

Detailed Chapter Outline with Key Terms

Chapter 4: The Study of Human Development

Focus: Helen Keller and the World of the Senses

CHILDBIRTH AND CULTURE: HOW BIRTHING HAS CHANGED

THE BIRTH PROCESS

- *Labor:* Contractions of the uterus during childbirth.
- **Parturition:** Process of uterine, cervical, and other changes, usually lasting about two weeks, preceding childbirth.

Stages of Childbirth

- *First stage:* Usually the longest stage, may last 12 hours or more, in which regular and increasingly frequent uterine contractions widen the cervix.
- *Second stage:* Lasting up to one hour, this stage begins when the baby's head moves through the cervix and into the vaginal canal, and ends when the baby emerges completely from the mother's body.
- *Third stage:* Lasting only about 5 to 30 minutes, this stage is the expulsion of the placenta and remaining tissues from the uterus.

Methods of Delivery

Vaginal versus Cesarean Delivery

- **Cesarean delivery:** Delivery of a baby by surgical removal from the uterus.
- **Electronic fetal monitoring:** Mechanical monitoring of fetal heartbeat during labor and delivery.

Medicated versus Unmedicated Delivery

- **Natural childbirth:** Method of childbirth that seeks to prevent pain by eliminating the mother's fear through education about the physiology of reproduction and training in breathing and relaxation during delivery.
- **Prepared childbirth:** Method of childbirth that uses instruction, breathing exercises, and social support to induce controlled physical response to uterine contractions and reduce fear and pain.

THE NEWBORN BABY

- **Neonatal period:** First 4 weeks of life, a time of transition from intrauterine dependency to independent existence.

Size and Appearance

- **Neonate:** Newborn baby, up to 4 weeks old.

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- *Fontanelles*: Places on a baby's head where the bones have not yet grown together.
- *Lanugo*: The birth hair, a fuzzy prenatal hair that will eventually drop off.
- *Vernix caseosa*: An oily protective covering of the skin against infection, which dries and sloughs off within the first few days.

Body Systems

- **Anoxia**: Lack of oxygen, which may cause brain damage.
- *Meconium*: Fetal waste matter, excreted during the first few days after birth.
- **Neonatal jaundice**: Condition, in many newborn babies, caused by immaturity of liver and evidenced by yellowish appearance; can cause brain damage if not treated promptly.

Medical and Behavioral Assessment

The Apgar Scale

- **Apgar scale**: Standard measurement of a newborn's condition; it assesses appearance, pulse, grimace, activity, and respiration.

Assessing Neurological Status: The Brazelton Scale

- **Brazelton Neonatal Behavioral Assessment Scale (NBAS)**: Neurological and behavioral test to measure neonate's responses to the environment. It assesses:
 - *Motor organization (such as activity level or motor coordination)*
 - *Reflexes*
 - *State changes (such as irritability or the ability to calm down after an upset)*
 - *Attention and interactive capacities (such as general alertness and responsiveness)*
 - *Central nervous system instability (such as tremors and skin color changes)*

Neonatal Screening for Medical Conditions

States of Arousal

- **State of arousal**: An infant's physiological and behavioral status at a given moment in the periodic daily cycle of wakefulness, sleep, and activity.

SURVIVAL AND HEALTH

Complications of Childbirth and Their Aftermath

Birth Trauma

- **Birth trauma**: Injury sustained at the time of birth.

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Postmaturity

- **Postmature:** Referring to a fetus not yet born as of 2 weeks after the due date or 42 weeks after the mother's last menstrual period.

Low Birthweight

- **Low birthweight:** Weight of less than 5 ½ pounds (2500 grams) at birth because of prematurity or being small for date.
- **Preterm (premature) infants:** Infants born before completing the thirty-seventh week of gestation.
- **Small-for-date (small-for-gestational age):** Infants whose birthweight is less than that of 90 percent of babies of the same gestational age, as a result of slow fetal growth.

Who Is More Likely to Have a Low Birthweight Baby?

- *Demographic and socioeconomic factors:* Factors such as atypical age of the mother, poverty, unmarried status or low educational level of the mother.
- *Medical factors predating the pregnancy:* Factors such as a mother having either no children or more than four, being thin or short, having had previous low birthweight babies or miscarriages, having been a low birthweight baby herself, or having genital or urinary abnormalities or chronic hypertension.
- *Prenatal behavioral and environmental factors:* Factors such as poor nutrition, poor prenatal care, smoking, use of alcohol or other drugs, or exposure to stress, high altitude, or toxic substances.
- *Medical conditions associated with the pregnancy:* Factors such as vaginal bleeding, infections, high or low blood pressure, anemia, too little weight gain, and having given birth either less than six months before or more than ten years before.

Immediate Treatment and Outcomes

- *Isolette:* An antiseptic, temperature-controlled crib.

Long-Term Outcomes

- *Very-low birthweight babies:* Babies weighing less than 1,500 grams.
- *Extremely low birthweight babies:* Babies weighing between 501 and 1000 grams, or about 1 to 2 pounds.

Stillborn

Can a Supportive Environment Overcome Effects of Birth Complications?

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The Infant Health and Development Studies

The Kauai Study

- **Protective factors:** Influences that reduce the impact of early stress and tend to predict positive outcomes.

Reducing Infant Mortality

Trends in Infant Mortality

- **Infant mortality rate:** Proportion of babies born alive who die within the first year.

Racial/Ethnic Disparities in Infant Mortality

Sudden Infant Death Syndrome (SIDS)

- **Sudden infant death syndrome (SIDS):** Sudden and unexplained death of an apparently healthy infant, sometimes called *crib death*.

Immunization for Better Health

EARLY PHYSICAL DEVELOPMENT

Principles of Development

- *Cephalocaudal principle:* Principle stating that growth (including sensory and motor development) occurs from the top down.
- *Proximodistal principle:* Principle stating that growth and motor development proceed from the center of the body outward.

Physical Growth

Nutrition

Breast or Bottle?

Nutritional Concerns

The Brain and Reflex Behavior

- **Central nervous system:** Brain and spinal cord.
- *Spinal cord:* A bundle of nerves running through the backbone.

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Building the Brain

- **Brain growth spurts:** Periods of rapid growth and development, coinciding with changes in cognitive behavior.
- *Brain stem:* The part of the brain responsible for such basic bodily functions as breathing, heart rate, body temperature, and the sleep-wake cycle.
- *Cerebellum:* The part of the brain that maintains balance and motor coordination.
- *Cerebrum:* The largest part of the brain, divided into left and right hemispheres.
- **Lateralization:** Tendency of each of the brain's hemispheres to have specialized functions.
- *Corpus callosum:* A tough band of tissue joining the right and left hemispheres.
- *Occipital lobe:* Section of the cerebral hemisphere that processes visual information.
- *Parietal lobe:* Section of the cerebral hemisphere that processes touch and spatial information.
- *Temporal lobe:* Section of the cerebral hemisphere that processes hearing and language.
- *Frontal lobe:* Section of the cerebral hemisphere that permits high-level functioning such as speech and reasoning.
- *Cerebral cortex:* The outer surface of the cerebrum.

Brain Cells

- **Neurons:** Nerve cells.
- *Glial cells:* Cells that support and protect the neurons.
- *Axons:* Branching extension from the neuron that sends signals to other neurons.
- *Dendrites:* Branching extensions from the neuron that receive incoming messages from other cells.
- *Synapses:* Tiny gaps between neurons.
- *Neurotransmitters:* Chemicals that bridge the synapse between neurons.
- **Integration:** Process by which neurons coordinate the activities of muscle groups.
- **Differentiation:** Process by which neurons acquire specialized structure and function.
- **Cell death:** Elimination of excess brain cells to achieve more efficient functioning.

Myelination

- *Myelin:* Fatty substance that coats the neural pathways.
- **Myelination:** Process of coating neurons with a fatty substance (myelin) that enables faster communication between cells.
- *Hippocampus:* A structure deep in the temporal lobe that plays a key role in memory.

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Early Reflexes

- **Reflex behavior:** Automatic, involuntary, innate response to stimulation.
- *Primitive reflexes:* Reflexes related to instinctive needs for survival and protection.
- *Postural reflexes:* Reactions to changes in position or balance.
- *Locomotor reflexes:* Reflexes that resemble voluntary movements that do not appear until months after the reflexes have disappeared, such as walking and swimming.

Molding the Brain: The Role of Experience

- **Plasticity:** Modifiability, or “molding,” of the brain through experience.

Early Sensory Capacities

Touch and Pain

Smell and Taste

Hearing

Sight

- *Binocular vision:* The use of both eyes to focus, allowing perception of depth and distance.

Motor Development

Milestones of Motor Development

- **Systems of action:** Increasingly complex combinations of skills, which permit a wider or more precise range of movement and more control of the environment.
- *Pincer grasp:* Grasp in which thumb and index finger meet at the tips to form a circle.
- **Denver Developmental Screening Test:** Screening test given to children 1 month to 6 years old to determine whether they are developing normally.
- **Gross motor skills:** Physical skills that involve the large muscles.
- **Fine motor skills:** Physical skills that involve the small muscles and eye-hand coordination.

Head Control

Hand Control

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Locomotion

- *Self-locomotion*: The ability of babies to get around under their own power by means of creeping or crawling.
- *Social Referencing*: Looking to caregivers for clues as to whether a situation is secure or frightening.

How Motor Development Occurs: Maturation in Context

- *Walking reflex*: Stepping movements a neonate makes when held upright with the feet touching a surface.

Motor Development and Perception

- **Visual guidance**: The use of the eyes to guide the movement of the hands (or other parts of the body).
- **Depth perception**: Ability to perceive objects and surfaces three-dimensionally.
- **Haptic perception**: Ability to acquire information about properties of objects, such as size, weight, and texture, by handling them.

Eleanor and James Gibson's Ecological Theory

- **Visual cliff**: Apparatus designed to give an illusion of depth and used to assess depth perception in infants.
- **Ecological theory of perception**: Theory developed by Eleanor and James Gibson, which describes developing motor and perceptual abilities as interdependent parts of a functional system that guides behavior in varying contexts.
- **Affordance**: In the Gibsons' ecological theory of perception, the fit between a person's physical attributes and capabilities and characteristics of the environment.

Cultural Influences on Motor Development