Consciousness

PSY 1000:
Introduction to Psychology

Consciousness: Personal Awareness

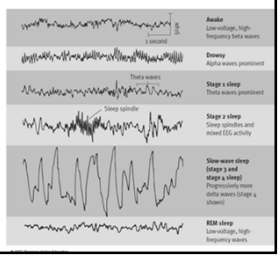
- Awareness of Internal and External Stimuli
  - **William James (1902)**: recognized that the contents of our consciousness is constantly changing (i.e., "stream of consciousness")
  - **Sigmund Freud (1900)**: wanted to explore the depths of the stream of consciousness by examining unconscious needs, wishes, and conflicts
  - Sleep/dreaming research has shown that people continue to maintain some level of awareness concerning external stimuli during sleep (ex. Parents may sleep through a thunderstorm but are awakened by the cry of their child)
    - Prank that involves putting a sleeping person's hand in warm water to cause urination

Levels of Awareness

Level of Awareness	Description	Examples
Higher-Level Consciousness	Involves controlled processing, in which individuals actively focus their efforts on attaining a goal; the most alert state of consciousness.	Doing a math or science problem; preparing for a debate; taking an at-bat in a baseball game.
Lower-Level Consciousness	Includes automatic processing that requires little attention, as well as daydreaming.	Punching in a number on a cell phone; typing on a keyboard when one is an expert; gazing at a sunset.
Altered States of Consciousness	Can be produced by drugs, trauma, fatigue, possibly hypnosis, and sensory deprivation.	Feeling the effects of having taken alcohol or psychedelic drugs; undergoing hypnosis to quit smoking or lose weight.
Subconscious Awareness	Can occur when people are awake, as well as when they are sleeping and dreaming.	Sleeping and dreaming.
No Awareness	Freud's belief that some unconscious thoughts are too laden with anxiety and other negative emotions for consciousness to admit them.	Having unconscious thoughts; being knocked out by a blow or anesthetized.

The Electroencephalograph: A Physiological Index of Consciousness

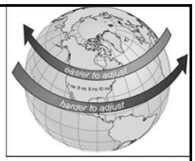
- **Electroencephalograph (EEG):** monitoring of brain electrical activity
- Brain-waves
  - **Amplitude** (height)
  - **Frequency** (cycles per second)
    - **Beta (β)**: 13-24 cps; normal waking thought, alert problem solving
    - **Alpha (α)**: 8-12 cps; deep relaxation, meditation
    - **Theta (θ)**: 4-7 cps; light sleep
    - **Delta (Δ)**: <4 cps; deep sleep



Biological Rhythms and Sleep

- Our level of awareness varies over the course of the day
- **Circadian Rhythms**: 24 hr biological cycles
  - Regulation of sleep and other bodily functions (e.g., blood pressure, urine production, hormonal secretions, body temperature)
  - Without light cues, the cycle is about 24.2 hrs
- Other biological rhythms:
  - Ultradian rhythms: shorter than 24 hrs (e.g., feeding)
  - Infradian rhythms: longer than 24 hrs (e.g., menstrual cycle)

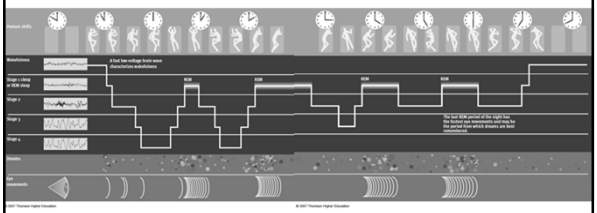
Circadian Rhythms



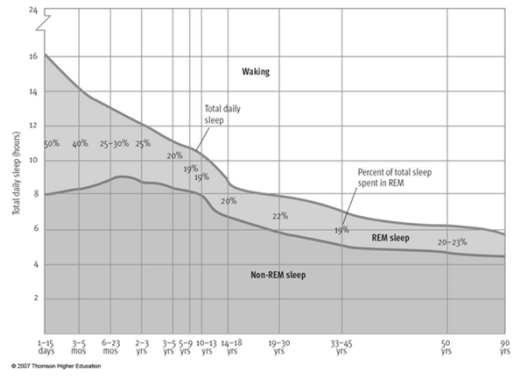
- Quality of sleep tends to suffer when we go to sleep at unusual times (e.g., jet lag)
  - Jet lag is worse when traveling east because of the shortening of the day
  - Rotating shift work (e.g., nurses, firefighters) plays havoc with biological rhythms
- Methods for realigning biological rhythms:
  - Melatonin (hormone produced by pineal gland that is involved in circadian rhythms)
  - Exposure to bright lights
  - Progressively later starting times for shift work (instead of earlier times)

Sleep Stages: Cycling Through Sleep

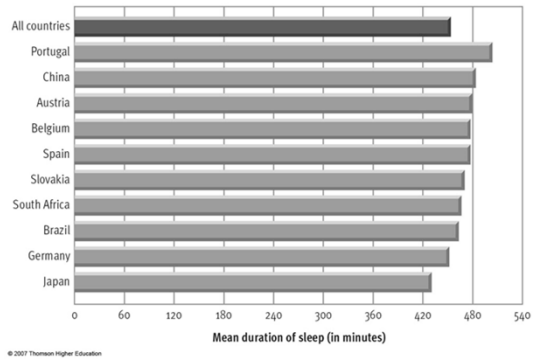
- Falling asleep: takes about 25 min on average (but depends on a number of factors)
- **Stage 1**: brief, transitional (1-7 minutes)
  - Alpha waves → theta waves (lower frequency)
  - **hypnic jerks**: muscular contractions
- **Stage 2**: sleep spindles (high frequency spikes) and mixed EEG activity (10-25 minutes)
- **Stages 3 & 4**: slow-wave sleep (30 minutes)
- **Stage 5**: the return to "stage 1" sleep; REM; EEG similar to awake; vivid dreaming (first a few minutes, then longer); REM paralysis



An overview of the cycle of sleep



Change in sleep patterns over time

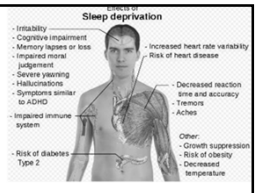


Cultural variations in how long people tend to sleep

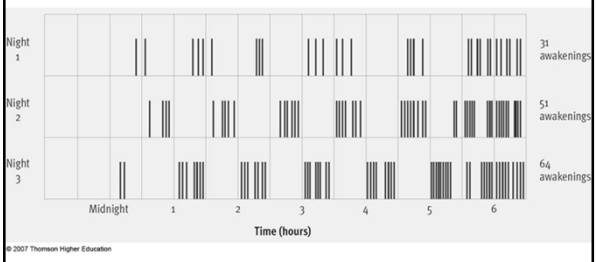
Why Do We Sleep?

- Hypothesis 1: Sleep evolved to conserve energy (i.e., we burn fewer calories while we are asleep)
- Hypothesis 2: Immobilization during sleep is adaptive because it reduces danger (i.e., prey animals sleep at night to decrease their risk of attracting predators)
- Hypothesis 3: Sleep helps animals to restore energy and other bodily resources
  - Replenish chemicals, repair cellular damage
  - Growth and bodily repair tend to occur during deepest stages of sleep
  - Disrupted sleep may delay growth and bodily repair

Sleep Deprivation



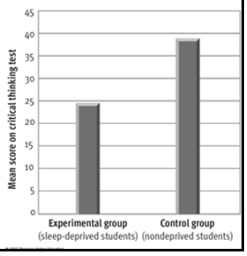
- Sleep deprivation can lead to serious changes in physical and mental functioning
- Complete deprivation:
  - 3 or 4 days is the maximum that most individuals can manage without sleep
  - Longest observed period was 11 days by Randy Gardner for a science fair project in the 1970s
- Partial deprivation or sleep restriction:
  - 63% report less than 8 hours per night and 31% report less than 7 hours
  - impaired attention, reaction time, coordination, and decision making
  - accidents: Chernobyl, Exxon Valdez
- Selective deprivation of REM sleep
  - REM and slow-wave sleep: rebound effect



REM across successive nights of a selective sleep deprivation study

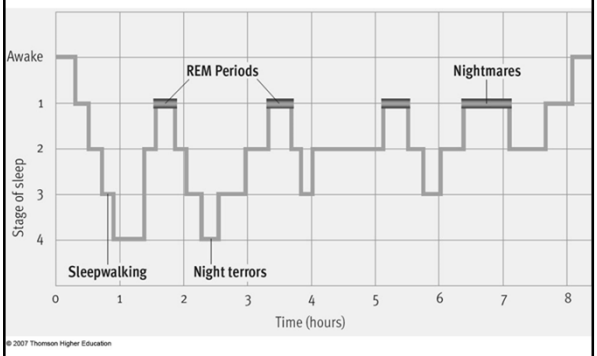
Pilcher & Walters (1997)

- Experimental group: deprived of sleep for one night
- Control group: slept normally (approximately 8 hrs)
- Experimental group performed significantly worse than control group on a critical thinking test BUT reported significantly higher ratings of effort, concentration, and performance
- Illustrates that individuals are often unaware of the impact of sleep deprivation



Sleep Problems

- **Insomnia**: difficulty falling or staying asleep
  - Causes: depression, anxiety, stress, health problems, use of stimulants
- **Narcolepsy**: falling asleep uncontrollably
  - Person goes directly from wakefulness to REM sleep
- **Sleep Apnea**: reflexive gasping for air that awakens and disrupts sleep
  - Often accompanied by loud snoring; person may awaken hundreds of time each night; linked with obesity
- **Nightmares**: anxiety arousing dreams (REM)
  - Mainly a problem among children; chronic difficulties may indicate emotional problems
- **Night Terrors**: intense arousal and panic (NREM)
  - yell → sit upright → stare straight ahead; not indicative of emotional problems
- **Somnambulism**: sleepwalking
  - Not indicative of underlying psychological problems; it is safer to gently awaken a sleepwalker than to let them wander about
- **REM Behavior Disorder**: loss of muscle atonia (paralysis) during REM
  - Sleeper may act in accordance with dream content (e.g., behave aggressively)



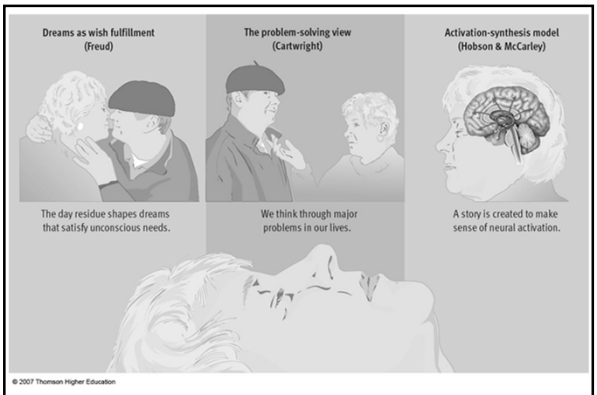
Sleep problems and the cycle of sleep

Suggestions for Better Sleep

- Go to bed when you are sleepy
  - If you can't go to sleep within 20 minutes, get up and do something like reading or watching TV until you are sleepy
- Don't do anything in your bed but sleep
  - Your bed should be associated with sleep…not watching TV or reading
  - Exceptions are often made for sex
- Don't try too hard to get to sleep and do NOT look at the clock and calculate how much sleep you will get
  - This just increases tension and makes it harder to fall asleep
- Keep a regular schedule
  - Go to bed and wake-up at the same time each day
- Don't take sleeping pills, drink alcohol, or use other drugs that slow down the nervous system
  - These drugs take you into deep sleep but do not allow for REM sleep…this causes problems over time

Dreams and Dreaming: Content and Significance

- **Dreams**: mental experiences during sleep
  - Content usually familiar and mundane (…but we are more likely to remember our bizarre dreams)
  - Common themes: sex, aggression, and misfortune
  - People usually dream about themselves
  - Waking life spillover – Freud's "day residue"
  - Suppressed thoughts are more likely to be the focus of dreams
  - People sometimes incorporate external stimuli into dreams (e.g., alarm clock becomes a siren)



Three theories of dreaming

Hypnosis: Altered State of Consciousness or Role Playing?

- **Hypnosis**: a systematic procedure that increases suggestibility
- **Hypnotic susceptibility**: individual differences in the ability to be hypnotized
- Four Steps in Hypnosis
  - Person is told to focus on what is being said
  - Person is told to relax and feel tired
  - Person is told to "let go" and accept
  - Person is told to use vivid imagination

- Effects that can be produced through hypnosis: temporary amnesia for session, pain relief, perceptual distortions, relaxation
- Effects that CANNOT be produced through hypnosis: superhuman abilities, memory enhancement, regression to childhood, regression to past life
- Role playing (expectancies) vs. altered state of consciousness (a type of dissociation)

Psychoactive Drugs

- **Psychoactive drugs**: chemical substances that modify mental, emotional, or behavioral functioning
  - Examples: cocaine and marijuana
- Why do people take psychoactive drugs?
- Continued use can lead to…
  - **Tolerance**: larger doses are necessary for effects
  - **Physical dependence**: body is unable to function normally without drug
  - **Psychological dependence**: feeling that a drug is necessary for emotional well-being or daily functioning
  - **Withdrawal**: physical symptoms (e.g., nausea, pain, tremors, high blood pressure) due to lack of a drug

Altering Consciousness with Drugs

- Narcotics/opiates (morphine, heroin): pain relief, overwhelming euphoria, “who cares” attitude
- Depressants/sedatives (barbiturates, benzodiazepines): sleep inducing
  - Alcohol**:** produces relaxed euphoria, boost in self-esteem, decrease in inhibitions (which is why it is often mistakenly thought to be a stimulant)
- Stimulants (caffeine, nicotine, amphetamines, cocaine, ecstasy): increase CNS activity
- Hallucinogens (LSD, mescaline, psilocybin): distort sensory and perceptual experience
  - Cannabis (marijuana, hashish)**:** mild sensory distortions; produces mild, relaxed euphoria; sluggish mental functioning; possible memory impairment