PY 101 – 012

Friday, January 29, 2016

Week 3, Day 3 Notes

Brain Usage, Repair, and Function

Quizlet for terms from this lecture: <https://quizlet.com/_1yzcyp>

How much of your brain do you use each day?

* achine generated alternative text:
  SCARLETT JOHANSSON 
  MORGAN FREEMAN 
  THE AV
* The movie Lucy is not true at all
  + We use virtually all of the brain
  + Most of the brain is being used at all times

How does the brain communicate with the body?

* PNS peripheral nervous system
  + Two primary components
    - Somatic
      * Transmits signals from cns
    - Autonomic nervous system
      * Regulates body's internal environment

Autonomic nervous system

* Sympathetic
  + Prepares fight or flight
* Parasympathetic division
  + Returns body to normal
* achine generated alternative text:
  The sympathetic division Of 
  the nervous s

The Endocrine system

* Endocrine system
  + Communication network influences thoughts, behaviors, and actions

achine generated alternative text:
Pineal 
(governs bodily rhythms) 
Hypothal

Hormones & Sexual Behavior

* Gonads
  + Endocrine glands influencing sexual behavior
* Gonadal hormones are identical in males and females
  + Androgens (testosterone) is simply more prevalent in males (women have them to some degree)
  + Estrogens
    - Men have it too, but not as much

The Nervous System & the Endocrine System

* Under the CNS's control

The four f's

* Fighting
* Fleeing
* Fleeting
* Reproduction…

achine generated alternative text:


* Phineas Gauge stabbed during work straight through the brain and lived, but altered personality-wise forever.

The Brain can Recover from Injury

* Radical hemispherectomy
  + Surgery to remove half the brain

The Interplay of Genes and Environment Wires the Brain

* Nature and nurture constantly interact to affect DNA's activity and the products of that activity
  + Brain adapts on biological level
    - Learning
    - Skills that are gained over time actually change the brain
      * If you couldn't play an instrument and now you can, you changed your brain
* Tissue transplanted early enough completely transforms into whatever type appropriate for new location

Experience Fine-Tunes Neural Connections

* Experience is important for normal brain development and maybe more so for superior developments
  + Example
    - Genie
      * Can't speak because she missed a critical time in her childhood to learn to speak
      * People try to teach languages to children because children have more brain placticity
    - Mice
      * One mouse was placed in a cage with basic stuff available
      * Other mouse was placed in a cage with ladders and obstacles and stuff and these mice had bigger brains at the end of their lives
        + This is true with humans as well

Cab drivers in London have to memorize a lot of streets and have growing brains

Culture Affects the Brain

* Our cultural experiences contribute to different patterns of brain activity
  + When people see people expressing emotions, they have more of a empathetic response when those people are from their culture

Brain Rewires Itself

* Although brain plasticity decreases with age, brain can grow new connections among neurons into very old age
  + If you start learning to play piano when you're ten, it's easier to learn than if you're 40

Change in the Strength of Connections Underlies Learning

* Changes in brain due to experience
* Entirely new connections can grow between neurons
* Neurogenesis may underlie neural plasticity

Vocab

|  |  |
| --- | --- |
| Somatic nervous system | Transmits sensory signals to and from the central nervous system |
| Autonomic nervous system | Regulates the body's internal environment (carries signals from the glands and internal organs to the central nervous system) |
| Sympathetic division | Prepares the body for action (Part of ANS) |
| Parasympathetic division | Returns the body to its normal, resting state (Part of ANS) |
| Endocrine system | Communication network influences thoughts, behaviors, and actions |
| Hormones | Chemical substances released into the bloodstream by the endocrine glands (such as the pancreas, thyroid, and testes or ovaries) |
| Pituitary gland | Governs the release of hormones from the rest of the endocrine glands responsible for major bodily process |
| Radical hemispherectomy | Surgical removal of entire cerebral hemisphere |
| Neurogenesis | New neurons are produced in some brain regions (hippocampus) |