

SENSATION AND PERCEPTION

Psychology 101

Auditory Processing

- Allow us to communicate through speech and sound
- Sound waves (vibrations)
 - Frequency
 - Pitch
 - Amplitude
 - Loudness

Structures of the ear

- Outer ear: Collects sounds and funnels them to the interior ear
- Middle ear:
 - Separated from the outer ear by the tympanic membrane (ear drum)
- Inner ear: Purpose is to convert sound waves into signals that can be sent to the brain

Theories of hearing

- Place theory: Sounds strikes the inner ear in particular places
- Frequency theory: Perception of a sound frequency depends on how often the auditory nerve fires
- Volley theory: Nerve cells fire in rapid succession

Auditory Processing in the brain

- Auditory nerve carries messages to the auditory section of the cortex
- Localizing sound: Ears in different places, so they pick up slightly different versions of the same sound.
 - Sounds reaching one ear travel further than sounds reaching the other ear
 - The ear furthest from the sound is in *sound shadow* of the listener's head

Skin senses

Cutaneous senses

- Touch: Mechanical energy (pressure)
 - Route of touch sensation: Spinal cord, brain stem, thalamus, somatosensory cortex
 - Different areas of the body have different levels of sensitivity (hands more than legs)
- Temperature: thermoreceptors (warm and cold)

Skin senses

Cutaneous senses

- Pain: The sensations that warn us of damage to the body
- Intense stimulation of any of the senses can produce pain (e.g., too bright, too loud)
- Tells motor system that it must act to prevent further injury

Skin senses

Pain

- Pain sensors exist throughout the body
- Two different neural pathways:
 - Fast pathway: Thalamus, sensory areas of cortex
 - Slow pathway: Limbic system, thalamus, sensory cortex
- Endorphins:
 - Involved in turning on and off pain sensations
 - Primarily involved in the slow pathway
- Varying tolerances for pain
- Culture

Chemical Senses

- Taste

- “Taste buds” (papillae): send messages to the sensory section of the brain
- Salty, sweet, bitter, sour
- *Unami* (“yummy”)
- Culturally influenced

Chemical Senses

- Smell

- Purpose: Tasting food, selecting romantic partners, identifying source of smell
- Olfactory epithelium:
 - Line the nose
 - Can replace themselves
- Route to brain:
 - Does not pass through the thalamus
 - Smell nerve impulses go directly to sensory cortex, then to the limbic system (center for emotion)

Kinesthetic and Vestibular Senses

- Provide information about your movement and position in space
 - Kinesthetic: Movement, posture and orientation
 - Vestibular: Balance and movement
 - Proprioception/proprioceptive
 - Semicircular canals