Development

Prenatal, Infancy, and Childhood
Prenatal Development
Conception

- A single sperm cell penetrates the outer coating of the egg and fuses to form one fertilized cell.
Prenatal: Germinal Stage

- **Zygote**: fertilized egg with 100 cells that become increasingly diverse over time
Prenatal: Embryonic Stage

- **Embryo:** At about 14 days the zygote turns into an embryo (a and b)
Prenatal: Fetal Stage

- **Fetus**: At 9 weeks, an embryo turns into a fetus (c & d)
- **Teratogens**: chemicals or viruses that can enter the placenta and harm the developing fetus.
Prenatal Summary

• Prenatal Development
  • Germinal Stage
  • Embryonic Stage
  • Fetal Stage
Infancy & Childhood Development
Outline

- Prenatal Development
- Infancy and Childhood
  - Motor Development
  - Brain Development
  - Cognitive Development
Reflexes

- **Reflex**: Involuntary response to a particular stimulus

- **Purposes**
  - Maintaining oxygen
  - Maintaining body temperature
  - Feeding
Reflexes - Rooting

- **Rooting**: Reflex which helps infants locate food
- Touched on its cheek, a baby opens its mouth and roots for a nipple
- Reflexes video
Motor Development

• Cross-cultural motor development

• Examples
  • Bali
  • Ivory Coast
Development: Summary so far...

- Prenatal Development
- Infancy and Childhood
  - Motor Development
  - Brain Development
  - Cognitive Development
    - Piaget’s Theory
Brain Development

- Neurons – *the bad news*
  - You are born with all the neurons you will ever have
  - As soon as you are born you start to lose neurons
  - By \( \approx \) age 20 you will have lost 90% of your neurons (synaptic pruning)
Brain Development

- Neurons – *the good news*
  - Neurons that you keep become infinitely more complex

![Brain Development Image](At birth, 3 months, 15 months)
Why do babies have big heads?

Because babies have big brains
- 25% of adult brain weight
Brain Development – Age Two

Percentage of Adult Size

- Brain Weight: 100%
- Body Height: 75%
- Body Weight: 25%
Cognitive Development

- **Cognition**: All the mental activities associated with thinking, knowing, remembering, and communicating.
Cognitive Development

- **Schemas**: Concepts or frameworks that organize and interpret information
  - “Mental molds into which we pour our experiences”

- Act as a road map that allows us to make sense of information

- Example:
  - Cow = animal + 4 legs + tail
Cognitive Development

- **Assimilation**
  - Incorporate new experiences into our current understanding (schema)

- Example:
  - Horse as “cow”
Cognitive Development

- **Accommodation**
  - Modify current schema to accommodate new information

- Example:
  - Horse as “horse”
Cognitive Development

- Jean Piaget

- Four stage model
  - Infancy
  - Preschool
  - Childhood
  - Adolescence
Piaget’s Cognitive Development Theory

1. Sensorimotor (birth - 2 years old)
2. Preoperational (2 - 7 years old)
3. Concrete Operational (7 - 11 years old)
4. Formal Operational (adolescence - adulthood)
Piaget - Sensorimotor Stage

- Birth to 2 years old
- Sensory and motor interactions
  - Looking, hearing, touching, mouthing, grasping
Piaget - Sensorimotor Stage

- Why does peek-a-boo work?

- **Object Permanence**: Awareness that objects exist when we do not perceive them
At 8 months of age what is out of sight is not out of mind.
Piaget - Preoperational Stage

- Ages 2-6
- Communication with words and images (language development)
- Egocentrism
  - Why does the sun shine?
  - Why is there snow?
  - Why is the grass green?
Piaget - Preoperational Stage

- **Theory of Mind:** an understanding, albeit limited, of how others think
Theory of Mind:
Taking the Perspective of Others

Length: 1:40

Source: “Will to Win”, Human Instinct (BBC Motion Gallery)
Piaget - Concrete Operational Stage

- 7-11 years

- **Can** think logically, but only about concrete things (e.g., conservation problems)

- **Cannot** think logically about ethics, death, spirituality, the future, meaning, etc.

Abigail Breslin, Age 10
Piaget – Formal Operational Stage

- 12ish – death
- Able to engage in abstract thought
- Development of morals

Justin Bieber, Age 16
Adolescence & Adulthood
Adolescence
Outline

Adolescence

• Physical development
  – Puberty
• Brain development
• Cognitive development
  – Morality
• Identity development
Adolescence

- Transition period from childhood to adulthood
- Begins at puberty
  - Girls: age 11
  - Boys: age 13
Puberty

- Period of physical and sexual maturation
- Surge of hormones causes 2-yr period of growth
- Development of 1° & 2° sex characteristics
Primary Sex Characteristics

- Reproductive organs
- External genitalia
Secondary Sex Characteristics

- Non-reproductive traits
  - Girls: breasts, hips
  - Boys: facial hair, deepened voice
Brain Development

- Frontal lobe vs. limbic system development

- **Adol Equation:**
  
  Limbic System
  + hormonal surge
  (- frontal lobes)

  = Occasional impulsiveness, risky behaviors, & emotional storms
Cognitive Development

- Egocentrism revisited
- New level of social awareness
- Criticize society, parents, and themselves
Identity Development

• Trying out different selves
• Become increasingly independent
• Talk, dress, and act more like peers than parents
• Ethnic identity & sexual orientation identity development
Adolescence: Summary

• Physical development
  – Puberty: sex characteristics

• Brain development
  – Limbic system vs. frontal lobe

• Cognitive development
  – Kohlberg’s Theory of Morality

• Identity development
Adulthood
Adulthood: Outline

• Physical and sensory abilities

• Cognitive abilities
  – Intelligence
  – Memory

• Social functioning
Adulthood

• Begins sometime after a person’s mid-20’s

• Stages?
  – Early adulthood
  – Mid-adulthood
  – Late adulthood
Physical and Sensory Abilities

Early Adulthood

- Physical performance peaks in early 20’s
  - Muscular strength
  - Reaction time
  - Cardiac output

- Sensory acuity also peaks around this time
Physical and Sensory Abilities

Mid-adulthood

- Physical declines accelerate
- ~ age 50
  - Women: Menopause
    - Ending of the menstrual cycle
    - Typically a smooth transition
  - Men: decreased levels of hormones & fertility
- Most men and women remain capable of satisfying sexual activity
Physical and Sensory Abilities

Late Adulthood

• ~ age 70
  – Sensory decline
    • Hearing, distance perception, sense of smell
  – Physical decline
    • Muscle strength, reaction time, stamina

• ~ age 80
  – Slowed neural processes
  – Weakened immune system
Cognitive Abilities

• Intelligence
• Memory
Intelligence

• Vocabulary and general knowledge *increase* with age

• **Crystallized Intelligence**
  – Accumulated knowledge and skills; vocabulary
  – Increases through mid adulthood

• **Fluid Intelligence**
  – Ability to reason quickly and abstractly
  – Slowly declines through mid adulthood
  – Quicker decline in late adulthood
Verbal Memory

- **Recognition Memory**
  - Ability to recognize words/info
  - Does not decline with age

- **Recall Memory**
  - Ability to produce words/info from memory
  - Declines with age
  - Meaningful info (e.g., past events) recalled better than meaningless info

Example: recognize face but can’t recall name
Memory

- **Procedural Memory**
  - Ability to learn and remember skills
  - Declines less than verbal recall
Social Functioning

• Relationships
  – More enjoyment
  – More stability
  – More importance

• Midlife crisis?
  – Little to no research support
Rates of Emotionality

Females

Males

No early 40s emotional crisis

Age in Years

24%

16%

8%

0%

33 36 39 42 45 48 51 54
Well-Being and Life Satisfaction

- Well-being and satisfaction stable across life span

- Positive feelings grow slightly after mid-adulthood (and negative feelings subside)
Gender and Aging

• Older adults (65+) are mostly women

• Caretaking

• Retirement
  – Poverty in old age higher in women