CHAPTER 5

Body Rhythms and Mental States
Biological Rhythms

• **Biological rhythms**
  – A periodic, more or less regular fluctuation in a biological system; may or may not have psychological implications.

• **Endogenous**
  – Generated from within rather than by external cues.
• **Circadian rhythms**
  – Biological rhythm with a period of about 24 hours
    • Example: the sleep-wake cycle
    • Occurs in animals, plants, and people
  – To study endogenous circadian rhythms, scientists isolate volunteers from time cues.
  – Suprachiasmatic nucleus
    • Located in hypothalamus, regulates melatonin, a hormone secreted by the pineal gland
Internal desynchronization

- A state in which biological rhythms are not in phase with one another.

- Circadian rhythms are influenced by changes in routine.
  - Airplane flights across time zones
  - Adjusting to new work shifts
  - Illness, stress, fatigue, excitement, drugs, and mealtimes
LO5.3 Explain why seasonal affective disorder is an example of a long-term biological rhythm.

• Moods and long-term rhythms
  – Seasonal affective disorder (SAD)
    • A controversial disorder in which a person experiences depression during the winter and an improvement of mood in the spring.
    • Treatment involves phototherapy or exposure to fluorescent light.
    • Evaluating frequency of and treatment for SAD is difficult.
LO5.3 Explain why seasonal affective disorder is an example of a long-term biological rhythm.

**Menstrual cycles and mood**

- Physical symptoms are common
  - Cramps, breast tenderness, and water retention
- Emotional symptoms are rare
  - Irritability and depression
Biological Rhythms, cont’

LO5.3 Explain why seasonal affective disorder is an example of a long-term biological rhythm.

• **Why women overestimate “PMS”**
  – They notice depression or irritability when these moods occur premenstrually but overlook times when moods are absent premenstrually.
  – They attribute irritability before menstruation to PMS and irritability at other times to other causes.
  – They are influenced by cultural attitudes and myths about menstruation.
The Rhythms of Sleep

LO5.4 Describe the five stages of sleep, and explain the primary features of each stage.

- The rhythms of sleep

**Stage 1.** Feel self drifting on the edge of consciousness

**Stage 2.** Minor noises won’t disturb you

**Stage 3.** Breathing and pulse have slowed down

**Stage 4.** Deep sleep

**REM.** Increased eye movement, loss of muscle tone, dreaming
The Rhythms of Sleep, cont’

LO5.4 Describe the five stages of sleep, and explain the primary features of each stage.

Typical night’s sleep for a young adult

![Graph showing the typical night's sleep for a young adult with stages of sleep labeled.](image)
Exploring the Dream World

LO5.5 List the mental consequences of sleeplessness, and the mental benefits of a good night’s sleep.

• Why we sleep
  – The exact function of sleep is uncertain but sleep appears to provide time for the body to carry out important functions.
    • To eliminate waste products from muscles
    • To repair cells
    • To conserve or replenish energy stores
    • To strengthen the immune system
    • To recover abilities lost during the day
LO5.5 List the mental consequences of sleeplessness, and the mental benefits of a good night’s sleep.

- **Sleep disorders**
  - Sleep deprivation leads to decreases in physical and mental functioning.
  - **Sleep apnea**
    - Breathing briefly stops during sleep, causing the person to choke and gasp and momentarily waken.
  - **Narcolepsy**
    - Sudden and unpredictable daytime attacks of sleepiness or lapses into REM sleep.
LO5.5 List the mental consequences of sleeplessness, and the mental benefits of a good night’s sleep.

• **Mental benefits of sleep**
  
  – Sleep helps to improve memory by contributing to consolidation in which synaptic changes associated with recently stored memories become durable and stable.
  
  – Improvements in memory have been associated with REM sleep and slow-wave sleep (stages 3 and 4), and with memory for specific motor and perceptual skills.
Exploring the Dream World, cont’

LO5.6 Discuss three major explanations for why we dream.

- Exploring the dream world
  - Not all people dream. Those with brain injuries typically do not dream.
  - Lucid dreams
    - Dreams in which the dreamer is aware of dreaming.
• Dreams as unconscious wishes
  – Freud concluded that dreams might provide insight into our unconscious.
  – Most psychologists accept Freud’s notion that dreams are more than ramblings but they also considered psychoanalytic interpretations of dreams to be far-fetched.
  – Not everything in dreams is symbolic.
LO5.6 Discuss three major explanations for why we dream.

- **Dreams as efforts to deal with problems**
  - Dreams may reflect ongoing conscious issues such as concerns over relationships, work, sex, or health.
  - Dreams are more likely to contain material related to a person’s current concerns than chance would predict.
    - Example: college students and testing
LO5.6 Discuss three major explanations for why we dream.

- **Dreams as thinking**
  - Dreaming is the same kind of activity we engage in when we are awake.
  - The difference is that the cerebral cortex is cut off from external stimulation.
  - Prediction that if we were awake, but cut off from external stimulation, our thoughts would have the same hallucinatory quality we experience in dreams!
LO5.6 Discuss three major explanations for why we dream.

Dreams as interpreted brain activity

Activation-synthesis theory

Dreaming results from the cortical synthesis and interpretation of neural signals triggered by activity in the lower part of the brain. At the same time, brain regions that handle logical thought and sensation from the external world are shut down.
Exploring the Dream World, cont’

LO5.7 Summarize the strengths and weaknesses of each major dream theory.

• Evaluating dream theories
  – Problem-focused
    • Skepticism about the ability to solve problems during sleep
  – Activation-synthesis
    • Does not explain coherent, story-like dreams or non-REM dreams
  – Cognitive
    • Some specific claims remain to be tested
The Riddle of Hypnosis
LO5.8 Summarize six established facts about hypnosis, and outline the truth and misconceptions associated with each.

• The riddle of hypnosis
  – Hypnosis: A procedure in which the practitioner suggests changes in the sensations, perceptions, thoughts, feelings, or behavior of the subject
The Riddle of Hypnosis

LO5.8 Summarize six established facts about hypnosis, and outline the truth and misconceptions associated with each.

• The nature of hypnosis
  – Hypnotic responsiveness depends more on the efforts and qualities of the person being hypnotized than on the skill of the hypnotist.
  – Hypnotized people cannot be forced to do things against their will.
  – Feats performed under hypnosis can be performed by motivated people without hypnosis.
• The nature of hypnosis, cont’
  – Hypnosis doesn’t increase the accuracy of memory.
  – Hypnosis doesn’t produce a literal re-experiencing of long-past events.
  – Hypnotic suggestions have been used effectively for many medical and psychological purposes.
The Riddle of Hypnosis, cont’

LO5.9 Contrast the dissociation theory of hypnosis from the sociocognitive approach, noting how each accounts for aspects of hypnotized behavior.

• Theories of hypnosis
  – Dissociation theories

Hypnosis is a split in consciousness in which one part of the mind operates independently of consciousness.

During hypnosis, dissociation occurs between an executive control system (probably in the frontal lobes) and other systems of thinking and acting.
The Riddle of Hypnosis, cont’

LO5.9 Contrast the dissociation theory of hypnosis from the sociocognitive approach, noting how each accounts for aspects of hypnotized behavior.

- **Theories of hypnosis**
  - Sociocognitive approach
    
    Effects of hypnosis result from interaction between social influence of the hypnotist and the abilities, beliefs, and expectations of the subject.
    
    Can explain “alien abduction” and “past-life regression”
• Consciousness-altering drugs

Certain cultures use drugs for

1) Religious ecstasy
2) Euphoria
3) Transcendence of pain
4) Communicate with animals, spirits, and supernatural forces
Consciousness-Altering Drugs

LO5.10 List the four main categories of psychoactive drugs, and summarize the main effects of each.

- **Classifying drugs**
  - Psychoactive drug
    - Drugs capable of influencing perception, mood, cognition, or behavior.
  - Types
    - *Stimulants* speed up activity in the CNS.
    - *Depressants* slow down activity in the CNS.
    - *Opiates* relieve pain.
    - *Psychedelic* disrupt normal thought processes.
Consciousness-Altering Drugs, cont’

LO5.11 Outline the physiology of drug effects, and explain the process by which biochemical changes take place.

• The physiology of drug effects
  – Psychoactive drugs work by acting on brain neurotransmitters. They can...
    • Increase or decrease the release of neurotransmitters
    • Prevent the reabsorption of excess neurotransmitter molecules by the cells that have released them
    • Interfere with the receptors that a neurotransmitter normally binds to
Consciousness-Altering Drugs, cont’

LO5.11 Outline the physiology of drug effects, and explain the process by which biochemical changes take place.

• **Cocaine’s effect on the brain**
  - Blocks the brain’s reuptake of dopamine and norepinephrine, raising levels of these neurotransmitters.
  - Results in overstimulation of certain brain receptors and a brief euphoric high
  - When drug wears off, depletion of dopamine may cause user to “crash.”
The psychology of drug effects
- Reactions to psychoactive drugs depend on several factors.
  - Experience with the drug refers to the number of times a person has taken it.
  - Individual characteristics include body weight, metabolism, initial state of emotional arousal, personality characteristics, and physical tolerance for the drug.
  - “Environmental setting” refers to the context in which a person takes the drug.
  - “Mental set” refers to a person’s expectations about the drug’s effects and reasons for taking it.