What order do the following happen in the developing fetus?

- 1. Fingernails develop
- 2. Hands are able to grasp
- 3. Nervous system begins to form
- 4. Eyes able to function properly
- 5. Embryo reaches 1.5 inches in length
- 6. Sexual organs develop
- 7. Digestive organs able to function

Answer:

- Nervous system begins to form: wk 1-2
- Embryo reaches 1.5 inches in length: wk 5-8
- Sexual organs develop: 3rd month
- Arms able to move: 4th month
- Fingernails develop: 5th month
- Eyes able to function properly: 7th month
- Digestive organs able to function: 8th month

In general

- The rule is that parts develop first
- Function of the parts develops later

At conception

- The sperm fuses with the egg
- The outside layer of the egg hardens
  - Prevents a second sperm from fusing with the egg
Stages of Prenatal Development

- Stage 1: Germinal Stage: conception - 2 weeks
  - Conception
  - Fertilization of sperm causes the hardening of the membrane of the egg, so that no other sperm can penetrate
  - Zygote
    - Upon conception, the cell rapidly divides

What happens during the germinal stage?

- Differentiation: the specialization of cells to be a certain type
- During the germinal stage, the beginning steps of differentiation occur
  - 3 layers develop
    - Layer 1: Forms skin and nervous tissue
    - Layer 2: Forms connective tissue (blood vessels, muscles)
    - Layer 3: Forms internal organs

Other stages of prenatal development

- Stage 2: Embryonic Stage: 2 – 8 weeks
  - Zygote attaches to uterine wall
  - Further differentiation begins
    - Brain, organs, and muscle begin to develop
    - Brain and Spinal cord begin to develop
  - Placenta fully develops
    - Produces pregnancy hormones
    - Filters out harmful substances
    - Cannot filter out all harmful substances

What happens when an unwanted substance crosses the placenta?

- Fetal Alcohol Syndrome
  - Caused by heavy drinking within the first 12 weeks
  - Physical traits: flattened nose, short eye openings, and short height
  - Psychological deficits such as retardation and hyperactivity

What if I don’t drink heavily?

- Prenatal Exposure to Alcohol (aka PEA)
  - Caused by moderate drinking
  - 3x more common than FAS
  - Deficits in cognitive tasks, academic skills, and fine motor speed and coordination

Final stage of prenatal development

- Stage 3: Fetal Stage: 8 weeks – birth
  - Fetus grows
  - Movement develops
  - Body organs become functional
What exactly does the baby have at birth?
- Reflexes
  - Rooting: touch cheek, baby turns head to suck
  - Babinski: fanning of the toes when the bottom of the foot is stroked
  - Stepping: lifting the baby upward with feet near the ground leads to the baby making a stepping motion
  - Grasping: finger in palm of the baby’s hand, the baby grasps the finger
- Still exist, are inhibited early (by about 1 year) on in life

Wire monkeys provided food and drink
Cloth monkeys did not have food and drink

What happened with the baby monkeys?
- Monkeys preferred the cloth monkeys to the wire monkeys
- Babies would hang from the cloth mothers while eating, but not really touching the wire mothers
- Bodily contact very important for a developing infant

What did Harlow do?
- Examined two aspects of mother baby relationships
  - Providing basic needs, like food and drink
  - Providing bodily contact
  - Raised monkeys with cloth monkeys and with wire monkeys
  - Wire monkeys provided food and drink
  - Cloth monkeys did not have food and drink capabilities

What order do the following happen in the developing infant?
- 1. Visually recognizes mother’s face
- 2. Smiles at any face
- 3. Expects to be fed, dressed and bathed (knows the routine)
- 4. Crawls
- 5. Able to distinguish between different smells and sounds

What is the most important development in the developing infant?

What did Harlow do?
- Examined two aspects of mother baby relationships
- Worked in the 1950’s and 60’s with monkeys
- Scientific question: What is the most important aspect of proper child development?

Attachment Theory
- Attachment: an emotional bond between the infant and their primary caregiver
- Harry Harlow
- Answer
  - Able to distinguish between different smells and sounds (birth)
  - Smiles at any face (2 months)
  - Visually recognizes mother’s face (4-6 months)
  - Expects to be fed, dressed and bathed (knows the routine) (6 months)
  - Crawls (7-9 months)
  - Infants develop quite quickly!!!
Attachment Theory in Humans

- Mary Ainsworth
- The Strange Situation
- 1 yr old enters playroom filled with toys and mother leaves for a short period
- Does the child experience separation anxiety?

What did Ainsworth find?
- Found four typical responses
  - Secure attachment - 65%
    - explore, sometimes cry but are easily soothed when mother returns
  - Avoidant attachment - 20%
    - show little distress when mother leaves and ignores her when she returns
  - Resistant attachment - 10%
    - experience extreme distress when mother is gone, not comforted when mother returns
  - Disorganized/disoriented attachment - 5%
    - Are quiet but unable to cope or interact, show lack of understanding when mother returns

Cognitive Development

- Piaget's Stages
  - Sensorimotor: experience through senses and actions
    - Birth to 2 years
      - Object permanence
      - Stranger anxiety
  - Preoperational: representing things with words and images; intuitive reasoning
    - 2-6 years
      - Lack of conservation
      - Egocentrism
      - Develops Theory of mind

Object Permanence

1. Objects placed in case.
2. Screen comes up.
3. Object is removed.
4. Possible outcome: Screen drops, revealing one object.

Piaget continued

Conservation
**Theory of Mind**
- Acknowledging that others have mental states
- These thoughts have consequences as well

**Concrete Operational**
- Thinking logically
- 7-11 years
  - Develop idea of conservation
  - Develop ability to perform mathematical transformations
    - $531 + 682 = 1213$
    - $1213 - 682 = ???$

**Formal Operational**
- Abstract reasoning
- 12 and older

**Parenting Styles**
- Authoritarian
  - Impose rules and expect obedience
  - “Because I said so”
- Permissive
  - Submit to children’s desires, make few demands, little punishment
- Authoritative
  - Both demanding and responsive
  - Encourage discussion and reasoning

**Critical Periods**
- Critical Period
  - an optimal period shortly after birth when an organism’s exposure to certain stimuli or experiences produces proper development
    - Language, imprinting
- Imprinting
  - forming attachments during a critical period very early in life

**Which technique is best?**
- Authoritarian?
  - Less social skills and self-esteem
- Permissive?
  - More aggressive and immature
- Authoritative?
  - Highest self-esteem, self-reliance, social competence
Adolescence

Physical Development
- Begins with puberty
  - When a person becomes capable of reproducing
  - Primary sexual characteristics
    - Reproductive organs and genitalia develop fully
  - Secondary sexual characteristics
    - Nonreproductive traits develop

Development of Morality: Kohlberg

- As moral development progresses, the focus of concern moves from the self to the wider social world

Social Development: Adolescence

- Identity
  - one’s sense of self
  - the adolescent’s task is to solidify a sense of self by testing and integrating various roles
- Intimacy
  - the ability to form close, loving relationships
  - a primary developmental task in late adolescence and early adulthood

Parental relationships change

Adulthood

- How well do things hold up?
  - Physical abilities decline with age
  - More susceptible to short-term illness
  - 3/4 of 65 and over live in elderly facilities
  - Brain neurons begin to die
  - Memory declines with old age
  - Life satisfaction peaks in 50’s and then declines
  - Women: menopause in the 50’s

Physical Development

- Declining senses and abilities
- Alzheimer’s Disease

Risk of dementia increases in later years

Percent with dementia
Cognitive Development

- Cognitive Decline
- Senses decline as well
  - Eyesight
  - Smell
  - Hearing

Social Development

At what age are people most satisfied with life?

Varies around spouses death; otherwise, very consistent across age.