

Chapter 4

Sensation and Perception

Sensation and Perception

- **Sensation**
 - The process of stimulating the sense organ receptor cells and relaying that information to higher brain centers for further processing
- **Perception**
 - The brain's process of organizing and interpreting sensory information to give it meaning

Thresholds

- **Absolute threshold**
- **Noise**
- **Difference threshold (JND)**
- **Weber's law**

The Visual System

- **Light**
 - A form of electromagnetic energy that can be described in terms of wavelengths
- **Wavelength**
 - The distance from the peak of one wave to the peak of the next

The Visual System

- **Sclera**
- **Iris**
- **Pupil**
- **Cornea**
- **Lens**
- **Retina**

The Visual System

- **Rods**
 - The receptors in the retina that are exquisitely sensitive to light but are not very useful for color vision
- **Cones**
 - Receptors in the retina for color perception
- **Duplicity Theory**
- **Visual Acuity**
- **Dark Adaptation**

The Visual System

The Visual System

- **Feature detectors**
 - Neurons in the brain's visual system that respond to particular lines or other features of a stimulus
- **Sensory adaptation**
 - A change in the responsiveness of the sensory system based on the average level of surrounding stimulation

Color Vision

- **Hue**
- **Saturation**
- **Brightness**

Theories of Color Vision

- **Trichromatic theory**

- **Opponent-process theory**

Theories of Color Vision

Perception: The Stroop Effect

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Visual Integration

- Perception of Form
- Size Constancy
- Shape Constancy
- Brightness Constancy

Depth Perception

- Depth perception
 - The ability to perceive objects three-dimensionally
- Monocular cues
 - Motion parallax
 - Speed
 - Kinetic depth effect
 - Size
 - Linear perspective

Depth Perception

- Interposition
- Texture
- Shadowing
- Atmospheric perspectives
- Accommodation
- Binocular cues
 - Retinal disparity
 - convergence

Motion Perception

- Apparent movement
 - Our perception of a stationary object as being in motion
- Stroboscopic motion
 - The illusion of movement created by a rapid stimulation of different parts of the retina

Illusions

- Gestalt Psychology
- Visual illusion
 - Illusion that occurs when two objects produce exactly the same retinal image but are perceived as different images

Shape Perception

- Contour
- Law of Pragnanz

- Figure-ground relationship
- Law of Proximity
- Law of Similarity
- Law of Continuity
- Common Fate Principle
- Law of Closure

The Auditory System

- Sounds
 - Pitch
 - Frequency
 - Loudness
 - Amplitude
 - Timbre

Structures of the Ear

- Outer ear
 - Ear drum
- Middle ear
 - Ossicles
- Inner ear
 - Cochlea
 - Basilar membrane
 - Organ of Corti

Theories of Hearing

- Place theory
 - Each frequency of sound waves produces vibrations at a particular spot on the basilar membrane
- Frequency theory
 - The perception of a sound's frequency is due to how often the auditory nerve fires
- Volley principle
 - Neural cells can fire neural impulses in rapid succession, producing a volley of impulses

Perception: Attention

- Selective attention
 - Focusing on a specific aspect of experience while ignoring others
- The 'cocktail party effect'
- Attention is shiftable

Approaches to Perception

- Information-processing approach
 - The view that perception is the process of internally representing information from the world, subjecting it to a series of internal manipulations
- Ecological approach

- A view of perception that stresses an active perceiver exploring and moving about the environment

Is Perception Learned or Innate?

- The visual cliff
- Recovery from blindness
- Culture and perception
 - Carpenters-world hypothesis
- Nature/nurture conclusions

The Skin Senses

- Touch
- Temperature
- Thermoreceptors
 - receptors located under the skin that respond to changes in temperature
- Pain
 - The sensation that warns us that damage is occurring to our bodies

The Skin Senses

- Gate-controlled theory
 - The theory that the spinal column contains a neural gate that can be opened (allowing the perception of pain) or closed (blocking the perception of pain)
- Acupuncture
 - Thin needles are inserted at specific points in the body to produce various effects, such as local anesthesia

The Chemical Senses

- Taste
- Papillae
 - Bumps on the surface of the tongue that contain taste buds, the receptors for taste
- Smell
- olfactory epithelium
 - Tissue located at the top of the nasal cavity that contains a sheet of receptor cells for smell

The Kinesthetic Sense

- Kinesthetic sense
 - The sense that provides information about movement, posture, and orientation

The Vestibular Sense

- Vestibular sense
 - The sense that provides information about balance and movement
- Semicircular canals

- Canals in the inner ear that contain the sensory receptors that detect head motion caused by tilting the head or other bodily motion

Extrasensory Perception (ESP)

- Extrasensory perception (ESP)
 - Perception that occurs without the use of any known sensory process
- Telepathy
- Precognition
- Psychokinesis