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PSYC 111: Chapter 3: Consciousness and the Two-Track Mind

Brain States and Consciousness

- Defining Consciousness

  Consciousness: our awareness of ourselves and our environment
  - Psych used to be about conscious (Freud): too difficult to measure: behaviorism
    - Cognition then later seen as important: consciousness
      - Can assemble info (when we reflect and think about future)
      - States of consciousness
      - Evolutionarily adaptive (person angry, stay away)
  - Spontaneous States
    - Daydreaming, drowsiness, dreaming
  - Physiologically induced
    - Hallucinations, orgasm, food or oxygen starvation
  - Psychologically induced
    - Sensory deprivation, hypnosis, meditation
- The Biology of Consciousness

  Cognitive neuroscience: the inter-disciplinary study of the brain activity linked with cognition (including perception, thinking, memory, and language)

  Dual processing: the principle that information is often simultaneously processed on separate conscious and unconscious tracks

  Blindsight: a condition in which a person can respond to a visual stimulus without consciously experiencing it
  - Cognitive Neuroscience: relating brain states to conscious experiences
    - Cortical activity (fMRI) to read mind
    - How does synchronized activity produce awareness?
  - Dual Processing: The Two-Track Mind: unconscious info occurs simultaneously parallel
    - Dual processing (know more than we know we know): seeing and grasping stuff
    - Visual perception and visual action tracks
    - Decision-making: consciousness arrives "late"
- Selective Attention

  Selective attention: the focusing of conscious awareness on a particular stimulus

  Inattentional blindness: failing to see visible objects when our attention is directed elsewhere

  Change blindness: failing to notices changes in the environment
  - Selective Attention and Accidents
  - Selective Inattention: conscious mind in one place at a time
    - Change blindness and choice blindness (jam test)
    - Popout stimuli: demand our attention

Sleep and Dreams

- Still process things when asleep (certain sounds i.e. name, don't fall off bed, etc)
- Biological Rhythms and Sleep

Circadian rhythm: the biological clock; regular bodily rhythms (for example, of temperature and wakefulness) that occur on a 24-hour cycle
REM sleep: rapid eye movement sleep, a recurring sleep stage during which vivid dreams commonly occur. Also known as paradoxical sleep, because the muscles are relaxed (except for minor twitches) but other body systems are active
Alpha waves: the relatively slow brain waves of a relaxed, awake state
Sleep: periodic, natural, reversible loss of consciousness-as distinct from unconsciousness resulting from a coma, general anesthesia, or hibernation
Hallucinations: false sensory experiences, such as seeing something in the absence of an external visual stimulus
Delta waves: the large, slow brain waves associated with deep sleep

- Circadian Rhythm: morning is peak, early afternoon dips, and drops in evening (b. temp)
  - Age and experience alter rhythm (older adults love morning and 20s love night)
  - Morning types do better in school, more motivated, less likely for depression
- Sleep Stages: every 90 minutes cycle through 4 stages
  - REM: NREM1 (non- REM) : hallucinations, sensation of falling (hypnagogic)
    - Into memories
  - Then NREM2: 20 min with periodic sleep spindles (bursts of brain act)
  - NREM3: deep sleep (30 min) delta waves and hard to awaken
- REM sleep: hour after you fall asleep-ascend from deep slumber (NREM2)
  - 10 min= heart rises, breathing rapid and irregular, start of dream, REMs
  - Brain stem blocks motor cortex at this time (although active)
  - Can't easily be awakened: paradoxically asleep
  - Repeats itself every 90 minutes: night goes on NREM3 sleep grows shorter and disappears and REM and NREM2 sleep get longer
- What Affects Our Sleep Patterns:
  - Avg 7-8 hrs a night (adults: students and workers fall short)
  - Light, shift work, social life= sleep later than a century ago
  - Morning light: act retinal proteins triggers signals in suprachiasmatic nucleus (SCN): cell clusters in hypothalamus cause pineal gland to decrease production of melatonin in morning and increase in evening

- Sleep Theories
  - 1. Sleep protects (ecological niche, out of harm's way)
  - 2. Sleep helps us recuperate: restore and repair brain tissue
  - 3. Sleep helps restore and rebuild our fading memories of the day's experiences
    - Consolidates memories, more sleep is better memory of recently learned, promotes recall of novel experiences
  - 4. Sleep feeds creative thinking: inspiration, boost to thinking and learning, better at spotting connections among novel info
  - 5. Sleep supports growth: pituitary gland releases growth hormone (Muscle development): can improve athletic ability
- Sleep Deprivation and Sleep Disorders

  Insomnia: recurring problems in falling or staying asleep

Narcolepsy: a sleep disorder characterized by uncontrollable sleep attacks. The sufferer may lapse directly into REM sleep, often at inopportune times
Sleep apnea: a sleep disorder characterized by temporary cessations of breathing during sleep and repeated momentary awakenings
Night terrors: a sleep disorder characterized by high arousal and an appearance of being terrified; unlike nightmares, night terrors occur during NREM-3 sleep, within 2 or 3 hours of falling asleep, and are seldom remembered

- Effects of Sleep Loss: drain our energy (9 hours: adults)- energized and happy
  - Predictor of depression (not other way around)
  - REM sleep processing of emotional experiences protects against depression
  - 4/5 teens and 3/5 18-29 yr olds wish they could get more sleep on weekdays
    - Difficulty studying, diminished productivity, mistakes, irritability, fatigue
  - Fatter: increases ghrelin (hunger arousing hormone) and dec leptin (opposite)
    - Increases cortisol: stress hormone (stimulates body to make fat)
  - Can suppress immune cells that fight off viral infections and cancer (live longer)
- Major Sleep Disorders:
  - Insomnia: people usually fret and overestimate how long it takes to sleep
    - Sleeping pills and alcohol aggravate problem by reducing REM sleep
    - Tolerance: inc doses needed
  - Narcolepsy: sudden attacks of sleepiness usually 5 min
    - Genes that cause it in dogs and humans (absence of hypothalamic neural center that produces orexin linked to alertness): brain disease
  - Sleep apnea: 1/20 have it (stop breathing)
    - Deprives them of slow-wave sleep
    - Associated with obesity: loud snoring, irritability, (high bp too)
      - Mask to relieve symptoms
  - Night Terrors: children: sit up walk around, talk incoherently, inc heart rates, look terrified- recall little next morning (NREM-3)
  - Sleepwalking: NREM-3 and sleeptalking
    - Usually harmless, childhood disorders, can occur in any stage, run in families, few remember sleepwalking, deepest and lengthiest NREM-3 sleep are most likely to experience this and night terrors
      - Grow older= NREM-3 diminishes

- Dreams

Dream: a sequence of images, emotions, and thoughts passing through a sleeping person's mind. Dreams are notable for their hallucinatory imagery, discontinuities, and incongruities, and for the dreamer's delusional acceptance of the content and later difficulties remembering it
Manifest content: according to Freud, the remembered story line of a dream (as distinct from its latent, or hidden, content)
Latent content: according to Freud, the underlying meaning of a dream (as distinct from its manifest content)
REM rebound: the tendency for REM sleep to increase following REM sleep deprivation (created by repeated awakenings during REM sleep)

- What we dream: daydreams include familiar details of life