BODY = BRAIN®

Part 1: The Embodied Self
Gut Brain
ENTERIC NERVOUS SYSTEM

Central Nervous System (CNS)
- brain & spinal cord
- integrative & control centers

Peripheral Nervous System (PNS)
- cranial nerves & spinal nerves
- communication between CNS & body

Autonomic Nervous System (ANS)
- visceral motor (involuntary)
- conducts impulses from CNS --> cardiac muscles, smooth muscles, glands

Somatic Nervous System
- somatic motor (voluntary)
- conducts impulses from CNS --> skeletal muscles

Sympathetic Division (SNS)
- “fight or flight”
- mobilizes body during activity

Parasympathetic Division (PSNS)
- “rest and digest”
- promotes “housekeeping” functions at rest

Enteric Division (ENS)
- handles digestion
- local, autonomous function; largely independent of CNS

Key
↑ = incoming / sensory / afferent
↓ = outgoing / motor / efferent
GUT - BRAIN AXIS

Vagus nerve

Vagus nerve

http://www.pitt.edu/~chorn/ image source
The Brain in Your Gut

The gut's brain, known as the enteric nervous system, is located in sheaths of tissue lining the esophagus, stomach, small intestine and colon.

**Submucosal plexus**
Layer contains sensory cells that communicate with the myenteric plexus and motor fibers that stimulate the secretion of fluids into the lumen.

**Myenteric plexus**
Layer contains the neurons responsible for regulating the enzyme output of adjacent organs.

**Lumen**
No nerves actually enter this area, where digestion occurs. The brains in the head and gut have to monitor conditions in the lumen across the lining of the bowel.

Source: Dr. Michael D. Gershon, Columbia University

http://kin450-neurophysiology.wikispaces.com/Enteric+Nervous+System image source

http://discoverysedge.mayo.edu/ibd/ image source
SEROTONIN

95% in gut

http://www.zazzle.com/serotonin_sunshine_card-137751496137113828 image source
GUT PSYCHOLOGY

http://www.ibsresearchupdate.org/ibs/brain-tie-4.html image source
CARLOS’ STORY

http://www.mudgoodjobs.com/job-search-networking/people-networking-event/
RELATIVE # OF NERVE CELLS

100 Billion: Head

100 Million: Gut

40,000: Heart

10%

< 1%
THE BIG IDEA

- The gut has its own nervous system that acts largely independently of the brain; the gut “thinks for itself”

- *No other part of the nervous system can do this*

- The gut influences the brain in the head far more than vice versa

- The gut plays a role in psychological state and in sorting out social dominance

- **WARNING:** gut feelings are not always accurate! More on this in future sessions.
FIELDWORK

What do you see about the intelligence of the gut that you didn’t see before?

How does this knowledge add to your understanding of embodiment?

Drawing on your own experience, how would explain the intelligence of the gut (or heart) as distinct from the intelligence of the brain in your head?
SELECT BIBLIOGRAPHY


Conger, K (2011) Digestive problems early in life may increase risk for depression, study suggests, *Stanford School of Medicine*


