

Hello all,

Welcome to Volume 2, Issue 9, *The Coherent Breathing Diet*. I've chosen this title with some seriousness and some facetiousness. On the serious side, how we breathe has a huge amount to do with how our minds and bodies function. On the facetious side, I'll be discussing how we breathe, not how we eat, but arguing that they are related.

An initial assertion we made in *The New Science Of Breath* is that when the body/mind is in a state of balance, everything works better. The opposite is also true, that when the body/mind is in a state of imbalance, things don't work as well. This includes every aspect of our being, i.e. how we perceive, how we process, how we think, the outcome of our thinking. Breathing heavily influences how our brain and our nervous system functions and the resultant homeostatic condition.

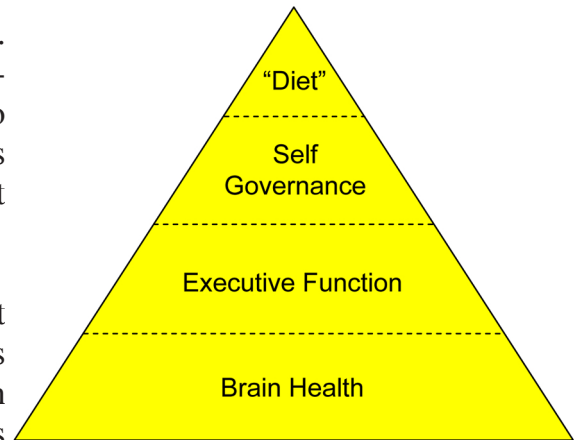


Figure 1: Executive function, self governance and "diet" are dependent on brain health.

We've known for a long time now that breathing coherently moves the autonomic nervous system toward balance and away from imbalance, where 8-12 minutes moves multiple biometrics including circulatory function, heart rate, brainwaves, muscle tension, and hand temperature away from bias and toward balance. Breathing coherently all the time, circumstances permitting, keeps these biometrics in balance, and with this balance there comes a different state of being, one of relative calm, quiet, and comfort. The internal noise level diminishes, and what appears as spurious noise is replaced by a sinusoid that follows diaphragm action. This is "coherence", the smooth regular phase synchrony of multiple body systems working in harmony with breathing.

At the initial writing of *The New Science Of Breath* (2005), it was generally accepted that breathing influenced the autonomic nervous system via baroreception, flow and pressure detectors in the arterial tree, that when the baroreceptors detect the presence of a relatively large increase in flow and pressure as occurs during exhalation, they signal the brain to lower heart rate, the brain thereby asserting efferent vagal action, the vagus nerve signaling the heart to slow down. The opposite occurs when flow and pressure fall off as occurs during inhalation. This is a closed loop feedback mechanism that avoids both unsafe rise and unsafe fall in arterial pressure. The mechanics of this have been understood for almost 100 years now, although the phenomenon continues to be marketed by some as a new age mystery. It isn't, its basic cardiopulmonary mechanics.

A more recent discovery is that the brain experiences this wholistic breathing induced blood wave that we've named "the Valsalva Wave", and its huge. In relative terms its just as large as it is at the earlobe where the breathing induced portion of the wave is just as large in amplitude as the heartbeat. (This suggests that breathing contributes as much pressure to circulation as does the heart, although this can't be accurately assessed without catheterization.) In any case, in our study of a couple of years ago, we found that when the brain experiences the wave, it generates extremely slow electrical waves that are 10 times larger than brainwaves in the delta, theta, alpha, and beta band. My summary take on this is that every time we inhale and exhale coherently, a large wave of blood washes through the brain. If so, this probably means that baroreception is the tip of the iceberg relative to our brain's awareness of our breathing.

I've proposed previously that the diaphragm and thoracic pump evolved with anatomical uprightiness out of necessity, i.e. the more upright the animal, the more evolved the diaphragm and its control. The theory that emerges is that breathing is necessary for brain health, well-being, and longevity. Evidence for how the brain remains healthy and clean from metabolic waste including beta-amyloid came from Rochester Medical Center in 2012, where they demonstrated that at night when we are horizontal, a function of the heart beat is to clean the brain (there is no mention in the study of breathing or a respiratory wave). The impending scourge of Alzheimer's is driving the medical industrial complex to invest in these areas. However, outside of Alzheimer's and stroke research, there isn't much concern for circulation and brain health. (The MIC has yet to recognize the role that breathing plays in circulation, much less the impact it may have on brain health.)

A theoretical brain function that elevates humans above "lower life forms" (not that all other life forms are lower), is a brain capacity referred to as "executive function". In a nutshell, executive function affords us "conscious" living and autonomous action, regarding all matters both constructive and destructive.

When we fail to employ our executive function, or our executive function isn't strong, we lose a degree of self-governance and autonomy. Generally, we tend to conceive of this matter as one of "the mind" and "self-control", but if we accept Steven Pinker's "the mind is what the brain does", then how the mind functions is predicated on the brain. There is no surprise here, we know that brain dysfunction can result in mental dysfunction, but what are the subtle effects of poor brain health? In medicine, this is hardly ever mentioned, except in the relatively recent context of acute matters of Alzheimers, stroke, and head injury.

I hope you can see the absurdity of the matter. There is alot of brain research going on but there is little regarding practical psycho-physiology and health. Recent reminders I've seen or heard in the media include "don't smoke", "eat a heart healthy diet", "do mental exercises", "alternate hands when brushing your teeth", etc. These are nice but they are superficial. The things we should really be talking about are diet, breathing, exercise, rest, and exercises to strengthen executive function and self governance.

We have alot of evidence that executive function and self-governance are improved when we are in a breathing induced state of autonomic nervous system balance. The body and mind become quiet. Anxiety and angst diminish. We are able to think more clearly and act more deliberately based on that thinking. We are less easily distracted and misled.

We don't need to be reminded that capitalism doesn't care and profits on all fronts from our lack of self-governance and our overall ignorance of the matter. I say, let's work on making our brains healthy, live consciously, take back our autonomy, and be who we want to be...

Stephen Elliott, President, COHERENCE

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