Chapter 4
INFANCY: THE FIRST YEAR OF LIFE
Read page 134 in your textbook. Discuss with a few people.

1. What is a typical day of an infant?
2. What are some differences and similarities in the way that you were raised in comparison to Makori?
3. Do you think that Makori is being raised appropriately?
Infants grow at faster rate first year than at any other time.

Weight doubles in first 5 months and triples by end of first year.

Babies appear plump
- Will lose baby fat in first year
- Height is more uneven in growth than weight

LO 4.1 Gains in Height and Weight
Infancy: Growth and Change

Developmental Pattern

- Two key growth patterns
  - **Cephalocaudal principle** (head to tail)
    - Growth begins at the head then proceeds down
      - Head is ¼ of the body length
      - Infants are able to hold their heads up before they can control their legs.
    - **Proximodistal principle** (near to far)
      - Trunk and arms grow faster than hands and fingers
      - Infants can control hands before they can control their fingers.

Figure 4.1 The Cephalocaudal Principle
Growth begins with the head and then continues downward to the rest of the body.
Infancy: Growth and Change
Teeth and Teething

• First tooth appears between 5-9 months
• Teething-first teeth break through skin
  ▪ Symptoms include:
    – Saliva production
    – Coughing
    – Rash
    – Grabbing things to put in mouth
• Relief can be found in teething ring or cold wet washcloth

LO 4.1 Gains in Height and Weight
At birth, brain is 25% the size of adult’s brain.
By age 2 it will be 70% of adult size.
Growth in brain due to:
- **Exuberance** - dendritic connections multiply
- **Myelination** - axons become encased in a myelin sheath

Synaptic pruning increases efficiency.
1. Dendrite connections between neurons increases during infancy

2. Myelination increases the speed of communication between neurons
Infancy: Growth and Change

Brain Development

• Brain divided into three major regions
  ▪ Hindbrain --- Midbrain ---- Forebrain
  Hindbrain & Midbrain mature early and perform basic biological functions like keep your lungs breathing
  ▪ Forebrain
A. Limbic system
  1. Hypothalamus controls hunger, thirst, body temp
  2. Thalamus receives/transfers sensory info from body to the brain
  3. Hippocampus - memory

LO 4.2 Brain Structures and Changes
B. Cerebral cortex

divided up between left and right hemispheres that communicative w/each other

**Lateralization** - specialization of 2 hemispheres

- Left side: language and interpreting information in steps
- Right side: spatial reasoning and interpreting information as a whole
• Each hemisphere (side) has 4 regions
  1. occipital- visual
  2. temporal-auditory
  3. parietal- bodily sensations
  4. frontal- language, planning, making decisions
Figure 4.2 Lobes of the Brain What are the distinct functions of each lobe?
Infancy: Growth and Change

Infant Brain Plasticity

• Brain is high in plasticity
• Plasticity—degree to which development can be influenced by environment.
• Adaptable to overcome damage
• Environmental deprivation can have permanent effects
• Example seen in Romanian Adoptions

LO 4.2 Brain Structures and Changes
Figure 4.3  Romanian Adoptees’ Cognitive Abilities, by Age of Adoption  The later the age of adoption, the lower their cognitive abilities. Source: Based on Beckett et al. (2006)
Infancy: Growth and Change

Sleep Changes

- Neonates sleep 16-17 hours total
- In REM sleep 50% of the time
- 3-4 months sleep 6-7 hours at night.
- 6 months cultural patterns influence sleep patterns
  - American 14 hours
  - Kipsigis 12 hours- strapped on to mom
  - Dutch 16 hours- rest & early bedtime
Infancy: Growth and Development

Sleep Changes

• Early infancy is highest risk period for Sudden Infant Death Syndrome (SIDS)
  ▪ Leading cause of death for infants 1-12 months in developed countries
  ▪ 2-4 months highest risk
  ▪ Ethnic variations
    – Asians are less at risk; higher rates for African Americans and Native Americans
  ▪ Poorer prenatal care could be a factor

LO 4.3 Infant Sleep Changes
Sudden Infant Death Syndrome

- Risk factors:
  - Sleeping on stomach instead of back
  - Low birth weight and APGAR score
  - Smoking
  - Soft bedding

- Why aren’t these referred to as causes?
Theory on SIDS

• At 2-4 months of age
• Transition form reflex behavior to intentional behavior
• when breathing is blocked reflexes cause baby to shake head, bring hands to face to move blockage
• Some babies are not able to intentionally do this once reflex disappears
Infancy: Growth and Development

Sudden Infant Death Syndrome

• Campaign to reduce SIDS includes a Back to sleep campaign
• Campaign has caused reduction of SIDS worldwide

LO 4.3 Infant Sleep Changes
Infancy: Growth and Development

Sudden Infant Death Syndrome

Figure 4.4 The Impact of Reduction Campaigns on Sids Rates

Why did rates of SIDS decline so much over this period?
Infancy: Growth and Change
Co-Sleeping

• Authorities in US warn against co-sleeping
  ▪ Why might this be?

• Developing countries view it as normal
  ▪ Believed to protect infants and to make breast feeding easier.

• How does this difference reflect different cultural beliefs?

LO 4.3 Infant Sleep Changes
Benefits of Cosleeping

• More self reliant
• More socially independent
• Helps w/prevention of SIDS
  1. sleeping on hard surfaces
  2. breastfeeding more=up more at night
  3. infants lay on their backs to breastfeed
Infant Health: Nutritional Needs

• Infants need a high fat diet which breast milk provides

• About 6 months may introduce solid foods
  ▪ Cultural variations in food introduced
  ▪ West-rice cereal
  ▪ Traditional cultures-mashed, pre-chewed, pureed

LO 4.4 Changes in Infants’ Nutritional Needs
Physical Development

Infant Health: Nutritional Needs

• Malnutrition during this time can be severe and enduring
• Can be caused by inability of mother to breastfeed
• Can cause marasmus- wasting away of body tissue due to lack of nutrients.
Physical Development

Infant Health: Infant Mortality

• Most infant mortality is neonatal mortality

• Top sources of infant mortality include
  ▪ Malnutrition
  ▪ Malaria
  ▪ Diarrhea - oral rehydration therapy

• Vaccinations have been beneficial

LO 4.5 Causes and Prevention of Infant Mortality
Map 4.1  Infant Mortality Rates Worldwide  How do infant mortality rates compare with neonatal mortality rates (as shown in Map 3.2)? What are some potential causes of the high infant mortality rates in developing countries?
Traditional cultures:
• Awareness of infant’s vulnerabilities influenced parenting practices
• What practices were developed to help infants avoid harm?
• Magical practices employed when medical remedies are not trusted or available
Physical Development
Motor and Sensory Development

• Gross motor development includes whole body movements like crawling
• Children tend to develop gross motor skills in sequence
• Sequence has genetic beginnings with environmental influences

LO 4.6 Gross and Fine Motor Development
Table 4.1  Milestones of Gross Motor Development in Infancy  Age ranges provided are for 90% of American infants. Based on: Bayley (2005)

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Average age</th>
<th>Age range*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding head up unsupported</td>
<td>6 weeks</td>
<td>3 weeks–4 months</td>
</tr>
<tr>
<td>Rolling over</td>
<td>4½ months</td>
<td>2–7 months</td>
</tr>
<tr>
<td>Sitting without support</td>
<td>7 months</td>
<td>5–9 months</td>
</tr>
<tr>
<td>Crawling</td>
<td>7 months</td>
<td>5–11 months</td>
</tr>
<tr>
<td>Standing</td>
<td>11 months</td>
<td>5–12 months</td>
</tr>
<tr>
<td>Walking with support (cruising)</td>
<td>11½ months</td>
<td>7–12 months</td>
</tr>
<tr>
<td>Walking</td>
<td>12 months</td>
<td>9–17 months</td>
</tr>
</tbody>
</table>

*Age ranges provided are for 90% of American infants.

Based on: Bayley (2005).
• Cultural practices emphasize the role of environment on gross motor skills
• Balance, posture, whole body movements.
• Swaddling is common practice which can be restrictive to infants
• Other cultures encourage gross motor skills
• Long-term effects tend to minimally impact gross motor development

LO 4.6 Gross and Fine Motor Development
Physical Development
Motor and Sensory Development

- **Fine motor skills** are the more precise motor abilities.
- Major accomplishments include reaching and grasping.
- By 9-12 mos., learn pincer grasp that allows feeding of themselves.

LO 4.6 Gross and Fine Motor Development
Physical Development
Motor and Sensory Development

• **Depth perception** is influenced by development of **binocular vision** at 2-3 months of age
  - Important when children become mobile

• **Intermodal perception**
  - One-month-olds match things in mouth to things they touch
  - By eight months can match unfamiliar faces with correct voice and gender

LO 4.7 Depth Perception and Intermodal Perception
Cognitive Development
Before Piaget people thought that...

- Children were passive recipients of information
- Children memorized facts
- Children did not have logical and regular ways of thinking
Piaget
Cognitive Development
1896-1980
Constructivist view
People interpret their current experiences based on past knowledge and experiences

Children build on what they already know
children are active thinkers

children’s thinking is consistent, even when it’s incorrect

ex: children of the same age give the same wrong answers.
Scheme: organized pattern of action or thought
building block for cognition; a starting point
built, modified, and reorganized over time
new experiences filter through existing schema
interaction with environment essential
Organized pattern of physical actions
infant reaching to grasp an object

Mental action
high school student thinking about how to solve an algebra problem
Interacting with the Environment

A. Organization
B. Adaptation
C. Reflective abstraction
Organization- tendency to combine separate elements into a system

Ex: Cell-tissue-organs-organ systems-body

People try to organize their knowledge all the time.

Thinking about something that didn’t make sense even when you don’t want to.

People will either organize thinking in a correct or incorrect way.
Adaptation - changing thinking or environment in order to make sense of environment

Assimilation - bringing new objects or information into a scheme that already exists

Accommodation - change old schemes or creating new ones to better fit new information

Inconsistencies or confusion cause cognitive disequilibrium
**Figure 5.6 • Adaptation and Equilibration**  In the cycle of adaptation and equilibration, a new experience is first assimilated into an existing scheme. If it does not fit properly, cognitive disequilibrium results. Accommodating (adjusting) the scheme brings the child to cognitive equilibrium until a new assimilation challenges the scheme again.

1. **Lily sees her first cow.** "Look Mommy, doggies."
2. "But it has udders and gives milk, and dogs aren’t that large."
3. Change "dog scheme": Dogs are smaller and don’t give milk.
4. Add new "cow scheme": Cows are larger and give milk.
5. Lily properly identifies dogs and cows.
6. Then Lily sees an elephant...
**Reflective Abstraction**

awareness of something in the environment
reflection on it
change of thinking if needed

Ex: Lily could not have accommodated her understanding of dogs had she not been able to notice that cows were larger than dogs, and reflected and thought about it.
People’s continual organization and adaptation leads to periodic reorganizations that result in the 4 stages of cognitive development.
<table>
<thead>
<tr>
<th>COGNITIVE STAGE</th>
<th>LIMITATIONS</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
</table>
| Sensorimotor Thought: Birth to 2 years  | • No representational thought; infants cannot form internal symbols early in this stage.  
• Object permanence is lacking early in this stage. | • Representational, symbolic thought gradually emerges as the stage progresses.  
• Object permanence develops as the stage progresses. |
| Preoperational Thought: 2–7 years       | • Intuitive logic leads to egocentrism, animism, artificialism, and an inability to use more objective forms of logic.  
• Schemes are not reversible, not operational.  
• Children fail conservation tasks because of centration, focus on static endpoints, and lack of reversibility. | • Flourishing mental representations and symbols are seen in language, art, and play. |
| Concrete Operational Thought: 7–12 years| • Logic is limited to concrete, tangible materials and experiences.          | • Logical thought is more objective, allows skills such as class inclusion and transitivity.  
• Schemes can be reversible, operational.  
• Children pass conservation problems due to decentration, focus on dynamic transformations, reversibility. |
| Formal Operational Thought: 12 years and up| • Adolescent egocentrism is seen in the imaginary audience and personal fable. | • Hypothetico-deductive reasoning emerges.  
• Abstract thought emerges. |
Sensorimotor Stage
all experiences involve sensory input and physical actions

Sensory: see, smell, taste, touch, hear

Motor: sucking, reaching, grasping

Infant learns through sensorimotor activity.
Piaget’s Theory of Cognitive Development

• Sensorimotor Substages:
  ▪ (0-1 month) Simple reflexes
  ▪ (1-4 months) First habits & primary circular reactions
  ▪ (4-8 months) Secondary circular reactions
  ▪ (8-12 months) Coordination of secondary schemes

LO 4.8 Sensorimotor Substages
Object Permanence
LO 4.9 Object Permanence

• Object permanence - objects continue to exist even when not aware of them
  ▪ Under 4 months no understanding
  ▪ 4-8 months - uncertainty about existence of object when dropped (babies look only briefly)
  ▪ 8-12 months - Developing awareness
    – Will still make A not B error
Assessing Infant Development
Pg 160

- four subscale assessment tool
  - Motor skills (sitting)
  - Language Use
  - Adaptive behavior (exploring new object)
  - Personal-Social behavior (using a spoon)
- Development Quotient (DQ) 100 = median score
• Gesell wanted to assess current ability and predict future development.
• Gasell's assessment is not predictive of later IQ or school performance
• His scale is no longer used
• Nancy Bayley used Gesell's approach and developed the Bayley Scale of Infant Development
Nancy Bayley produced a contemporary measure of infant development.

- **3 main scales:**
  - **Cognitive:** attention & exploration
  - **Language:** use and understanding of language
  - **Motor:** fine & gross motor skills

- Low reliability = score changes in short time.
- Not predictive of later IQ or school performance.
- Used as a screening tool for infants that score very low.
Assessing Infant Development

LO 4.13 Assessing Infant Development

• Research using habituation-dishabituation technique shows that infants look longer at new stimuli, and that they see difference in color and shape.

  habituation- tendency of infants to reduce response to stimuli that are shown repeatedly.

  dishabituation- increase in infant’s response to a new stimulus

• Infants with short habituation time, process information more quickly

• Longitudinal studies have shown a connection between habituation time and IQ and higher achievement
Can listening to Mozart enhance a baby's cognitive development?
Can watching educational shows like “Baby Einstein” make babies smarter?
• In 1990 a study was published that listening to Mozart enhanced cognitive function.
• Study was conducted with university students not babies
• Effect lasted only 10 minutes
Media Stimulation
LO 4.14 Educational Media

• “Mozart” effect led to creation of educational videos and DVDs
  ▪ Most studies have not supported the effectiveness of education CDs and videos

• One study found that for every hour of educational DVDs viewed per day showed that babies understood 8-16 fewer words than babies who did not view the DVDs.
What can parents do to help enhance an infant's cognitive development?
• Talk to them
• Read to them
• Respond to them
• Be patient with them
### TABLE 4.2 Milestones of Infant Language Development

<table>
<thead>
<tr>
<th>Age</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months</td>
<td>Cooing (preverbal and gurgling sounds)</td>
</tr>
<tr>
<td>4–10 months</td>
<td>Babbling (repetitive consonant–vowel combinations)</td>
</tr>
<tr>
<td>8–10 months</td>
<td>First gestures (such as “bye-bye”)</td>
</tr>
<tr>
<td>10–12 months</td>
<td>Comprehension of words and simple sentences</td>
</tr>
<tr>
<td>12 months</td>
<td>First spoken word</td>
</tr>
</tbody>
</table>

**Note:** For each milestone there is a normal range, and babies who are somewhat later in reaching the milestones may nevertheless have normal language development.

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**Table 4.2 Milestones of Infant Language Development**
• 4 month old infant can understand his/her name
• By age 1 they can speak a few words but can understand about 50 words
• Language comprehension is stronger than language production
Many cultures use infant-directed speech to speak to infants:
- Higher Pitch with simplified grammar
- Exaggerated intonation (rise/fall of speech) and phrases repeated

Infants seem to prefer this speech and is common in many cultures.

Why do infants prefer ID speech?
1. more emotionally charged than other speech
2. exaggeration and repetition enables infants to get an idea of the meaning of words
3. separates speech into clear words and phrases
Language Development

LO 4.16 Cultural Variation in Stimulating Language

• Some cultures do not speak to infants in any special way like the Gusii & Ifaluk

• No consistent negative effects in cultures with no IDS Why?

• Infants are apart of a language rich environment all day.

• Many other children and adults around infants who are speaking
Emotional and Social Development
• In 1956 Thomas & Chess began a longitudinal study on temperament.
• Wanted to see how an infant's innate tendencies would be shaped into personality through childhood and adolescents.
• Able to show that temperament in infancy predicted later development in some respects.
Temperament

LO 4.17 Infant Temperament

• Temperament - innate tendencies that are the raw material of personality
  ▪ Composed of activity level, adaptability, intensity of reactions and quality of mood
  ▪ Classified as:
    – Easy = 40% of the sample
    – Difficult = 10% of the sample
    – Slow to warm up = 15% of the sample

How did they rate the remainder 35% of the babies?

• Current research adds self-regulation or sociability
<table>
<thead>
<tr>
<th>Quality</th>
<th>Thomas and Chess Description</th>
<th>Quality</th>
<th>Rothbart Description</th>
<th>Quality</th>
<th>Buss and Plomin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity level</td>
<td>Ratio of active time to inactive time</td>
<td>Activity level</td>
<td>Frequency and intensity of gross motor activity</td>
<td>Activity</td>
<td>Overall activity level</td>
</tr>
<tr>
<td>Attention span</td>
<td>Length of time devoted to an activity before moving on to the next</td>
<td>Attention span/persistence</td>
<td>Duration of attention to a single activity</td>
<td>Attention span</td>
<td>Duration of attention to a single activity</td>
</tr>
<tr>
<td>Intensity of reaction</td>
<td>Emotional expressiveness, e.g., crying, laughing</td>
<td>Fearful distress</td>
<td>Fear/distress in response to novel or intense stimulation</td>
<td>Emotionality</td>
<td>Emotional reactivity</td>
</tr>
<tr>
<td>Rhythmicity</td>
<td>Regularity of physical functions such as feeding and sleeping</td>
<td>Irritable distress</td>
<td>Expression of distress when frustrated</td>
<td>Soothability</td>
<td>Responsiveness to attempts to soothe when distressed</td>
</tr>
<tr>
<td>Distractibility</td>
<td>Extent to which new stimulation stops current behavior, e.g., when crying</td>
<td>Positive affect</td>
<td>Frequency of expression of happiness and other positive emotions</td>
<td>Sociability</td>
<td>Degree of interest in others, positive or negative responses to social Interactions</td>
</tr>
<tr>
<td>Approach/Withdrawal</td>
<td>Response to new object or person</td>
<td>Self-regulation</td>
<td>Ability to suppress an initial response to a situation and execute a more adaptive response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability</td>
<td>Adjustment to changes in routines</td>
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<tr>
<td>Threshold of responsiveness</td>
<td>Stimulation required to evoke a response</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Quality of mood</td>
<td>General level of happy versus unhappy mood</td>
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</tbody>
</table>

• Difficult babies were at high risk for problems in childhood: aggressive behavior, anxiety, social withdrawal

• Slow to warm up babies became sometimes fearful, had academic problems, problems w/peers once they entered school
Goodness of Fit

LO 4.18 Goodness-of-fit

• **Goodness-of-fit** match between temperament and environmental demands
  ▪ Babies with negative temperamental qualities did better with tolerant parents

• Cultures value different traits leading to cultural goodness of fit
  ▪ Asian babies less active and irritable as this is culturally important
  ▪ Shyness is a positive trait
Infant Emotions
LO 4.19 Primary Emotions

- Primary emotions are basic emotions we share with other animals: anger, fear, disgust, surprise, happiness
- Secondary emotions develop later and are called socio-moral emotions: embarrassment, shame, guilt
- Primary emotions- distress, interest and pleasure in first weeks of life
  - Becomes anger, sadness, fear, surprise and happiness
Infant Emotions

LO 4.19 Primary Emotions

- Anger as being separate from crying occurs by 7 months of age
- Sadness is rare unless mothers are depressed
- Fear- by 6 months of age
  - Fear seems to occur with stranger anxiety
- Surprise -about 6 months of age
- Happiness-2 to 3 months
• Emotional contagion - crying in response to hearing another cry
• At first, infants perceive emotions better by hearing than seeing
• Still-face paradigm shows infants quickly learn to expect certain emotional reactions b/c infants react w/distress.
• By 7 months - can match auditory to visual emotions
• By 9-10 months - show social referencing
1. Infants are with their mothers for the early months of life
2. After 6 months, most daily care done by older girls rather than the mother
3. Infants are among many other people in the course of the day

LO 4.21 Infants’ Social Worlds
1. Infants are held or carried almost constantly
2. Fathers are usually remote or absent during first year

LO 4.21 Infants’ Social Worlds
Foundation of Social Development

LO 4.22 Theories of Infants’ Social Development

• Erikson's First stage focuses on trust versus mistrust
• Centers around the emotional and social bond and not the biological bond
• Developing trust in infancy provides foundation for future social development
Foundation of Social Development

LO 4.22 Theories of Infants’ Social Development

• Bowlby’s attachment theory focused on early quality relationships as well
• Focused on primary caregiver being sensitive and responsive
• Origins in evolutionary theory and research on mother-offspring relationships in animals