

Cheat Sheet: States of Consciousness

Essential Concepts

Consciousness

- Consciousness is our awareness of internal and external stimuli, with different states and levels of awareness. The subconscious refers to processes not in conscious awareness but easily brought to the surface, while the unconscious involves deeper psychological forces inaccessible to conscious awareness, driving behavior according to Freudian theory.
- Individuals with damage to their occipital lobes may experience a phenomenon known as blindsight, where they are blind in a specific area of their visual field but can still respond to visual stimuli in that area without conscious perception. This suggests that visual processing can occur without conscious awareness.

Sleep

- States of consciousness vary over the course of the day and throughout our lives. Important factors in these changes are the biological rhythms, and, more specifically, the circadian rhythms generated by the suprachiasmatic nucleus (SCN). Typically, our biological clocks are aligned with our external environment, and light tends to be an important cue in setting this clock.
- We devote a very large portion of time to sleep, and our brains have complex systems that control various aspects of sleep. Several hormones important for physical growth and maturation are secreted during sleep. While the reason we sleep remains something of a mystery, there is some evidence to suggest that sleep is very important to learning and memory.
- The different stages of sleep are characterized by the patterns of brain waves associated with each stage. As a person transitions from being awake to falling asleep, alpha waves are replaced by theta waves. Sleep spindles and K-complexes emerge in stage 2 sleep. Stage 3 and stage 4 are described as slow-wave sleep that is marked by a predominance of delta waves. REM sleep involves rapid movements of the eyes, paralysis of voluntary muscles, and dreaming. Both NREM and REM sleep appear to play

important roles in learning and memory. Dreams may represent life events that are important to the dreamer.

Sleep Disorders

- When people travel across multiple time zones or work rotating shifts, they can experience disruptions of their circadian cycles that can lead to insomnia, sleepiness, and decreased alertness. Bright light therapy has shown to be promising in dealing with circadian disruptions. If people go extended periods of time without sleep, they will accrue a sleep debt and potentially experience a number of adverse psychological and physiological consequences.
- Many individuals suffer from some type of sleep disorder or disturbance at some point in their lives.
 - Insomnia is a common experience in which people have difficulty falling or staying asleep.
 - Parasomnias involve unwanted motor behavior or experiences throughout the sleep cycle and include RBD, sleepwalking, restless leg syndrome, and night terrors.
 - Sleep apnea occurs when individuals stop breathing during their sleep, and in the case of sudden infant death syndrome (SIDS), infants will stop breathing during sleep and die.
 - Narcolepsy involves an irresistible urge to fall asleep during waking hours and is often associated with cataplexy and hallucination.

Drugs and Substances

- Substance use disorder is defined in DSM-5 as a compulsive pattern of drug use despite negative consequences. Both physical and psychological dependence are important parts of this disorder.
- Alcohol, barbiturates, and benzodiazepines are central nervous system depressants that affect GABA neurotransmission.
- Cocaine, amphetamine, cathinones, and MDMA are all central nervous stimulants that agonize dopamine neurotransmission, while nicotine and caffeine affect acetylcholine and adenosine, respectively.
- Opiate drugs serve as powerful analgesics through their effects on the internal opioid neurotransmitter system.

- Hallucinogenic drugs cause pronounced changes in sensory and perceptual experiences. The hallucinogens are variable with regards to the specific neurotransmitter systems they affect.

Other States of Consciousness

- Hypnosis is a focus on the self that involves suggested changes of behavior and experience. Meditation involves relaxed, yet focused, awareness. Both hypnotic and meditative states may involve altered states of consciousness that have potential application for the treatment of a variety of physical and psychological disorders.

Glossary

activation-synthesis theory

states that dreams don't actually mean anything. Instead, dreams are merely electrical brain impulses that pull random thoughts and imagery from our memories.

alpha wave

type of relatively low frequency, relatively high amplitude brain wave that becomes synchronized; characteristic of the beginning of stage 1 sleep

blindsight

a phenomenon in which individuals who are blind in a particular area of their visual field, due to damage to the primary visual cortex, are still able to respond to visual stimuli in that area without consciously perceiving them

biological clock

innate timing device controlled by the suprachiasmatic nucleus

biological rhythm

internal cycle of biological activity

cataplexy

lack of muscle tone or muscle weakness, and in some cases complete paralysis of the voluntary muscles

central sleep apnea

sleep disorder with periods of interrupted breathing due to a disruption in signals sent from the brain that regulate breathing

cognitive-behavioral therapy

psychotherapy that focuses on cognitive processes and problem behaviors that is sometimes used to treat sleep disorders such as insomnia

continuous positive airway pressure (CPAP)

device used to treat sleep apnea; includes a mask that fits over the sleeper's nose and mouth, which is connected to a pump that pumps air into the person's airways, forcing them to remain open

chronotype

individual differences in circadian patterns of activity indicating a propensity to sleep at a certain time

circadian rhythm

biological rhythm that occurs over approximately 24 hours

codeine

opiate with relatively low potency often prescribed for minor pain

collective unconscious

theoretical repository of information shared by all people across cultures, as described by Carl Jung

consciousness

awareness of internal and external stimuli

continual-activation theory

proposes that dreaming is a result of brain activation and synthesis; its assumption is that, during REM sleep, the unconscious part of the brain is busy processing procedural memory

delta wave

type of low frequency, high amplitude brain wave characteristic of stage 3 sleep

depressant

drug that tends to suppress central nervous system activity

euphoric high

feelings of intense elation and pleasure from drug use

evolutionary psychology

discipline that studies how universal patterns of behavior and cognitive processes have evolved over time as a result of natural selection

hallucinogen

one of a class of drugs that results in profound alterations in sensory and perceptual experiences, often with vivid hallucinations

homeostasis

tendency to maintain a balance, or optimal level, within a biological system

hypnosis

state of extreme self-focus and attention in which minimal attention is given to external stimuli

infradian rhythm

a biological rhythm that lasts longer than 24 hours

insomnia

consistent difficulty in falling or staying asleep for at least three nights a week over a month's time

jet lag

collection of symptoms brought on by travel from one time zone to another that results from the mismatch between our internal circadian cycles and our environment

K-complex

very high amplitude pattern of brain activity associated with stage 2 sleep that may occur in response to environmental stimuli

latent content

hidden meaning of a dream, per Sigmund Freud's view of the function of dreams

lucid dream

people become aware that they are dreaming and can control the dream's content

manifest content

storyline of events that occur during a dream, per Sigmund Freud's view of the function of dreams

meditation

clearing the mind in order to achieve a state of relaxed awareness and focus

melatonin

a hormone secreted by the endocrine gland that serves as an important regulator of the sleep-wake cycle

meta-analysis

a study that combines the results of several related studies

methadone

synthetic opioid that is less euphorogenic than heroin and similar drugs; used to manage withdrawal symptoms in opiate users

methadone clinic

uses methadone to treat withdrawal symptoms in opiate users

methamphetamine

type of amphetamine that can be made from pseudoephedrine, an over-the-counter drug; widely manufactured and abused

narcolepsy

sleep disorder in which the sufferer cannot resist falling to sleep at inopportune times

night terror

sleep disorder in which the sleeper experiences a sense of panic and may scream or attempt to escape from the immediate environment

non-REM (NREM)

period of sleep outside periods of rapid eye movement (REM) sleep

obstructive sleep apnea

sleep disorder defined by episodes when breathing stops during sleep as a result of blockage of the airway

opiate/opioid

one of a category of drugs that has strong analgesic properties; opiates are produced from the resin of the opium poppy; includes heroin, morphine, methadone, and codeine

parasomnia

one of a group of sleep disorders characterized by unwanted, disruptive motor activity and/or experiences during sleep

physical dependence

changes in normal bodily functions that cause a drug user to experience withdrawal symptoms upon cessation of use

pineal gland

endocrine structure located inside the brain that releases melatonin

psychoactive drugs

chemical substances that alters brain functioning, causing changes to consciousness, perception, mood, and thoughts

psychological dependence

emotional, rather than a physical, need for a drug which may be used to relieve psychological distress

rapid eye movement (REM) sleep

period of sleep characterized by brain waves very similar to those during wakefulness and by darting movements of the eyes under closed eyelids

restless leg syndrome

sleep disorder in which the sufferer has uncomfortable sensations in the legs when trying to fall asleep that are relieved by moving the legs

rotating shift work

work schedule that changes from early to late on a daily or weekly basis

sleep

a state marked by relatively low levels of physical activity and reduced sensory awareness that is distinct from periods of rest that occur during wakefulness

sleep apnea

sleep disorder defined by episodes during which breathing stops during sleep

sleep debt

result of insufficient sleep on a chronic basis

sleep rebound

sleep-deprived individuals will experience longer sleep latencies during subsequent opportunities for sleep

sleep deprivation

the state of not getting enough sleep, either in duration or quality, resulting in negative effects on physical and mental functioning

sleep regulation

brain's control of switching between sleep and wakefulness as well as coordinating this cycle with the outside world

sleep spindle

rapid burst of high frequency brain waves during stage 2 sleep that may be important for learning and memory

sleepwalking (somnambulism)

sleep disorder in which the sleeper engages in relatively complex behaviors

stage 1 sleep

first stage of sleep; transitional phase that occurs between wakefulness and sleep; the period during which a person drifts off to sleep

stage 2 sleep

stage of sleep; the body goes into deep relaxation; characterized by the appearance of sleep spindles

stage 3 sleep

third stage of sleep; deep sleep characterized by low frequency, high amplitude delta waves

stimulant

drug that tends to increase overall levels of neural activity; includes caffeine, nicotine, amphetamines, and cocaine

subconscious

mental processes and information that are not in conscious awareness but can be easily brought to awareness with some attention or stimuli

sudden infant death syndrome (SIDS)

infant (one year old or younger) with no apparent medical condition suddenly dies during sleep

suprachiasmatic nucleus (SCN)

area of the hypothalamus in which the body's biological clock is located

theta wave

type of low frequency, low amplitude brain wave characteristic of the end of stage 1 sleep

threat-simulation theory

suggests that dreaming should be seen as an ancient biological defense mechanism that provides an evolutionary advantage because of its capacity to repeatedly simulate potential threatening events, thus enhancing the mechanisms required for efficient threat avoidance.

tolerance

state of requiring increasing quantities of the drug to gain the desired effect

ultradian rhythm

a biological rhythm that lasts less than 24 hours

unconscious

mental processes and information that are inaccessible to conscious awareness

wakefulness

characterized by high levels of sensory awareness, thought, and behavior

withdrawal

variety of negative symptoms experienced when drug use is discontinued