

Chapter 8 Sensation and Perception

Sec 1: Sensation

Stimulus – any aspect of or change in the environment to which an organism responds

Sensation – what occurs when a stimulus activates a receptor

Perception – organization of sensory info into meaningful experiences

Psychophysics – study of relationships between sensory experiences and physical stimuli

Absolute Threshold – weakest amount of a stimulus that a person can detect half the time

1. Vision – seeing a candle flame 30 miles away on a clear night
2. Hearing – hearing a watch ticking 20 feet away
3. Taste – tasting 1 tsp. of sugar dissolved in 2 gallons of water
4. Smell – smelling 1 drop of perfume in a 3 room house
5. Touch – feeling a bee's wing falling a distance of 1 cm onto your cheek

Difference Threshold – the minimum amount of difference a person can detect between two stimuli half the time

1. Weber's Law – the larger or stronger a stimulus, the larger the change required for a person to notice that anything has happened

Sensory Adaptation – we are able to respond to changes in our environment because our senses have an ability to adapt to a constant level of stimulation

1. Our senses get used to a new level and only respond to deviations from it

Signal Detection Theory – study of people's tendencies to make correct judgements in detecting the presence of stimuli

1. Based on the notion that the stimulus must be detected in the presence of competing stimuli

Sec 2: The Senses

Vision – most studied of all the senses

1. Optic Nerve – the nerve that carries impulses from the retina to the brain
2. Color Deficiency – several types, most see some colors but not all
 - a. Affects 8% of American men
 - b. Less than 1% of women

- c. Hereditary condition passed on by women
- 3. Binocular Fusion – process of combining received images from the two eyes into a single, fused image
- 4. Retinal Disparity – differences between the images stimulating each eye, essential for depth perception
- 5. Nearsightedness – eyeball is too long, can see objects close to you but not far away
- 6. Farsightedness – eyeball is too short, can see objects far away but not up close

Hearing – depends on vibrations of the air, sound waves

- 1. Auditory Nerve – carries impulses from the inner ear to the brain, resulting in the perception of sound
- 2. Loudness – determined by the height of sound waves (amplitude), higher the amplitude, louder the sound
- 3. Decibels – measures strength of sound
 - a. Any sound over 110 and persistent exposure to 80 decibels damages hearing
- 4. Pitch – experience associated with a sound’s frequency, its “highness” or “lowness”
- 5. Deafness – Two Types:
 - a. Conduction – occurs when anything hinders physical motion through the outer or middle ear, also caused by rigid bones in middle ear that cannot carry sounds
 - i. Can be helped with hearing aids
 - b. Sensorineural – occurs from damage to the cochlea, the hair cells, or the auditory neurons

i. Cochlear implants can help

Balance

1. Vestibular System – three semicircular canals that provide the sense of balance, located in the inner ear & connected to the brain by a nerve

Smell & Taste – known as chemical senses because their receptors are sensitive to chemical molecules

1. Olfactory Nerve – carries smell impulses (caused by gaseous molecules entering the nose)
2. Taste – liquid chemicals must stimulate receptors in the taste buds on your tongue
 - a. Consists of 4 Primary Sensory Experiences:
 1. Sour
 2. Bitter
 3. Salty
 4. Sweet
3. Flavor – combination of taste, smell, & tactile sensation
4. Much of taste is produced by the sense of smell

Skin Senses – receptors provide the brain w/ at least 4 kinds of info about the environment:

1. Pressure – varies from place to place, serve as protection
2. Warmth
3. Cold

4. Pain – makes it possible to prevent damage to your body, it's an emergency system
 - a. Two types of pain sensations:
 - i. Sharp, localized pain
 - ii. Dull, generalized pain
 - b. Gate Control Theory of Pain – can lessen pains by shifting our attention away from pain impulses or by sending other signals to compete with the pain signals

Body Senses

1. Kinesthesia – sense of movement and body position, helps to maintain posture and balance

Sec 3: Perception

Perception – organization & interpretation of sensory info into meaningful experiences

Gestalt – experience that comes from organizing bits & pieces of info into meaningful wholes

1. Principles Brain uses in Constructing Perceptions
 - a. Proximity
 - b. Continuity
 - c. Similarity
 - d. Closure
 - e. Simplicity
2. These principles of organization help explain how we group our sensations & fill in gaps to make sense of the world

Figure-Ground Perception – ability to discriminate properly between a figure and its background

Perceptual Inference – phenomenon of filling in the gaps in what our senses tell us, largely automatic & unconscious

Subliminal Messages – brief auditory or visual messages that are presented below the absolute threshold

Depth Perception – ability to recognize distances & 3-dimensionality

1. Monocular Depth Cues – cues that can be used w/ one eye
 - a. Relative Height – objects that appear farther away from another object are higher on your plane of view
 - b. Interposition – overlapping of images, causes us to view objects we can see in their entirety to be closer than one whose outline is interrupted by another object
 - c. Light & Shadows – yield info about an object's shape and size
 - d. Texture-density Gradient – farther removed an object is, the less detail we can identify

- e. Motion Parallax – apparent movement of objects that occurs when you move your head from side to side or when you walk around
- f. Linear Perspective – based on the fact that parallel lines converged when stretched into the distance
- g. Relative Motion – objects in a nearby field seem to be moving in the opposite direction to your movement

Constancy – tendency to perceive certain objects in the same way regardless of changing angle, distance, or lighting

Illusions – perceptions that misrepresent physical stimuli

Extrasensory Perception (ESP) – ability to gain info by some means other than the ordinary senses

1. Clairvoyance – perceiving objects or info w/o sensory input
2. Telepathy – reading someone else's mind or transferring one's thoughts
3. Psychokinesis – involves moving objects thru purely mental effort
4. Precognition – ability to foretell events