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Chapter Objectives

After students have completed their study of this chapter, they should be able to:

1. Explain the physical growth and development of the infant brain, especially the cerebral cortex, brain volume, and neurons.
2. Understand the processes of synaptogenesis and myelination.
3. Point out the need for neural pruning.
4. Explain the phenomenon of brain plasticity.
5. Discuss the automatic reflexes of sucking and rooting in newborns.
6. Understand the inherent benefits associated with breastfeeding.
7. Describe the devastating effects of malnutrition and undernutrition in infants and children.
8. List and describe the three main federal programs designed to feed infants (Food Stamp Program; Special Supplemental Nutrition Program for Women, Infants, and Children; and Child and Adult Care Food Program).
9. Explain the important role of crying in infants’ expression of needs.
10. Learn techniques to quiet a crying baby (swaddling, pacifiers, skin-to-skin contact, kangaroo care, whooshing sounds, massage, mobiles, and so on).
11. Describe a newborn’s pattern of consciousness and sleep.
12. Explore ways to help babies learn to self-soothe.
13. Present the pros and cons of co-sleeping.
14. Point out the unpredictable incidences of Sudden Infant Death Syndrome (SIDS) and the importance, as well as the limitations, of the Back to Sleep program.
15. Discuss the functioning level of each of an infant’s five senses immediately after birth up through the first birthday (hearing, smell, taste, touch, and sight).
16. Define the preferential-looking paradigm, habituation, and face perception studies.
17. Describe the infant’s development of depth perception and the research significance of the visual cliff.
18. Explain infant motor development and corresponding milestones.
19. Understand the importance of baby-proofing a home.
20. Describe Piaget’s stage of cognitive development associated with infancy (sensorimotor stage, with circular reactions, primary circular reactions, and secondary circular reactions).
21. Present criticisms of Piaget’s theory.
22. Describe some indicators of social cognition, such as joint attention, in infants.
23. Explain the roots and milestones of speech/language in infants.

Chapter Outline

Opening Vignette

Ask the students to read the vignette silently. You may want to point out that Kim, Elissa’s mother, is worried because her baby doesn’t cry much. New mothers often worry about many things that may be considered normal for their babies.

Here are some typical parental concerns:
• My baby cries a lot. Am I doing something wrong?
• Am I giving my baby enough food?
• Should I wake my baby for a feeding or let her sleep?
• Is my baby sleeping (or awake) too much?
• Is the baby having normal bowel movements?
As babies get a little older, parental concerns shift to thoughts such as:

- Should my baby be smiling more?
- Should my baby be rolling over or sitting up by now?
- Should I pick my baby up when she cries or should I let her cry?
- Am I spoiling my baby?
- Should I be giving my baby food now or just milk/formula?

Engage students in a discussion about the anxieties of being a new parent.

Ask:

- What other fears have you heard new mothers and fathers express?
- What parenting behaviors have you noticed, in new parents, that bother you?
- Do you think we expect too much from new parents?
- Do you think new mothers and fathers have similar fears?
- Do you think a lack of sleep may exaggerate a parent’s anxiety?
- What other things in the environment could promote fears in new parents (i.e., advice from grandparents, friends, questions, news articles, and so on)?

I. Setting the Context

A. The Expanding Brain

*Lecture/Discussion: Features of Brain Development*

In addition to the Brain-Busting facts in Table 3.1, you may also want to add the following information to your lecture/discussion for this section:

- The newborn brain weighs approximately 25 percent of what an adult brain weighs (average adult brain = 2.9–3.1 pounds/average newborn brain = 0.8–0.9 pounds).
- The cortex is made up of a large (3’ × 3’) sheet that is about the thickness of a nickel.
- It is the cortex that gives humans their advanced cognitive abilities, consciousness, language, and the ability to imagine and think about the past and the future.
- At birth humans have, for the most part, all of the neurons they will ever have. They will grow many more synapses, but not new neurons.
- The cortex is divided into lobes, each with its own set of skills. Remember, however, that few human skills are controlled by only one part of the brain. The frontal lobe is the thinking and reasoning part of the brain. The temporal lobe manages hearing and memory. The parietal lobe is related to sensory systems such as taste, pain, and temperature. The occipital lobe is the vision center of the brain.
- Neurons communicate with each other using an electrochemical process.
- The chemicals that the brain uses are called neurotransmitters. Examples of neurotransmitters are serotonin and norepinephrine. Neurotransmitters cross the synaptic gap as a result of an electrical charge in the neuron.
- Scientists currently believe that there are about 350 different neurotransmitters, but they have only identified and named about 75.
- Neurotransmitters do not flow through the brain like the blood flows through the body. They only enter the synapse if the neuron shoots them there with an electrical charge. Then, if the dendrite of the next neuron doesn’t take the neurotransmitter, the original neuron will take it back. So, there are never unused neurotransmitters floating around the brain. An analogy would be tossing one end of a rope to someone standing on a dock in hopes that the person will tie up your boat. It takes energy to toss the rope; the rope won’t throw itself. If the receiving person (on the dock) doesn’t catch the rope, then the rope will come back to you. And the process would repeat until the person catches the rope and secures the boat.
• It is difficult for physicians to control neurotransmitters in people who have been diagnosed with a psychiatric (brain) disorder. There are no tests for what is or isn’t present. We don’t know how much of any neurotransmitter we need.

• Drugs can either encourage or discourage the neurons to discharge and/or retrieve or block the neurotransmitters. Therefore, prescribing psychiatric medication is a trial-and-error process. The physician has to try different medications until he/she discovers the one that addresses the client’s problem.


Video Tool Kit for Human Development: Brain Development Animation: Infants and Toddlers (2 min., 34 sec.)

This animation provides two perspectives of brain development in infants and toddlers. A microscopic view highlights the formation of myelin on the connecting fibers (axons) of neurons. A macroscopic view shows the brain growing in step with the enlargement of the infant’s head.

Classroom Exercise: Demonstration of Brain Development (Synaptogenesis and Pruning)

This simple demonstration illustrates the concept of synaptogenesis—the connections between neurons that form at the synapses—and the pruning of synapses that occur as children develop. The only material you’ll need for this demonstration, in addition to a number of students, is one or more balls of yarn or string.

1. Form groups of 4 to 6 students each, and provide each group with a large ball of yarn or string.

2. Ask groups to stand in a circle. The student holding the ball of yarn or string should think of something that might stimulate brain development in infants (related to emotional attachment, language, music, colors and shapes, and so on). That student should grasp the end strand in the ball of yarn or string, name the stimulus, and then toss the ball to another group member.

3. Continue in the process, with the ball tossed from student to student, as each student holds onto the string end as he or she tosses the ball. After a number of tosses, a spider web pattern will emerge inside the circle.

4. When the spider pattern occurs for most groups, stop; if possible, elicit from students that they have just demonstrated synaptogenesis in that they’ve grown a rich network of connections based on stimuli in early childhood.

5. For the second part of this demonstration, have students reverse the sequence, this time thinking of things that might hinder (or prune away) synaptic connections. As students toss the ball of yarn or string it back to the person it came from, they should wind it up, thereby removing the connections that previously existed.

This demonstration was developed by Heather Holmes-Lonergan, Ph.D., at Metropolitan State College of Denver.

Classroom Exercise: Malfunctioning Neurons Demonstration

You might help students learn about potential problems with neurons and neurotransmitters by playing a game of “telephone.” Have students stand next to their desks. Whisper the following sentence to the student on your far right: “Never eat bubble gum covered entirely in hot pepper sauce.” Then have that student whisper the phrase he/she heard to the student behind him/her, and so forth. Snake all of the way around the room with students whispering the sentence from one to the next. When the last student has been told the sentence, have him/her say it aloud. Compare that distorted sentence to the sentence you first said. Odds are the sentence was lost somewhere along the way, and the correct message never got to the last student. This is similar to what happens between neurons when there is an imbalance in brain chemistry (neurotransmitters).
Using vivid graphics, animation, and three-dimensional models, this spectacular video takes students on a complete tour of the brain.

B. Neural Pruning and Brain Plasticity

*Lecture/Discussion Topic: Brain Plasticity, an Analogy Based on Everyday Experience*

Students are often confused about the phenomenon of brain plasticity. I like to use the following analogy to make it clearer: If you have ever been in deep snow immediately after it falls, you know that it takes time and effort to forge a path to wherever you want to go. After walking back and forth on that path again and again, the snow becomes stamped down and it’s much easier to traverse.

If a large tree fell across your snow path, you would have to forge a new path around the tree in order to reach your destination. This process would take time and effort, just like the first path you created, but over time the new path would be stamped down and easier to use.

This analogy is just like how brain plasticity works in infants. It takes constant exposure to the environment and stimuli to create a neural pathway in the brain. This neural pathway becomes stronger every time the infant uses it. If the infant experiences a trauma that severs or blocks that neural pathway, he or she will need to create a new neural pathway around the damaged area in order to resume normal brain activity in that region.

You might want to see if students can think of another analogy for this process—for instance, when creating a bouquet, you first gather flowers, but then pull off the excess leaves and trim the stem bottoms to complete the bouquet arrangement.

*Classroom Exercise: Student Examples of Brain Plasticity*

Only after first receiving your students’ approval to share personal information, ask any student who has personally experienced brain trauma to describe the process of rehabilitation he or she went through. Also ask volunteers to share a story of someone they know who went through this experience. Sometimes using “live” examples helps to illustrate the concept of brain plasticity.

*Lecture/Discussion Topic: Increasing Infant Neural Network Development*

Researchers have found that a stimulating environment can help enhance babies’ brain development. Stimulation helps develop neurons and establish synapses, which result in a more complex web of neural pathways.

Babies are born learners who collect information as they actively explore the environment by using their five senses. The more objects infants can see, touch, and taste, the greater their neural pathway production. Stimulation actually increases babies’ curiosity and attention, which results in more exploration. This effect is especially powerful if the stimulation includes their caregivers. Babies love looking at their caregivers, hearing their caregivers talk, experiencing their scent, etc. For new parents, taking the time to read to their babies, singing songs for them, playing music, dancing, and touching them will go a long way in improving their babies’ cognitive development and capabilities.


*Video Tool Kit for Human Development: Interview with Charles Nelson* (2 min., 50 sec.)

Techniques that can be used to look at brain structure and function include X-rays, electroencephalography (EEG), computerized tomography (CT), positron emission tomography (PET), magnetic resonance imaging (MRI), and functional magnetic resonance imaging (fMRI). In this clip, Charles Nelson, a researcher of brain structure and development, describes the use of brain-imaging techniques in children.

*Additional Media Suggestion: Pediatric Neuroscience: Rage of Innocents* (Films for the Humanities & Sciences, 47 min.)

Taking a strong sociocultural and evolutionary perspective, this film explores the impact of attentive and neglectful caregiving on the emotional and neurological development of the
child. Researchers discuss studies demonstrating a biochemical link between early caregiving and the development of brain regions that regulate emotions and the individual's response to stress. It also explores parental nurturing from the perspective of evolutionary biology.

Lecture/Discussion Topic: Brain Plasticity and Nature vs. Nurture

Jay Belsky and Michael Pluess, from the Institute for the Study of Children, Families and Social Issues at Birkbeck University of London, have been conducting research on the role of nature and nurture in brain plasticity. Their findings indicate that children who are born with negatively emotional temperaments are not just susceptible to negative parental environments. Children with these fragile temperaments are actually more susceptible to positive parental environments. In other words, negative parenting may have a profoundly negative impact; however, positive parental environments may have a profoundly positive impact. Therefore, the positive environment in which these emotionally temperamental children are raised could contribute a great deal to their long-term success and happiness.


II. Basic Newborn States
A. Eating: The Basis of Living

Video Tool Kit for Human Development: Newborn Reflexes (2 min., 18 sec.)

Some of the reflexes present at birth in the healthy infant are rooting, sucking, swallowing, stepping, grasping, crying, and what are called the Babinski and Moro reflexes. This video shows a newborn displaying various reflexes.

Lecture/Discussion Topic: Temporary vs. Permanent Reflexes

Some newborn reflexes, such as the rooting, sucking, swallowing, stepping, grasping, Babinski, and Moro reflexes, are temporary. In other words, they disappear with time, because over time they are no longer needed. For instance, the rooting reflex helps the infant navigate to the milk in her mother’s breast when the infant automatically turns her head toward anything that touches her face. With age, breastfeeding is no longer the way the child receives nourishment, so the rooting reflex disappears. Other reflexes (breathing, sneezing, coughing, blinking, turning head and/or raising arms in front of face to protect from injury) are needed for a lifetime, so they are permanent. According to the evolutionary perspective, temporary and permanent reflexes appear to be prewired and are essential for life.

Video Tool Kit for Human Development: Newborn Tastes (32 sec.)

This video clip shows the responses of a newborn to sweet, salty, and sour tastes. From a Q-tip, the newborn is first fed a substance of sugar and water. Next, the baby is fed a substance of salt and water. Last, the baby is fed a substance of lemon and water. Each taste elicits a different response.

Newborn Senses: Observation (48 sec.)

This video clip presents footage of a 3-month-old infant; various sensory responses may be observed.

Classroom Exercise: About Breastfeeding

Explain that breast milk is produced in breast glands, called lobules, which develop after the woman enters the second trimester of pregnancy and when certain hormones are present (estrogen, progesterone, pituitary prolactin, and placental lactogen). After birth, infant suckling causes another hormone (prolactin) to be released, which induces milk production and the release of one final hormone (oxytocin). Oxytocin causes contractions in the milk glands (lobules), which force the milk through the milk ducts and out through the nipple.
After you receive approval from any mothers in the class, have them describe their own experience and decisions about breastfeeding, in particular, whether or not they chose to breastfeed and what influenced their decision.

People generally have strong opinions about whether or not to breast-feed, influenced by cultural and/or personal beliefs. Have your students break up into small groups and discuss the pros and cons of breastfeeding. After 10 to 15 minutes of discussion, have the students who are “for” breastfeeding stand on one side of the room and those who are “against” breastfeeding stand on the opposite side. Give each group the opportunity to present supporting arguments. When both sides have aired their views, ask if anyone has changed his or her mind, based on the arguments and the chapter text.

Be sure to notice and point out any naturally occurring patterns in the two groups: Are more males than females in one group or the other? Are there age or ethnic differences between the groups?

You may also encourage debate based on the following situation, made public in the media a few years ago: The actress Angelina Jolie visited Africa and breast-fed a local baby who was malnourished, due to the mother’s lack of natural milk production. While some thought this was touching and generous, others argued that this action was inappropriate. Ask students to take a stand on this issue and defend their position.

Finally, consider using Handout 3-1 to offer advice to those who are considering breastfeeding but are uncertain about the best way to implement their decision or their ability to do so.

Note: Some mothers feel rejected and incompetent if their babies won’t breast-feed, even after training the baby to suck on the nipple. Please let the students know that if the mother has any type of infection, the milk will taste sour rather than sweet, and neonates are prewired to prefer sweet things, detected by taste buds found on the front tip of the tongue.

Source: www.nlm.nih.gov/medlineplus/print/ency/article/002451.htm

Video Tool Kit for Human Development:

Breastfeeding Promotion (2 min., 16 sec.)

In this clip, viewers observe worldwide efforts, including those sponsored by United Nations Children’s Fund (UNICEF), to encourage breastfeeding.

Worldwide Malnutrition (1 min., 51 sec.)

In this video clip, viewers learn that 30 percent of children worldwide are undernourished, and 10 children die every minute due to a lack of food.

Food Insecurity (2 min., 12 sec.)

In this video, Elizabeth Gartlan, manager of Nutrition Education Programs for City Harvest, an organization in New York City, discusses eating habits that foster undernutrition—a state that results from a family’s food insecurity—as well as problems undernourished children experience in school.

Malnutrition and Children in Nepal (10 min., 20 sec.)

This video explores how women in Nepal are tackling the vicious cycle of infant malnutrition and poverty. Viewers are introduced to Dev Kumari, a 42-year-old migrant woman who struggles to sustain her large extended family. Her children and grandchildren are locked into an invisible cycle that is crippling Nepal’s development. Protein Energy Malnutrition, or PEM, not only causes stunting, slow development, disease and death among young children today, it also has a disastrous effect on each successive generation—a cycle that is proving hard to break.

Additional Media Suggestions:

Bottle Babies (University of Michigan Media, 26 min.)

This film exposes some of the adverse effects of marketing baby formulas in developing countries, including infant disease and malnutrition that may result from the substitution of powdered milk formulas for breastfeeding.
**Nutrition** (Magna Systems, 15 min.)

This film presents a concise overview of the importance of good nutrition in each stage of childhood. The food pyramid and nutrient composition of common foods are explained.

*Keeping Babies Healthy and Safe* (Child Development Media, 33 min.)

The first part of this video focuses on how caregivers keep their babies physically healthy, focusing on resistance to illness. The second part discusses the importance of parental monitoring and other ways to keep infants and toddlers safe in the home and elsewhere.

*The Newborn: Development and Discovery* (Magna Systems, Inc., 29 min.)

This film discusses the developmental needs of the neonate, focusing on tests that determine the state of sensory, motor, cognitive, and social development. Other issues explored include bonding, breast versus bottle feeding, and the care of high-risk infants.

**B. Crying: The First Communication Signal**

*Lecture/Discussion Topic: Features of Crying*

You may want to include the following material for a lecture on infant crying:

- Crying is reflexive; it is a clue to the baby’s needs and functioning. What follows are some commonly asked questions, accompanied by advice:
  - What is the duration, frequency and intensity of the crying? If crying lasts for 3 hours at a time, and occurs for as many as 3 days per week, the problem may be colic. Support can be gained from pediatricians and lactation specialists if the mother is nursing.
  - Could the baby be too hot or too cold? While it’s true that babies’ bodies respond more slowly to changes in the environment than do adults’ bodies, babies don’t need any more warm clothes or covering than adults. Fear of the baby being too cold causes some parents to cover the baby too much.
  - Could the baby be tired? Many babies cry from being too tired or overstimulated.
  - Is the baby having difficulty eating or sleeping? The culprit could be mucus in air passages, gas, or a mildly upset stomach.
  - Is there a pattern to the crying? Recognizing a pattern may help parents figure out how to help calm their baby.

When health-care providers try to help parents who are concerned about their baby’s crying, no cause for the crying is usually found. Still, babies should be checked by their pediatricians so that problems, particularly ear infections (which are common in young babies), may be ruled out. As Belsky states, babies who are under 6 months old, who are crying, need attention. After 6 months, parents can begin to let the baby fuss a little before picking him or her up.

*Lecture/Discussion Topic: Understanding Colic*

Colic, babies’ version of indigestion, creates a great deal of stomach pain and discomfort for newborns. As a result, babies who have colic typically cry a lot more than most babies. And because they are in pain, you will see them clenching their fists and curling up their legs toward their bodies. Moreover, it is quite common for babies to turn bright red from crying. Unfortunately, the pain causes crying, the crying causes babies to inhale more air, which then causes more discomfort. It’s a difficult cycle to break and not only causes distress for the babies; it causes stress for the parents.

It’s important for parents to know that their babies are not crying because of parental errors. Colic can occur in babies receiving excellent attention and love. It’s a digestive problem, not a parenting skills problem. Although colic may seem to last a long time, it typically resolves itself within 3 months. If colicky symptoms last longer than 3 months, it’s a good idea to consult a pediatrician because it could be an ongoing acid reflux disorder.

According to the American Academy of Family Physicians, parents should contact a doctor when their colicky infants display the following symptoms: cries that change to painful cries, a halt to weight gain, or the onset of fever. Also, if parents are afraid they might hurt their infant, they should contact their physician.
After discussing colic and passing out Handout 3-2 (providing tips for comforting a colicky baby), invite students, who feel comfortable sharing personal experiences, to describe experiences they have had with colicky babies.

Sources:

Lecture/Discussion Topic: Distinguishing Cries with a Cry Decoder

Parents who have trouble distinguishing their babies’ various communication cries might consider using a baby “cry decoder.” The first cry decoder was invented by the Spanish electronic engineer, Pedro Monagas. As a parent, he never knew what his baby needed because he couldn’t distinguish among different crying patterns.

Monagas’ decoder analyzes babies’ cries by using identified rhythms, pitches, and volume. In just 20 seconds, the decoder will let you know what the baby needs. Although seemingly gimmicky and flawed, the device is actually quite accurate and useful.

Invite students to debate whether or not they’d consider buying a baby cry decoder, or if they wish to have one when they become parents.

Source: http://news/bbc.co.uk/2/hi/health/2329205.stm

Student Project: An Essay on Infant Crying and New Parents

Before assigning the project, and after checking first and receiving approval, ask any parents in your class to share their experiences as first-time parents with a crying baby. Were they frightened? How did they decide what to do when the baby cried? Did they figure out what to do by themselves; did they read a book or ask either a family member or medical expert for advice? How long did it take them to attach cries to specific situations such as being hungry, wet, or tired? Was one parent or caregiver better at distinguishing between the cries than the other? Why?

To learn more about firsthand new parent experiences, have students use the previous questions to interview parents outside of class. It might be especially interesting if students included an interview with their own parents about how they were when they were infants. Have students write an essay that compares and contrasts information presented in the text (pages 82–84) to the responses they collect in their interviews.

Video Tool Kit for Human Development: To Touch and Be Touched: Keys to Development (1 min., 37 sec.)

This clip explores the physical and psychological benefits of both touching and being touched. The clip shows patients in a children’s hospital who are able to pet visiting dogs. Research suggests that patients who have the opportunity to touch a pet heal faster and more fully. The clip also shows parents are taught and encouraged to stroke their infant children lovingly; it demonstrates the health and psychological benefits that babies have when being touched, particularly premature babies.

C. Sleeping: The Main Newborn State

Video Tool Kit for Human Development: Nonalert Awake (32 sec.)

Developmentalists have identified six primary states of arousal in newborns, which occur throughout the day and night: quiet awake, active awake, crying, drowsiness, active sleep, and deep sleep. Each state is associated with its own pattern of activity (gross muscle movements, eye movements, breathing patterns, and brain states). The videos in this series show newborns in the various states of arousal. Across a 24-hour period, a typical newborn in the United States will experience about 7 sleep intervals and 7 waking intervals, each lasting from a few minutes to a few hours. Taken together, the sleep intervals occupy about 16 hours of each day, half spent in active (REM) sleep and half in deep sleep. Over the first few years, total
sleep decreases, and sleep bouts consolidate into fewer, more long-lasting intervals of sleep. The quiet awake state is characterized by slight activity, a relaxed face, open eyes, and regular breathing. Responses to sights, sounds, and touch are mild. This state may occur shortly after waking, or after a more active period. It consumes about 2.5 hours of a neonate’s day. In this video, note the baby’s relaxed face, open eyes, and regular breathing.

*Newborn States: Alert Awake* (Segment 1, 19 sec.; Segment 2, 40 sec.)

The active awake state is characterized by frequent diffuse motor activity, vocalizations, flushed skin, and irregular breathing. The newborn occasionally makes sounds, and reacts to sights and sounds more strongly than in the quiet awake state. Neonates spend about 2.5 hours each day in the active awake state.

*Newborn States: Fussing, Crying* (17 sec.)

Crying is a state associated with distress and is comprised of vigorous but diffuse motor activity, facial grimaces, red skin, and intense rhythmic vocalization. Neonates spend about 2 hours each day crying. Initially, crying is an involuntary reflex, controlled by structures in the lower, primitive parts of the brain that activate when the infant is in distress and needs comfort or food. After a few months, crying becomes more voluntary, and an infant can cry to get a caregiver’s attention.

*Newborn States: Drowsiness* (Segment 1, 50 sec.; Segment 2, 21 sec.)

The drowsiness state is characterized by low activity, eyes opening and closing, eyes glazed when open, and variable breathing. Neonates spend about 1 hour in this state.

*Newborn States: Quiet Sleep* (Segment 1, 32 sec.; Segment 2, 36 sec.)

The active sleep state (also known as REM sleep) is characterized by increased muscle tone and motor activity, facial grimaces and smiles, occasional eye movements under closed lids, and irregular breathing. Active sleep occurs at the start of a period of sleep in newborns. After 2 or 3 months, the sequence of active sleep and quiet sleep will reverse—quiet sleep will occur before active sleep, as it does in adults. Newborns spend about 8 hours a day—50 percent of their total sleeping time—in REM sleep. The proportion of REM sleep declines rapidly in the months after birth.

*Newborn States: Active Sleep* (21 sec.)

The deep (also known as non-rapid-eye-movement—NREM) sleep state of full rest is characterized by low muscle tone and motor activity, closed eyelids, still eyes, and regular breathing. Neonates spend about 8 hours in deep sleep.

*Additional Media Suggestion: Discovering the Outside World* (Films for the Humanities & Sciences, 23 min.)

This program focuses on the extraordinary development of the individual that occurs during the first 9 months. Sleep–waking cycles are described, sensory development is outlined, and the infant’s expanding repertoire of communication skills is delineated.

*Lecture/Discussion Topic: Self-soothing and the Five S’s Strategy*

A current popular approach to calming a baby was developed by Dr. Harvey Karp from the UCLA Medical School. Dr. Karp’s program is called “The five S’s.” The five S’s are shushing, swinging, sucking, stomach/side, and swaddling. Dr. Karp suggests that use of all of these strategies at once will calm any baby. His theory is that babies are crying reflexively and that they have a calming reflex that can be stimulated with the five S’s strategies. He wants parents to re-create the sensory input that the baby was receiving in the womb. Dr. Karp suggests that use of all of the strategies at once will calm any baby. Dr. Karp’s strategies have been individually tested by researchers and have been found to be helpful. Some researchers criticize the approach saying that the system as a whole is not tested. Researchers also question his hypothesis that babies have a calming reflex that can be stimulated. Following are suggestions for using the five S’s:
• **Shushing** should be done near the baby’s ear and louder than the crying of the baby.

• **Swinging** can be rocking, swaying, walking around, but should be in parent’s arms—not mechanical.

• **Sucking** is essential. Dr. Karp recommends pacifiers, but letting baby fall asleep nursing or taking a bottle is fine. Dr. Karp recommends putting the baby down just before full, deep sleep.

• **Stomach/side** positioning while swinging or rocking helps. Baby can be gently bounced on stomach.

• **Swaddling** very tightly is also essential. It is important for the baby’s arms to be tightly wrapped at the sides.


**Lecture/Discussion Topic:** About Co-sleeping

The text states that in spite of the fact that the American Pediatric Association warns against co-sleeping, it is a controversial topic. Most parents co-sleep with their babies at least some of the time. Some research has found that co-sleeping may prevent SIDS, and the American Pediatric Association recommends that infants sleep near parents, in the same room, but on a hard surfaced bed with no covers and no soft objects near the baby, with the baby lying on his or her back. Proponents of co-sleeping have proposed that bed sharing provides the infant with the sounds of breathing, as well as the parents’ heartbeats. The APA now recognizes that sleeping very near to parents is desirable for the same reason.

If parents decide to bring the baby to bed, there are some important safety measures to take:

• Parents should not smoke, drink, or take any drugs that would promote sleep.

• Parents should not be overtired, and likely to fall into a deep sleep.

• The baby should be placed on back, with no covers that could fall over the baby’s head.

• There should be no space between mattress and headboard where the baby could get stuck.

• The baby should be positioned so that she could turn her head toward free air space.

• The mattress should be firm, and the baby should have free air space around her.


Milwaukee Healthy Beginning Project. *Babies sleeping safe: Cosleeping with your baby.* Milwaukee, WI.

**Classroom Exercise:** Co-sleeping Debate

For this activity, ask students to form three groups in the classroom, with everyone standing and looking into the center of the room. One group will represent the “pro” arguers, another group the “con” arguers, and the third group would represent the “no-position” arguers. Acting as a moderator, begin by asking one student from each group to give a well-structured reason for his or her position. As the moderator, you can ask questions that will enhance the argument before going on to the next arguer. Get one reason from each of the three groups and then ask if anyone would like to change to another group. Encourage students to change groups by suggesting it, and by reinforcing it. Repeat and continue the process until you feel that there are no more reasons to be discussed for any of the opinions.
There are two points to make by engaging in this type of debate. One is to encourage more critical thinking in students, and to have them employ information and logic as they draw conclusions. This means that students must have a good deal of information in hand before engaging in this activity. The other point is that conclusions are based on reasons, and we should be open-minded enough to consider whether our reasons may not be as good as someone else’s reason, in which case we should change sides.

*Lecture/Discussion Topic:* Routine and Ritual or Emotional Availability

Bedtime can be very emotional for both infants and caregivers. As the text notes, parents expect a young infant to wake several times throughout the night. Once the baby reaches 5–6 months, however, there is an equal expectation that the child will sleep through the night.

Although plenty of pop psychology is available about bedtime routines, consistency, and aids such as transitional objects, Teti et al. (2010) found that parents’ attitudes and emotional responsiveness to their children at bedtime was more influential than any specific bedtime routine in getting infants to sleep through the night.

Teti’s study, SIESTA I (Study of Infants’ Emergent Sleep Trajectories) looked at data from 35 families. Contrary to popular parenting advice, Teti’s study found no significant relation between sleep disruptions and the amount of time parents spent in close contact with infants or involved in quiet activities before bedtime. What they did find was that those parents who were emotionally available and attuned to their children at bedtime, whatever the routine might have been, had children with greater success in sleeping through the night and self-soothing behaviors when they did awaken. This supported his original hypothesis that the emotional availability of the parents promotes feelings of safety and security and, thus, makes it easier for the infant to self-soothe and sleep.

Teti’s findings pose new challenges to parents because they suggest that being emotionally available, paying attention to cues, and responding to children appropriately is more effective at promoting sleep than is a specific bedtime behavior. In other words, how parents put their children to sleep may be more important than what they do in the process.

With these results, he developed an ongoing longitudinal study, SIESTA II, which is being funded by the National Institute of Child Health and Human Development and will include additional questions regarding temperament, nighttime parenting, and overall development.

Discuss the ramifications of this research in conjunction with the popular psychology and “self-help” parenting periodical trends of the day. Does the bedtime routine matter? Is the routine itself a way of being emotionally available? What does it mean to be emotionally attuned to your infant? Does the need fluctuate?

*Source:* All references to Dr. Teti’s work may be found at: [http://www.hhdev.psu.edu/news/2010/7_29_10_infant_sleep.html](http://www.hhdev.psu.edu/news/2010/7_29_10_infant_sleep.html). Accessed September 30, 2012.

*Lecture/Discussion Topic:* In Focus: When Sleep Is Lethal

In your discussion, you may note the updates to the research regarding the “Back to Sleep” campaign. Ask students if they know of any cases of Sudden Infant Death Syndrome (SIDS) in your community or perhaps in their own families. Take time to discuss worries and concerns of new parents, especially as it relates to anxiety that so often stems from a perceived lack of control.

SIDS refers to the unexplained death of an apparently healthy infant, often while sleeping, during the first months of life. Although it strikes only about 1 in 1,000 U.S. babies, SIDS is a top-ranking cause of infant mortality in the United States and the rest of the developed world (Karns, 2001).

In the 1990s, recognition that a prone sleep position increases the risk for SIDS led to national campaigns, such as Back to Sleep in the early to mid-1990s. Despite initial success, however, with a decrease of 43 percent in the infant mortality rate (Gore & DuBois, 1998), the overall SIDS rate has plateaued in the last decade (Hauck, 2008). Thus, although we don’t hear about it as much in the news as we once did, SIDS remains the leading cause of postneonatal infant mortality in the United States.
Emerging research in SIDS reveals that the syndrome appears to result from abnormalities in brainstem control of autonomic function and breathing during a critical developmental period. Specifically, SIDS can be viewed as a disorder caused by a defect in one or more components of the medullary 5-HT system, and any single case need not express defects in all 5-HT markers simultaneously. The authors note that further research is warranted (Duncan, 2010).

Sources:


Additional Media Suggestion: The First 365 Days in the Life of a Child (Films for the Humanities & Sciences, 13 programs, 28 min. each)

This 13-part series describes normal development of an average healthy child during the first year of life. The series focuses on the research of a group of pediatricians at the University of Munich who systematically observed and filmed five babies for a year. From these observations, the researchers developed a system of developmental tests that measures a baby’s most important developmental functions monthly. The first program shows the reactions of the newborn 10 days after birth. Programs 2–13 show the baby at 1 month, 2 months, and so on until the first birthday.

Lecture/Discussion Topic: Cardiopulmonary Resuscitation (CPR) for Infants

In as little as 4 to 6 minutes after a baby stops breathing or his heart stops beating, death occurs. With this in mind, parents and caregivers of infants may be interested in knowing that correct administration of cardiopulmonary resuscitation (CPR) can be lifesaving in the case of babies whose breathing or heartbeat has stopped, or in cases of drowning, suffocation, choking, or injuries. The procedure involves rescue breathing, which provides oxygen to the infant’s lungs, and chest compressions, which keeps the infant’s blood circulating. Although it is best if someone with training administers CPR, the procedure must continue until the infant’s heartbeat and breathing return and/or until the arrival of medical assistance.

Preventable accidents are often the cause of an infant’s need for CPR. Because of this circumstance, babies should never be left alone on a bed or other surface from which they can roll and fall. Playpens should always have all sides up. Also, it is always wise to use safety straps provided with highchairs and strollers. A safe environment for an infant also includes toys that are age-appropriate and safe, a supervised environment in which medicines and small objects (such as buttons, batteries, foods, pacifiers, and so on) are out of an infant’s grasp if not under careful caregiver supervision. Point out that as babies become more mobile, the risk of poisoning increases. On the chalkboard, write the emergency poison control telephone number for students’ information: 1-800-222-1222. Explain that this number accepts calls from anywhere in the United States.

Note: Students interested in this topic may want to use the next item, for extra credit, a student project involving research on how to administer infant CPR.


Student Project: Research First-Aid Procedures for Infants

The main symptoms that suggest the use of infant cardiopulmonary resuscitation (CPR) are when a baby becomes unconscious, stops breathing, and/or has no pulse. To learn the
proper procedures for CPR on infants, students might want to research online materials about infant CPR provided by the American Heart Association and/or other organizations. For extra credit, invite students who perform this research to present an oral report with visual aids or a dramatized demonstration (possibly using a doll) on the correct procedures for infant CPR.

III. Sensory and Motor Development

*Lecture/Discussion Topic:* Features of Hearing, Touch, Smell, Taste, and Touch in Infants

Consider including the following information as you introduce the topic of infant sensory development:

- Hearing is one of babies’ most primitive senses in an evolutionary sense.
- Babies hear before birth, and after birth, and are quickly able to echolocate (determine where the sound is coming from).
- Babies are especially sensitive to high-pitched sounds, which might explain the preference for high-pitched baby talk.
- Babies have been found to prefer smooth, melodic tunes (lullabies) when trying to sleep and relax. They often find loud music startling and quick rhythms exciting.
- Babies’ sense of smell and taste are also well developed at birth, but have much refinement to undergo before adult abilities are achieved.
- Babies’ taste buds (taste receptors) change throughout childhood and into adolescence, with more sweet buds prevalent at birth. The concentration of sweet buds makes evolutionary sense because breast milk is naturally sweet, thus eating would be more pleasurable and more likely to reoccur.
- Babies’ most primitive sensory system at birth is touch. As we have noted, swaddling them tightly gives babies deep pressure, helping calm them.
- Scientists have also noted that babies need to be held. Premature babies who receive extra tactile stimulation grow at a faster rate and leave the incubator sooner than babies who do not receive extra stimulation. When babies are not held their growth can slow to the potential danger of a condition called “failure-to-thrive.”


*Additional Media Suggestion:* Newborn (Filmakers Library, 28 min.)

Three of the most highly respected neonatal researchers—T. Berry Brazelton, Lewis Lipsitt, and Louis Sander—are shown testing newborns. The impressive array of newborn reflexes, sensory abilities, and learning potential is demonstrated. Probably even more important, these neonatal abilities are put into context, showing the infants able and willing to respond to their parents. Thus, the film goes beyond the clinical test procedures and captures some of the warmth that is possible in the parent–newborn relations.

A. What Do Newborns See?

*Lecture/Discussion Topic:* Features of What Newborns See

Consider including the following information as you discuss the sense of sight in newborns:

- Babies’ ability to see the world they live in is quite limited at birth. In fact, newborns would be classified as legally blind. Everything they see is blurry. Their eyesight is considered to be approximately 20/400, which makes them especially nearsighted (not able to see things far away).
- Babies prefer looking at light and dark contrasting objects/images.
• For the first month or so babies are only able to see up to 8–12 inches from their face, which happens to be the approximate distance from the baby’s face to the mother’s face when breastfeeding.
• By 2 months, babies are able to see facial features and shift their sight from one object to another.
• By 3 months, babies will develop the ability to form eye contact with caregivers.
• By 4–6 months, the baby has developed visual recognition (memory) of caregivers.


Lecture/Discussion Topic: What Newborns Learn to Ignore

Just as infants make neural connections to strengthen their skills in every area, they also ignore certain abilities and, thus, set the stage for those particular connections to be pruned. As noted in the text, Lewkowicz and colleagues have done extensive research into this intriguing area.

Their findings suggest that as infants accumulate selective experience with the faces and vocalizations of their own species, they cease to integrate the facial and vocal gestures of other species because such gestures do not represent their everyday perceptual experiences (Lewkowicz et al., 2010; Lewkowicz et al., 2008; Pons et al., 2009). They also note that this perceptual narrowing observed in early human development may not be a universal feature of development. Their current findings indicate that humans begin postnatal life with a “broadly tuned perceptual system that makes it possible for them to integrate the audible and visible signals of other species by relying on a low-level but powerful perceptual processing mechanism that is sensitive to the onsets and offsets of stimulus energy in different sensory modalities.” But environmental stimulation is vital in strengthening specific neural networks and determining which connections will be pruned (Fox, Levitt, & Nelson, 2010).

What is the importance of the environment on the ability to discriminate? Are children in lower socioeconomic classes at risk? What can or should be done to bridge the gap?

Sources:


Video Tool Kit for Human Development:

Emotional Expression in Infants (3 min., 5 sec.)

This video shows examples from a system that Carroll Izard and his colleagues devised for identifying emotional expression in infants. Each of the emotions shown here—interest/excitement, enjoyment/joy, sadness/dejection, and anger/rage—is illustrated with a photo, an artist’s drawing, and then a video of an infant displaying the emotion.

Can Babies Recognize Faces? (3 min., 15 sec.)

This video examines how humans come to recognize faces as distinct from the recognition of other shapes. It includes research that reveals major differences between the performance of newborns and the performance of eight-month-olds in facial recognition.

Visual Cliff, Clip A: (2 min., 9 sec.)

In this video, Joseph Campos describes his research with the visual cliff, and we see two infants reacting to the visual cliff. One has been crawling for a month. The other has just learned to crawl.

Visual Cliff, Clip B: A New Crawler (25 sec.)

This clip shows that Amanda, a new crawler, is at first hesitant to venture out, but with coaxing from her mom, she crawls right over the visual cliff.
Visual Cliff, Clip C: An Experienced Crawler (1 min., 17 sec.)

In this video, even though his mother is waiting on the other side and coaxing him, Andy, an experienced crawler, simply cannot bring himself to cross the visual cliff.

B. Expanding Body Size

Additional Media Suggestions:

The First Year of Life (Films for the Humanities & Sciences, 28 min.)

These two films examine physical growth during infancy, including cephalo-caudal and proximo-distal principles, the relationship between cognitive and physical growth, and the development of vision, hearing, and perceptual abilities. The Growing Infant follows one child through several stages of development. The First Year of Life explores how newborns see, hear, and make use of skills developed even before birth to interact with their surroundings. The infant’s emerging individuality is also discussed.

In the Beginning: The Process of Infant Development (Davidson Films, 15 min.)

Nurturing (Davidson Films, 17 min.)

These two movies can be shown together. Both feature Dr. Bettye Caldwell describing infant development. In the Beginning shows stages of development in several children, illustrating normal variation in growth rates. Nurturing examines the role of the caregiver as an active contributor to optimal growth. Caldwell offers several suggestions for fostering curiosity, exploration, and stimulation.

C. Mastering Motor Milestones

Lecture/Discussion Topic: Development of a Kinesthetic Sense

Babies, like all humans, have the vestibular and proprioceptive sensory systems. The vestibular system refers to the sense controlled by the fine hairs in the inner ear that tells us where we are in relation to gravity, whether we are right side up or upside down, or whether we are stationary or moving through space. The proprioceptive system is the sense controlled by nerve endings that tell us where our limbs are, whether our joints are bent or straight, and whether our muscles are tense or relaxed. These two sensory systems are sometimes called our kinesthetic sense. In babies, these two systems require stimulation in order that gross motor skills and balance for walking can develop. Babies depend on being active in the world in order for them to gain the ability to receive sensory information, process it in the brain, and use it to either interpret the world or move around in it. Before they can move themselves around, the walking around and patting on the back activities of parenting in the early months promotes kinesthetic development.

Ultimately, all of the rocking, swaddling, patting on the back, shushing, moving around, and touch stimulation that babies get are important for their developing nervous system. These experiences are helping the baby brain to begin to interpret the world.

Video Tool Kit for Human Development:

Motor Milestones of the First Two Years: Head Up (15 sec.)

On average, infants can lift their head by about 2 months. This motor milestone occurs early, often in combination with the reflexive movements of the arms and legs that are observed when infants lie on their stomach. The videos in this series show infants attaining various motor milestones. As control of head and neck muscles increases, the reflexive movement of the legs decreases.

Motor Milestones of the First Two Years: Rolling Over (14 sec.)

At 2 or 3 months, most infants can roll over without assistance. This infant seems very accustomed to rolling over.

Motor Milestones of the First Two Years: Sitting Up (19 sec.)

Most infants sit without support by 5 or 6 months. This child’s ability to sit alone gives her some independence in exploring her world—at least the part of it she can reach.
Motor Milestones of the First Two Years: Crawling (17 sec.)

By 8 to 10 months, most children can lift their bellies off the floor and crawl on their hands and knees, or hands and feet.

Motor Milestones of the First Two Years: Cruising (23 sec.)

Between 7 and 9 months, most infants can pull themselves upright. Between 9 and 10 months, they can cruise holding onto a person’s hand or onto furniture, as this little girl does.

Motor Milestones of the First Two Years: Walking (27 sec.)

The time of walking varies, with about 50 percent of all children walking well by 12 months, and 90 percent walking well by 14 months. In their first months of walking, infants spread their legs wide to help maintain balance, producing the characteristic “toddling” movement.

Motor Milestones of the First Two Years: Kicking (11 sec.)

On average, children can kick a ball, which requires the ability to maintain balance while standing on one leg, at between 20 and 22 months. This little girl has no trouble giving the ball a good kick.

Additional Media Suggestions:

The Discovery Year (Films for the Humanities & Sciences, 52 min.)

Christopher Reeve hosts this exploration of the first year of life—the discovery year—as babies learn to use their senses, crawl, explore, and finally walk. The program also examines how personality develops at this young age by focusing on how three sets of parents respond to the individual personalities of their infant daughters.

A Child Grows: The First Year (Insight Media, 25 min.)

This program outlines the development of motor and cognitive abilities during the first year of life. Special attention is paid to the development of eye–hand coordination and the process by which infants learn to distinguish self from non-self.

Freedom to Move on One’s Own (Child Development Media, 26 min.)

Hungarian pediatrician Emmi Pikler comments on the rich variation in movement and position of infants who are allowed to move freely on their own. Commenting on sessions with three infants, ranging from 8 to 13 months of age, the commentary discusses the genetic basis for motor development and the impact of early movement on cognitive development.

Infancy: Landmarks of Development (Magna Systems, 22 min.)

This film traces the major landmarks in the development of gross and fine motor skills during the first year. It also discusses influences on the timing of motor development, including nutrition, health care, opportunities for practice, and cultural patterns.

IV. Cognition

Classroom Exercise: Identifying Developmental Landmarks

Before students read this section of their text, encourage their thinking about a variety of developmental landmarks, which is the focus of this exercise, prepared by Scott VanderStoep. Distribute Handout 3-3, which can be completed by students as they work individually or in small groups. The items on the handout refer to physical, cognitive, language, and social skills. For some skills, students probably will underestimate or overestimate at what age the developmental landmark occurs. Have students compare their judgments with the following correct answers that you can present to the entire class:

1. Laugh—2 months
2. Pedal a tricycle—24 months
3. Sit without support—5 to 6 months
4. Feel ashamed—2 years
5. Walk unassisted—12 months
6. Stand on one foot for 10 seconds—4 1/2 years
7. Recognize and smile at mother or father—4 to 5 months
8. Kick ball forward—20 months
9. Think about things that cannot be seen—2 years
10. Make two-word sentences—20 to 22 months


A. Piaget’s Sensorimotor Stage

Lecture/Discussion Topic: Features of Piaget

Consider adding the following information to your discussion of Piaget:

- Piaget was a child genius. He wrote his first published scientific paper at age 11, and had his first teaching position by age 17.
- His training was in biology; in fact, much of the language he uses has biological etiology.
- He uses the term “adaptation” to describe learning.
- He used the metaphor of a spiral to describe a schema.
- A schema in Piaget’s view might be described as an organized understanding.
- Everything we store in our memory has a schema, and the organization and understanding is of our own making, based on how we view the world as we take in the information.
- When we are at equilibrium, we are comfortable with our understanding, and we can assimilate information or take it in.
- When we are at disequilibrium, we are uncomfortable with our understanding and we have to accommodate the new information.
- Accommodation can happen in two ways, either by building a new schema or changing a schema we already have.

You might want to distribute Handout 3-4, which shows a diagram that might help students visually understand the relationship of Piagetian concepts of assimilation, accommodation, equilibrium, and disequilibrium.

Classroom Exercise: Demonstration for Assimilation and Accommodation

In order to demonstrate the phenomena of assimilation and accommodation, consider using the following exercise. Ask students to visualize their home and write down how many people their home could sleep. Most students will count the number of beds and determine how many people could fit in each bed. For example, a three-bedroom house might have three queen-size beds and therefore sleep six people. Have students call out how many people they could sleep; then make a mental note of the lowest number you heard.

Using that lowest number, ask students if their home could sleep that number of people without making any special arrangements. They will of course say yes, and you can tell them that that is an example of assimilation.

Then ask students what they would do if they had to host 20 people overnight in their homes. How would they go about finding places for all those people to sleep? Point out that making use of the couch, floor, or a reclining chair are examples of accommodation. Help students understand that they had to reconsider the schema they had about their home’s ability to sleep 6 people and make the proper adjustments to that limited view in order to provide for all their potential 20 guests.

Video Tool Kit for Human Development:

Piaget’s Stage of Sensorimotor Development (2 min., 45 sec.)

The scenes in this video illustrate the six stages of sensorimotor development.
Research of Karen Adolph (51 sec.)

Karen Adolph (New York University) has studied how a child’s perception of affordances (the opportunity for perception that is offered by people, places, and objects in the environment) changes with his or her ability to move about. A child’s perception of a safe distance to reach across changes as he or she learns how to crawl. As a child makes the transition from crawler to walker, his or her perception of the safety of a slope changes.

In this clip, Hillary initially perceives the slope as risky and decides not to crawl down, opting instead to slide down on her bottom. (This is mostly likely driven by her past experience with crawling.) Now walking, but only for a brief period, Hillary decides to try walking down the ramp, forgetting what she learned as a crawler about the risks of traveling down inclined surfaces. Hillary, now with 10 weeks of walking experience, is reintroduced to the ramp. After contemplating her situation, she decides to scoot down on her bottom. Her past experiences in walking, along with her developmental level, her assessment of this opportunity, and her motivation to reach the bottom, affect her perception of the ramp and the actions required to descend it.

Affordances: The Red Ball (43 sec.)

Eleanor and James Gibson developed the idea of affordance in cognitive development. An affordance is an opportunity for perception, action, and interaction. For a young child, everything in the environment affords opportunities—each item can be perceived and interacted with in a multitude of ways. Whether a child perceives an object or place as an affordance depends on the child’s past experiences, developmental level, awareness of the opportunity, and immediate need and motivation. For the child in this clip, the ball is an opportunity for perception and interaction.

Hothouse Babies (1 min., 55 sec.)

Most psychologists believe that pushing children to perform tasks beyond their level can turn learning into a source of anxiety. Parents should ensure that the experience of learning for infants and toddlers is a joyful one, and allow unstructured time for play. Developmentalists tend to believe that the most important point is to follow the child’s lead and to support the natural developmental process through challenging, age-appropriate activities that reflect the child’s interests. Household toys and toys created by parents can provide all the stimulation children need.

Additional Media Suggestions:

The Development of the Human Brain (Films for the Humanities & Sciences, 40 min.)

This film traces the course of brain development from conception to age 8. After describing brain functions that are already present at birth, it identifies the range of motor and cognitive skills that appear as the brain matures.

Tim: His Sensory-Motor Development (HarperCollins, 31 min.)

This movie follows Tim through the first 2 years of life, focusing on his performance on a structured set of Piagetian tasks, including tests of object permanence and goal-directed behaviors. The movie helps illustrate the substages of sensory-motor development, including circular reactions. It also provides a good way to contrast methods of assessing cognitive development; although it is clear that mastery of motor skills such as sitting and walking help Tim explore his world, and thereby enhance his cognitive development, they do not in themselves lead automatically to cognitive gains.

Student Project: Toys for Infants

Have students visit a local store (or online store) that carries infant and toddler toys. Have them describe the types of toys they see and comment on how appropriate they think the toys are, based on the sensory information provided in the chapter and your additional class instruction. Distribute Handout 3-5 for students to record their findings and evaluations.
Emphasize to students the need for light and dark contrasting colors for newborns; multiple textures to touch and explore for infants and toddlers; simple toys like blocks or nesting cups; low-tech items that they can explore, such as different shapes, things they can make noise with, etc.


**Video Tool Kit for Human Development:**

7-month-old Failing Basic Object Permanence Task (30 sec.)

In the classic demonstration of object permanence, an adult shows a child an interesting object and then places an easily removed cloth or blanket over it. If the child attempts to remove the cloth, the infant has acquired object permanence. If the infant briefly looks disappointed and then adjusts to the loss, object permanence is not present.

An extension of this research is Piaget’s A-not-B task. In this task, infants see an object placed under a blanket (A) and become accustomed to the object’s being in that location. When the object is then placed in a new location (B), infants tend to search for the object in the (A) location, even though they watched the experimenter place the object in the new (B) location. The tendency seems to indicate that the concept of object permanence is present but still developing toward its final form.

In this clip, even after several trials, this 7-month-old girl seems to accept that the giraffe disappears when the researcher places it under the cloth. Although the toy is easily within her reach, she makes no attempt to retrieve it, no matter where it is hidden.

9-month-old Passing Basic Object Permanence Task (20 sec.)

The child in this clip has clearly acquired a concept of object permanence and has no trouble retrieving toys from the location.

9-month-old Failing A-not-B Task (1 min., 20 sec.)

The child in this clip has clearly acquired a concept of object permanence and has no trouble retrieving toys from the A location. But when the researcher moves the toy to a new (B) location, the child continues to search for it in its previous location.

9-month-old Passing A-not-B Task (37 sec.)

The 9-month-old girl in this clip has mastered the concept of object permanence, and she easily passes the A-not-B task, looking for the keys in their new location immediately.

**B. Critiquing Piaget**

**Lecture/Discussion Topic:** Emerging Morality

**Video Tool Kit for Human Development:** *The Research of Carolyn Rovee-Collier* (2 min., 14 sec.)

The research of Dr. Carolyn Rovee-Collier (Rutgers University) focuses on learning and memory in preverbal infants. As you watch this video clip, note how baby Jessica responds. There are two stands over her crib. One is empty, and the other supports a mobile. A ribbon is attached to the empty stand and to Jessica’s ankle. As you watch this video clip, note how baby Jessica responds. Later, the ribbon is attached to the mobile stand and to Jessica’s ankle. Finally, the ribbon is again attached to the empty stand and Jessica’s ankle. When Jessica kicks and the ribbon is attached to both her ankle and the mobile stand, the mobile moves.

What, if anything, does Jessica learn? What, if anything, does Jessica remember when the circumstances in her crib change?

**Additional Media Suggestions:**

*The Developing Child: The Crucial Early Years* (Films for the Humanities & Sciences, 20 min.)

This interesting film deals with the importance of early experiences in fostering cognitive development in the infant. Its messages are that learning begins in the cradle, as the newborn
responds to sensory stimulation, and that parents can assist cognitive development by encouraging learning. The film also discusses the controversial issue of IQ testing.

First Adaptations (RMI Media Productions, 30 min.)

This program explores the awesome cognitive capacities of the newborn and infant. Experts chart the infant’s developing cognitive abilities as the nervous system matures. Research on the learning abilities of newborns only a few hours old is described.

Growing Minds: Cognitive Development in Early Childhood (Davidson Films, 25 min.)

In this video, David Elkind reviews the work of Lev Vygotsky and Jean Piaget, using their work—and his own—to examine three aspects of cognitive development: reasoning, visual perception, and language development.

The Infant Mind (Insight Media, 30 min.)

This film explains and challenges Piaget’s stage theory of development. Several developmentalists explain that infants possess a basic understanding of cause and effect, object permanence, and number earlier than Piaget believed.

Simple Beginnings? (Films for the Humanities & Sciences, 24 min.)

This short film explores child development from birth to age 5. An especially interesting feature is the description of three experiments, which test early abilities of infants to recognize faces and motion as well as their short-term memory.

C. Moving on from Piaget: A Note on Emerging Social Cognition

Video Tool Kit for Human Development:

Familiarity: Recognizing and Remembering Throughout Development (2 min., 22 sec.)

This video clip looks at how developed a person’s capacity for memory is right after birth and, later, in early and middle childhood. It showcases an experiment in which a 1-month-old child’s brain is scanned while he listens to his mother’s voice alternated with a stranger’s. The clip then shows an experiment in which a 3-year-old’s brain is scanned while judging various facial expressions and trying to remember them. Finally, the clip shows an experiment with a 9-year-old child; the experiment demonstrates that the system of memory in the child’s brain is now very complex.

Can Babies Count? Lessons from Animals (6 min., 16 sec.)

This video explores the math skills of babies by comparing them to the math skills exhibited by various animals. It shows an experiment with babies, in which they are shown a number of objects, which are covered, and then uncovered with fewer objects remaining. The babies’ confusion is noted and taken as a sign that they understand concepts of amounts. The same experiment is shown with macaques, as are a number of experiments to determine whether animals understand the concepts of addition and subtraction, and whether they can count. Different researchers interpret the results of these experiments in different ways, not always agreeing on how sophisticated animals’ or babies’ math and counting skills are.

V. Language: The Endpoint of Infancy

A. Nature, Nurture, and the Passion to Learn Language

Lecture/Discussion Topic: Features of Language and the Brain

You may want to add the following to your discussion of language development:

- Chomsky’s view that humans are programmed by genetics to have language is becoming less controversial and more accepted by linguists. His concept of LAD, as described by Belsky, could be seen as a metaphor for the way the brain works.

- Humans are born with two areas of the brain that store and produce language: (1) Broca’s area is in the left side prefrontal cortex near the temporal lobe and stores and controls the syntax or grammar of the language; (2) Wernicke’s area is in the left side in the temporal
area near the auditory cortex. It stores all of the words a person knows, called the lexicon or dictionary of the brain.

- In earliest infancy, the brain begins to store the phonemes of the language or languages the baby hears. Each person who speaks a phoneme says it a little differently; so the baby must develop small categories for each sound.
- Babies can store sounds for more than one language.
- Up until 6 months, babies’ cooing and babbling sound very similar no matter what language the babies hear. All over the world, babies sound the same. Babies who are deaf coo and babble nearly as much as hearing babies. Then, between 6 and 8 months, the baby begins to babble in the sounds of the language or languages being heard.
- Babies begin to understand words before they are able to speak the words. Parents usually will notice signs of understanding between 9 and 12 months. Then, at around a year, most babies will speak their first word.

If you have student parents in your class, who would like to share their children’s language learning experiences (including learning more than one language), invite them to do so.

**Video Tool Kit for Human Development:**

**Infants’ Prespeech Gestures** (2 min., 44 sec.)

This video clip presents Linda Acredolo, a professor of psychology at the University of California Davis, and Susan Goodwyn, a professor of psychology and Child Development at California State University, Stanislaus. These research collaborators discuss Baby Signs, their book about the signs parents and their preverbal babies use in order to communicate with one another. According to Acredolo and Goodwyn, baby signs may be improvised or borrowed from ASL (American Sign Language), such as the sign for “more” that you see near the beginning of the video clip.

Studies have shown that baby signs facilitate language development and cognitive skills in the children who have used them. In follow-up studies, 8-year-old children who had used baby signs scored higher on IQ tests.

**Chomsky’s View of Language Development** (1 min., 26 sec.)

According to linguist Noam Chomsky, humans master grammar in a way that cannot be explained by learning alone, as B. F. Skinner and other learning theorists would suggest. Chomsky theorizes that the human brain has a “language acquisition device” and is thus prewired to use grammar. The same process of language development is evident in all language groups.

Observation of the use of signing among older deaf students, and then among young deaf children who had come together as a group at a much younger age, reveals that there is an evolution from inconsistent signing with no predictable grammar toward signing as a grammatical language.

**Interview with Steven Pinker** (2 min., 57 sec.)

According to linguist Noam Chomsky, humans master grammar in a way that cannot be explained by learning alone. Chomsky theorizes that the human brain is “prewired” to learn words and use grammar. Stephen Pinker has studied language acquisition in young children. In this clip, he talks about the ways in which children learn language.

**The Research of Janet Werker** (5 min., 26 sec.)

In this video, infants respond to and discriminate among speech sounds of native and nonnative languages. Janet Werker discusses infant behaviors in relationship to certain speech sounds, the head-turning procedure used in this clip, and the conclusions this study has led to.

**Understanding Neuroscience Methods: ERP** (2 min., 29 sec.)

The laboratory of Debra Mills recorded and analyzed the brain-wave patterns of an infant who listened as a puppet recited words, both familiar and unfamiliar. This laboratory scene is captured in this video along with Mills discussing ERP (Event-Related Potentials) research, in
particular, research related to changes in brain organization (especially cerebral lateralization of language) that occur as children acquire language.

Additional Media Suggestions:

Baby Talk (Insight Media, 60 min.)

This video from the “Nova” series investigates the radical reappraisal of language development that stemmed from the writings of Noam Chomsky. It depicts how researchers monitor fetal response to sound and analyze patterns of crying, cooing, and babbling. Interviews with Chomsky, J. S. Bruner, and other leading psycholinguists chart the major steps in language acquisition.

Beginning Language (Insight Media, 30 min.)

This film examines various theories of early language development, using film clips to document the development of speech. David Premack discusses his work on artificial language in chimpanzees.

Language (Insight Media, 30 min.)

This film looks at the interaction of nature and nurture in language development, taking the position that language in humans is biologically programmed. The question of whether animal communication qualifies as language is among the many interesting issues addressed.

Language and Thinking (RMI Media Productions, 30 min.)

This film explores the origins of language in human development. As toddlers are observed, various experts explain the major theories about the brain’s role in processing language during the play years.

Growing Minds: Cognitive Development in Early Childhood (Davidson Films, 25 min.)

In this video, David Elkind reviews the work of Lev Vygotsky and Jean Piaget, using their work—and his own—to examine three aspects of cognitive development: reasoning, visual perception, and language development.

B. Tracking Emerging Speech

Video Tool Kit for Human Development: Intermodal Perception (2 min., 2 sec.)

The relationship infants detect between what is said and who is saying it is illustrated in the video, based on two classic studies of intermodal perception by Patricia Kuhl. Younger infants relate lip movements and speech sounds. Older infants also relate gender to a voice they hear. In this clip, although the infants in the study experienced each item of a pair on a separate monitor, you will observe these auditory–visual pairings on one screen.

Learning Language: Newborns (41 sec.)

The clips in this series show different aspects of language learning as newborns grow into infants and toddlers. At birth and for the next few weeks, infants’ communicative sounds and gestures are reflexive, and they make their needs known through crying, expressions, and gestures.

Learning Language: Two months old (1 min., 29 sec.)

Over the second and third months, new sounds are emerging: first, cooing, crying, fussing, and laughing; and later, squeals, growls, croons, trills, and vowel sounds. Infants use these sounds in a playful and meaningful way during face-to-face interactions.

Learning Language: Three to Four months old (28 sec.)

New sounds are emerging in the third and fourth months, including squeals, growls, croons, trills, and vowel sounds. The child and caretaker share emotions, each focusing on the emotional expressions of the other.
**Learning Language: Six months old** (30 sec.)

At around 6 months, infants are able to sit without support, and their interest in objects in their environment increases. At this age, infants will make babbling sounds, which are repetitions of syllables, such as “ba-ba-ba-ba,” “da-da-da-da,” “dee-dee-dee-dee,” or “ma-ma-ma.”

**Learning Language: Nine months old** (44 sec.)

Beginning around 9 months, infants are babbling gibberish and saying their first words and word approximations. They understand a few simple words.

**Learning Language: First Words** (1 min., 17 sec.)

Around their first birthday, most infants are using single-word utterances. Vocabulary grows slowly between 12 and 18 months.

**Learning Language: Word Combinations** (1 min., 13 sec.)

Word learning is much faster after 18 months of age—the child learns about one new word every 2 hours! This is also the time when infants start to use two-word strings.

**Learning Language: Two- and Three-Year-Olds** (Segment 1, 22 sec.; Segment 2, 34 sec.)

By 24 months, the end of infancy, children typically are using multiword sentences.

**Do Language Skills Differ Between Chimpanzees and Young Children?** (4 min., 15 sec.)

This clip demonstrates research conducted by Sue Savage-Rumbaugh at Georgia State University on whether chimpanzees can be taught language skills and comprehension. The clip shows one chimpanzee, Panbanisha, who is able to identify and respond to both written symbols and spoken English. This chimpanzee also is able to comprehend the importance of word order. The researcher argues that the chimpanzees with whom she is working demonstrates language comprehension skills that are the equal of a child of at least ages 5 to 7 years old.

**Classroom Exercise: Infant Sign Language**

Explain to the class that teaching infants to sign before they can speak is a new and controversial topic. Some people believe it will confuse the infants and delay their mastery of verbal language. Others believe that gesturing with sign language will enhance the infants’ ability to communicate and fulfill their needs.

Distribute Handout 3-6, which shows a few sign language examples that infants are encouraged to use. Have students come up with a message they might want to communicate to a baby—the message should involve one of the signs shown on the handout. In a small group, have students take turns communicating their message by using gestures, including the sign, to fellow group members. After groups have completed their experiment, reconvene the class and encourage an informal debate on the worthiness of communicating with sign language, especially using sign language to communicate with infants before babies are even able to speak. List the pros and cons on the chalkboard to help document the arguments. Finally, tell students that researchers have determined that gesturing with sign language does not interfere with verbal development and may, in fact, enhance its development.


**Additional Media Suggestions:**

*Pre-Verbal Communication* (Filmakers Library, 20 min.)

This film makes it clear that the language of gestures, facial expressions, and noises provides a rich communication link between mother and infant, long before the infant is able to begin speaking. In this case, a mother and an 8-month-old enjoy a conversation, even though each sees the other on a video screen rather than in person.
Development of Pre-Verbal Speech (Insight Media, 15 min.)

This brief video traces speech development in infants from their first cries after birth to the age of 1 year, when they can use and comprehend single words.

Out of the Mouths of Babes (Filmakers Library, 28 min.)

There are many films tracing language development; these are two of the best. Child Language is written and narrated by Dr. Eve Clark, with emphasis on the complexities of language that the very young child learns without benefit of formal instruction. Out of the Mouths of Babes is an authoritative and humorous account of the course of language development over the first 6 years.

The Child: Part III (CRM/McGraw-Hill, 29 min.)

A boy and girl are shown as they grow from age 1 to 2. During this period, we see their language develop from the 1- to the 2-word stage and their social skills emerge as they model their behavior on that of others. The stubbornness and selfishness typical of this age are well-balanced with the toddler’s interest and involvement with the activities of other people. Again, since this is cinéma-vérité, you should preview the film to know how to prepare your students.
Handout 3-1

Tips for Breastfeeding
The following tips can help foster successful nursing:

1. Start nursing within an hour after delivery. The infant is awake and the sucking reflex is activated. You won’t be producing milk yet but you will be secreting colostrum, which is a thin fluid carrying valuable antibodies to disease.

2. Make sure the baby’s mouth is wide open and your nipple is as deep in her mouth as possible.

3. Try different positions of the baby to find the one that is most comfortable for you. There is no one correct way of positioning for breastfeeding.

4. Nurse the newborn when she is hungry (on demand) but certainly within 2 hours of the last feeding. Breast milk digests quicker than formula, so frequent feeding is necessary. Moreover, frequent feeding will encourage greater milk production.

5. There’s no need to supplement your breast milk feedings with other liquids. Additional liquids will only fill the baby’s stomach and reduce the desire to nurse. Since frequent nursing helps with milk production, you do not want to reduce the frequency of feedings.

6. It’s best to wait a week or more before introducing the baby to a pacifier or bottle. These artificial nipples require a different sucking action than real ones and might confuse the infant.

7. To keep the nipples from cracking and becoming infected, it is best to let them air dry after feedings and coat them with breast milk or other natural moisturizers (Vitamin E oil or lanolin).

8. Be on the lookout for breast infections. You will know you have an infection if you run a fever, develop painful lumps, or the breast turns reddish in color.

9. Understand that you will be producing lots of milk and your breasts will become engorged, hard, and potentially painful for the first few days. Frequent feedings will help reduce the engorging and a warm compress may help reduce some discomfort. In time it will become less painful, so don’t give up.

10. You need to make sure that you maintain a balanced diet and include at least 500 extra calories a day to help nourish your body. Be sure to drink plenty of water (6 to 8 glasses per day) and sleep as much as you can.

If you follow these tips, your breastfeeding experience should be more pleasant for you and your infant.

Source: http://womenshealthcaregroup.adam.com/content.aspx?productId=111&pid=14&gid=000114
Ten Tips for Comforting a Colicky Baby

1. Consider frequent, smaller, and slower feedings. Let colicky babies feed frequently (twice as often as a non-colicky baby). This will make digestion easier and provide the baby with some relief.

2. Changing your holding pattern may provide the baby with some relief. Try putting baby face down (stomach down), supported by your forearm. Then lightly massage the baby’s belly.

3. Try neck snuggling. Place the baby’s head between your chin and your chest as you pull her close. Then hum a monotone tune while gently swaying. The rhythmic pattern of your voice, along with the vibration from your chest will soothe the baby and with luck, induce sleep.

4. Dance, dance, dance. Hold your baby in the “neck snuggle” position and begin to dance. The goal is to gently bounce the baby up and down and side to side. Some babies even enjoy feeding while they’re dancing.

5. Try bicycle pedaling. Lay the baby on her back in your lap, with her feet facing you. Take the baby’s legs and gently move them in a bike-pedaling pattern.

6. Do some arm curls. Use your hands to hold the baby’s bottom and lean him back against your chest. Then do slow, rhythmic arm curls—lifting the baby’s bottom even with his head.

7. Do belly rolls. Hold the baby securely and lower her belly onto the top of a large ball. Then gently roll the baby forward and backward and side-to-side.

8. Use a warm (but never hot!) water bottle. Wrap a warm water bottle in a hand towel. Then position the bundle under the baby’s belly as she lays face down. Warning: Be sure to turn the baby’s head to the side so her airway is clear.

9. Try a tummy massage. Sit the baby on your lap. Place your hand across the baby’s belly and gently massage his belly as you slowly lean forward.

10. Try a warm, soothing bath. Sit the baby in a baby tub filled with warm water. With one hand holding the baby upright, scoop water with your other hand and gently pour it on the baby’s body. You might also try this with you in a tub of warm water with the baby on your lap. Warning: Never leave a baby unattended near water to avoid drowning.

Bonus Tip: The magic mirror has pulled many babies out of many crying jags. Hold a colicky baby in front of a mirror and let her witness her own drama. Place her hand or bare foot against her image on the mirror surface and watch the intrigued baby grow silent.

Developmental Landmarks

Directions: Give your best estimate for the age at which about 50 percent of children begin to:

_____ 1. Laugh
_____ 2. Pedal a tricycle
_____ 3. Sit without support
_____ 4. Feel ashamed
_____ 5. Walk unassisted
_____ 6. Stand on one foot for 10 seconds
_____ 7. Recognize and smile at mother or father
_____ 8. Kick ball forward
_____ 9. Think about things that cannot be seen
_____ 10. Make two-word sentences
Piaget's Concepts

Directions: Use this diagram to better understand the relationship among the following Piagetian concepts: assimilation, accommodation, disequilibrium, equilibrium.

When we are at equilibrium we assimilate or take in information, but if we are at disequilibrium, we have to accommodate.
**Handout 3-5**

**Infant Toy Selection Activity**

*Directions:* Through visits to stores or online research, find toys designated for infants and evaluate them in terms of their appropriateness and safety. Record your findings and evaluations in the chart below.

<table>
<thead>
<tr>
<th>Name of Toy</th>
<th>Description of Toy</th>
<th>Appropriateness of Toy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Signs for Use with Infants

*Directions:* Review the descriptions of some signs that researchers have suggested for use with infants. Then, think of a message you might want to communicate to an infant. Try to communicate that message by using the signs in the chart below along with other gestures—but no speech.

<table>
<thead>
<tr>
<th>Word</th>
<th>Description of Gestures/Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>drink</td>
<td>Finger to your nose wrinkled up</td>
</tr>
<tr>
<td>more</td>
<td>Tap your index finger</td>
</tr>
<tr>
<td>hat</td>
<td>Pat top of your head</td>
</tr>
<tr>
<td>fish</td>
<td>Smack your lips together</td>
</tr>
<tr>
<td>water</td>
<td>Rub your palms together</td>
</tr>
<tr>
<td>book</td>
<td>With hands, palms up and side by side, open and close your palms</td>
</tr>
<tr>
<td>fan</td>
<td>Hold one finger up and make circles with it</td>
</tr>
<tr>
<td>afraid</td>
<td>Pat your chest and repeat that gesture over and over</td>
</tr>
<tr>
<td>out (go outside)</td>
<td>Show the action of turning a knob of a door</td>
</tr>
<tr>
<td>tractor</td>
<td>Show the action of steering a wheel</td>
</tr>
<tr>
<td>Where?</td>
<td>Show your palms up</td>
</tr>
</tbody>
</table>