Body Rhythms and Mental States
Learning objectives

5.1 – How biological rhythms affect our physiology and performance

5.2 – Why you feel out of sync when you fly across time zones or change shifts at work

5.3 – Why some people get the winter blues

5.4 – How culture and learning affect reports of “PMS” and estimates of its incidence
Understanding biological rhythms

Consciousness
Awareness of oneself and the environment

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

Entrainment
Biological rhythms are synchronized with external events such as changes in clock time, temperature, and daylight.
Endogenous biological rhythms

Circadian rhythms
Once about every 24 hours
Example: the sleep-wake cycle

Infradian rhythms
Occur less frequently than once a day
Examples: birds migrating, bears hibernating

Ultradian rhythms
Occur more frequently than once a day
Examples: stomach contractions, hormone fluctuations
Circadian rhythms

Occur 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 when biological rhythms are not in phase with each other

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
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.
Menstrual cycles and mood

Physical symptoms are common
Cramps, breast tenderness, and water retention

Emotional symptoms are rare
Irritability and depression
Fewer than 5% of women have symptoms predictably.
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.
Some men experience periodic fluctuations in their levels of testosterone in cycles that vary from a few weeks to a month or more. What kind of cycles are these?

1. Infradian
2. Circadian
3. Ultradian
Some men experience periodic fluctuations in their levels of testosterone in cycles that vary from a few weeks to a month or more. What kind of cycles are these?

1. Infradian
2. Circadian
3. Ultradian
Learning objectives

5.5 – The stages of sleep

5.6 – How sleep gets disrupted and the consequences that result

5.7 – The mental benefits of sleep
Realms 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
Typical night’s sleep for a young adult
Your turn

Early in the evening, Joey’s parents find him walking around. They try to wake him, but he does not seem to respond. What kind of sleep is Joey in?

1. REM sleep
2. Fast-wave sleep (Stages 1 and 2)
3. Slow-wave sleep (Stages 3 and 4)
Your turn

Early in the evening, Joey’s parents find him walking around. They try to wake him, but he does not seem to respond. What kind of sleep is Joey in?

1. REM sleep
2. Fast-wave sleep (Stages 1 and 2)
3. Slow-wave sleep (Stages 3 and 4)
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 strengthen the immune system
To recover abilities lost during the day
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

Staying up late and not allowing oneself enough sleep
2/3 of Americans get fewer than recommended 8 hours.
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.

![Graph illustrating recognition scores for negative and neutral scenes in wake and sleep states.](image)
Learning objectives

5.8 – Freud’s theory that dreams are the “royal road to the unconscious”

5.9 – How dreams might be related to your current problems and concerns

5.10 – How dreams might be related to ordinary daytime thoughts

5.11 – How dreams could be caused by meaningless brain-stem signals
What is your experience?

Do you typically remember your dreams?

A. Yes
B. No
What is your experience?

Have you ever died in a dream?

A. Yes
B. No
What is your experience?

Do you have a recurring dream?

A. Yes
B. No
What is your experience?

Have you ever dreamed about doing something impossible (e.g., flying, playing music even though you can’t)?

A. Yes
B. No
What is your experience?

Have you ever had a dream in which one person transformed into another?

A. Yes
B. No
What is your experience?

Do your dreams often contain inconsistencies?

A. Yes
B. No
What is your experience?

Have you ever dreamed about a sexual experience?

A. Yes
B. No
What is your experience?

Have you ever dreamed about being attacked or pursued?

A. Yes
B. No
What is your experience?

Have you ever dreamed about arriving too late for something important?

A. Yes
B. No
Dreams as unconscious wishes

Freud concluded that dreams might provide insight into our unconscious.

Manifest content includes aspects of the dream we consciously experience. Latent content includes unconscious wishes and thoughts symbolized in the dream.

To understand a dream we must distinguish manifest from latent content.

Not everything in dreams is symbolic.
Dreams as reflections of current concerns

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

Males and females appear to dream about similar issues now that lives and concerns of the two sexes have become more similar.
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.

Predicts that if we were awake, but cut off from external stimulation, our thoughts would have the same hallucinatory quality we experience in dreams!
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.
Evaluating dream theories

Psychoanalytic
Interpretations are often far fetched

Problem-focused
Skepticism about the ability to solve problems during sleep

Cognitive
Some specific claims remain to be tested

Activation-synthesis
Does not explain coherent, story-like dreams or non-REM dreams
Learning objectives

5.12 - Common misconceptions about what hypnosis can do

5.13 – The legitimate uses of hypnosis in psychology and medicine

5.14 – Two ways of explaining what happens during hypnosis
Hypnosis

A procedure in which the practitioner suggests changes in the sensations, perceptions, thoughts, feelings, or behavior of the subject
The nature of hypnosis

Hypnotic responsiveness depends more on 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

Hypnosis doesn’t increase 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.
Theories of hypnosis

Dissociation theories

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

2. During hypnosis, dissociation occurs between an executive control system (probably in the frontal lobes) and other systems of thinking and acting.
Theories of hypnosis

Sociocognitive theories

Effects of hypnosis result from interaction between social influence of the hypnotist and the beliefs and expectations of the subject.

Can explain “alien abduction” and “past-life regression”
Learning objectives

5.15 – The major types of psychoactive drugs

5.16 – How recreational drugs affect the brain

5.17 – How people’s prior drug experiences, individual characteristics, expectations, and mental sets influence their reaction to drugs
Classifying drugs

Psychoactive drug
Substance 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.
Pschedelic drugs disrupt normal thought processes.
What do you think?

Binge drinking is extremely prevalent on college campuses.

A. Yes
B. No
What do you think?

Marijuana should be legalized.

A. Yes
B. No
What do you think?

The drug ecstasy should be used for therapeutic purposes, such as treatment of depression from the loss of a loved one.

A. Yes
B. No
What do you think?

Is Ritalin overprescribed for children diagnosed with Attention Deficit Disorder (ADD)?

A. Yes
B. No
What do you think?

Should nicotine be made illegal?

A. Yes
B. No
Physiology of drug effects

Psychoactive drugs work by acting on neurotransmitters. They can. . .

Increase or decrease the release of neurotransmitters

Prevent the re-absorption of excess neurotransmitters by the cells that release them

Block the effects of neurotransmitters on receiving cells

Bind to receptors that would ordinarily be triggered by a neurotransmitter or neuromodulator
Cocaine’s effect on the brain

Blocks the brain’s reuptake of dopamine and norepinephrine, raising levels of these neurotransmitters.

Results in over-stimulation of certain brain circuits and a brief euphoric high.

When drug wears off, depletion of dopamine may cause user to “crash.”
Psychology of drug effects

Reactions to psychoactive drugs depend on several factors.

Physical factors such as body weight, metabolism, initial state of emotional arousal, and physical tolerance

The number of times a person has used a drug

Environmental factors such as where and with whom one uses a drug

Mental set or expectations of a drug’s effects