

Chapter 6: Sensation and Perception

- **Sensation**- the experience of having your sense organs stimulated
- **Perception**- interpreting the sensations that are experienced, to recognize meaningful objects and events (ex. smelling something and knowing it's coffee)

Sensation vs. Perception Evidence

- **Sensation with out perception**- difficult to interpret images
- **Same sensation, different perception**- images with multiple interpretations

Sensation & Perception

- **Prosopagnosia**- inability to perceive faces even though vision is fine (from damaged brain areas)
- **Bottom-up processing**- analysis beginning with sensory receptors and works up to brain's integration of sensory info (sensory → higher levels of processing) → sensation
- **Top-down processing**- info processing guided by higher mental processes (experience, expectations) → perception
- **Thresholds**
 - **Psychophysics**- study of relationship between physical characteristics of a stimuli (ex. intensity) and our psychological experiences of them
 - **Absolute threshold**- minimum stimulation needed to detect a particular sense/stimulus 50% of the time
 - **Signal detection**
 - Signal vs. background noise (how and when we detect)
 - Experience, expectation, motivation, fatigue
 - **Subliminal stimulation**
 - **Subliminal**- below threshold or conscious awareness
 - **Priming**- activation, often unconscious of certain associations, predisposing one's perceptions, memory, or response (exposure at time 1 effects exposure at time 2)
 - **Difference threshold** (just noticeable difference, JND)- minimum difference a person can detect between two stimulus half the time
 - **Weber's Law**- to be different, the stimuli must vary by a constant proportion, NOT AMOUNT
- **Sensory adaptation**- diminishing sensitivity to an unchanging stimulus helps you perceive things because it gives a different input (ex. you don't smell your perfume but others do → adjust to it)
- **Perceptual set**- a set of mental tendencies and assumptions that greatly affect what we perceive (ex. seeing two images in 1)

Vision

- **Transduction**- transforming one form of energy into another
- **Wave length**- distance from one peak of one wave to peak of another → determines color (short= blue, long= reddish)
- **Amplitude**- height of the wave; tells us how bright the light is (higher= brighter)

- **The eye**
 - o **Pupil**- hole in the eye; allows light to enter
 - o **Iris**- muscle that surrounds the pupil; regulates the amount of light that it's going to let enter the eye
 - o **Cornea**- clear coating that goes over the eye; focuses light and protects the eye
 - o **Lens**- behind the pupil; focuses light
 - o **Retina**- along the back of your eye; where photo receptors are → detect light energy and starts process of transduction
 - o **Fovea**- point of central focus; whatever you're focusing on is the image that falls on your fovea (not peripheral vision)
 - **Normal vision**- occurs when light gets focused on fovea
 - **Nearsightedness**- visual image is focused on the front of the fovea
 - **Farsightedness**- visual image is focused behind fovea
 - 1. Light enters the eye → triggers photochemical reaction in rods and cones at the back of the retina
 - **Rod**- black and white; active during the night; bigger shapes and sizes & greater concentration in periphery of fovea
 - **Cones**- color vision; work best in day type conditions; give detail; highest concentration at fovea
 - 2. Chemical reaction in turn activates bipolar cells
 - 3. Bipolar cells activate ganglion cells, the axons of which converge to form optic nerves. This nerve transmits info to the visual cortex (via the thalamus) in the brain.
 - **Blind spot**- part of the eye where optic nerve exits; no photo receptors—no stimulation on that part of the eye

Visual Processing

- **Optic nerves come from eyes, cross over at optic chiasm, sent to thalamus, and then sent to the brain**
- **Feature detectors**- nerve cells that respond to specific features of the stimulus (ex. shape, angle)
- **Supercell clusters**- receive info from the feature detectors and respond to more complex patterns (ex. faces, houses, chairs)
- **Parallel Processing**- processing many aspects of a problem simultaneously (more than 1 thing at a time)

Color vision

- **Wavelength**- determines color
- **Young-Helmholtz trichromatic theory**- retina contains 3 different color receptors (R,G,B) → all other colors formed from the combination of those three
- **Opponent-process theory**- opposing retinal processes allow for color vision (red-green, yellow-blue, white-black)

Visual Organization

- **Figure and ground**- organization of visual fields into its objects (figures) and its surroundings (ground) → what figures stand out in the ground
- **Grouping**- tendency to organize stimuli into coherent groups
 - o **Proximity**- things that are near each other in space are perceived to be in the same group
 - **Similarity**- things that are alike get grouped
 - **Continuity**- want to perceive things as a constant sequence
 - **Connectedness**- pair because connected
 - **Closure**- filling in lines and edges that aren't there (psychologically)
- **Depth perception**- ability to perceive the world in 3-D even though the images that fall on the retina are in 2-D (ex. visual cliff); see how far objects are from us
 - o **Binocular cues**- depth cues that depend on the use of two eyes (ex. two pencils together)
 - o **Retinal disparity**- difference between two images
 - o **Monocular cues**- depth cues available to eyes separately
 - o **Motion perception**- ability to perceive movement
 - o **Perceptual constancy**- perceiving objects as unchanging even as illumination and retinal images change
 - o **Color constancy**- perception of consistent color
 - o **Brightness constancy**- perception of consistent brighten when it's illumination varies
- **Perceptual organization**- Gestalt said we perceive things as an organized whole; a whole is different than the sum of its parts

Hearing

- **Audition**- the sense/act of hearing
- **Volume is measured in decibels** → threshold for humans is 0 decibels; 80-90 decibels starts hearing damage
- **Sound waves**-
 - o **Amplitude (height)**- loudness → taller= louder
 - o **Wave length**- pitch/frequency

The Ear

- **Outer ear**- what we see
 - o **Pinna**- acts like a funnel → what you hear
 - o **Auditory canal**- channel that sound waves travel through
- **Middle ear**
 - o **Ear drum**- piece of tissue that's pulled tight → as sound goes through ear, causes eardrum to vibrate
 - o **Hammer, anvil, stirrup**- eardrum vibrates and sets off hammer → anvil → stirrup to vibrate
- **Inner ear**-