Consciousness: Sleep, Dreams, Hypnosis, and Drugs

PSY 100: Foundations of Contemporary 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

<table>
<thead>
<tr>
<th>Level of Awareness</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Higher-Level Consciousness</strong></td>
<td>Involves controlled processing, in which individuals actively focus their efforts on obtaining a goal, the most alert state of consciousness.</td>
<td>Doing a math or science problem, preparing for a test, trying to read a difficult novel.</td>
</tr>
<tr>
<td><strong>Lower-Level Consciousness</strong></td>
<td>Includes automatic processing, that requires little attention, as well as daydreaming.</td>
<td>Punching in a number on a cell phone, tying on a keyboard, when one is an expert, going on a rant.</td>
</tr>
<tr>
<td><strong>Altered States of Consciousness</strong></td>
<td>Can be produced by drugs, trauma, fatigue, possibly hypnosis, and sensory deprivation.</td>
<td>Feeling the effects of having taken alcohol or psychedelic drugs, undergoing hypnosis to quit smoking or lose weight.</td>
</tr>
<tr>
<td><strong>Subconscious Awareness</strong></td>
<td>Can occur when people are awake, as well as when they are sleeping and dreaming.</td>
<td>Sleeping and dreaming.</td>
</tr>
<tr>
<td><strong>No Awareness</strong></td>
<td>People believe the same unconscious thoughts are incorporated with anxiety and other negative emotions to consciousness to admit them.</td>
<td>Having paranoid thoughts, being taunted by a fellow or misunderstood.</td>
</tr>
</tbody>
</table>
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

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.
- The 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.

Complete deprivation:
- 3 or 4 days is the maximum that most individuals can manage without sleep.
- The 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.

Cultural variations in how long people tend to sleep.
REM across successive nights of a selective sleep deprivation study

<table>
<thead>
<tr>
<th>Night</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awake</td>
<td>10</td>
<td>15</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

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
  - Person goes directly from wakefulness to REM sleep
- **Narcolepsy**: falling asleep uncontrollably
  - Often accompanied by loud snoring; person may awaken hundreds of times each night, linked with obesity
- **Sleep Apnea**: reflexive gasping for air that awakens and disrupts sleep
  - Often accompanied by loud snoring; person may awaken hundreds of times each night, linked with obesity
- **Nightmares**: anxiety arousing dreams (REM)
  - Many a problem among children; chronic nightmares 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 relaxed
  - 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