

Chapter Five

Consciousness

Consciousness

- Our subjective experience of the world, our bodies, and our mental perspectives
- Sleep paralysis, out-of-body, near death, and mystical experiences are all alterations of normal consciousness

Biology of Sleep

- Our **circadian rhythms** are cyclical changes that occur on a roughly 24-hr basis
 - Biological processes like hormone release, body temp
- Regulated by the **biological clock** (SCN) of the hypothalamus
 - Triggers our sense of fatigue via increasing melatonin

Biology of Sleep

- Disruptions of circadian rhythms (jet lag, late shifts) can cause numerous health problems
- How much sleep?
 - Newborns = 16 hours
 - College students = 9 hours
 - Most people = 7-10 hours
 - People(<1%) with DEC2 mutation = 6 or less

Sleep deprivation

- Building up a sleep debt can have numerous negative consequences
 - Weight gain
 - Depression
 - Increased risk for cardiovascular problems
 - Decreased immune system

Stages of Sleep

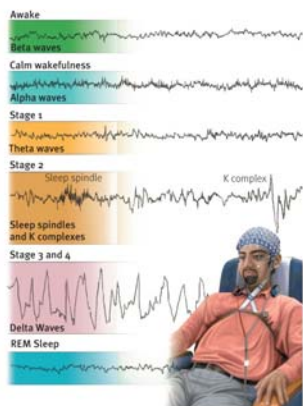
- We cycle through five stages of sleep, in 90 minute cycles
- **Non-REM** happens in stages 1-4
 - No eye movements, less dreams
- **REM sleep**
 - Stage 5, vivid dreams, quick eye movements

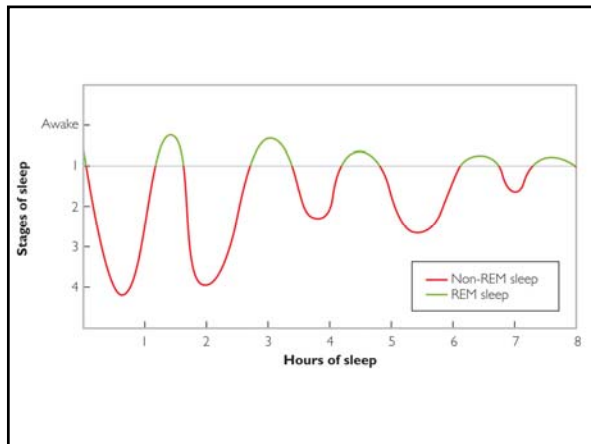
Stages of Sleep

- Stage 1 (5-10 minutes)
 - *Theta waves*
 - *Hypnagogic imagery*
 - Myoclonic jerks
- Stage 2 (10-30 minutes)
 - *Sleep spindles and K-complexes*
 - As much as 65% of total sleep

Stages of Sleep

- Stages 3 and 4 (15-30 minutes)
 - *Delta waves*
 - Crucial to feel rested; suppressed by alcohol
- Stage 5 (10-20 minutes)
 - **REM sleep**
 - Brain activity similar to wakefulness
 - Becomes longer as the night goes on







NREM dreams

- Shorter
- More thought-like
- Repetitive
- Concerned with daily tasks



REM dreams

- More dreams
- Emotional, illogical
- Prone to plot shifts
- Biologically crucial

Photos from woodleywonderworks's Flickr stream

REM Facts

- *Paradoxical sleep* as bodies are paralyzed but brains are active
- *REM rebound* occurs when we don't rest well for several nights
- Function of the eye movements is unknown
- Muscles in middle ear are also active

Lucid Dreaming

- Sleep and wake may not be as distinct as once thought
- **Lucid dreaming** occurs when you know that a dream is a dream
- Some report being able to control dreams
 - May help with nightmares, but not other problems

Sleep Disorders

- Widespread and costly problem
 - \$35 billion a year cost
 - 30-50% of population experiences at some point
- Most common is **insomnia** (9-15% of people)
 - Difficulty going to, staying asleep, or early waking
 - High rates with depression, pain, medical conditions

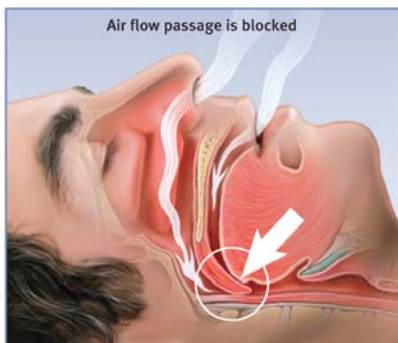
Beating Insomnia

	
Do • Hide clocks • Sleep in cool room • Regular schedule	Don't • Drink caffeine • Take naps • Read in bed • Watch TV/use computer before bed

Photos from dichohocho and maxintosh's Flickr streams

Sleep Disorders

- **Narcolepsy** is the rapid and unexpected onset of sleep
 - Some can experience *cataplexy* as well
 - Due to lack of *orexin* production
- **Sleep apnea** is caused by the blockage of the airway during sleep
 - May wake briefly hundreds of times per night, causing fatigue and other health problems



Sleep Disorders

- **Night terrors** are sudden waking episodes characterized by screaming, perspiring, and confusion followed by a return to a deep sleep
 - Most common in children, harmless
- **Sleepwalking** occurs in 15-30% of children and 3-5% of adults

Dreams

- Unsure exactly why we dream, but involved in
 - Processing emotional memories
 - Integrating new experiences with established memories
 - Learning new strategies and ways of doing things
 - Simulating threatening events so we can better cope with them in everyday life
 - Reorganizing and consolidating memories

Freud's Dream Protection Theory

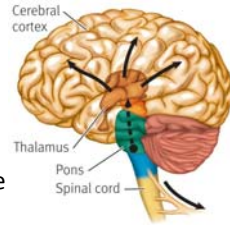
- Dreams transform our sexual and aggressive instincts into symbols that represent *wish fulfillment*
- These require interpretation to reveal their true meaning
 - *Manifest vs. latent content*

Freud's Dream Protection Theory

- Rejected by most scientists due to lack of evidence
 - Most dreams are negative in content
 - Very few sexual dreams (< 10%)
 - Straightforward dream content
 - Post-trauma nightmares

Activation-Synthesis Theory

- Dreams reflect the brain's attempt to make sense of random and internally generated neural signals during REM
- These signals originate in the pons and move to forebrain



Activation-Synthesis Theory

- Alternatives to AST emphasize role of forebrain in dreaming
- Damage to forebrain can eliminate dreams completely, even if pons is intact
- Also, dreams are consistent over time, not random as AST would expect

Neurocognitive Theory

- Dreams are a meaningful product of our cognitive capacities, which shape what we dream about
- This is why dreams of adults are more complex than those of children

Alterations in Consciousness

- *Hallucinations* are realistic perceptual experiences in the absence of external stimuli
- Brain activates in same way for hallucinations as for “real” sensory experiences
- Relatively normal experience
 - 10-39% of people report having had at least one

Alterations in Consciousness

- **Out-of-body experience** is the sense that our consciousness has left our body
- More commonly reported by those who have other unusual experiences
- A scrambling of sensory information, not actually leaving the body, may be the reason

Alterations in Consciousness

- **Near-death experiences** are OBEs reported by people who’ve nearly died or thought they were going to die
- Differ cross culturally, in response to expectations about the afterlife
- Can be experimentally triggered via stimulation of temporal lobes and other means

Alterations in Consciousness

- **Déjà vu** is the feeling of reliving an experience that is actually new
- Very common, up to 2/3 of people experienced at least one episode
- May be due to seizures, present events resembling past ones, unconscious processing

Alterations in Consciousness

- **Mystical experiences** involve a sense of unity or oneness with the world
- Often religious in nature, and can be induced via fasting, seizures, prayer, and drugs
 - LSD and other hallucinogens

Hypnosis

- A set of techniques that provides people with suggestions for alterations in perceptions, thoughts, feelings, and behaviors
- In widespread use as adjunctive therapy, but not effective alone
- 15-20% of people are of high suggestibility

Hypnosis Myths

1. It produces a trance State in which “amazing” things happen
 - Doesn’t have a great impact on suggestibility
 - Doesn’t turn people into mindless robots
2. Hypnotic phenomena are unique
 - No biological difference between hypnosis and wakefulness

Hypnosis Myths

3. It is a sleeplike state
 - Not biologically similar to sleep
4. People are unaware of their surroundings
 - Most are fully aware of their surroundings and what happened during hypnosis

Hypnosis Myths

5. People forget what happens during hypnosis
 - Rare and mostly limited to people who expect to be amnesic following hypnosis
6. Hypnosis enhances memory
 - Increases the *amount* we recall, but much of it is inaccurate
 - Does increase confidence by eyewitnesses

Theories of Hypnosis

- **Sociocognitive theory** - a person's approach to hypnosis is based on their attitudes, beliefs, and experiences
- **Dissociation theory** - hypnosis is based on a separation between personality functions that are normally well integrated
