Development Across the Life Span

PSY 100: Foundations of Contemporary Psychology

Across the life span

- **Prenatal development** (conception until birth)
- **Infancy** (birth to 2 years)
- **Early childhood** (2 years to 6 years)
- **Middle childhood** (6 years to 12 years)
- **Adolescence** (12 years to 20 years)
- **Young adulthood** (20 years to 40 years)
- **Middle adulthood** (40 years to 65 years)
- **Late adulthood** (65 years and older)

Progress Before Birth: Prenatal Development

- **Germinal stage**: refers to the first two weeks of life
  - Development begins with conception (i.e., creation of a *zygote* which is a one-celled organism formed by the union of a sperm and an egg)
  - By the seventh day, the cell mass implants itself in the uterine wall
    - About 20% of pregnancies result in spontaneous abortions at this time...often without the mother’s knowledge
  - The *placenta* begins to develop during implantation
    - The placenta is a structure that allows oxygen and nutrients to pass into the fetus from the mother’s bloodstream and bodily wastes to be removed
Progress Before Birth: Prenatal Development

- **Embryonic stage**: spans from two weeks after conception to two months after conception
  - The developing child is now referred to as an **embryo**
  - Formation of vital organs and systems (e.g., heart, spine, brain)
  - Cell division becomes more specialized
  - Although the embryo is only about an inch long, it is already beginning to look human
  - The embryonic stage is a highly vulnerable time because nearly all the basic physiological structures are being formed (and the rate of development is very fast)
  - Most miscarriages occur during this stage
  - Most structural birth defects are also due to problems at this stage

- **Fetal stage**: spans from two months after conception until birth
  - Developing child is now referred to as a **fetus**
  - Rapid bodily growth continues
  - Fetus becomes capable of movement
  - Brain cells multiply very rapidly during the last three months
  - **Age of viability** is the age at which a baby can survive in the event of a premature birth
  - Medical advances have decreased this to sometime between the 22nd and 26th week
  - Survival rate is much better for babies born in later weeks

Overview of fetal development
Environmental Factors and Prenatal Development

- **Critical periods** are times during which certain environmental influences can have an impact on the development of the child.

- **Maternal nutrition**
  - Pregnant women should gain 25-35 pounds.
  - Malnutrition linked to increased risk of birth complications, neurological problems, and psychopathology.

- **Maternal drug use**
  - Most drugs consumed by pregnant women can pass through the membranes of the placenta.
  - Pregnant women should avoid recreational drugs, alcohol, tobacco, and caffeine.

- **Maternal illness**
  - Fetus is largely defenseless against infection... but the placenta screens out many infectious agents.
  - Illnesses that raise the mother’s body temperature may also cause damage to the developing child.

### Teratogenic Agents

**Teratogen** is any factor that can cause a birth defect.

| Teratogenic Agent | Effect on Embryos
|-------------------|------------------|
| Rubella           | Mental, deafness, heart defects, brain damage.
| Malaria           | Infertility, miscarriage, newborn with a heavily marked face, mental retardation.
| Coccidia          | Generalized low birth weight, respiratory problems, anorexia, teratogenic or difficulty in survival.
| Alcohol           | Fetal alcohol syndrome (FAS), birth defects, death, partial birth defects, multiple miscarriages.
| Nicotine          | Prematurity, low birth weight, defects, premature birth, brain damage, mental retardation.
| Mercury           | Intellectual disability, liver damage.
| Syphilis          | Intellectual disability, deafness, hearing loss.
| Caffeine          | Prematurity, low birth weight.
| Radiation         | Higher incidence of cancer, physical deformities.
| High Fever Temp   | Increased chance of neural tube defects.

Cross-cultural comparisons of infant mortality
Despite our pride in our medical system, we are only 20th in the prevention of infant mortality

Reflexes
- Reflexes are innate involuntary behavioral patterns that help the infant survive until they can learn more complex strategies
  - A) Grasping reflex
  - B) Startle reflex (Moro reflex)
  - C) Rooting reflex (turn head toward touch on cheek)
  - D) Stepping reflex
  - E) Sucking reflex

Basic Principles of Motor Development
- **Motor development** refers to the progression of muscular coordination required for physical activities
- **Cephalocaudal trend**: the head-to-foot direction of motor development
  - Example: Learn to use their arms for crawling before their legs
- **Proximodistal trend**: the center-outward direction of motor development
  - Example: Torso develops more quickly than limbs
- **Maturation** is the gradual unfolding of one's genetic blueprint
  - This is impacted by the experiences of the developing child
Landmarks in motor development
25%, 50%, and 90% mastery (median alone may be misleading)

Table 8.1
A Comparison of Three Developmental Research Designs

<table>
<thead>
<tr>
<th>STUDY</th>
<th>Group One</th>
<th>Group Two</th>
<th>Group Three</th>
<th>Research done in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>5-year-old participants</td>
<td>10-year-old participants</td>
<td>15-year-old participants</td>
<td>2011</td>
</tr>
<tr>
<td>Study 2</td>
<td>Same participants at 5 years old</td>
<td>Same participants at 10 years old</td>
<td>Same participants at 15 years old</td>
<td>2011</td>
</tr>
<tr>
<td>Study 3</td>
<td>5-year-old participants</td>
<td>10-year-old participants</td>
<td>15-year-old participants</td>
<td>2015</td>
</tr>
</tbody>
</table>

Easy and Difficult Babies:
Differences in Temperament

- **Temperament** refers to characteristic mood, activity level, and emotional reactivity
- Often considered to be a precursor to personality
- Thomas, Chess, and Birch (1970): Identified 3 basic temperamental styles – based on parental reports – that were somewhat stable over time (but they could change)
  - **Easy** (40%): tended to be happy, regular in sleep and eating, adaptable, and not readily upset
  - **Slow-to-warm-up** (15%): tended to be less cheery, less regular in their sleep and eating, and slower in adapting to change
  - **Difficult** (10%): tended to be glum, erratic in sleep and eating, resistant to change, and relatively irritable
  - The remaining 35% were **Mixed** (i.e., showed a combination of these behaviors)
Easy and Difficult Babies: Differences in Temperament

  - Inhibited temperament (15%-20%): Shyness, timidity, and wariness of unfamiliar people, objects, and events
  - Uninhibited temperament (25%-30%): Less restrained, approaching unfamiliar people, objects, and events with little trepidation
  - Evidence suggests a genetic basis for these temperaments and that temperament is relatively stable into young adulthood

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Early Emotional Development: Attachment

- Do parents and children form bonds in the first few hours after birth?
- Do early emotional bonds affect later development?
- Attachment refers to the close, emotional bonds of affection that develop between infants and their caregivers
  - Much focus on initial attachment to mother (because of her role as primary caregiver) with other attachments typically coming later (e.g., father, grandparents)
  - The infant’s attachment to the mother is not instantaneous
    - Infants show little preference for mother during the first few months (e.g., can be given to babysitters with little trouble)
    - However, by about 6-8 months, the child develops a deep preference for the mother and will often protest when separated
      - This is the first indication of separation anxiety (emotional distress seen in many infants when they are separated from people with whom they have formed an attachment)

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Early Emotional Development: Attachment

- Why do infants form a special attachment to their mothers?
- Behaviorists argued that it was due to the mother being associated with the reinforcement of being fed
- However, Harry Harlow’s (1958, 1959) famous studies of attachment in rhesus monkeys called this into question
  - Raised with a wire mother and a terrycloth mother
  - Half were fed from a bottle attached to the wire mother and half from the terrycloth mother
  - When babies were frightened by a strange toy, they ran to the terrycloth mother (regardless of which mother fed them)
Early Emotional Development: Attachment

- Bowlby (1969) believed that there must be a biological basis for attachment
  - Infants are programmed to emit behavior (smiling, cooing, clinging, etc.) that triggers affectionate, protective responses from adults
  - Adults are programmed to respond with love, warmth, and protection
  - These behaviors are adaptive for promoting children’s survival

- Ainsworth (1979) used the strange situation to understand attachment types
  - Secure: use mother as a secure base to explore the world
    - Comfortable with mother present, becomes upset when she leaves, but quickly calmed by return
  - Anxious-ambivalent: appears anxious even when mother is near
    - Excessive protest when separated but not calmed by return
  - Avoidant: seek little contact with mother and not visibly distressed by her departure
  - Disorganized-disoriented (added later): children are confused about whether to approach or avoid mother; especially insecure
Attachment Process

- Is the attachment figure sufficiently near, attentive, responsive, approving?
  - Yes: Secure attachment. Child tends to feel security, love, and confidence.
  - No: Continue with steps.
- Anxious-ambivalent attachment child tends to engage in visual checking, signaling to reestablish contact, calling, pleading, moving to reestablish contact clinging.
- Fear and anxiety lead to Defensiveness.
- Avoidant attachment child tends to maintain proximity while avoiding close contact.

Stage Theories of Development: Personality

- **Stage** is a developmental period during which characteristic patterns of behavior are exhibited and certain capacities are established.
- **Stage theories** have three components:
  - Progress through stages in order
  - Progress through stages related to age
  - Major discontinuities in development

Erik Erikson (1963)

- Eight stages spanning the life span
- Psychosocial crises determining balance between opposing polarities in personality

<table>
<thead>
<tr>
<th>Stage</th>
<th>Psychosocial Crisis</th>
<th>Determining Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infancy</td>
<td>Basic Trust vs. Mistrust</td>
<td>Balance between secure attachment and mistrustful attachment.</td>
</tr>
<tr>
<td>Toddler</td>
<td>Autonomy vs. Shame and Doubt</td>
<td>Balance between self-control and self-regulation.</td>
</tr>
<tr>
<td>Pre-school</td>
<td>Initiative vs. Guilt</td>
<td>Balance between initiative and inhibitory behavior.</td>
</tr>
<tr>
<td>Adolescence</td>
<td>Identity vs. Role Confusion</td>
<td>Balance between identity and role confusion.</td>
</tr>
<tr>
<td>Young Adulthood</td>
<td>Intimacy vs. Isolation</td>
<td>Balance between love and loneliness.</td>
</tr>
<tr>
<td>Middle Adulthood</td>
<td>Generativity vs. Stagnation</td>
<td>Balance between caring for others and stagnation.</td>
</tr>
<tr>
<td>Later Adulthood</td>
<td>Ego Integrity vs. Despair</td>
<td>Balance between wisdom and despair.</td>
</tr>
</tbody>
</table>
Cognitive development refers to transitions in youngsters’ patterns of thinking, including reasoning, remembering, and problem solving.

Jean Piaget (1920s-1980s): children actively construct their cognitive world using assimilation and accommodation.

- **Assimilation**: involves interpreting new experiences in terms of existing mental structures.
- **Accommodation**: involves changing existing mental structures to explain new experiences.

Piaget’s model of cognitive development had four stages:

1. **Object permanence** develops when a child recognizes that objects continue to exist even when they are no longer visible.
2. **Irreversibility** is the inability to envision reversing an action.
3. **Centration** is the tendency to focus on just one feature of a problem, neglecting other important aspects.
4. **Egocentrism** in thinking is characterized by a limited ability to share another person’s viewpoint.
Piaget's stage theory

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor/motor period</td>
<td>Preoperational period</td>
<td>Concrete operational period</td>
</tr>
<tr>
<td>Coordination of sensory input and motor responses, development of object permanence</td>
<td>Development of symbolic thought marked by irreversibility, centration, and equilibration</td>
<td>Mental operations applied to concrete events; mastery of conservation, hierarchical classification</td>
</tr>
<tr>
<td>Birth to 2 years</td>
<td>2 to 7 years</td>
<td>7 to 11 years</td>
</tr>
</tbody>
</table>

Piaget's conservation task

**Step 1**
The child agrees that breakers A and B contain the same amount of water.

**Step 2**
The child observes as the water from beaker B is poured into beaker C, which is shaped differently.

**Step 3**
The child is asked: "Do breakers A and C contain the same amount of water?"

<table>
<thead>
<tr>
<th>Typical tasks used to measure conservation</th>
<th>Trial of age, accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation of number</td>
<td>3-5</td>
</tr>
<tr>
<td>The numbered stones are shown to the child, who agrees that there are the same number of stones.</td>
<td>3-5</td>
</tr>
<tr>
<td>One row is lengthened, and the child is asked whether one row has more stones.</td>
<td>0-5</td>
</tr>
<tr>
<td>Conservation of mass</td>
<td>3-5</td>
</tr>
<tr>
<td>The child is shown two bowls of the same weight.</td>
<td>3-5</td>
</tr>
<tr>
<td>The ropes are changed so that one bowl is longer and wider, and the child is asked if there is still the same amount of rocks.</td>
<td>3-5</td>
</tr>
<tr>
<td>Conservation of length</td>
<td>3-5</td>
</tr>
<tr>
<td>The child is shown two rods, aligned with each other on the same length.</td>
<td>3-5</td>
</tr>
<tr>
<td>After moving one stick to the left weight, the experimenter asks the child whether the sticks are of equal length.</td>
<td>3-5</td>
</tr>
<tr>
<td>Conservation of area</td>
<td>3-5</td>
</tr>
<tr>
<td>Two identical sets of cardboard have wooden blocks placed on each. The child chooses the set that contains the same amount of space, without seeing piece of cardboard.</td>
<td>3-5</td>
</tr>
<tr>
<td>The experimenter shows the child how one of the cardboard and paper moves the child whether the two groups have the same amount of unoccupied area.</td>
<td>3-5</td>
</tr>
</tbody>
</table>
Piaget’s stage theory

Vygotsky’s Theory: The Importance of Being There

- Vygotsky stressed the importance of social interactions with other people (especially other children or adults with greater skill)
- **Scaffolding** is a process in which a more skilled learner gives help to a less skilled learner, reducing the amount of help as the less skilled learner becomes more capable
- **Zone of proximal development** is the difference between what a child can do alone (e.g., 4th grade math problems) and what he can do with the help of a teacher (e.g., 6th grade math problems)
  - This leads to a different way of thinking about intelligence

Language Development

- Children appear to have an innate capacity to learn language
- **Receptive-productive lag** refers to the fact that infants appear to understand language more readily than they can produce it
- Stages of language development
  - **Cooing** (around 2 months): make vowel-like sounds
  - **Babbling** (around 6 months): add consonant sounds to the vowels and sounds closer to real speech
  - **One-Word Speech** (around 1 year): begin to say actual words which are often nouns
    - **Holophrase**: use of one word for a phrase (e.g., “Milk!” means “I want milk”)
  - **Telegraphic speech** (around 18 months): string words together to make short sentences (e.g., “Mommy go”)
  - **Whole sentences** (continues to develop until age 6 or so)
The Development of Moral Reasoning

- In Europe, a woman was near death from cancer. One drug might save her, a form of radium that a druggist in the same town had recently discovered. The druggist was charging $2,000, ten times what the drug cost him to make. The sick woman’s husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, “No.” The husband got desperate and broke into the man’s store to steal the drug for his wife.
- Should the husband have done that? Why?

The Development of Moral Reasoning

- Kohlberg (1976) wanted to know how we develop our sense of right and wrong
- Focused on reasoning as opposed to behavior
- Presented moral dilemmas to individuals across the life span

<table>
<thead>
<tr>
<th>Kohlberg's Three Levels of Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRINCIPALITY</strong></td>
</tr>
<tr>
<td>Rational</td>
</tr>
<tr>
<td>Agent-Beatitude</td>
</tr>
<tr>
<td>Rationalized morality (approx. age 10-12 years)</td>
</tr>
<tr>
<td>“What’s good for me is good, right?”</td>
</tr>
</tbody>
</table>

Adolescence: Physiological Changes

- **Puberty** is the stage during which sexual functions reach maturity; marks the beginning of adolescence
  - **Primary sex characteristics**: necessary for reproduction
    - Menarche: first menstruation (12-13 years)
    - Spermarche: first occurrence of ejaculation (13-14 years)
  - Begins earlier than in the past; highly variable
- **Secondary sex characteristics**: physical features that distinguish males from females but that are not essential for reproduction
- **Maturation**: early or late maturation may lead to problems
  - Example: Females who develop early tend to have sex earlier and more unwanted pregnancies
The Expanse of Adulthood

- **Personality development**
  - Personality is characterized by both stability and change (i.e., percentile scores are consistent)
  - Only a minority go through midlife crisis
- **Social development**
  - **Marriage**
    - Average age is 27 for men and 25 for women; over 90% eventually marry
  - **Parenthood**
    - Parents exhibit lower marital satisfaction
    - Mothers of infants report the steepest decline in marital satisfaction
    - The more children couples have, the lower their marital satisfaction tends to be

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**Physical development at puberty**

- Physical changes
  - Thinning and graying hair; baldness
  - Increased weight; increased proportion of body fat
  - Sensory decline; reflexes slow; loss of stamina and strength
  - Hormonal changes (e.g., menopause)
- Cognitive changes
  - Intelligence is stable over the life span for most individuals
  - Loss in working memory in late adulthood
  - Speed of cognitive tasks declines in late adulthood
  - Many individuals are healthy, active, and productive in their 70s, 80s, and 90s

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Characteristics of Aging: Cognitive Change

Mean performance

Age in years

Age-related changes in intellectual skills vary according to the specific cognitive ability in question. (Source: Schaie, 1994)

- Inductive reasoning
- Spatial orientation
- Number skills
- Verbal meaning
- Word fluency

Theories of Aging

- **Cellular Clock Theory**: cells have a limited number of times they can reproduce to repair damage
  - E.g., chromosomes appear to shorten each time a cell reproduces
- **Wear-and-Tear Theory**: organs and cells wear out as a result of repeated use and abuse
  - E.g., collagen is an elastic tissue that wears out over time causing wrinkles
- **Free Radical Theory**: a variation of wear-and-tear theory in which free radicals (oxygen molecules with an unstable electron) inflict cellular damage

Stages of Death and Dying

- Elizabeth Kubler-Ross theorized 5 stages of death and dying:
  - **Denial**: people refuse to believe the diagnosis of death
  - **Anger**: people are angry about dying and their feelings of helplessness
  - **Bargaining**: people try to make deals with doctors or supernatural forces to prevent death
  - **Depression**: people feel sad about impending loss
  - **Acceptance**: people accept the inevitability of death