Announcements

- Spring Break Next Week!
- No instructor office hours Wednesday Mar 12
- Next Aplia due Monday after Spring Break

Grade Query Tool!

V. Pain

A. Tissue damage causes
   1. release of a special chemical
   2. stimulates pain receptors
B. Pain receptors send axons to spinal cord; synapse
C. Pain pathway in spinal cord rises to thalamus and on to cortex
D. Two regions of cortex
   1. Somatosensory area for perception of pain
   2. Frontal lobes for emotional response

Gate-Control Theory of pain control

Pain

E. Pain reduction
   1. Pressure stimulation – competition at spinal synapse
   2. CNS Descending inhibition from Peri-Aqueductal Grey (aka PAG)
      a. Pain induced inhibition
      b. Opiate induced inhibition (Endogenous Opiates)
Motivation

Do you care?

What Motivates?

Sex and And
Drugs and Food and
Rock-n-Roll Water and
Is very good indeed Safety and
Moneky and
Fame and
Chocolate and…

Maslow’s Hierarchy of Needs

- Begins at the base with physiological needs that must first be satisfied
- Then higher-level safety needs become active
- Then psychological needs become active
- Self-Actualization = living up to one’s fullest and unique potential

Motivation

- Homeostasis
  - tendency to maintain a balanced or constant internal state
  - maintain equilibrium

1. Homeostasis

A. Body attempts to maintain relatively constant internal environment
B. Homeostasis depends upon:
   1. Internal sensor to provide feedback
   2. A comparator
   3. An adjustment mechanism
III. Eating and Obesity

A. Weight is a function of:
   1. Intake
   2. Expenditure

B. What initiates eating??
   1. Habit, boredom, emotional upset, etc...
   2. Hunger Pangs?
   3. The physiological event that initiates eating is a low level glucose available to the cells

Body Chemistry & the Brain

➢ Levels of glucose in the blood are monitored by receptors (neurons) in the stomach, liver, and intestines.

➢ They send signals to the hypothalamus in the brain.

Eating and Obesity

C. What stops eating (Satiety)
   1. In mouth
   2. Stomach intestine, and liver
   3. Brain sensors—hypothalamus

D. Lesions of Hypothalamus
   1. VMH lesions produce "VMH syndrome"
   2. LH lesions produce "LH syndrome"

Hypothalamic Centers

The ventromedial hypothalamus (VMH) depresses hunger (stimulation). Destroy the VMH, and the animal eats excessively.
Eating and Obesity

V= Voracious and Very Large

Age-adjusted prevalence of obesity in adults between the ages of 20 and 74 by sex and survey year

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D. Lesions of Hypothalamus
   1. VMH lesions produce "VMH syndrome"
   2. LH lesions produce "LH syndrome"
   3. These syndromes suggested the presence of a satiety center & a hunger center
Eating and Obesity

E. Set-point theory of weight regulation
   1. Yet, rats with these lesions still regulated body weight
   2. These animals simply regulate at a new weight
   3. Set-point works to prevent much gain and to minimize losses
      a. Dieting: your body works to minimize losses below your set point

F. Obesity--why are people obese?? Obesity has multiple causes

Set Point and Metabolism

When reduced from 3,500 calories to 450 calories, weight loss was a minimal 6% and the metabolic rate a mere 15%.

The obese defend their weight by conserving energy.

Eating and Obesity

1. Eating
   a. Loss of control over eating behavior
   b. Emotional eating

2. Expenditure
   a. High proportion of fat tissue results in slower metabolic rate
   b. lack of exercise
Activity

Lack of exercise is a major contributor to obesity. Just watching TV for two hours resulted in a 23% increase of weight when other factors were controlled (Hu & others, 2003).

The Genetic Factor

Identical twin studies reveal that body weight has a genetic basis.

The obese mouse on the left has a defective gene for the hormone leptin. The mouse on the right sheds 40% of its weight when injected with leptin.

Eating and Obesity

3. Genetic programming??
   a. Number of fat cells
   b. Dieting may put some under setpoint

Eating and Eating Disorders

G. Anorexia
1. Severe end of a continuum of concern about weight and dieting
2. To diagnose, must have all of the following:
   (a) Restriction of food intake leading to significantly low body weight
   (b) Intense fear of gaining weight or becoming fat
   (c) Disturbances in body shape perception, or undue influence of weight on self-evaluation, or lack of insight
Eating and Eating Disorders

G. Anorexia

3. Causes: multiple (biopsychosocial)
   a. Bio:
      1. Genetics
      2. Setpoint
   b. Psycho:
      1. Low self-evaluations
      2. Perfectionistic
      3. Family focus on appearance and weight
   c. Social
      1. Not seen in cultures where larger is desirable

Eating and Eating Disorders

Bulimia

(1) Recurrent binging and lack of control during the episode
(2) Recurrent inappropriate compensatory behavior (purging, vomiting, laxatives), medications, fasting, excessive exercise)
(3) Binges and compensatory behaviors occur on average at one twice per week for at least 3 months
(4) Self-evaluation unduly influenced by body weight and shape