Consciousness Is a Subjective Experience

• Consciousness
  – Because of the very nature of consciousness, conscious experiences differ from person to person
  – The combination of a person’s subjective experience of the external world and the person’s mental activity; this combination results from brain activity

• Most psychologists reject dualism for materialism, the idea that the brain and the mind are inseparable and that the processing of the brain allows for the experiences of the mind
Different Levels of Consciousness

• When fully conscious we are very alert
  – Have you ever begun daydreaming while reading and then realized you had no idea what you had just read? Familiar tasks can become ‘automatic’ while new tasks need to be consciously ‘controlled’.

• Subliminal perception
  – The processing of information by sensory systems without a person’s conscious awareness
    • Though material presented subliminally can influence how people process information, it has little or no effect on complex thinking and actions
Brain Activity Gives Rise to Consciousness

• Psychologists examine and even measure consciousness and other mental states once considered too subjective to be studied
  – Psychology is beginning to reveal how brain activity may give rise to specific subjective experiences

• **Global workspace model**
  – Consciousness is a product of activity in specific brain regions
    • The key idea of the global workspace model is that no single area of the brain is responsible for general “awareness”
Brain Activity Gives Rise to Consciousness (3)

- **Prefrontal cortex:** “I understand plans.”
- **Primary motor cortex:** “I’m all about movement.”
- **Parietal lobe:** “I’m aware of space.”
- **Occipital lobe:** “I see things.”
- **Temporal lobe:** “I hear things.”
Brain Activity Gives Rise to Consciousness (4)

• Split brain
  – When the corpus callosum is surgically cut the two hemispheres of the brain do not receive information directly from each other
    • Just as the brain has been split in two, so has the conscious mind. We discover that the left hemisphere is the ‘interpreter’. Makes the world make sense.
    • Provides many important insights into the basic organization and specialized functions of each brain hemisphere: example, the left hemi does language.
    • This split allows psychologists to separately test the functions of the two hemispheres
Brain Activity Gives Rise to Consciousness (7)

- **Left hemisphere:** better with language, processes right visual field information, and controls right side body movements.
- **Right hemisphere:** better with spatial relationships, processes left visual field information, and controls left side body movements.
Brain Activity Gives Rise to Consciousness (8)

The sense-constructing activity in the left hemisphere is called the interpreter. This term means that the left hemisphere interprets or tries to make sense out of what the right hemisphere has done.

(a) When a person with a split brain is asked what he sees, the left hemisphere processes the fork on the right side of the screen and can verbalize that.

(b) The right hemisphere processes the left side of the screen, but cannot verbalize what is seen. However, the person can pick up the correct object using the left hand.

Figure 3.6
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3.2 How Does Sleep Affect Consciousness?

• People commonly think that the brain shuts itself down during sleep, but in fact, many brain regions are more active when we are asleep than when we are awake.

• **Circadian rhythms**
  – The regulation of biological cycles into regular, daily patterns
    • Changes in light register in the suprachiasmatic nucleus of the hypothalamus, which activates the pineal gland to trigger the production of melatonin.
Sleep Is Part of the Normal Rhythm of Life (2)

• Melatonin
  – A hormone released in the brain that aids the regulation of circadian rhythms, as bright light reduces production and darkness increases production.
Consciousness Changes During Sleep (1)

• Stages of sleep
  – The electroencephalograph (EEG) records electrical brain activity during different stages of sleep
Consciousness Changes During Sleep (3)

• Five stages of sleep
  – Stage 1 begins when sleepers drift off, shown on the EEG as a shift from beta and alpha waves to more theta waves
  – In Stage 2 breathing becomes more regular, and sleepers become less sensitive to external stimulation.
  • The EEG shows bursts of brain activity called K-complexes
Consciousness Changes During Sleep (4)

- **Slow-wave sleep**: Stages 3 and 4 of deep sleep, when EEGs reveal large, regular delta waves and sleepers are hard to awaken.
- **REM sleep**: EEGs show beta wave activity associated with an awake, alert mind, and sleepers experience rapid eye movements, dreaming, and paralysis of motor systems.

The repeating sleep cycle

- Over the course of a typical night, we cycle through the stages of sleep about five times.
Consciousness Changes During Sleep (6)
People Dream While Sleeping (1)

• Dreams
  – Products of consciousness during sleep in which a person confuses images and fantasies with reality
    • On average people spend 6 years of their lives dreaming

• REM dreams and non-REM dreams
  – REM dreams are more likely to be bizarre
  – Non-REM dreams feel normal, like everyday life
People Dream While Sleeping (3)

(a) Motor cortex
(b) Prefrontal cortex
Visual association areas

Prefrontal cortex (bottom area)
Amygdala
Brain stem

Active
Inactive

Visual association areas

Figure 3.11
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People Dream While Sleeping (4)

• What do dreams mean?
  – Manifest content is the way information is seen in the dream and remembered by the dreamer
  – The latent content is the meaning behind what is being visually manifested
  – No support exists for Freud’s ideas that dreams represent hidden conflicts and that objects in dreams have special symbolic meanings

Activation-synthesis theory
  – Dreams are the result of the brain’s attempts to make sense of random brain activity by synthesizing the activity with stored memories
Sleep Is an Adaptive Behavior (1)

• Three benefits of sleep
  1. Restorative theory: Sleep allows the body, including the brain, to rest and repair itself
  2. Circadian rhythm theory: Sleep has evolved to preserve animals, including humans, from harm. Danger of attack usually is greatest when it is dark
  3. Consolidation theory: Circuits wired together during the waking period are consolidated, or strengthened, during sleep
Sleep Is an Adaptive Behavior (2)

• Sleep deprivation can impair function
  – Sleep deprivation: Most studies find that two or
    three days of sleep deprivation have little effect
    on strength, athletic ability, or the performance of
    complex tasks
    • A long period of sleep deprivation does decrease
      cognitive performance
    • Infants & young kids need more sleep, and spend
      proportionally more time in REM. Rebound.
    • Sleep deprivation also interferes with the body’s
      hunger signals, contributing to overeating and weight
      gain
Sleep Disorders Are Relatively Common Throughout Life (1)

- **Insomnia**
  - A disorder characterized by an inability to sleep
    - Between 12 percent and 20 percent of adults are estimated to have insomnia
    - Insomnia is more common in women than in men and in older adults than in younger adults
Sleep Disorders Are Relatively Common Throughout Life (2)

• **Sleep apnea**
  – A sleep disorder in which the throat closes and breathing stops; results in frequent awakenings during the night

• **Narcolepsy**
  – A sleep disorder in which a person experiences excessive sleepiness during normal waking hours, sometimes going limp and collapsing
Sleep Disorders Are Relatively Common Throughout Life (3)

• REM behavior disorder and sleepwalking
  – REM behavior disorder is roughly the opposite of narcolepsy
    • Those with the disorder act out their dreams while sleeping
  – Sleepwalking, or somnambulism, is relatively common and occurs during slow-wave sleep, typically within the first hour or two of sleep
3.3 What Is an Altered State of Consciousness?

- An altered state of consciousness occurs when the external world seems much more or less clear to us than usual, and when our thoughts are much more or less organized than usual.

- Altered consciousness can involve intense meditation, drug-induced hallucinations, or hypnosis.
Hypnosis Can Produce Changes in Perception, Memory, and Action (1)

• Posthypnotic suggestion
  - **Hypnosis**: A social interaction during which a person, responding to suggestion, experiences changes in memory, perception, brain activity patterns, and/or voluntary action
  • Therapists sometimes hypnotize clients and give them posthypnotic suggestions to help them lose weight or quit smoking
Hypnosis Can Produce Changes in Perception, Memory, and Action (3)

• Two theories of hypnosis
  – *Sociocognitive theory of hypnosis:*
    Hypnotized people are not in an altered state, but they behave in a way that is expected in that situation
  – *Dissociation theory of hypnosis:*
    Hypnotized people are in an altered state in which their awareness is separated from other aspects of consciousness
Hypnosis Can Produce Changes in Perception, Memory, and Action (4)

- Hypnosis and pain
  - Hypnotic analgesia may work by changing the client’s interpretation of pain rather than by diminishing pain
  - Lends support to the dissociation theory of hypnosis
Meditation Affects Cognitive Processing and Brain Function

• Meditation
  – A practice in which intense contemplation leads to a deep sense of calmness, which has been described as an altered state of consciousness
  – Benefits include lowered stress, preserved brain function as we age, and improved attention.
  – There are three basic forms of meditation
    • Concentrative meditation
    • Mindfulness meditation
    • Transcendental meditation
Flow Activities Can Lead to Altered Consciousness (1)

• Participation in an intense sport or an intense religious ceremony can also lead to altered consciousness
  – **Flow**: A highly focused, altered state of consciousness, when awareness of self and time diminishes due to complete absorption in an enjoyable activity
Flow Activities Can Lead to Altered Consciousness (2)

• Escaping the self
  – Sometimes people choose to escape the self rather than engage with life; to forget their troubles they drink alcohol, take drugs, play video games, watch television, surf the Web, or text or chat

• Throughout history and across all cultures, people have discovered that ingesting certain substances can alter their mental state
People Use—and Abuse—Many Psychoactive Drugs (1)

• Psychoactive drugs are mind-altering substances that change the brain’s neurochemistry by activating neurotransmitter systems
  – Drugs have legitimate medical uses, but many of them are commonly abused outside treatment
People Use—and Abuse—Many Psychoactive Drugs (2)

• **Stimulants**
  – Stimulants activate the sympathetic nervous system, increasing heart rate and blood pressure, and improved mood
    • Cocaine and methamphetamine are drugs that act as stimulants, as are caffeine and nicotine
People Use—and Abuse—Many Psychoactive Drugs (5)
People Use—and Abuse—Many Psychoactive Drugs (6)

• Drugs with hallucinogenic effects
  – Several drugs have hallucinogenic effects that alter sensation and perception
  – **Hallucinogens**: Psychoactive drugs that affect perceptual experiences and evoke sensory images even without sensory input

• These drugs include MDMA (ecstasy), lysergic acid diethylamide (LSD), psilocybin mushrooms, peyote, and marijuana
People Use—and Abuse—Many Psychoactive Drugs (7)

- **Opiates**
  - **Opiates**: Psychoactive drugs that reduce pain and produce pleasurable feelings
    - Opiates include heroin, morphine, and codeine
      - These drugs provide enormous reward value, producing feelings of relaxation, insensitivity to pain, and euphoria
    - Opiates have been used to relieve pain for hundreds of years
People Use—and Abuse—Many Psychoactive Drugs (9)

- **Depressants**: Psychoactive drugs that decrease both mental processes and physical activity
  - In large doses, depressants can cause sleep, which is why they are sometimes referred to as sedatives
  - Alcohol is the most widely used depressant
    - Expectations about alcohol’s effects are learned very early in life, through observation
People Use—and Abuse—Many Psychoactive Drugs (10)

• Korsakoff’s syndrome, a disorder sometimes caused by alcoholism, is characterized by both severe memory loss and intellectual deterioration
  – The overall cost of problem drinking in the United States—including health care expenses and lost productivity due to employee absence—is estimated at more than $100 billion each year
People Use—and Abuse—Many Psychoactive Drugs (11)

– Men drink more than women across a wide variety of measures
  • Men are twice as likely to report binge-drinking
– Many people view alcohol as a “magic elixir,” capable of increasing social skills, sexual pleasure, confidence, and power
Addiction Has Physical and Psychological Aspects (1)

• Addiction
  – Compulsive drug craving and use, despite the negative consequences of using the drug

• Tolerance
  – A physical effect of addiction that occurs when a person needs to take larger doses of a drug to experience its effects
Addiction Has Physical and Psychological Aspects (2)

• **Withdrawal**
  
  – A physical and psychological effect of addiction that occurs when a person experiences anxiety, tension, and cravings after discontinuing use of an addictive drug
  
  • Only about 5 percent to 10 percent of people who use drugs become addicted
  
  • There is some evidence for genetic components of addiction, especially alcoholism