12

Mean figures

The mean figures for the G2 were:

Pre-treatment			Post-treatment		
	LLC	63.50		LLC	32.50
	MLC	31.00		MLC	53.12
	HLC	5.50		HLC	14.37
	AES	-206		AES	-19

Mean improvement = 23.375%

The mean figures for the control group (CG) were:

Pre-treatment			Post-treatment		
	LLC	52.50		LLC	46.00
	MLC	44.00		MLC	49.75
	HLC	3.62		HLC	4.25
	AES	-151		AES	-117

Mean Improvement 4.28%

Least improvement in group G2: S3 and S4 +7.25%
Least improvement in CG: S5 -6.87%

Greatest improvement in group G2: S5 +43.75%
Greatest improvement in CG: S8 +13.12%

Discussion of Results:

The group G2 showed a significantly greater overall improvement in heart-brain integration as measured by the HRV than the control group. All of the G2 improved to some extent, whilst two of the eight members in the control group had poorer results post-treatment than prior to the treatment. Removing them for the moment from the figures for the control group would still show the CG having an overall 7% increase, far less than the G2's 23.38%. Conversely, although six out of the eight in the control group improved somewhat, the greatest overall improvement demonstrated was a little over 13%, whereas two subjects in G2 improved more than 40%.

Whereas the LLC in the CG dropped from a mean figure of 52.50 to 46.00 after the placebo treatment, in the G2 it dropped from 63.50 to 32.50. In percentage terms the LLC for the CG group dropped 6.50% whereas for the G2 it dropped 31%. Such improvements as were evident in the CG were for the most part in an increase in MLC; HLC increased only marginally. By contrast, the subjects of G2 demonstrated an increase in HLC from 5.50 to 14.37 as well as a 22.12% increase in MLC.

It should be noted that the control group were overall better performed pre-treatment than G2, and this may have had a minor effect on their comparative pre– to post-treatment results. This is not
considered significant. Of more interest as far as the control group is concerned is that six out of the eight improved through the placebo process. How far one can call it a true "placebo" given

such considerations as trust in a client-practitioner relationship, relaxation simply from reclining, as well as the elusive placebo "permission to heal" factor may be open to some debate. In the light of the latter consideration, of course, no placebo can be called a "true" placebo.

Despite acknowledging the improvement in the control group, it must be emphasized that the improvement in HRV in the group G2 was of an entirely different order, being nearly 20% greater. Attaining a substantial proportion of HLC in one session is only sometimes evident in clinic when people are aiming to improve their HLC directly through guided focus techniques. Three of the eight subjects in G2 improved their HLC by 10% or greater; this ranks as good if not better than in clinic, where people frequently find their HRV deteriorates in the first one or two sessions before it improves – due to uncertainty about focus techniques or an anxiety regarding improvement or "wave form envy".

Frequently, after six direct focus sessions, people demonstrate 60% or greater of HLC in clinic. It would be an interesting follow up study to track the subjects of G2 over a series of sessions using the NSI technique in each session to see if the improvement evident in one session is sustained and improves comparably or even better. There would appear great possibilities in using the NSI technique to fast-track people towards a coherence practice of heart management in conjunction with these focus techniques, as well as lifestyle changes that flow from an increasing emphasis on the heart, not as a purely muscular organ, but as a integral part of the thinking and feeling self.