

Janet Belsky's Experiencing the Lifespan, 3e



Chapter 5: Physical and Cognitive Development

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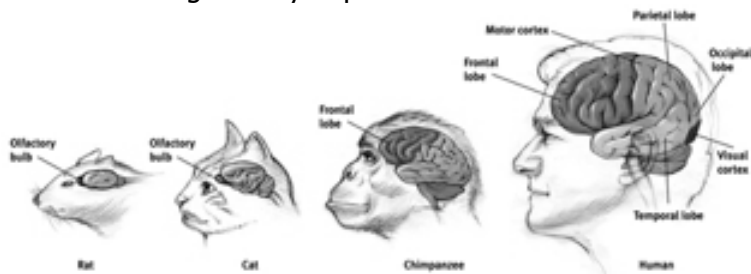
Setting the Context: Special Social Learning Tasks

- What sets us apart from other animals?
 - Human Socialization
 - Learn norms of our culture
 - Ability to take another person's perspective
 - Mind-reading skill (begins with joint attention)
 - Language



Slow-growing Frontal Lobes

- Compared to other parts of the brain, frontal lobe development is on a delayed timetable.
- As frontal lobes mature throughout childhood and adolescence, our ability to think through, inhibit, and plan our actions gradually improves.



Physical Development

- *Cephalocaudal* sequence—bodies elongate and lengthen
- *Mass-to-specific* sequence—physical abilities become more coordinated and precise
- Two types of physical skills
 - *Gross Motor skills*: large muscle movement
 - *Fine Motor skills*: small coordinated movement



TABLE 5.1: Selected Motor Skill Milestones: Progression from Age 2 to Age 6

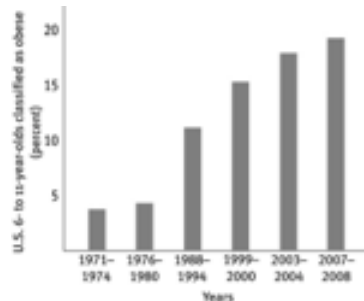
At age 2	At age 4
Picks up small objects with thumb and forefinger, feeds self with spoon	Cuts paper, approximates circle
Walks unassisted, usually by 12 months	Walks down stairs, alternating feet
Rolls a ball or flings it awkwardly	Catches and controls a large bounced ball across the body
At age 5	At age 6
Prints name	Copies two short words
Walks without holding on to railing	Hops on each foot for 1 meter but still holds railing
Tosses ball overhand with bent elbows	Catches and controls a 10-inch ball in both hands with arms in front of body

Threats to Growth and Motor Skills

- ***Inadequate Nutrition:*** top-ranking twenty-first-century global public health threat to physical development!
 - Stunting
 - Compromises bone, muscle, and brain development
 - Causes lethargy
 - Impairs gross and fine motor skills

Childhood Obesity

- Monitored in the United States by National Health and Nutrition Study (NHANES), a National Poll
 - Assessed by *BMI* = ratio of weight to height
 - **Overweight**
 - At or over the 85th for the norms
 - **Obesity**
 - BMI at or above the 95th percentile compared to U.S. norms



Percentage of U.S. children age 6-11 classified as obese, selected years.

Exploring the Epidemic's Size

- **Global Epidemic**
 - Demographics differ in developed and developing worlds.
 - Obesity in the developed world
 - Children from low-income families
 - In the United States, highest among Latino and African American children
 - Obesity in the developing world: most prevalent in cities and among affluent boys and girls

Factors Promoting Obesity

- Primary culprit: lack of physical activity
 - Internet, TV
 - Research shows that time spent watching TV predicts obesity.
- Oversized portions of food
 - Restaurant foods, large servings, and caloric content
- Negative attitudes toward the obese
 - Teasing; stereotyping
 - Studies show gym teachers display negative attitudes (obese children judged slow and clumsy).

TABLE 5.2: Three Low-Stress, Research-based Obesity-Control Techniques for Parents and Three Research Messages for Society

Tips for parents:

- **For babies:** As the overweight pathway has its onset during infancy (see text), limit over-consumption at the youngest age. **Relevant study:** When researchers trained parents to minimize feeding for non-hunger related fussiness and introduce solid foods later and begin with vegetables, children gained less weight by age 1 (Paul and others, 2011).
- **For elementary schoolers:** Rather than restricting intake, load plates with low-calorie foods. **Relevant study:** When parents were told to double the portion size of fruits and vegetables on children's plates, overweight boys and girls ate far less of a high-calorie main dish (pasta).
- **For teenagers:** Have the child exercise for a half hour early each day. **Relevant study:** After 30 minutes of high-intensity morning exercise, obese teens ate significantly less during the next 24 hours, without feeling deprived (Thivel and others, 2011).

Tips for society:

- Heavily target obesity-prevention efforts to women of childbearing age to break this intergenerational cycle that may begin in the womb.
- Don't discriminate against overweight children (and adults).
- Hold off from blaming parents for their children's obesity issues!

Sources: Based on Paul and others, 2011; Thivel and others, 2010; and the chapter sources.

Cognitive Development

TABLE 5.3: Piaget's Stages: Focus on Childhood

Age	Name of Stage	Description
0-2	Sensorimotor	The baby manipulates objects to pin down the basics of physical reality. This stage ends with the development of language.
2-7	Preoperations	Children's perceptions are captured by their immediate appearances. "What they see is what is real." They believe, among other things, that inanimate objects are really alive and that if the appearance of a quantity of liquid changes (for example, if it is poured from a short, wide glass into a tall, thin one), the amount becomes different.
8-12	Concrete operations	Children have a realistic understanding of the world. Their thinking is really on the same wavelength as adults'. While they can reason conceptually about concrete objects, however, they cannot think abstractly in a scientific way.
12+	Formal operations	Reasoning is at its pinnacle: hypothetical, scientific, flexible, fully adult. Our full cognitive human potential has been reached.

Cognitive Development Piaget's Preoperational Stage

- Spans ages 2-7
- *Preoperational* thinking
 - Characteristics
 - Child has an inability to step back from his immediate perceptions and think conceptually.
 - Thinking is qualitatively unlike that of an adult.
 - Child cannot reason logically, and cannot look beyond appearance of objects.
 - Young children understand only what they can see.

Assessing Preoperational Thought

- Piaget's Conservation Tasks
 - *Conservation*: our knowledge that the amount of a given substance remains the same despite changes in its shape or form
 - Preoperational children do not understand:
 - The laws of conservation!
 - The concept of *reversibility*!
 - Children *center* only on what they can see!

Piaget's Conservation Tasks

Type of conservation	Initial setup and question	Transformation and next question	Preoperational child's answer
Number	Two equal rows of pebbles. "Are these two rows the same?" (Yes.)	Increases spacing of pebbles in one row. "Now is the amount of pebbles the same?"	"No, the longer row has more."
Mass	Two equal balls of clay. "Do these two balls have the same amount of clay?" (Yes.)	Squashes one ball into a long pancake shape. "Now is the amount of clay the same?"	"No, the long, flat one has more clay."
Volume or liquid	Two glasses of the same size with liquid. "Do these glasses have the same amount of liquid?" (Yes.)	Pour one into a taller, narrower glass. "Now do these glasses have the same amount of liquid?"	"No, the taller glass has more liquid."
Weight*	Two identical cubes of sugar. "Do these cubes have the same amount of sugar?" (Yes.)	Crushes one cube in a glass of water. "Now is there the same amount of sugar?"	"No, because you made one piece of sugar disappear."

*That is, the idea that a substance such as sugar is "still there" even though it seems to have disappeared by dissolving.

Preoperational Thinking

- Children also have trouble grasping these concepts:
 - *Class inclusion*: the understanding that a general category can encompass several subordinate elements
 - *Seriation*: the ability to put things in order according to some principle, such as size



Seriation
When asked to "put these sticks together from biggest to smallest," this kindergartner may center on the uppermost part of the table, identifying sticks 2 and 5 as the biggest.

Preoperational Thinking: Peculiar Perceptions About People

- Children have an inability to grasp "identity constancy"
 - A person's core "self" stays the same despite changes in external appearance.



Peculiar Perceptions about People

- *Animism*
 - The belief that inanimate objects are alive
- *Artificialism*
 - The belief that humans make everything in nature
- *Egocentrism*
 - An inability to understand another's perspective



Animistic Thinking

Piaget's Concrete Operational Stage: Ages 8–11

- Transition from preoperations to concrete operations develops gradually (5–7), but by age 8 children are firmly in this stage.
 - Understand conservation tasks
 - Understand identity constancy
 - Look beyond immediate appearances
 - Begin to understand principles of basic math

Evaluating Piaget

- Should the pre-operational and concrete operational stages be classified as different stages?
 - Skills appear gradually!
- Piaget overstated egocentric thinking.
- Culture has an influence on the timing of learning certain tasks.
- Piaget did not believe in active teaching; he believed children would automatically grow out of their preoperational worldview.



In a collectivist culture, children may grasp conservation tasks much quicker due to hands-on training.

Lev Vygotsky: A Different View of Cognitive Growth

- Human interaction promotes learning and cognitive growth.
- Zone of Proximal Development
- Scaffolding
- Learning is bidirectional.

Tips for Effective Scaffolding

- First and foremost, foster a secure attachment.
- Break larger cognitive tasks into smaller, more manageable steps.
- When child makes a mistake, give nonthreatening feedback.
- Continue helping until child has mastered concept, then move on.
- Set an overall framework for the learning task and build in motivation.

TABLE 5.5: Piagetian and Vygotskian Perspectives on Life and Learning

	Lev Vygotsky (1896-1934)	Jean Piaget (1896-1980)
		
Biography	Russian, Jewish, communist (reached teenage years during the Russian Revolution), believed in Marx	Swiss, middle-class family
Basic interests	Education, literature, literary criticism Wanted to know how to stimulate thinking	Biology, mollusks Wanted to trace the evolution of thought in stages
Overall orientation	Look at interpersonal processes and the role of society in cognition	Look for universal developmental processes
Basic ideas	<ol style="list-style-type: none"> 1. We develop intellectually through social interactions. 2. Development is a collaborative endeavor. 3. People cause cognitive growth. 	<ol style="list-style-type: none"> 1. We develop intellectually through physically acting on the world. 2. Development takes place on our own inner timetable. 3. When we are internally ready, we reach a higher level of cognitive development.
Implications for education	Instruction is critical to development. Teachers should sensitively intervene within each child's zone of proximal development.	Provide ample materials to let children explore and learn on their own.

Cognitive Development: Information-Processing Perspective

- Looks at specific skills such as the development of memory, concentration, and the ability to inhibit and control our actions
- Mental growth occurs gradually, not in stages.
- Attempts to decode the “processing steps” involved in thinking
- Explores the development of *memory* and *executive functions*

Information Processing: Making Sense of Memory

- Working Memory
 - Holds about 7 bits of information
 - Keeps information in awareness; we either process information or discard it
 - Executive processor: allows us to focus on important material to prepare for permanent storage
 - Memory bin capacity expands between ages 2–7.
 - Allows for new understanding at around 7–8 (concrete operations)

Information Processing: Exploring Executive Functions

- *Executive Functions*: any frontal-lobe ability that allows us to inhibit our responses and to plan and direct our thinking
 - Rehearsal
 - Selective Attention
 - Inhibition

TABLE 5.6: Information-Processing Guidelines for Teachers and Parents

Early childhood

1. Don't expect a child to remember, without considerable prompting, regular chores such as feeding a pet, the details of a movie or show, or the name of the person who telephoned.
2. Expect the child to have a good deal of trouble with any situation that involves inhibiting a strong "prepotent impulse"—such as not touching toys, following unpleasant rules, or keeping a secret.

Middle childhood

1. Don't assume that the child knows how to best master school-related memorization tasks. Actively teach the need to rehearse information, selective attention strategies (such as underlining important points), and other studying skills.
2. Scaffold organizational strategies for school and life. For example, get the child to use a notebook for each class assignment and to keep important objects, such as eyeglasses, in a specific place.
3. Expect situations that involve many different tasks, such as getting ready for school, to present problems. Also expect activities that involve ongoing inhibition to give children trouble, such as refraining from watching TV or using the Internet before finishing their homework. Try to build in a regular structure for mastering these difficult executive-functioning tasks: "The rule is that at 8 or 9 P.M., it's time to get everything ready for school." "Homework must be completed by dinnertime, or the first thing after you get home from school."
4. To promote selective attention (and inhibition), have a child do homework, or any task that involves concentration, in a room away from tempting distractions such as the TV or Internet.

Attention Deficit/Hyperactivity Disorder (ADHD)

- Characteristics:
 - Excessive restlessness
 - Easily distracted
 - Difficulties focusing
 - Usually diagnosed in elementary school
 - Most often diagnosed in boys
 - More often diagnosed in the United States

Information Processing: Helping Children with ADHD

- Standard treatment: psycho-stimulant medications
 - Best when used with reinforcement for appropriate behavior
- Foster best person–environment fit
 - Provide nondistracting environment that demands selective attention (e.g., homework)

Interventions for ADHD

- Reduce distractions.
- Allow special time for exercise.
- Give the child special time and help with activities that demand several steps.
- Minimize the need to multitask.
- Consider psycho-stimulant medication.
- Avoid power assertion. Do not define your child as a “bad kid.”

Language

- Vygotsky
 - Emphasized language as being front and center of everything we learn
 - *inner speech*: repeating information silently or “out loud” in order to regulate behavior or to master cognitive challenges
 - Young children speak “out loud” to monitor their behavior.

Developing Speech

- By age 2, children begin to put together words.
- *Phonemes*: individual word sounds of language (e.g., in English, “c” sound for cat)
- *Morphemes*: the basic *meaning units* of language
 - Coded by “mean length of utterance” (MLU)
 - “Me want juice” = 3 MLU’ s
- *Syntax*:
 - System of grammatical rules in a particular language

Developing Speech

- *Semantics*: understanding word meanings
 - About 10,000 words at age 6
 - Vocabulary continues to grow throughout life.
- *Overregularization*
 - Puts irregular “pasts” and “plurals” into regular form
 - “If I walked, I also must have *runned* and *swimmed*.”
- *Over/underextensions*
 - Applies verbal labels too broadly/narrowly

TABLE 5.7: Challenges on the Language Pathway: A Summary Table

Type of challenge	Description	Example
Phonemes	Has trouble forming sounds	Boba, psghetti
Morphemes	Uses few meaning units per sentence	Me go home
Syntax (grammar)	Makes mistakes in applying rules for forming sentences	Me go home
Semantics	Has problems understanding word meanings	Calls the family dog a horsey
Overregularization	Puts irregular pasts and plurals into regular forms	Foots; runned
Over/underextension	Applies verbal labels too broadly/narrowly	Calls every old man grandpa; tells another child he can't have a grandpa because grandpa is the name for his grandfather alone

Constructing Our Personal Past

■ *Autobiographical Memory*

- Recollections of events and experiences that make up one's life history
- Scaffolded through *past-talk conversations*
 - Becomes more elaborate as children move from preschool to elementary school
 - Use experiences to connect with others



Making Sense of Other's Minds: Theory of Mind

- The understanding that other people have different beliefs and perspectives from one's own
- Emerges about age 4–5
 - Typical in Western cultures
- Researchers use “False-Belief” studies
 - See illustration at right.
 - “Mean Monkey” exercise
 - Studies proved Piaget's belief's about preoperational egocentrism had flaws.



#3: Where will Mrs. X look for the toy?

Differences in Development of Theory of Mind?

- Early development of Theory of Mind
 - Having older siblings
 - Advanced intellectual development
 - Bilingual preschoolers
- Later development of Theory of Mind
 - Frontal lobe damage
 - Autism “mindblindness”



TABLE 5.8: Brain-Imaging Theory-of-Mind and Autobiographical-Memory Findings to Wrap your Head Around:

Reflecting on the self and others' mental states is a frontal-lobe activity involving slightly different brain regions: When people are asked to recall autobiographical memories or presented with self-referent stimuli such as their name, a brain region called the medial frontal cortex lights up. When given theory-of-mind-type tasks, a slightly different area of the medial frontal cortex is activated, which suggests that thinking about ourselves and other people's motivations involve distinctive (but closely aligned) brain areas.

Interesting cultural variation: While the above (slight) neural separation between self and other-person reflections applies to Westerners, the identical brain area lights up when Chinese adults think about themselves and their mothers. More astonishing, thinking about yourself and family members activates either the same or more separate brain regions, depending on whether you have a collectivist (interdependent) or individualistic (self-oriented) worldview.

Interesting variation from person to person: When you judge the mental state of someone you see as very much like you, such as a close friend, a closely aligned brain region lights up as when you are asked to reflect on yourself (as if you are drawing on your feelings about how you would respond in interpreting this person). But, inferring the mental states of dissimilar others—people you view as very different—activates truly separate brain areas. Imagining the feelings of disliked out-group members (e.g., as a Palestinian being asked to empathize with the perspective of a Jewish-Israeli West Bank settler) may elicit reduced activity in the "social" brain!

Conclusion: Our attitudes about the self in relationship to other human beings are mirrored in the physical architecture of our brain.

Source: Abu-Mel & Sharay-Tsoref, 2012; Paul & Hoge, 2001; Ochs and others, 2005; Ochs and others, 2006; Rubin and others, 2006.

Can Adults Fail Theory of Mind Tests?

