



## Good vibrations and gut feelings

Lincoln Stoller, PhD., 2012

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License](#)

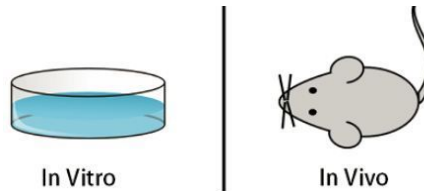


I'll pass on two interesting results relating to neurofeedback.  
\* how electrical vibrations influence perception, and  
\* connections between the brain and stomach.

### Good vibrations ...

The "good vibrations" stuff is so complex that it's unclear if it will stand the test of time. We'll have to take it at face value.

Historically there have been two ways of looking at the brain: observing what comes out of it, and seeing what's going on inside of it. These two ways are roughly the "in vivo" and the "in vitro" approaches, one being subjective, the other objective. As it happens, the whole question of the brain lies in between these poles, and neither approach gets to the nature of mind.



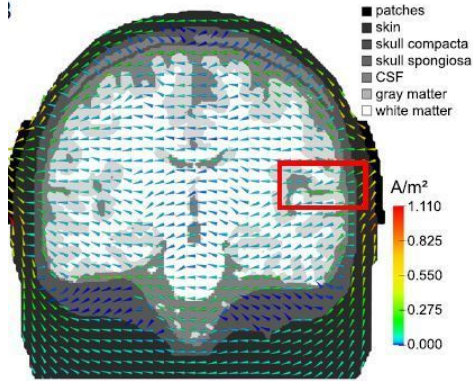
This is starting to change, as evidenced by a 2012 paper by Neuling et al. titled "Good vibrations: Oscillatory phase shapes perception." This paper is different because it's trying to both explore the brain and watch how it naturally responds at the same time. They're sending signals into the brains of normal, aware people and then watching how this affects normal thinking processes without being disruptive or reductive.

They're trying to develop another kind of conversation with the brain, one conducted using another sense. In this case that sense involves a simple electrical signal.



Their simple "language" is a small, barely noticeable oscillating current of 10 cycles per second across the temporal lobes. Nothing more. Nevertheless the paper is complicated by the authors' lack of knowledge of where this message is going, or how it's being received. They make some estimates, but the brain is so active that their signal gets lost like someone beating a drum in Times Square.

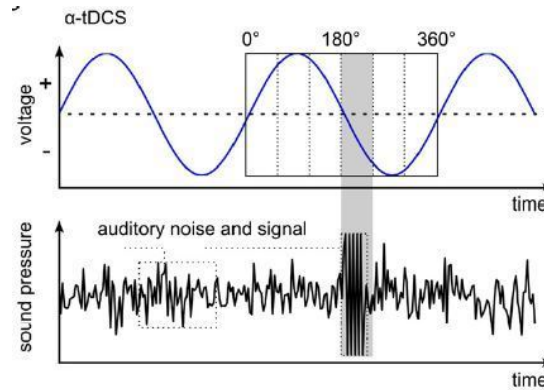
To compensate for the little they know about how their signal is being heard they ask two simple questions: "Does this signal have some apparent electrical effect on the brain?" and "Does it have some effect on perception?"



The first question is pretty simple to answer. Yes, it has an electrical effect as one sees the brain oscillate to the same rhythm that they're feeding into it. That's simply called entrainment and it is neither deep nor mysterious. It's largely a matter of conduction and chemistry and it does not have a lasting effect.

The second question is more subtle: what effect does this have? They say that it affects a person's ability to discriminate short bursts of sound at certain frequencies.

In particular, if the bursts of sound that subjects hear are in a certain phase with relation to the electrical stimulation being delivered across their temples, then they can better discriminate the sound. If the phase relationship is off, then their discrimination is worse.



The authors' conclude that this result shows perception to be periodic and not continuous. They're basically saying that by adding a periodic signal they're able to disrupt or enhance perception, so perception must be periodic.

This may not sound like much and, as I say, the conclusion relies on so much theory that it may not withstand scrutiny. Still, it's a first stab at establishing an active dialog with a normal brain that is not being mediated by mind, personality, or words.

Their conclusion has indirect bearing on neurofeedback. It implies that if one can change the frequencies at which the brain operates, and there are many such frequencies, then you can change what is perceived and, by extension, change how your brain works. And this is just what we try to do in neurofeedback.



## ... and gut feelings

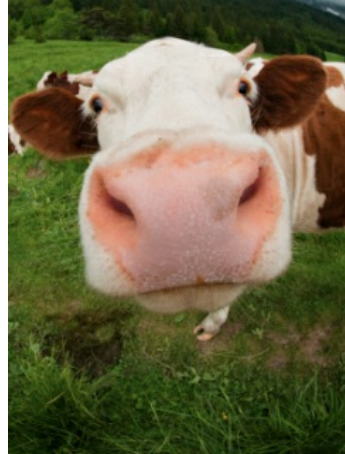
In "*Gut feelings: the emerging biology of gut-brain communication*," (Neuroscience, vol.12, August 2011, p.453) Emeran A. Mayer says:



*"Recent neurobiological insights into gut–brain crosstalk have revealed a complex, bidirectional communication system that .. is likely to have multiple effects on affect, motivation and higher cognitive functions, including intuitive decision-making."*

Basically, there is a nervous system associated with our gut that is thought to evolutionarily predate the central nervous system. It's called the Enteric Nervous System (ENS). This system regulates the gut and is also connected to the brain stem and the spinal cord. The research that's been done has mapped many of these connections and noticed correlations between the chemicals being released in the gut and in the brain. The technical description is rather dull and sounds like this:

*"Excitatory vagal input occurs to ganglia within the ENS to mediate vago–vagal motor reflexes and the cephalic phase of gastric acid secretion, to gastrin- and somatostatin containing enteroendocrine cells and histamine releasing enterochromaffin cells, and to enterochromaffin cells to mediate 5-hydroxytryptamine release."*



On the other hand, here are some interesting facts about the gut that you may not know.

- 90% of the DNA housed within the human body is not human it's the DNA associated with foreign bacteria that live in the gut and on the skin.
- 70–80% of the body's immune cells are contained within the gut reflecting the unique challenge for this part of the immune system to maintain a balance between tolerance and immunity.

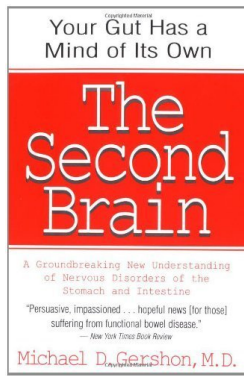
Taking these figures into account, and reflecting on the obvious fact that the gut, more than the heart, is the power plant that supports our lives, it seems likely that what the gut does is so complex and important that it cannot be left under the control of our pitiful conscious minds.

Our minds are pitiful in the sense that they can barely juggle 5 thoughts per second, and keeping track of more than 7 digits in our short-term memory is the limit of our ability. In contrast, the gut manages the cooperation and the micro-environmental balance of 100 trillion foreign cells, 10 times the number of our own human cells, who belong to 1,000 different bacterial species. Clearly the gut cannot be governed democratically, or *bacterio-critically*.

What we really want to know is whether the gut *thinks*, but it's hard to draw any high-level conclusions at this point because no one has any idea of what thinking is. Mayer poses this question more scientifically.

*"Although it is intriguing to speculate about the effects of enteroendocrine and enterochromaffin cell–vagal signalling to the brain as an important mechanism of emotion modulation in health and disease, the experimental literature mostly supports the hedonic effects of food intake (taste and satiation) and the aversive effects of acute mucosal inflammation or irritation by luminal toxins and pathogens."*

He then seems to move closer to the notion of gut-thinking, but still dances around the issue, when he says:



"The generation of gut sensations can lead to the formation of interoceptive memories of the multidimensional experience associated with the sensation (such as the feeling of nausea associated with a disgusting experience or a particular taste with a pleasant social experience)."

I believe the notion of thinking is misconstrued. Thinking would be better seen as a process in which actors able to communicate are created to represent the interests of competing needs, sort of like legislators representing constituents.

I once had an experience where my stomach spoke to me with an audible voice and reprimanded me for being so out of touch with its business. That conversation still has an impact on me and I think that by using my imagination I can reopen the verbal communication.



The main obstacle to understanding ourselves, I believe, is the myth that we are only of one mind. We don't see these actors who constitute our mind and instead operate under the illusion that we are only the loudest voice that speaks. People who see the multiplicity in themselves are sometimes called mediums, off-balance or full-on nuts. At other times they're called healers and geniuses. As a person who tries to explore this realm of consciousness I can attest to it being difficult. Perhaps you'd agree.

"The moment will approach when we begin to realize that what is revealed to us in the silence of inner thinking activity is more real than the physical objects around us... we realize that thoughts are not mere shadow pictures and that hidden beings speak to us through thoughts. Out of the silence something begins to speak to us."

— Rudolf Steiner (1909), *How to Know Higher Worlds*, p.33



[Collin Ross, MD](#) is considered an expert on Multiple Personality Disorder and wrote a 1991 paper that I like titled "[The Dissociated Executive Self and the Cultural Dissociation Barrier](#)".

In this article he says that having multiple aspects of self is normal, and that it's those people who are unable to access their alternate voices who are likely to lose control of their identity.

"Multiplicity is a normal organizational principle of the human psyche. Multiplicity theory postulates the existence of independent centers or spheres of consciousness in the normal mind, each capable of operating with varying degrees of autonomy from other part selves. ... In western industrial culture normal multiplicity has been suppressed through formation of a cultural dissociation barrier which separates the executive self or dissociated ego from other part selves in the mind.

...

*"Twenty-two properties of the dissociated executive self have been described. These include monotheistic religion, non-hypnotizability, mathematical modes of logic, idealization of nature, and hostility to multiplicity."*  
– Colin Ross



This Theory of Multiplicity connects with the gut-as-brain idea as it does not say where these other selves are located, nor does it need to. In Ross's words:

*The Theory of Multiplicity posits "many centers or spheres of consciousness in the normal human mind, many of which are outside the zone of awareness of the executive ego. These different parts of the mind or part selves can function with varying degrees of autonomy from each other. Also, they can function with varying degrees of cooperation and conflict."*

In a similar vein there is R.Rogers 1991 paper "[Multiple Personality and Channeling](#)". This theory is interesting but views channeling from a pathological perspective failing to appreciate its transcendent potential.

A bit more insight is shown in Winkelman's 2001 paper "[Alternative and traditional medicine approaches for substance abuse programs: a shamanic perspective](#)", in which he says:

*"A lack of a spiritual emphasis in the emerging biopsychosocial paradigm reflects the general lack of religious beliefs and values among US health professionals (McPeake et al., 1991). This lack of involvement and experience, compounded by a lack of consideration of spiritual issues in their education, leaves health professionals poorly prepared to assess spiritual constructs."*



The McPeake article he refers to is titled "Altered states of consciousness therapy—a missing component in alcohol and drug rehabilitation treatment". I cannot find this article on the web, so a more recent one that refers to it will have to suffice. That is Vega, 2004's "[Addiction: The Search for, Loss, and Transformation of Consciousness](#)"

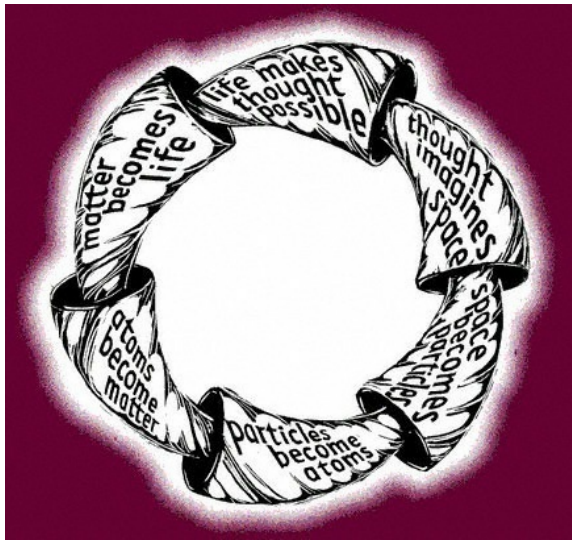
But back to matters of the bowel.

Mayer concludes:

*"One of the great advantages in addressing these questions is the fact that most of these hypotheses can be studied in human patients, from whom stool samples for metagenomic sequencing of the microflora and gut tissue for analysis of signalling mechanisms can be obtained relatively easily by endoscopic biopsies, and brain structure, function and signalling can be studied with non-invasive neuroimaging techniques."*

There is something satisfyingly complete in connecting to top and bottom chakras. As above, so below.


As yet, no one has tried to perform neurofeedback training on the Enteric Nervous System, but it's a thought worth digesting.



©2012 tenger | Shokan, NY



Add a comment...

 Facebook social plugin

Powered by [Mad Mimi](#) ©