Chapter 11
PHYSICAL and COGNITIVE DEVELOPMENT in Adolescence
Adolescence

- A time between childhood and adulthood
- Period of tremendous physical and cognitive growth
- Able to devise new, complex plans
- A time of risk and opportunity
- Some risks have long-lasting consequences
Puberty. What's that?
Puberty

- Five physical components:
  - Rapid acceleration of growth
  - Development of primary sex characteristics
  - Development of secondary sex characteristics
  - Changes in body composition
  - Changes in circulatory and respiratory systems
The Endocrine and Reproductive Systems

- Primary sex characteristics
  - Growth of testes and penis
  - Growth of ovaries, uterus, and vagina

- Secondary sex characteristics
  - Breast development
  - Changing voice pitch
  - Beard growth
  - Body hair
Figure 11.1: The Onset of Puberty

Hypothalamus
- controls the firing of GnRh neurons
  - which are monitored by
    - Hormones
      - Androgens
      - Estrogens
    - which release
      - Gonads
        - Testes in males;
          - Ovaries in females
      - which stimulate
        - Pituitary Gland
          - stimulates hormones
            - which stimulate
              - Hypothalamus
                - controls the firing of GnRh neurons
Video: Puberty: Body Image
Onset of Puberty

- Trigger of puberty affected by genetics and environment.

- Rising levels of leptin may be most important signal in triggering puberty, particularly in females.

- Sexual attraction stimulated by maturation of the adrenal glands (adrenarche).
Changes in Height, Weight, and Appearance

- Adolescent growth spurt – girls two years earlier than boys
- Tanner stages – development of secondary sex characteristics
- Boys – first stages of puberty growth in testes and scrotum
- Girls – first stages of puberty elevation of breasts
  - Menarche:
    - The time of first menstruation, one of the important changes to occur among females during puberty
Figure 11.2: How Puberty Affects Adolescent Behavior

- Internal biological changes
- Outward appearance
- Feelings about self
- Responses of others
- Behavior
Psychological and Social Impact of Puberty

- Biological changes of puberty affect behavior directly or indirectly through change in self-image.

- Rite of passage:
  - A ceremony or ritual marking an individual’s transition from one social status to another

- Adolescent emotions – psychological functioning shaped by social context of puberty
  - Direct connection between hormones and mood is weak.
Early and Late Maturation

- **Genetic and Environmental Influences**
  - Timing of puberty is a product of an interaction between nature and nurture.
    - Secular Trend
  - Nutrition and Menarche
    - Secular Trend
  - Early maturation has positive impact on boys although they may be more likely to get involved in deviant activities.
  - Early maturation has negative impact on girls in terms of psychological well-being.
Eating Disorders

- Disordered eating:
  - Patterns of unhealthy eating attitudes and behaviors

- Obesity
  - Single most serious public health problem affecting American teens

- Anorexia nervosa and bulimia
  - Bulimia – pattern of binging and purging
  - Anorexia nervosa – starving

- Treatments
  - Individual psychotherapy
  - Cognitive-behavioral modification
  - Group and family therapy
  - Antidepressant medication
Body Image and Eating Disorders

- Although most teens are weight-conscious, eating disorders are more extreme
- Sufferers have a distorted body image
- Eating disorders can be fatal
- More common among girls, and also gay and lesbian teens
Body Image and Eating Disorders
Anorexia Nervosa

- Extreme dieting
- Intense fear of gaining weight
- Weight loss approaching starvation
- Symptoms may include cessation of menstruation, insensitivity to pain, loss of hair, low blood pressure, and death
Body Image and Eating Disorders

Bulimia

- Frequent cycles of binge eating
- Purging through self-induced vomiting, laxatives, or excessive exercise
- Intense concern about weight
  - Not abnormally thin
  - Feel intense shame about their behavior
  - May experience significant depression
- Symptoms include tooth decay, stomach irritation, lowered body temperature, and loss of hair
Body Image and Eating Disorders

Causes

- Negative body images
- Girls who participate in activities such as ballet and gymnastics
- Emphasis on thinness as a characteristic of attractive women
- General tendency towards mental illness
- Girls who internalize the “thin ideal” in middle childhood more dissatisfied with body image.
Sexual Activity During Adolescence

- More adolescents are sexually active at an earlier age than several decades ago.
  - Ethnic differences in age of first intercourse among males
  - Sexual activity in adolescence not associated with psychological disturbance
Sexual Development in Girls

**Menarche** – First Menstruation

- Occurs 2 years after beginning of other visible signs
  - Average age – between 12 and 13
  - Irregular menstrual cycles first few years.
  - Ovum may not be produced during every cycle

- Secular trend
  - Lowering of the age of menarche by 4 months per decade
  - Due mainly to changes in diet and lifestyle
Sexual Development in Boys

- Sperm production begins between 12 and 14
- First ejaculation about age 13 or 14
- Genital development and pubic hair development precedes the end of the growth spurt.
- Development of beard and voice changes occur near the end of the sequence
Sexual Behavior

- Girls who are sexually active
  - Experienced early menarche
  - Low interest in school
  - Dated early
  - History of sexual abuse
  - A higher number of risk factors increases likelihood of sexual activity
Sexual Behavior

- Activities and moral beliefs and influence lower sexual activity
  - Teens who believe premarital sex is wrong
  - Teens who attend religious services
  - Teens who participate in school activities
  - Teens who do not use alcohol
Sexual Behavior

- Despite school units, teens show ignorance of STDs

- Fail to discuss condom use
  - 63% reported use of a condom
  - 21% of sexually active females use the pill

- Abstinence and contraceptive education still controversial in many schools
Homosexuality During Adolescence

- Same-sex sex play is not uncommon in young adolescents.
- 3 to 4 percent of adolescents identify themselves as gay, lesbian, or bisexual.
- Sexual orientation is shaped by biological and social factors.
Contraceptive Use

Many sexually active adolescents do not use contraception regularly.

Reasons for lack of use:
- Partners don’t want to use contraception.
- Use of contraception means admitting choice in becoming sexually active.
Sex Education

- School-based sex education programs have no effect on adolescent’s sexual activity, but small impact on use of contraceptives.

- Abstinence-only programs are not effective in changing adolescent’s sexual behavior or reducing rates of non-marital pregnancy.
Teenage Pregnancy

- U.S. has highest rate of teen pregnancy of industrialized world.
- About half of teen pregnancies result in birth of a child raised by a teen parent.
- More common in nonwhite communities
Substance Use and Abuse in Adolescence

- **Prevalence of use and abuse**
  - Alcohol and nicotine more commonly used and abused than illegal drugs.
  - Experimentation with marijuana common
  - Only 10 percent of teenagers have used an illicit drug other than marijuana in the last month.

- **Binge drinking:**
  - Consuming five or more drinks in a row on one occasion
  - An indicator of alcohol abuse
Figure 11.7: Substance Use in Adolescence

- Alcohol
- Cigarettes
- Marijuana
- Smokeless tobacco
- Amphetamines
- Inhalants
- Barbiturates
- Hallucinogens
- Cocaine
- Ecstasy
- Steroids
- Heroin

High school students who have used various drugs (percentage)
Adolescent Health

Sensation Seeking

- Desire to experience increased levels of arousal
- Risky behavior may gain peer acceptance and gain autonomy from parents
- Teens not involved in extracurricular activities and who value popularity are at risk
- Popular media’s messages of sex, violence, drugs, and alcohol may influence risky behavior
  - Often portray teens smoking and drinking (less so for illicit drugs)
Drugs, Alcohol, and Tobacco

- Teen use of illicit drugs down from earlier generations
- Still a problem
- Alcohol use is prevalent
- Sensation seeking is related to increased use of alcohol and drugs
Drug use and the Adolescent Brain

- Potential for addiction to nicotine and alcohol much greater in adolescence than adulthood
- Effects of nicotine and alcohol on brain functioning worse in adolescence
  - Harmful effects of alcohol on the hippocampus
- Causes and consequences of use and abuse:
  - Substance abuse:
    - The misuse of alcohol or other drugs to a degree that causes problems in the individual’s life
  - Substance dependence:
    - The misuse of alcohol or other drugs to a degree that causes physical addiction
- Risk factors include psychological, familial, social, and contextual factors
Video: Risk Taking
Prevention and Treatment of Substance Use and Abuse

- Prevention focuses on:
  - The supply of drugs
  - Environment in which teens are exposed
  - Characteristics of potential drug user

- Most effective programs focus on social competence training and community-wide intervention.
The Adolescent Brain

- **Brain maturation**
  - Prefrontal cortex
    - Dorsolateral prefrontal cortex – planning and controlling impulses
    - Orbitofrontal cortex – evaluating risks and rewards

- **Changes in neurotransmitters**
  - Dopamine and serotonin affecting the limbic system

- **Implications for behavior**
  - Risk taking and behavioral problems during adolescence
  - May crave novelty, reward, and stimulation
**Figure 11.8: The Prefrontal Cortex**

- **Dorsolateral prefrontal cortex:** important for deliberate decision making and impulse control.
- **Orbitofrontal cortex:** important for evaluating risks and rewards.
- **Ventromedial prefrontal cortex:** important for gut-level, intuitive responding.
How Thinking Changes During Adolescence

- Five important sets of changes:
  - We become better able to think about what is possible, not just about what actually is.
  - We become better able to think in sophisticated ways about abstract concepts, like love, democracy, and justice.
  - We become better at thinking about the process of thinking.
  - We improve in our ability to think about things from multiple vantage points at the same time.
  - We start to see things as relative, rather than absolute.
Thinking About Possibilities

- Deductive and inductive reasoning
  - Deductive reasoning – draw logically necessary conclusions from a general set of premises

- Hypothetical thinking
  - “If-then” thinking allows to think abstractly
Video: Abstraction and Hypothetical Propositions
Thinking About Abstract Concepts

- Easier to comprehend higher-order abstract logic inherent in puns, proverbs, metaphors, analogies
- Applies to interpersonal and philosophical matters
Thinking About Thinking

- **Metacognition**
  - Monitoring one’s own cognitive activity during the process of thinking

- **Adolescent egocentrism**
  - Increased introspection, self-consciousness, intellectualization
  - **Imaginary audience:**
    - The belief that everyone is watching and evaluating one’s behavior
  - **Personal fable:**
    - A person’s belief that he or she is unique and therefore not subject to the rules that govern other people’s behavior
Thinking in Multiple Dimensions

- Ability to think about things from different vantage points at the same time
  - Describe themselves and others in more differentiated and complicated terms
  - Look at problems from multiple perspectives
Adolescent Relativism

- More likely to question others’ assumptions, less likely to accept “facts” as absolute truths
  - Question everything, especially parents
Theoretical Perspectives

- Piaget’s view
  - Formal operations

- Information-processing view
  - What is it about the ways that adolescents think about things that make them better problem solvers than children?
    - Attention
    - Working memory
    - Processing speed
    - Organization
    - Metacognition
Figure 11.9: The Growth of Cognitive Abilities
The Transition to Secondary School

- Can disrupt academic performance, behavior, and self-image
  - Disruption temporary, especially when other aspects of life remain stable and supportive

- Middle and junior high schools fail to meet developmental needs of young adolescents.
  - More satisfaction in classes where there is a moderate degree of structure with high student involvement and high teacher support
Achievement Motivation and Beliefs

- **Need for Achievement:**
  - A need that influences the extent to which an individual strives for success in evaluative situations

- **Beliefs about likelihood of success/failure**

- **Motivation**
  - **Intrinsic:**
    - Based on pleasure
  - **Extrinsic:**
    - Based on reward

- **Achievement attributions:**
  - The belief one holds about the causes of one’s successes and failures
Figure 11.10: Influences on Achievement

- Intrinsic or extrinsic motives
- Need for achievement
- Expectations for success
- Attributions for prior outcomes
**Figure 11.11: The Reciprocal Relation Between Beliefs and Achievement**
Dropping Out of High School

- Proportion of individuals who have not completed high school has declined steadily over the last 50 years.
- Huge variations in rates from region to region
- Ethnic differences
- Dropping out a culmination of a long process
Social class is a better predictor of school completion than ethnicity.

When a teen’s peer group puts a low value on completion, teens are more likely to drop out.

Students with a history of academic failure are at risk.

Quiet, disengaged, low-achieving, and poorly adjusted students are high risks for dropping out.

Negative consequences include unemployment, lower wages, depression, and increased criminal activity.