



Thinking 3

Jill Bolte Taylor

- Stroke, memory, hemispheric asymmetry, brain states



- Do you know someone who has suffered a stroke
 - A. Yes – Family member or close friend
 - B. Yes – But not someone I know well
 - C. No



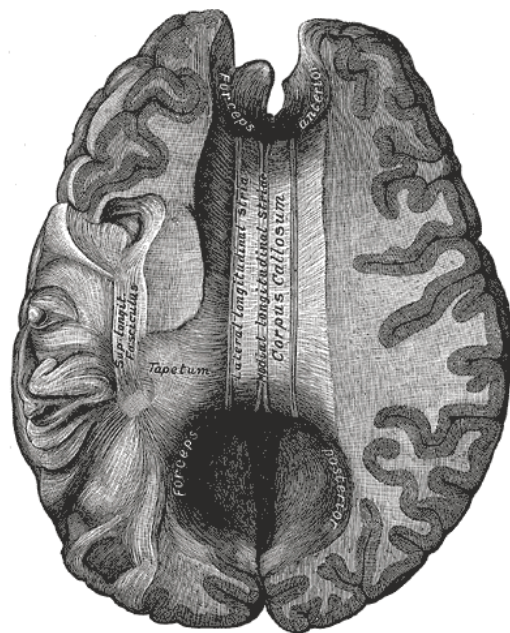
Jill Bolte Taylor

http://www.ted.com/talks/jill_bolte_taylor_s_powerful_stroke_of_insight.html

- Neuroanatomist at Harvard who studied schizophrenia and bipolar disorder
- Describes her experience having a stroke
- Learning Goals
 - Functional asymmetry of the brain hemispheres
 - Memory: recall versus reconstruction
 - Recovery from stroke
 - Two modes of awareness

Communication Between the Hemispheres of the Brain

- Corpus callosum (300 million axons)
- Agenesis of the corpus callosum
- Three other smaller connections
 - Anterior commissure (50 thousand axons)
 - Hippocampal commissure
 - Posterior commissure
 - Other subcortical connections



Functional Asymmetry of the Hemispheres

- Handedness – Control of the opposite side of the body

Left Hemisphere Functions	Right Hemisphere Functions
Heavily language oriented Syntax and speech production Brain chatter	Some language comprehension Important for appreciating jokes, puns, and prosody
Analysis relating the now to the past (generalization) and future (planning)	Awareness of the immediate moment
Sequencing (apraxia), body sense	Spatial orientation, face perception
Categorization generally Self as separate	

- Unresolved issue: Why are hemispheres specialized?



- If you are concerned and want to determine if someone may be having a stroke, which of the following should you do?
- A. Ask “Can you smile?”
- B. Ask “Can you raise both arms?”
- C. Ask “Can you say a simple sentence?”
- D. Ask all three of the questions above.
- E. Something else, questions like this cannot help determine if someone is having a stroke!



Taylor's Stroke Symptoms

- Left hemisphere stroke
 - Severe headache
 - Right arm paralysis
 - Actions sequences become slow and poorly coordinated
 - Can hear but is unable to speak or comprehend language
 - Unable to comprehend numbers or letters, but still able to do shape matching
- How can she recall so much detail?



Stroke Recovery

- We will return to this general topic at the end of the quarter
- Her recovery required 8 years of therapy and retraining
- Although she is “recovered,” the brain she has now is not the same as the brain she had before the stroke

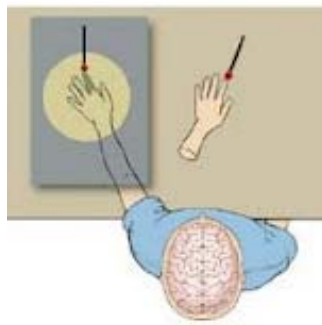


Unusual States of Awareness

- Among the effects of her stroke, Taylor describes
 - Euphoria of disconnection from the external world
 - Peacefulness and a feeling of nirvana
 - Witnessing events from the outside her body
 - A sense of losing the boundaries of her body

Body Sense

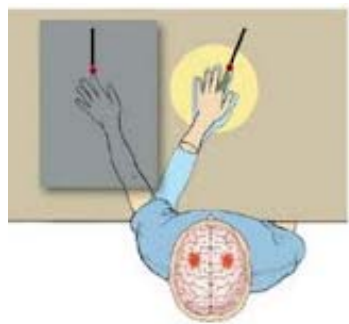
The Rubber Hand Illusion



Botvinick, M. & Cohen, J. (1998). Rubber hands 'feel' touch that eyes see. *Nature*.

Body Sense

The Rubber Hand Illusion



- After a short period, most of participants start to feel the touch in the position of rubber hand and experience as if the rubber hand is the real hand.



Two Modes of Thought

- Left: Linear, analytic, language oriented, separate, “me” focused
- Right: Non directed, non separated, immediate, “deep inner peace”
- Taylor exhorts us to choose – but how?

Other Paths to these Two Modes

- Near death experiences
 - a sense of being dead,
 - a feeling that one's "soul" has left the body,
 - a voyage toward a bright light, and
 - a reality where love and bliss are all-encompassing.
- Hallucinogens and other drugs

Other Paths to these Two Modes

- Just before falling asleep
- Flow - mental state in which a person in an activity is fully immersed in a feeling of energized focus, full involvement, and success in the process of the activity
- Meditation
 - In Yoga meditation:
Witnessing = Observing + Non-Attachment
- Meditative practice is a way to make this choice



Looking Ahead

- Next Wednesday
 - Chapter Test on Thinking
- For Friday
 - Gleitman: Ch. 9, pp. 358-364
 - Zap #14: Decision making