PY 101 – 012

Wednesday, January 27, 2016

Week 3, Day 2 Notes

Specialized Brain Regions

Quizlet for vocab from this lecture: <https://quizlet.com/_1yzdii>

Serotonin

* Responsible for regulation of emotional states, impulse control, and dreaming
* Low levels associated with
  + Anxiety
  + Food cravings
  + Aggressive behavior
* Drugs that block serotonin reuptake treat depression, ocd, and eating disorders

GABA

* Gamma-aminobutyric acid
* Primary inhibitory neurotransmitter in the nervous system
  + Quiets the central nervous system
* GABA agonists:
  + Alcohol
  + Benzodiazepines
    - Xanax
    - Valium

* What happens when we deplete dopamine?
  + <http://www.youtube.com/watch?v=xIueQPhBawg>

achine generated alternative text:
Drug 
Alcohol 
Amphetamines 
Caffeine 
Coc

Mouse party (interactive look at how drugs affect the brain) - <http://learn.genetics.utah.edu/content/addiction/mouse/>

Chapter 4 - section 2

First attempts to understand the brain

* Broca
  + Patient in 1861 who could understand and write language, but couldn't speak it (even though they weren't mute
  + Large lesions on front left side of the brain

Gall & Spurzheim

* Based on the idea that the brain operates through functional localization (I.E. different areas were entirely responsible for brain function)
  + Completely false

Evolutionary Perspective

* Reptilian brain
  + Involved in survival process
  + Brainstem and cerebellum
    - Areas responsible for survival
    - Fight or flight
      * Predator appears
        + This part of the brain tells us that
* Mammalian brain
  + Involved in providing more memory and wider range of emotions
  + Limbic system, basal ganglia, thalamus
* The human brain
  + Involved in problem solving, imagination, and social behavior
    - Newest part of brain
    - Cerebral cortex
* Spinal cord
  + Coordinates reflexes
  + Carries sensory information to the brain and motor signals away from the brain
    - If you encounter pain the spinal cord will immediately react without even consulting the brain
* Brain stem
  + functions
    - Survival
    - Heart rate
    - Breathing
    - Swallowing
    - Orgasm
    - Vomiting
    - Urination
  + You can't tell your body not to perform these functions
  + Automatic functions
* Cerebellum
  + Means little brain
  + Important for motor function, learning, and motor memory
  + Also believed to be involved in empathy
    - If you see someone performing an action, you may find the desire to perform the same action

Subcortical Structures

Hypothalamus

Hippocampus

Amygdala

(Limbic system)

* Hypothalamus
  + Responsible for regulation
* Hippocampus
  + Plays important role in storing new memories.
    - achine generated alternative text:
      
  + Can grow larger with increased use
    - If you have a job which encourages you to use it, you get better at using it.
* Amygdala
  + Responsible for emotion
    - achine generated alternative text:
      
  + Serves a vital role in our learning to associate things in the world with negative and positive emotional responses
* Thalamus
  + Receives and processes sensory information
    - Smell and what not
  + During sleep, the thalamus partially shuts the gate on incoming sensations
    - achine generated alternative text:
      
* Basal ganglia
  + Crucial for planning and producing movement
    - Contains the nucleus accumbens
      * Important for experiencing reward
        + achine generated alternative text:
          

Cerebral Cortex

* Site of all thoughts
* Detailed perceptions and complex behaviors
* Underlies all complex mental activity
* Comprised of four lobes

achine generated alternative text:
Cerebral 
cortex 
Frontal Lobe 
• Thought 

achine generated alternative text:
Primary 
motor cortex 
Prefrontal 
cortex 

Fusiform face area

* Completely responsible for facial recognition and memory

achine generated alternative text:
Lips 
Gums 
Teeth 
Jaw 
Tongue 
Knee 
Ankl

Homunculus

* Top area of the brain
  + These parts of the brain are mirrors of each other and control these different parts of the body

achine generated alternative text:
Lateralization 
Brain lateralization 
• 
•

The brain is lateralized

* Each hemisphere controls opposite side of the body's motor skills
* Right side is verbal, analytical, math / science, logic, etc
* Left side is emotional, impulse, art, intuition, imagination, etc

Vocab

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| --- | --- |
| Serotonin | Chemical responsible for regulating emotional states and impulse control |
| GABA | Chemical which quiets the central nervous system (Xanax, valium, alcohol) |
| Broca's area | Refers to an area on the left side of the brain responsible for language functions |
| Phrenology | Assessed personality traits and mental abilities by measuring bumps on people's heads |
| Spinal cord | Responsible for reflexes. Carries sensory information to the brain and motor signals away from the brain |
| Cerebellum | Important for proper motor function, learning, and motor memory (means 'little brain') |
| Subcortical structures | Lie below the cerebral cortex and responsible for more basic processes (limbic system) |
| Hypothalamus | Brains regulatory structure (body rhythms, blood pressure, temperature) |
| Hippocampus | Stores new memories |
| Amygdala | Responsible for emotion |
| Thalamus | Processes sensory information (and can block it out when necessary) |
| Basal ganglia | Crucial for planning and producing movement |
| Nucleus accumbens | Important for experiencing reward and motivating behavior |
| Cerebral cortex | Handles all complex mental activity. Comprised of four lobes |
| Frontal lobe | Lobe in cerebral cortex responsible for thought, planning, and movement |
| Parietal lobe | Lobe in cerebral cortex responsible for touch and spatial relations |
| Occipital lobe | Lobe in cerebral cortex responsible for vision |
| Temporal lobe | Lobe in cerebral cortex responsible for hearing and memory |
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