Announcements

- Check Attendance/Grade Query Tool on class website (psy150a1.org) for:
  - Attendance tracking
  - Syllabus Quiz
- Chapter 2 Aplia Homework due next Monday (Feb 10)
  - Aplia deadline for purchase extended to Feb 18
- Exam #1 NEXT Wednesday (Feb 12)
  - Review session Monday Feb 10, 5:30 pm, here
  - Test your computer/tablet on D2L

Returning to Lecture...

Measurement in Psychology

C. Correlation

1. Correlated = related
2. Coefficient of correlation (r)
   a) Positive
   b) Negative
   c) None
3. Correlation does not imply causality
Measurement in Psychology

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"Correlation doesn't imply causation, but it does waggle its eyebrows suggestively and gesture furtively while mouthing 'look over there'."

xkcd.com/552/

Cause or Correlation:

- As reported by Reuters:
- "WASHINGTON - People who literally cannot sit still may have inborn behavior that keeps them slim even if they overeat a little, researchers said Thursday.
- Tests on slim and overweight people who all described themselves as "couch potatoes" showed the main difference between the two groups was how long they spent sitting still.
- "Our study shows that the calories that people burn in their everyday activities are far, far more important in obesity than we previously imagined," said Dr. James Levine of the Mayo Clinic in Rochester, Minn., who helped lead the study.

Graph from Levine et al, Science, 2003

Correlation or Causal?!
Biological Bases of Psychology

Behavior and experience are embodied phenomena

The mind depends on the brain

The mind influences the brain

I. The common household neuron

Purpose

Variations

Roadmap....

Neural Communication
- Neurons
- How Neurons Communicate
- How Neurotransmitters Influence Us

The Nervous System
- The Peripheral Nervous System
- The Central Nervous System (especially the brain)

I. The common household neuron

A. Anatomy of a neuron
   1. Cell body (soma)
   2. Dendrites
   3. Axon
   4. Terminal buttons
   5. Myelin sheath on many neurons to speed conduction

I. The common household neuron

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I. The common household neuron

B. Three types
   1. Sensory
   2. Motor
   3. Interneuron

C. Nerve = a bundle of axons from hundreds or thousands of neurons

I. The common household neuron

D. Two types of signal transmission
   1. Axonal – within neurons
   2. Synaptic – between neurons
II. Axonal conduction; an electrochemical process

A. Resting potential
B. Depolarization and threshold
C. Action potential
D. Propagation
E. Refractory period

Action Potential

A neural impulse. A brief electrical charge that travels down an axon.

Action Potential Properties

All-or-None Response: When the depolarizing current exceeds the threshold, a neuron will fire. If the depolarizing current fails to exceed the threshold, a neuron will not fire.

Intensity of an action potential remains the same throughout the length of the axon.
III. Synaptic transmission

A. Synaptic gap or cleft at the synaptic junction
B. Within terminal button, synaptic vesicles containing neurotransmitters
C. As action potential arrives
   1. synaptic vesicles migrate to cell membrane, fuse, and release
   2. Neurotransmitters diffuse across the synaptic cleft
   3. Neurotransmitters combine with post synaptic receptor cells (on dendrites or soma)

Lock & Key Mechanism
Neurotransmitters bind to the receptors of the receiving neuron in a key-lock mechanism.
Neurotransmitter | Behaviors influenced by the neurotransmitter
--- | ---
Acetylcholine (ACh) | Movement, Memory, Autonomic nervous system function
Epinephrine (Adrenalin) | Arousal
Norepinephrine (Noradrenalin) | Arousal, Vigilance
Dopamine | Movement, Planning, Reward
Serotonin | Mood, Appetite, Sleep, Sleep
Glutamate | Excitation of brain activity
GABA | Inhibition of brain activity
Endorphins | Pain

Table 2.2, Cacioppo & Freberg

Botox as ACh Antagonist

Cacioppo & Freberg

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Synaptic transmission

D. Types of Postsynaptic Potentials (PSP’s)
   1. Excitatory (EPSP)  
      Depolarizes
   2. Inhibitory (IPSP)  
      Hyperpolarizes
Synaptic transmission

D. Types of Postsynaptic Potentials (PSP's)
1. Excitatory (EPSP)  Depolarizes
2. Inhibitory (IPSP)  Hyperpolarizes

E. After release,
1. reuptake
2. degradation

V. Organization of the nervous system

A. Central nervous system
1. Brain
2. Spinal cord

B. Peripheral nervous system
1. Somatic system
2. Autonomic system; two branches work in generally antagonistic fashion
V. Organization of the nervous system

B. Peripheral nervous system

2. Autonomic system
   a. Sympathetic nervous system
      1. tends to have system-wide effects
      2. flight or flight; activity
   b. Parasympathetic nervous system
      1. tends to affect one organ at a time
      2. quiescent processes--digestion, protects and conserves energy