

- Sensation – The process of receiving, translating, and transmitting information to the brain
- Perception – Process of the brain organizing and interpreting sensory information
  - Gives meaning to the sensory information
- Sensation Process
  - Everything we're aware of goes through sensation
  - Sense organs: Receive external stimuli
    - Stimuli – Anything being processed, incoming information
    - Sensory Receptor Cells – Begin process of transduction
      - Turn meaningless energy to a meaningful form
      - Raw energy -> neural impulse (transduction)
- Sensory Limits
  - Not every single message is transmitted
  - Subliminal – Below sensory detection
    - Sense them, but not aware of the sensation
  - Thresholds – Boundaries
    - Absolute Threshold – Minimum amount of a stimulus that can be detected at least half of the time
    - Difference Threshold (Just-Noticable)
      - Minimum amount of difference that can be detected between 2 stimuli
      - Weber's Law – The amount of change in a stimulus needed to detect a difference; is directly associated with the strength of the original stimulus
- Sensory Adaptation
  - Weakening of a sensation due to prolonged exposure to it
  - When we become more sensitive to a weak stimulus in preparation for something
  - Dark Adaptation – When you walk into a dark room and can't see at first, after a while sensory receptor cells rest and then make out the shapes
  - Light Adaptation – When eyes readjust after exiting a dark room, sensory receptors overwhelmed, takes them a while to relax
  - Color Vision
    - Trichromatic Theory – Earliest theory
      - Color perception results from the mixing of 3 color systems
        - Blue, red, and green
      - Does not account for
        - Complimentary Colors
        - Color Afterimages
        - Partial Colorblindness
    - Opponent-Process Theory
      - Color perception is based on 3 systems of opposites
        - Blue and Yellow
        - Red and Green

- Black and White
- Perception – Adding meaning (all based on Gestalt)
  - Our perceptions based on our experiences and our expectations
  - Also based on our emotions
  - Perceptual organization – How brain organizes raw information
  - Visual perception
    - Gestalt principles
      - Figure-Ground Perception
        - We always mentally perceive an object as the figure and everything else becomes the background
        - What is chosen as the figure influences what is perceived
      - Continuity
        - Human brain has the tendency to perceive things in continuous lines
      - Proximity
        - Idea that we perceive things near each other as belonging together
      - Similarity
        - We have mental tendency to group things together that seem alike
      - Closure
        - Principle of organization that takes something incomplete and mentally perceives it as complete
    - Perceptual Constancy
      - Our perceptions remain relatively stable and unchanging
        - Brightness constancy and Color constancy
          - Perceiving steady appearance of colors even when the amount of light changes
        - Size Constancy
          - As something is in motion, mind sees it as keeping the same shape, no matter what way it is
    - Depth Perception
      - Rely on monocular and binocular cues
      - Monocular – Visual depth cues that require use of one eye only
        - Texture Gradient – Allows us to judge the depth in something with more texture seems closer
        - Linear Perspective – Has to do with retina itself, retina casts smaller image on our eye when things are more distant; processes distance as opposed to size change

- Superposition – Tells that regardless of size cast on retina, things closer will partially cover things more distant, that are farther away
  - Shadowing – Shadows give the brain some indication of distance
  - Speed of movement – processes both ground and air information; something that looks like it's moving faster and the same thing more distant seems to be slower; the faster object is closer
  - Aerial Perspective – By water vapor, pollution and things in the atmosphere that tell the mind they are farther away
  - Accommodation – Has to do with muscle movements in the eye that allow us to focus; usually only accurate for about 5 feet
  - Vertical Position – Objects on the ground that appear farther from the horizon, appear closer to you
- Consciousness – A state of awareness
  - Consciousness of sensory awareness
    - Aware of surrounding through the senses
  - Consciousness of direct inner awareness
    - Aware of thoughts, emotions, and feelings
  - Consciousness of sense of self (Self Awareness)
    - Aware of who you are as an individual
    - Developed over time
- Daydreams
  - Altered state of consciousness
  - A form of thinking
- Divided Consciousness
  - 2 conscious activities that occur at the same time
- The cocktail party phenomenon
  - Has to do with being very attentive to one aspect of the environment and without realizing it, taking in all the other stimuli
- 3 Variant levels of consciousness
  - Unconscious – Level below awareness
    - Pre-conscious – Things we are aware of but not focused on, can easily bring to conscious thought ; ie memories
    - Non-conscious – Things you're aware of but cannot sense no matter how hard you try
      - Fingernails grow
      - The earth rotates
- Sleep Stages
  - Electroencephalogram (EEG)

- Most used to study sleep
  - Stage 1 (Hypnagogic state)
    - Lasts between 1 and 7 minutes
    - Usually won't admit being asleep
    - Myoclonia
      - An abrupt movement during stage 1 with sensations like imagined falling
  - Stage 2
    - Lasts 20-30 minutes
    - First stage of Real sleep
    - Vitals begin to decrease
    - Enter a very relaxed state
  - Stages 3 and 4
    - More relaxed, vitals continue to decrease
    - 30-40 minutes
    - Difficult to be awakened
  - During a typical 8 hour sleep, go through 5-6 different sleep cycles
  - 80% of sleep is stages 1-4, non-REM sleep
  - REM Rapid Eye Movement > 20%
    - Increases in length as sleep cycle goes on
    - Dreams
    - Main Dream Stage
    - Vitals increase, very active stage
    - Autonomic Storms
      - Have to do with increase in vitals
      - Body enters a paralyzed type state, so can't act dreams out
- Sleep:
  - 1-2-3-4-3-2-1-REM-1-2-3-4-3-2-1-REM-1-2-3-4-3-2-1-REM-1-2-3-4-3-2-1-REM
- Circadian Rhythms
  - Our internal clocks that operate on a 24 hour cycle that alert us of whether we're tired or more awake
  - Secretion of Melatonin
    - Higher during daylight
  - Regulate secretion of growth hormone (Pituitary Gland)
  - Majority of growth hormone secreted in 1<sup>st</sup> 2 hours of sleep
  - Cortisol
    - Secretion of Cortisol begins when we begin to fall asleep and is at its height before waking up
- Dream Content
  - Bio psychological View – Altered state of consciousness and neural communication gets confused

- Day Residue
  - Something from the preceding day shows up in dreams
- Stimulus Incorporation
  - Dreaming about a stimulus that is actually present outside the dream
- Dream Interpretation
  - Sigmund Freud – Past unresolved childhood experiences, subconscious mind surfaces
    - Manifest content – exactly what the dream consists of
    - Latent Content – Freud considered the true meaning that is disguised in manifest content
- Reasons for sleep and Dreams
  - J. Allen Hobson (Need sleep; sleep restores us)
    - Identified 2 centers of the brain stem
      - Sleep Inhibiting System (Active when Awake)
        - Eventually tires, and needs to rebuild energy
      - Sleep Promoting System (Active while Sleeping)
        - Sleep inhibiting system restores itself while Sleep Promoting System is active
    - Took 2 groups used to sleeping 8 hours a night and cut one group back gradually to two hours, while cutting the other back to 4 hours in one week, then 2 the next; Gradual group seemed fine, other group... not so much
  - Wilse Webb (Sleep is unnecessary and developed as an adaption for protection)
    - Sleep cause eyes are not adjusted to low light
    - Protective, not restorative
- Sleep Disorders
  - Insomnia (Most common)
    - Has to do with difficulty sleeping
    - Sleep onset insomnia
      - Difficulty falling asleep, but generally sleep for remainder of night
    - Early Awakening Insomnia
      - Fall asleep fine, but wake up before the set time they want to without being able to fall back asleep
    - Treatable (pills)
  - Narcolepsy
    - Has to do with suddenly falling asleep regardless of what you're doing
    - From completely awake to stage 3 or 4 in a matter of seconds
  - Sleep Apnea

- When individuals stop breathing during sleep for more than 20 seconds at a time
    - Interrupts sleep, so never reach the deep stages
    - Muscles in throat are not relaying the signals from the brain and became too relaxed
  - REM Behavior Disorder
    - When large muscles do not enter paralyzed state during REM stage
    - Physically act out dreams
  - Sleep Paralysis (Not really a sleep disorder)
    - Only a disorder when wake up paralyzed and cannot move for an extended period
- Sleep Phenomena
  - Nightmares
    - Unpleasant dreams that take place during REM stage
    - Generally diminish in frequency as you mature
  - Night Terrors
    - Most common in preschool age children
    - Mostly take place in stage 4
    - Appear to wake up screaming and crying, but have no recollection of it
  - Sleep Walking
    - Usually occurs in stage 4, generally why people don't remember when they sleep walk
  - Sleep Talking
    - Can occur during all stages
    - Deeper stages, it is harder to understand sleep talk
  - Lucid Dreaming
    - When you're dreaming, you realize it and take control
- Drugs and Altered states of consciousness
  - Some characteristics Identified by people
    - Distortion of Perception
      - Time passes differently
    - Intense Positive Emotions
      - Feelings of joy and tranquility
    - Sense of unity
      - Spiritual
      - Feel connected to the universe; in touch with nature
    - Illogical thought
    - Indescribable Experience
      - Have a feeling, but can't describe it to others
    - Transcendent

- Things overlap, span across times or spaces without any recollection of this
  - Self Evident Reality
    - Think everything is figured out even if it isn't
- Meditation
  - Used as an escape from reality
  - Deals with concentrating thoughts and feelings away from everything that exists in reality
  - Goal is to calm or relax the autonomic nervous system, especially the sympathetic
- Hypnosis
  - An altered state that has to do with subconscious and leads to a highly relaxed mind where people are more susceptible to suggestion
  - Experiences
    - Relaxation
    - Hypnotic Hallucination
    - Hypnotic Analgesia
      - Losing sense of touch or pain in certain area of the body
      - Used in dentistry
    - Hypnotic Age Regression
      - Re-experience things from an earlier time
    - Hypnotic Control
      - Feeling like body movements are out of control