BRAIN MATTERS: PRACTICING RELIGION, FORMING THE FAITHFUL

David A. Hogue
Religious Education Association
Toronto, Canada
November 4, 2011
The 5-Minute University
Three Selective Domains of Neuroscience

- Telling Stories
- Re-membering
- Relating
Purposes

1) The neurosciences are now making claims about matters that religious communities have experienced and pondered for millennia,

2) The sciences can make significant contributions to our understanding of our religious practices, and

3) A preliminary methodology for engaging the sciences in ways that are also faithful to our own religious traditions.
Cerebrum
- Motor Cortex (Movement)
- Sensory Cortex (Pain, heat, and other sensations)
- Frontal Lobe (Judgement, foresight, and voluntary movement)
- Broca's Area (Speech)
- Frontal Lobe (Smell)
- Temporal Lobes (Intellectual and emotional functions)
- Brainstem (Swallowing, breathing, heartbeat, wakefulness center and other involuntary functions)

Parietal Lobe (Comprehension of language)

Temporal Lobe (Hearing)

Occipital Lobe (Primary visual area)

Wernicke's area (Speech comprehension)

Cerebellum (Coordination)
Limbic System

- Corpus callosum
- Limbic cortex
- Fornix
- Mammillary body
- Amygdala
- Hippocampus
- Hippocampus of right hemisphere (ghosted in)
- Cerebellum
The Axon

- Dendrites
- Nucleus
- Schwann Cells
- Myelin Sheath
- Terminals
Dopamine Pathways

- Frontal cortex
- Nucleus accumbens
- VTA

Functions
- Reward (motivation)
- Pleasure, euphoria
- Motor function (fine tuning)
- Compulsion
- Perseveration

Serotonin Pathways

- Striatum
- Substantia nigra
- Hippocampus
- Raphe nuclei

Functions
- Mood
- Memory processing
- Sleep
- Cognition
“Neurons that fire together

... wire together.”
Telling Stories
Split-brain Research
Michael Gazzaniga et al.
Michael Gazzaniga

- “The left brain weaves its story in order to convince itself and you that it is in full control.”

- “Biography is fiction. Autobiography is hopelessly inventive.”

7
“Fashioning a personal myth is not an exercise in narcissistic delusion, or a paranoid attempt to establish oneself as God. Instead, defining the self through myth may be seen as an ongoing act of psychological and social responsibility. Because our world can no longer tell us who we are and how we should live, we must figure it out on our own.”
Re-membering
Types of Memory

Working Memory
Short-term
Long-term Memory

Semantic memory – Concepts and Facts
Procedural – Skills and habits
Episodic – Explicit personal incidents
Anterograde Amnesia: Strategies
Relating
... soul is “not an essence apart from the physical self, but the net sum of those encounters in which embodied humans relate to and commune with God (who is spirit) or with one another in a manner that reaches deeply into the essence of our creaturely, historical, and communal selves.”

Neuropsychologist Warren Brown
1) We are embodied creatures

NEUROSCIENCE

- Critiques strict body-soul dualisms
- Reclaims the value of body
- Demands attention to particularity and context

PRACTICAL THEOLOGY

- Human destiny transcends biology
- Engagement with the transcendent
- Confronting mortality
2) Am I my brother’s keeper, or my keeper’s brother?
Symbolic capacity and language are distinctive human markers

Empathic connectedness shared more fully with other species

Reconfigures notions of unconscious processes

Biblical images of the imago dei – what does it now mean to bear the image of God?

Rethinking the meaning of “dominion”

The role of human agency and moral reflection
3) “Technologies” of Education and Spiritual Formation

**NEUROSCIENCE**

- Neuroplasticity – the brain rewire itself in response to experience/practice
- Shift of focus from ideology to practice

**PRACTICAL THEOLOGY**

- Names the sacredness of human intimacy
- Reinforces relational context of human development and maturation – assembling together
- Refocuses attention to orthopraxy rather than orthodoxy
Prayer Changes Things

Prayer Changes Brains
4) The Essential Relatedness of Human Beings

**NEUROSCIENCE**
- Brain and body enable social relatedness
- Brain and body require social relatedness
- Social relationships are constrained by biological processes

**PRACTICAL THEOLOGY**
- Centrality of the moral imperative to love God and neighbor
- Biology is not destiny
- Welcoming the stranger challenges biological preferences for kin
PEANUTS

This is my "depressed stance."

When you're depressed, it makes a lot of difference how you stand...

The worst thing you can do is straighten up and hold your head high because then you'll start to feel better.

If you're going to get any joy out of being depressed, you've got to stand like this.