

UNIT 5: States of Consciousness

Consciousness

Consciousness:

A person's awareness of his or her own existence, sensations, cognitions, and environment. Usually arises from several areas in the parietal and frontal lobes.
*** Consciousness is not merely perception***

Normal/Waking Consciousness: Occurs during the usual waking state.

Altered Consciousness: Other than normal waking state (e.g. sleep, hypnosis and psychoactive drugs).

Sleep

Sleep: Naturally recurrent experience during which normal consciousness is suspended; essential to mammals and most other animals.

Circadian Rhythm: The biological clock; regular bodily rhythms that occur within a roughly 24 hour cycle, includes blood pressure, pulse rate, body temperature, blood sugar level, hormone levels and metabolism.

- Regulated through hypothalamus, specifically through the suprachiasmatic nucleus, the light sensitive portion of the hypothalamus that receives info on light of day through receptors in eyes.

Stage 1 Sleep:

Transition from wakefulness to sleep (hypnagogic sleep).

Characterized by **Alpha Waves:** relatively slow brain waves of a relaxed awake state.

May "see" flashing lights/geometric patterns.

May feel **Hypnic Jerk:** Experience a falling/floating sensation & jerk violently.

Easily awakened from stage 1.

Lasts for about five minutes.

Stage 2 Sleep:

Characterized by the following:

Sleep Spindles: brief bursts of rapid rhythmic brain activity.

K-Complexes: single high amplitude waves.

Relatively easily awakened.

Lasts for about 20 minutes.

Stage 3 & 4 Sleep:

Marked by production of **Delta Waves:** slow, high-amplitude waves.

Stage 3: 20-50 % delta waves

Stage 4: more than 50% delta waves.

Marked by decreases in heart rate, blood pressure, breathing rate and body temperature. Lasts about 30 minutes.

Rapid Eye Movement (REM) Sleep:

Brain activity similar to stage 1.

Rapid and irregular breathing and heart rate, bursts of eye movement behind closed lids.

REM dreams: emotional, story like, rich & vivid unlike earlier stage dreams.

Visual & auditory cortices in brain more active in REM than any other stage.

Sleep Cycle:

1, 2, 3, 4, 3, 2, REM, 2, 3, 4, 3, 2, REM (repeat).

Repeats about every 90 minutes and 4-5 times per night.

Why Do We Sleep?

Restorative Theory: helps the body recover from the day's events.

Evolutionary Theory: keeps people out of trouble at night

Cognitive Theory: helps consolidate memories.

Sleep Disorders

Parasomnias: sleep disorders involving transitions in and out of sleep, or between sleep stages.

Sleep Walking (Somnambulism): moving around, sometimes performing other actions, as if awake even though the person is asleep. Positively correlated with stress/anxiety.

Sleep Talking (Somniloquy): talking out loud during sleep. Usually occurs during transitions between non REM stages but occasionally occurs during REM.

Insomnia: repeated difficulty falling asleep, staying asleep or waking up too early. Usually due to stress, anxiety or excitement.

Narcolepsy: overwhelming sleep attacks that last 5-20 minutes. Sufferers slip into REM sleep within 10 minutes. Possibly due to deficit in hypocretin, a neurotransmitter that keeps us alert.

Sleep Apnea: person temporarily stops breathing during sleep, usually accompanied by loud snoring. Airway muscles relax during sleep, narrowing passage to lungs. Decreased blood oxygen wakes sleeper, sometimes up to 400 times per night. Person usually doesn't remember these occurrences.

Night Terrors: Vivid and extremely frightening experiences while you are sleeping. Person wakes up gasping, sometimes screaming, sweating and breathing heavily. Usually impossible to wake up, typically no memory of incident. Positively correlated with stress and anxiety.

Dreams

Dreams: Sequence of images, emotions and thoughts passing through a sleeping person's mind.

One can dream during any stage of sleep, but the dreams we remember are during REM Sleep.

Why Do We Dream?

Freud: "royal road to the unconscious."

Dreams allow us to express and fulfill our unconscious desires.

Manifest Content: the obvious memorable content of a dream

Latent Content: the symbolic content and meaning of a dream

Modern Explanation:

Activation-Synthesis Theory: dreams are a product of random bursts of neural activity. Activate auditory and visual areas; brains attempt to make sense of the hodgepodge of info using stored info.

Consolidated Memories Theory: dreams may help consolidate memories by strengthening neural passageways

Hypnosis

Hypnosis: a state of mind characterized by increased focus attention of vivid imagined experiences, increased suggestibility, and decreased awareness of the external environment. Often attained using relaxation techniques that suggest heavy limbs, eyelids, etc.

Use of Hypnosis

Decreased compulsive habits (smoking, eating, and bedwetting).

Reduce pain and stress (childbirth, surgery).

Dissociation: a split in consciousness, which allows some thoughts and behaviors to occur simultaneously with others.

Selective Attention: focusing away from pain stimulus

Drugs

Psychoactive Drugs: chemicals that alter perceptions and or moods (illegal drugs, alcohol, nicotine, caffeine, etc).

Substance Abuse: pattern of use that leads to distress and for difficulty functioning in major areas of life.

Addiction: compulsive drug craving and use.

Tolerance: requiring more and more of a substance to achieve the same effect.

Withdrawal: discomfort and distress that occurs after stopping the use of an addictive drug.

3 Classes of Psychoactive Drugs

1. **Depressants:** reduce central nervous system activity and slow bodily functions and awareness.

Alcohol: has inhibitory effects on excitatory neural transmitters. Magnifies our tendencies and impulses.

 Focused attention on current situations, not consequences.

 Reduced REM sleep (memory interference).

 Reduced self-awareness.

Barbiturates (a.k.a. Tranquilizers): cause sedation and drowsiness, often used as sleep aids and anti-anxiety medication

 Can be lethal alone or especially with alcohol.

Opiates: opium and its derivatives (morphine, codeine, heroine)

 Can alleviate physical pain and anxiety but highly addictive.

 Activate dopamine-based reward pathway, mimic endorphins.

 Bind to endorphin receptors, so body produces less endorphins, so person craves more opiates to relieve pain.

2. **Stimulants:** stimulate the central nervous system and speed up bodily functions. Increase heart rate and breathing, cause pupil dilation, and increase energy

Cocaine: typically sniffed, leads to 15-30 minute euphoric rush.

 Depletes the supply of dopamine, serotonin and norepinephrine.

 Results in a depressive crash after drug wears off.

MDMA: aka. Ecstasy

 Euphoric moods, feelings of social connectedness.

 Triggers release of dopamine and serotonin

 Even one use can permanently damage serotonin-producing neurons

3. **Hallucinogens:** class of drugs that distort perceptions and can evoke sensory images (hallucinations). Includes marijuana, LSD, PCP.

Marijuana: major active ingredient is THC

Near Death Experiences

NDE (Near Death Experience): Altered state of consciousness sometimes reported after a close brush with death.

 Usually experienced after person has been declared clinically dead.

 12-40% recall NDEs