

MOD. 13 BRAIN HEMISPHERE ORGANIZATION AND THE BIOLOGY OF CONSCIOUSNESS

Unit 3

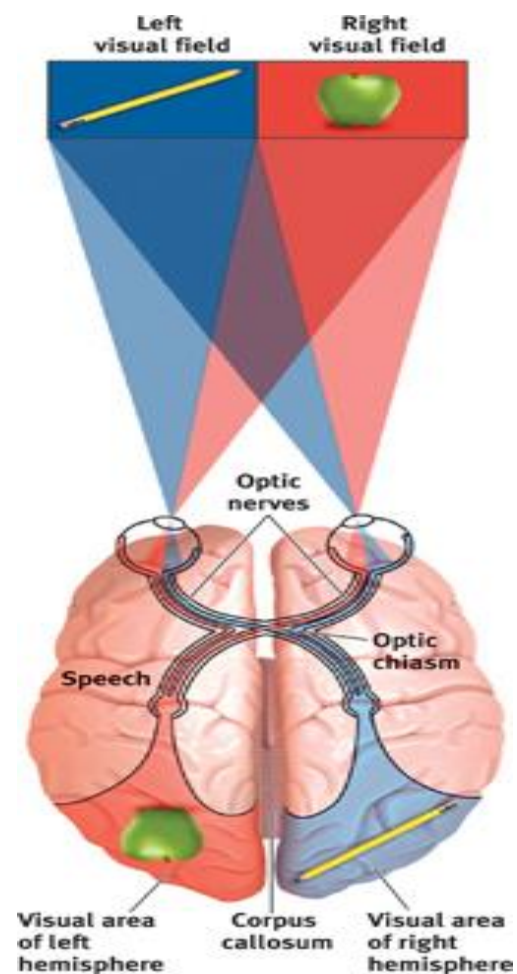
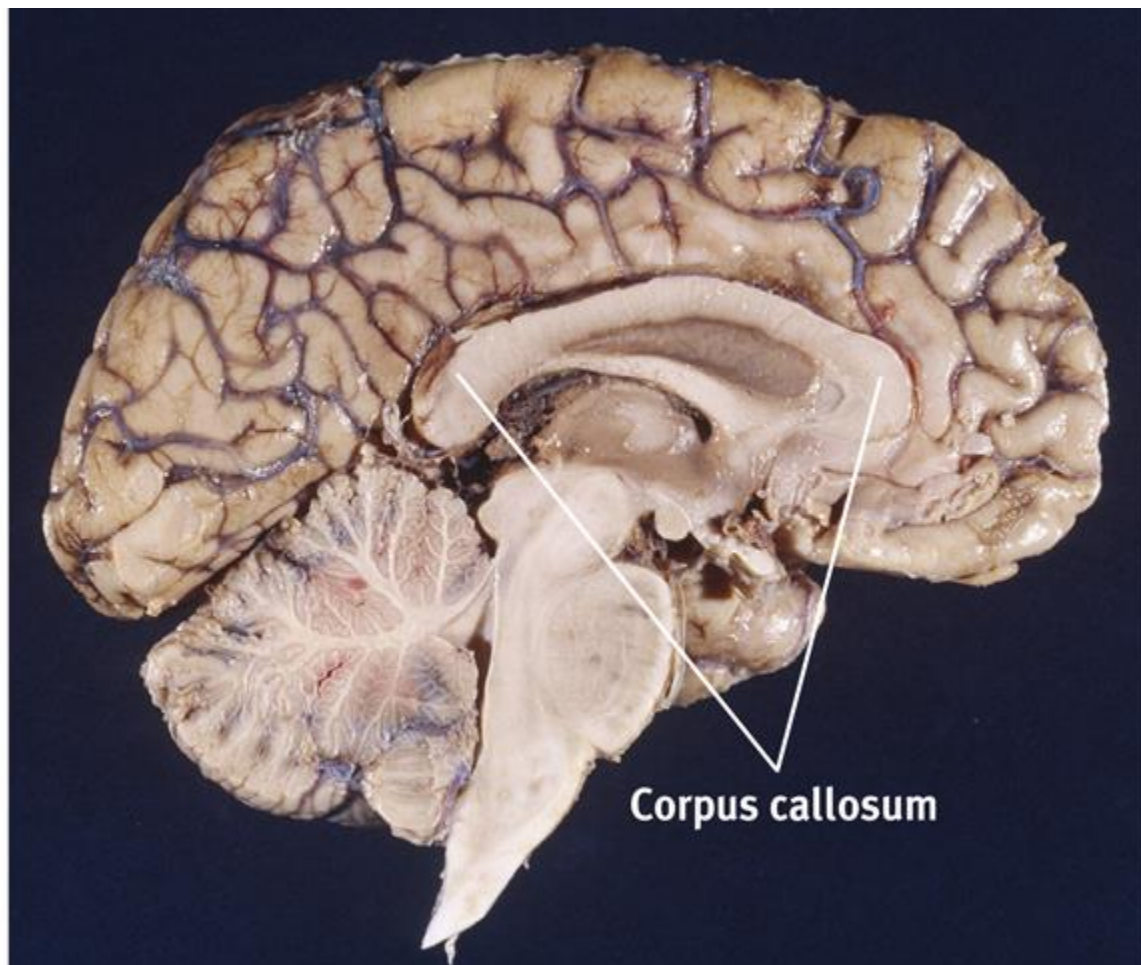
13.1 What do split brains reveal about the function of our two brain hemispheres?

- **Lateralization:** the fact each brain hemisphere has different functions
 - **Left:** reading, writing, speaking, arithmetic, reasoning and understanding
 - **Right:** decoding visual info

Splitting the Brain

- **Corpus Callosum:** cable of nerves that connect the two hemispheres
 - Sperry and Gazzaniga, cut this to stop seizures
 - **Split Brain:** isolates the 2 hemispheres from each other
 - Left visual field goes to the right hemisphere and vice versa
 - **But, each eye receives info from both fields

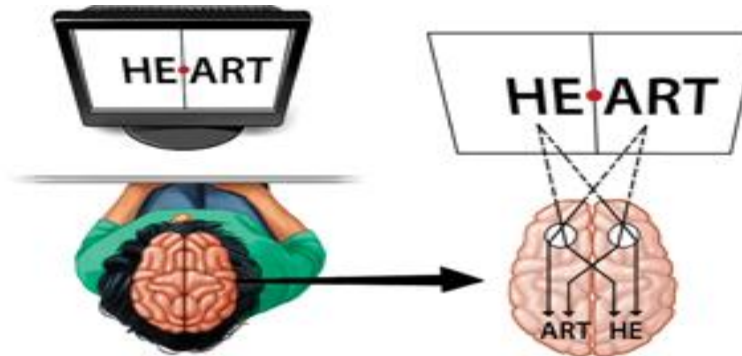
Left hemi' will try to “explain” that the right is telling you to do— “Interpreting”





"Look at the dot."

(a)



Two words separated by a dot are momentarily projected.

(b)



"What word did you see?"

or



"Point with your left hand to the word you saw."

(c)

Right-Left Differences in Intact Brain

- Brain waves, glucose usage, and blood flow indicate which hemi' is working
- Perceptual tasks...seems to be increased in “right” hemi'
- Speaking/calculating... “left”
- A stroke in the left hemi' affects language comprehension in both hearing and signing (deaf)
 - Left: quick interpretations
 - Right: better at inferences and subtleties, modulates speech, sense of “self”

Handedness

- 90% of population is right handed
- Righties: 96% process speech in left hemi'
- Lefties: 3/10 use right or both hemi's
- Seem to be a tendency toward right-handedness from genetics

13.2 What is the “dual-processing” being revealed by today’s cognitive neuroscience?

- **Consciousness:** awareness of self and environment
 - Planning into the future—promotes survival
- **Cognitive Neuroscience:** studies connection between brain’s activities in conjunction with mental processes
 - Study the cortex
 - A stronger stimulus stimulates synchronized brain activity

Dual Processing

- Two minds
 - Parallel Track is the one under awareness—happening at the same time as conscious processing
 - Perception, memory, thinking, language and attitudes all operate on two levels
- **Dual Processing:**
 - **Conscious:** deliberate “high” road
 - **Unconscious:** “low” road, happens automatically

Blindsight

- Acting as if a blind person can see
- Occurs because different areas of the brain process different factors of vision
- **Visual perception track:** recognizing objects and plan future actions
- **Visual action track:** moment to moment movement (unconscious)

These two tracks can conflict—hollow face illusion



Dual Processing Cont.

- Conscious thought is “tip of the iceberg”
- Consciousness lags behind decision making

Bottom line: we focus and act on auto pilot