PART III

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CHILDHOOD

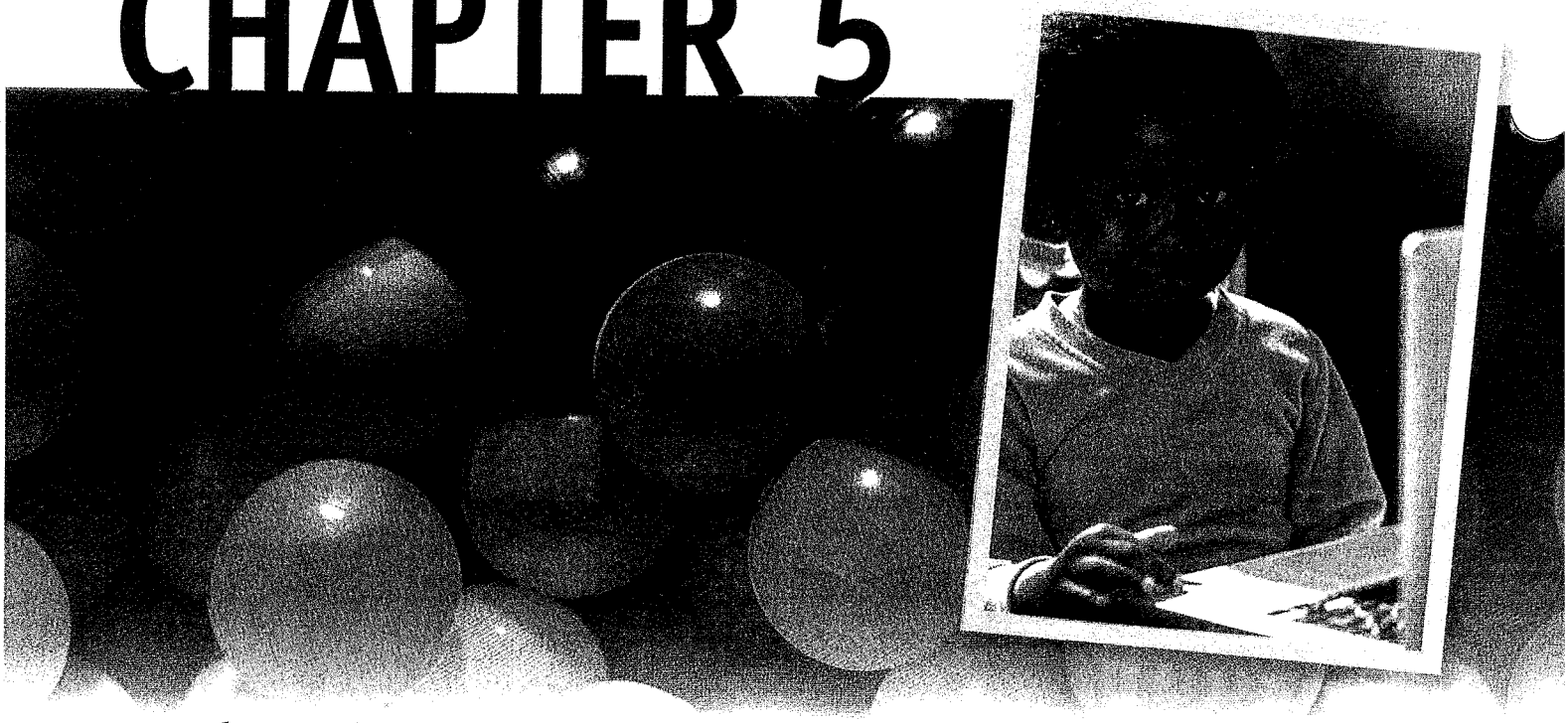
In this three-chapter part, the first two chapters trace children's development in stages. The final chapter explores the settings within which children develop: home, school, and community.

Chapter 5—Early Childhood focuses on preschool and kindergarten (ages 3 to 6). First, I'll explore young children's physical skills. Then, the heart of this chapter—cognition—decodes the strange ways preschoolers think, offers a framework for teaching, and shows how language develops. Next, I'll trace how children learn they have an enduring self and decode other people's mental states, and describe autism spectrum disorders. Finally, I'll enter the world of preschool play.

Chapter 6—Middle Childhood turns to elementary school (ages 7 to 12). After spelling out why two world-class psychologists target middle childhood as the first adult-like life stage, I'll describe the brain changes that make elementary school–aged children's thinking unique, and explore children's health and motor skills. Then, I'll examine cognition and emotional states, tracking self-awareness (and self-esteem), caring acts, and aggression. The final sections of this chapter explore friendships and popularity and then examine bullying, the scourge of childhood.

Chapter 7—Settings for Development: Home, School, and Community first tackles children's families. Is there an ideal way of parenting? Why do some children thrive in spite of dysfunctional early lives? What is the impact of spanking, child abuse, and divorce on the child? Here you will learn about intelligence tests, what makes schools successful, and how teachers can make every child eager to learn. Throughout this chapter, I'll highlight the important role communities play in children's success.

CHAPTER 5



Karel Noppé/Alamy

Early Childhood

As the 3-year-olds drift in to Learning Preschool, Ms. Angela fills me in . . . "First, we have free play. Then, read a story. At 10:30, we have a snack and go outside. We focus on stretching the children's capacities, but don't expect too much—no academics at this age. The goal is to get them to master the basics for school and life: listen; take turns; share; be respectful; talk about feelings; don't yell (use your inside voice). The room is arranged into activity centers to give the children room to explore."

At the kitchen center, Kanesha is pretending to scrub pots. "What is your name?" I ask. "You know!" says Kanesha, looking at me as if I'm totally dumb. Kanesha gives me a plate: "Let's have psghetti and Nadia makeacake." We are having a wonderful time talking as she loads me up with plastic food. The problem is that we aren't communicating. Who is Nadia, that great cook?

Then two girls and a boy run from the doll corner and things begin to escalate: "We are mommies and daddies. Our Barbies need food!" Sara and Tania grab plastic vegetables off the table; Mark commandeers Kanesha's pot. Then, Ms. Angela runs in: "What are you supposed to do?" The kids chant, "Listen; take turns; share," and everyone starts giggling and gives Kanesha hugs.

I move to the crafts table. "Hey!" Moriah yells as José cuts his sheet into pieces, "José has more than me!" Moriah is making beautiful circles with paste. José tries to copy her but can only make random lines. These children are so different in their physical abilities, even though they are the same age. But—oh no—here come the children from the kitchen corner, and things get out of control again! Luckily, it's story time.

Ms. Angela reads a book about a bear who takes honey from the community cave when no one is around. "What is Little Bear feeling?" she asks. One boy says, "Hungry!" Another says, "Sad." Then José proudly informs the class, "He's happy and scared because he is being bad." But—just when I conclude José is a psychological

CHAPTER OUTLINE

Setting the Context
Special "Mind Reading" Talents
Age of Exploration

Physical Development
Two Types of Motor Talents
Threats to Preschool Physical Skills

Cognitive Development
Piaget's Preoperational Stage
- *Experiencing the Lifespan:* Animism and the Power of Stephen King
- *Interventions:* Using Piaget's Ideas at Home and at Work

Vygotsky's Zone of Proximal Development
- *Interventions:* Becoming an Effective Scaffolder

Language

Emotional Development
Constructing Our Personal Past
Making Sense of Other People's Minds
- *Trending in Developmental Science:* Autism Spectrum Disorders

Social Development
Play: The Work of Early Childhood
Girls' and Boys' Play Worlds
- *Interventions:* Careers in Early Childhood: Encouraging Less Gender-Typed Play

Final Thoughts: Screen Learning Versus Real-Life Learning

genius—Ms. Angela follows up: "When the bears return, will they know it's him?" José and everyone yell, "Yes!"

At the activity centers, the girls are already separating from the boys. During outdoor play, however, I notice (a bit sadly) that José abandons Moriah as the boys joyously wrestle and compete to jump as far as they can. As the wind starts gusting, everyone gets excited and these gender differences disappear: "Let's catch Mister Wind. . . . He ran away again!" And now (whew!) it's time for lunch and rest.

These 3-year-olds have amazing skills. They can cut, climb, and jump, follow directions (a bit), and tell me about their lives. But they are clearly on a different wavelength in the way they think about life. Why was the class certain that the other animals would know who took the honey even though no one saw the offending bear? Why was Kanesha sure I *had* to know her name, and why did Moriah assume José had more paper when he cut his sheet into pieces? What makes pretending compelling during preschool, and why do girls and boys separate into same-sex groups? This chapter offers answers as we immerse ourselves in the magical stage called **early childhood** (ages 3 to 6).

early childhood The first phase of childhood, lasting from age 3 through kindergarten, or about age 6.

Setting the Context

Learning Outcomes

- Describe what makes humanity special.
- Contrast Erikson's early-childhood and middle-childhood tasks.

To introduce this special age, let's first step back. What makes human beings unique? What makes early childhood different from the next stage of development, called **middle childhood** (ages 7 to 12)?

middle childhood The second phase of childhood, comprising the ages from roughly 7 to 12 years.

Special "Mind Reading" Talents

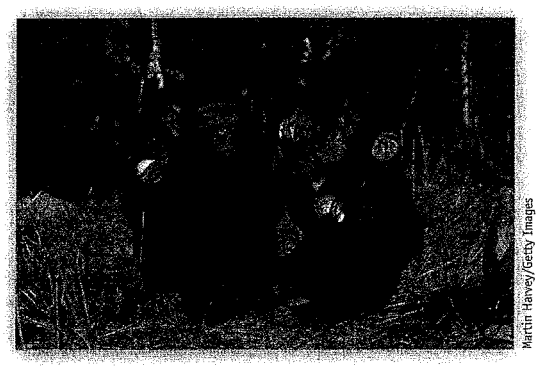
The primates in this photo are clearly enjoying life (Poirier & Smith, 1974). But why did these species stay in the savanna while human beings had the talent to construct cities and negotiate cyberspace?

The reason, according to evolutionary theorists, is that humans have a unique capacity — the ability to reflect on our actions and read each other's minds. Great apes do possess basic mindreading skills (see Buttelmann, Call, & Tomasello, 2009). But because they lack language, our primate cousins can't share each other's thoughts to transform the world. ("Oh, *now* I understand what you were trying to do. Let's work together to improve on that.")

In this chapter, I will describe how, during early childhood, the *social cognitive skills* that define humanity lock in. I'll also explain why early childhood is unique compared to older ages. That master theorist, Erik Erikson, best captured the essential quality defining this special stage of life.

initiative Erik Erikson's term for the early childhood psychosocial task that involves exuberantly testing skills.

industry Erik Erikson's term for the middle childhood psychosocial task involving bending to adult reality and needing to work for what we want.



Martin Harvey/Getty Images

Imagine that these primate pals could *really* share their insights and understand what's happening in each other's minds. Wouldn't they be the species that has transformed the world?

Age of Exploration

Erikson, as you can see from Table 5.1, labeled the early childhood psychosocial task as **initiative**. From racing a tricycle in the street to scaling the school monkey bars, Erikson believed that our mission during preschool is to confidently exercise our bodies and minds.

In middle childhood (beginning approximately at age 7), this agenda shifts. Now our challenge is to develop **industry**, because we understand that succeeding in the world requires work. Therefore, the in-between interlude, when we have mastered walking and

Table 5.1: Erikson's Psychosocial Stages

Life Stage	Primary Task
Infancy (birth to 1 year)	Basic trust versus mistrust
Toddlerhood (1 to 2 years)	Autonomy versus shame and doubt
Early childhood (3 to 6 years)	Initiative versus guilt
Middle childhood (7 to 12 years)	Industry versus inferiority
Adolescence to emerging adulthood (teens into twenties)	Identity versus role confusion
Early adulthood (twenties to early forties)	Intimacy versus isolation
Middle adulthood (forties to sixties)	Generativity versus stagnation
Late adulthood (late sixties and beyond)	Integrity versus despair

Robert Dant/Alamy

mangpor2004/Shutterstock

Exuberantly taking off on your tricycle versus listening to the teacher and finishing your homework shows why early childhood is a magical time before we enter the adult world and must work.

talking but haven't yet entered elementary school, is a time of vigorously testing our talents before we must bend to reality and curb our desires. Exploration (and initiative) is a vital prelude to confronting the demands of adult life.

Beginning with physical development, then moving to cognitive development, emotional development, and finally to play — the work of childhood — let's now track this age of exploration in the flesh.

Tying It All Together

1. In a sentence, explain what makes human beings different from other species.
2. Think back to life as a preschooler and a third grader. Then, in a sentence, use Erikson's initiative and industry tasks to target the essential difference between these two age groups.
3. Preschool is devoted to *exploring the world/working for what you want.* The challenge of elementary school is *exploring the world/working for what you want.* (Select the correct answers.)

Answers to the Tying It All Together questions can be found at the end of this chapter.

Learning Outcomes

- Describe physical development.
- Name two types of motor skills.
- Outline threats to preschool physical skills.

Physical Development

Compare preschoolers to older children and you will immediately see the *cephalocaudal principle* of physical growth discussed in Chapters 2 and 3. Three-year-olds have large heads and squat, rounded bodies. As children get older, their limbs lengthen and their bodies thin out. Because they grow at similar rates, boys and girls are roughly the same size until they reach the preadolescent years.

Now visit a playground to see the *mass-to-specific* principle — the progression from clumsy, uncoordinated to sure, swift movements from ages 2 to 6. Toddlers have trouble grasping crayons; at age 6, they can draw bodies and faces. Two-year-olds are just mastering spearing food; in first grade, they can hurl balls down the bowling alley and sometimes hit pins. You can see the changes from mass to specific in a few skills from ages 2 to 6 in Table 5.2.


Lucianne Fashley/AGE Fotostock


Ariel Skelley/DigitalVision/Getty Images

The tip-off about the ages of the children in these two photos relates to the *cephalocaudal principle* of development. We know that the children in the first photo are preschoolers because they have squat shapes and relatively large heads. The longer bodies in the second photo are typical of the middle childhood years.

gross motor skills Physical abilities that involve large muscle movements, such as running and jumping.

fine motor skills Physical abilities that involve small, coordinated movements, such as drawing and writing one's name.

Two Types of Motor Talents

Developmentalists divide physical skills into two categories. **Gross motor skills** refer to large muscle movements, such as running, climbing, and hopping. **Fine motor skills** involve small, coordinated movements, such as buttoning a shirt, drawing faces, and writing one's name.

The stereotype that boys have superior gross motor abilities and girls are better at fine motor tasks is true — although often the differences are small. The largest sex difference in sports-related abilities occurs in throwing speed. Boys can typically hurl a ball much faster and hit farther than girls (Geary, 1998; Thomas & French, 1985). But the female fine motor talent of connecting with the ball may even the playing field.

Imagine that a preschooler has exceptional physical abilities. Will that child be advanced at school? The answer is yes, *if* we look at fine motor skills. In several longitudinal studies, fine motor talents predicted early elementary school success — not so much in reading, but in math (Asakawa, Murakami, & Sugimura, 2019; Gashaj and others, 2019; Suggate, Pufke, & Stoeger, 2019).

Why might fine motor abilities foreshadow academic skills? Clues come from adopting the *information processing perspective* to analyze the age 2 example in Table 5.2: eating with a spoon. Mastering this feat logically requires complicated mental steps: "I must grasp the handle towards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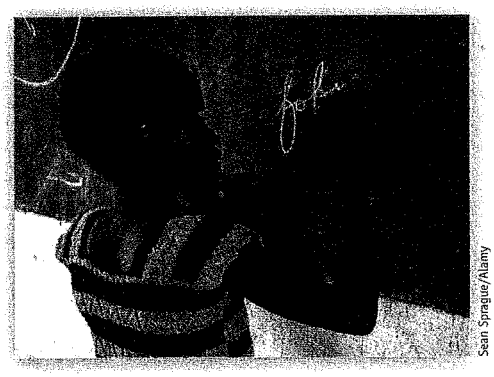

Sean Sprague/Alamy

These boys — being advanced in their gross motor skills — may be the victors when they compete with girls in this potato sack race. But this girl's exceptional fine motor talents set her up to do well in school.

Table 5.2: Selected Motor Skill Milestones: Progression from Age 2 to Age 6

At age 2	At age 4
Walks unassisted, usually by 12 months	Cuts paper, approximates circle
Rolls a ball or flings it awkwardly	Walks down stairs, alternating feet
Picks up small objects with thumb and forefinger, feeds self with spoon	Catches and controls a large bounced ball across the body
At age 5	**At age 6**
Writes 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

Hill Street Studios/DigitalVision/Getty Images

Although she may not realize it, this teacher is helping these boys master a crucial lifelong ability. Counting on fingers is a fine motor skill we use at every age!

the bottom, not the top of the utensil, and coordinate my arms (and eyes) to reach for and dip into the bowl. When I scoop out the cereal, I need to keep my spoon upright (don't let it tip over!), then inhibit my immediate desires (I'm hungry right now!) to delicately transport those morsels to my mouth." What a remarkable intellectual feat!

Why do fine motor skills specifically predict performance in math? One creative longitudinal study offers clues: Apart from the self-control talents I just described, researchers found that preschool finger dexterity makes it easier to grasp the principles of first-grade arithmetic because it helps manipulate each finger to count (Fischer and others, 2018).

Do you ever use this counting-on-your-hands strategy to boost your memory today? "At the store, I must remember to buy five items," you say as you repeatedly count the fingers on one hand. Or, in my case, I want to revise two chapters of this book per month, and I'm on Chapter 5. So when I get to the end of both hands five months from now, I'll be done with this 15-chapter book!

The implication is that training preschoolers in fine motor activities (such as manipulating their fingers to draw shapes) might help them master first-grade math. And there is a minor transfer to real-world arithmetic when researchers teach young children fine motor skills (Asakawa, Murakami, & Sugimura, 2019). But based on Erikson's age of exploration principle, pressuring (forcing) preschoolers to perform physical (and intellectual) tasks can turn counterproductive. During early childhood, we should offer items — such as markers and paper — that boys and girls enjoy manipulating on their own (Zaichkowsky & Larson, 1995). Allow preschoolers to exercise their blossoming talents, but don't push, and provide the right *person–environment fit.*

Threats to Preschool Physical Skills

Now that we've scanned what typically happens, let's examine two forces that can limit children's growth and motor skills.

Lack of Outdoor Play

Anyone who is middle-age or older can immediately identify one influence limiting physical initiative. When I was in preschool, children spent their days running outside. Today, a range of forces converge to limit the free-form physical explorations that have always defined early childhood, from adult anxieties ("If I let my child go to the park, he may be abducted") to living in dangerous neighborhoods ("With all that violence, I would never let my daughter out of the house") to the pressure to focus on academics at an early age ("My son will be a kindergarten star if I buy him a tablet!" — more about the effect of screen time at the chapter's end).

But aren't the hands-on challenges described in Table 5.2 — catching balls, running around, drawing circles — equally effective at training children's minds? There are even social benefits to running around. In one study, children who engaged in "exercise play" (physically playing outside) were rated more well-liked by their peers (Lindsey, 2014).

Lack of Food

A telling example highlighting the social function of play relates to the problem discussed in Chapter 3: *undernutrition.* In addition to causing stunting, undernutrition impairs fine motor skills because it compromises the development of our bones, muscles, and brain (Meylia and others, 2020). Most important, when children don't have enough food, they are too tired to engage with the world.

During the 1980s, researchers observed how undernourished children in rural Nepal maximized their growth by cutting down on play (Anderson & Mitchell, 1984). Play, as you will learn later in this chapter, does more than exercise our bodies; it helps us master the social demands of adult life. The principle that physically acting in the world is critical to expanding our mental capacities was vividly spelled out by that genius, Jean Piaget.

Tying It All Together

1. Darpreet has exceptional fine motor skills and average gross motor skills. Select three sports from this list that would best draw on Darpreet's talents: *long-distance running, tennis, archery, the high jump, bowling.*
2. Drawing on this section, which strategy would be *least helpful* in stimulating physical development during early childhood?
   a. Teaching young children sports
   b. Providing low-cost, safe spaces in the community for children to play (such as free child-centered hours at the gym)
   c. Ensuring that young children have enough food

Answers to the Tying It All Together questions can be found at the end of this chapter.

Cognitive Development

Learning Outcomes

- Describe Piaget's preoperational stage, referring to specific terms and concepts.
- Compare Vygotsky's and Piaget's theories.
- Describe Vygotsky's ideas about language.
- Outline how language develops, making reference to its specific properties.

As I spelled out in Chapter 1, Piaget believed that through assimilation (fitting new information into our existing cognitive structures) and accommodation (changing those cognitive slots to match input from the world), children undergo qualitatively different stages of cognitive growth. In Chapter 3, I discussed Piaget's sensorimotor stage. Now, it's time to tackle Piaget's next stage: preoperations (see Table 5.3).

Piaget's Preoperational Stage

Just as with Erikson's stages, we can best understand preoperations in conjunction with Piaget's next stage of cognitive growth. **Preoperational thinking** is defined by what young children are missing — the ability to step back from their immediate perceptions. **Concrete operational thinking** is defined by what older children possess: the ability to reason about the world in a logical, adult-like way.

preoperational thinking
In Piaget's theory, the type of cognition characteristic of children aged 2 to 7, marked by an inability to step back from one's immediate perceptions and think conceptually.

concrete operational thinking
In Piaget's framework, the type of cognition characteristic of children aged 8 to 11, marked by the ability to reason about the world in logical, adult ways.

Table 5.3: Piaget's Stages: Focus on Childhood

Age (years)	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 of liquid itself changes.
7–12	Concrete operations	Children have a realistic understanding of the world. Their thinking is really on the same wavelength as that of 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. We have reached our full cognitive human potential.

When children leave infancy and enter preoperational thought, they have made tremendous mental strides. Still, their thinking seems on a different planet from that of adults. The problem is that preoperational children can't look beyond the way objects immediately appear. By age 7 or 8 (during elementary school), children mentally transcend what first catches their eye. They have reached the concrete operational stage.

Taking the World at Face Value

You saw vivid examples of this "from another planet" thinking in the chapter-opening vignette. Now let's enter the minds of young children and explore how they reason about physical substances and the social world.

Strange Ideas About Substances The fact that preoperational children are locked into immediate appearances is illustrated by Piaget's (1965) famous **conservation tasks**. In Piaget's terminology, *conservation* refers to knowing that the amount of a given substance remains identical despite changes in its shape or form.

conservation tasks Piagetian tasks that involve changing the shape of substances to see whether children can go beyond the way that substance visually appears to understand that the amount remains the same.

In the conservation-of-mass task, an adult gives a child a round ball of clay and asks that boy or girl to make another ball "just as big and heavy." Then the adult reshapes the ball to look like a pancake and asks, "Is there still the same amount now?" In the conservation-of-liquid task, the procedure is similar: Present a child with identical glasses containing equal amounts of liquid. Make sure the child agrees, "Yes, they have the same amount of juice [or water]." Then pour the liquid into a tall, thin glass while the child watches, and ask, "Is there more or less juice now, or is there the same amount?"

Typically, when children under age 7 are asked this final question, they give a peculiar answer: "Now there is more clay" or "The tall glass has more juice." Why? "Because now the pancake is bigger" or "The juice is taller." Then, after adults remold the clay into a ball or pour the liquid into the original glass, the children report: "Now it's the same again." The logical conflict in their statements doesn't bother them at all. Figure 5.1 illustrates these procedures, as well as additional Piagetian conservation tasks to perform with children you know.

Developmental Psychology Videos

Cognitive Development in Early Childhood

In this video, you will see children of different ages tackle Piaget's conservation-of-liquid task. Achieve

Why can't young children conserve? One issue is that children don't grasp a concept called **reversibility**. This is the idea that an operation (or procedure) can be repeated in the opposite direction. Adults accept the fact that we can change substances, such as our hairstyle or our house decorations, and then reverse things to their original state. Young children lack this fundamental *schema*, or cognitive structure, for understanding the world.

reversibility In Piaget's conservation tasks, the concrete operational child's knowledge that a specific change in the way a given substance looks can be reversed.

A second problem lies in a perceptual style that Piaget calls **centering**. Young children interpret things according to what first catches their eye, rather than taking in the entire visual array. In the conservation-of-liquid task, children become captivated by the liquid's height. They don't notice that the width of the original glass makes up for the other container's increased height.

centering In Piaget's conservation tasks, the preoperational child's tendency to fix on the most visually striking feature of a substance and not take into account other dimensions.

In concrete operations, children **decenter**. They can step back from a substance's immediate appearance and understand that an increase in one dimension makes up for a loss in the other one.

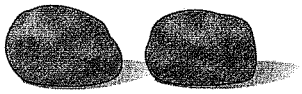
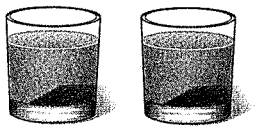
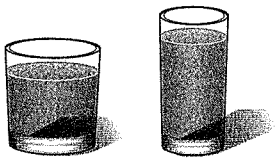
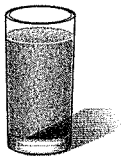
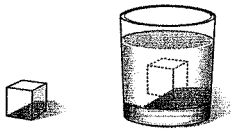
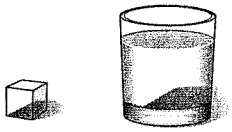
decentering In Piaget's conservation tasks, the concrete operational child's ability to look at several dimensions of an object or substance.

Centering — or fixating on immediate impressions — impairs **class inclusion**. This is the knowledge that a category can comprise subordinate elements. For example, spread 20 small chocolate chips and a few gummy bears in a dish and ask a 3-year-old, "Would you rather have the candy or the chocolate?" and she is almost certain to say "chocolate," even when you have determined beforehand that both types of candy have equal appeal. She gets mesmerized by the number of chocolate chips and does not notice that "candy" is the label for both.

class inclusion The understanding that a general category can encompass several subordinate elements.

This tendency to focus on immediate appearances explains why, in the opening chapter vignette, Moriah believed that José had more paper when he cut his sheet into sections. Her attention was captured by the spread-out pieces, and she believed that now there must be more paper than before.

The idea that "bigger" automatically equals "more" extends to every aspect of preoperational thought. Ask a 3-year-old if he wants a nickel or a dime, and he will

Type of conservation	Initial step and question	Transformation and next question	Preoperational child's answer
Number	Two equal rows of pennies.  "Are these two rows the same?" (Yes.)	Increase spacing of pennies in one line.  "Now is the amount of money 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.)	Squeeze one ball into a long pancake shape.  "Now is the amount of clay the same?"	 "No, the long, thin one has more clay."
Volume or liquid	Two glasses of the same size with liquid.  "Do these glasses have the same amount of juice?" (Yes.)	Pour one into a taller, narrower glass.  "Now do these glasses have the same amount of juice?"	 "No, the taller glass has more juice."
Matter*	Two identical cubes of sugar.  "Do these cubes have the same amount of sugar?" (Yes.)	Dissolve 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).

Figure 5.1: Four Piagetian conservation tasks Can you try out these classic tasks with a child you know?

choose the first option. (This is a great source of pleasure to older siblings asked to equally share their funds.) Perhaps because greater height means "older" in their own lives, children even believe that a taller person has been on earth for a longer time:

> I was substitute teaching with a group of kindergarten children — at the time I was about 22 — and when I met a student's mother, she was shocked. "When I asked Ben about you," she said, "he told me you were much older than his regular teacher." This teacher was in her mid- to late fifties and looked it. However, then we figured out the difference. This woman was barely 5 feet tall, and I am 6 feet 2!

identity constancy In Piaget's theory, the preoperational child's inability to grasp that a person's core "self" stays the same despite changes in external appearance.

Peculiar Perceptions About People Young children's idea that "what catches my eye right now is real" explains why a 3-year-old thinks her mommy becomes a princess when she dresses up for Halloween, or cries after visiting the beauty salon because she is sure her short haircut has transformed her into a boy. It makes sense of why a favorite strategy of older sisters and brothers (to torture younger siblings) is to put on a mask and see the child run in horror from the room. As these examples show, young children lack **identity constancy**. They don't realize that people remain their essential selves despite changes in the way they visually appear.

Sylvie Gagetimain/EyeEm/Getty Images

When this boy's mom puts on a mask, she becomes a scary animal because he has not fully grasped the principle of identity constancy.

Frank Gaglione/Getty Images

This 4-year-old boy's animistic thinking causes him to believe that his bear is going to enjoy the ride he is about to provide.

I gained insights into this identity constancy deficit at my son's fifth birthday party, when I hired a "gorilla" to entertain the guests (some developmental psychologist!). As the hairy 6-foot figure rang the doorbell, mass hysteria ensued — requiring the gorilla to take off his costume's huge head. After the children calmed down, and the gorilla put on his head again to enact his skit, guess what? Pure hysteria again!

Why did that "animal" cause pandemonium? The reason is that the children believed that the gorilla, even though a costumed figure, was alive.

Animism refers to the problem young children have in sorting out what is alive. Specifically, preschoolers see inanimate objects — such as dolls or costumed figures — as having consciousness, too. Turn to the chapter-opening vignette to see animistic thinking in action — the hungry Barbies or the wind that ran away. Now think back to when you were age 5 or 6. Do you remember being afraid the escalator might suck you in? Or perhaps you recall believing, as in the Experiencing the Lifespan box, that your dolls came alive at night.

animism In Piaget's theory, the preoperational child's belief that inanimate objects are alive.

Experiencing the Lifespan Animism and the Power of Stephen King

There was one shadow that would constantly cast itself on my bedroom wall. It looked just like a giant creeping towards me with a big knife in his hand.

I used to believe that Satan lived in my basement. The light switch was at the bottom of the steps, and whenever I switched off the light it was a mad dash to the top. I was so scared that Satan was going to stab my feet with knives.

Boy, do I remember the doll that sat on the top of my dresser. I called it "Chatty Kathy." This doll came to life every night. She would stare at me, no matter where I went.

My mother used to take me when she went to clean house for Mrs. Handler, a rich lady. Mrs. Handler had this huge, shiny black grand piano, and I thought it came alive when I was not looking at it. It was so enormous, dark, and quiet. I remember pressing one of the bass keys, which sounded really deep and loud and it terrified me.

I remember being scared that there was something alive under my bed. I must tell you I sometimes still get scared that someone is under my bed and that they are going to grab me by my ankles. I don't think I will ever grow out of this, as I am 26.

Can you relate to any of these childhood memories collected from my students? Perhaps your enemy was that evil creature lurking in your basement, the scary stuffed animal on your dresser, or a huge object (with teeth) such as that piano.

Now you know where that master storyteller Stephen King gets his ideas. King's genius is that he taps into the preoperational thoughts that we have papered over, not very well, as adults. When we read King's tale of a toy animal that clapped cymbals to signal someone's imminent death, or about Christine, the car with a mind of its own, or about the laundry-pressing machine that loved human blood, these stories fall on familiar childhood ground. Don't you still get anxious when you enter a dark basement? Even today, at night, do you have an uneasy feeling that some monster might be lurking beneath your bed?

Listen to young children talking about nature, and you'll hear delightful examples of animism: "The sun gets sleepy when I sleep." "The moon likes to follow me in the car." The practice of assigning human motivations to natural phenomena is not something we grow out of as adults. Think of the Greek thunder god Zeus, or the ancient Druids who worshiped the spirits that lived within trees. Throughout history, humans have used animism to make sense of a frightening world.

artificialism In Piaget's theory, the preoperational child's belief that human beings make everything in nature.

A related concept is called **artificialism**. Young children believe that human beings make nature. Here is an example of this "daddy power" from Piaget's 3-year-old son, Laurent:

> L was in bed in the evening and it was still light: "Put the light out please" . . . (I switched the electric light off.) "It isn't dark" — "But I can't put the light out outside" . . . "Yes you can, you can make it dark." . . . "How?" . . . "You must turn it out very hard. It'll be dark and there will be little lights everywhere (stars)."
>
> (Piaget, 1951/1962, p. 248)

Animism and artificialism perfectly illustrate Piaget's concept of assimilation. A child knows that he is alive and so applies his "alive" schema to every object. Watching adults perform heroic physical feats, such as turning off lights, a 3-year-old generalizes the same "big people control things" schema to the universe. Imagine being a young child taking a family vacation. After visiting that gleaming construction called Las Vegas, wouldn't it make sense that people carved out the Grand Canyon and the Rocky Mountains, too?

The sun and moon examples illustrate another aspect of preoperational thought. According to Piaget, young children believe that they are the literal center of the universe, the pivot around which everything else revolves. Their worldview is defined by **egocentrism** — the inability to understand that other people have different points of view.

egocentrism In Piaget's theory, the preoperational child's inability to understand that other people have different points of view from one's own.

By *egocentrism*, Piaget does not mean that young children are vain or uncaring — although they will tell you they are the smartest people on Earth and the heavenly bodies are at their beck and call. There is nothing more loving than a 3-year-old offering a favorite "blankee" if he sees you upset. The child is egocentric, however, because he assumes that what comforts *him* will automatically comfort you.

You can see delightful examples of egocentrism when talking with a young child. Have you ever had a 3-year-old say to you, "Do you like my dress?" when you never saw that piece of clothing, or refer to a dream she had as if you already knew it because you were living in her head?

Piaget views egocentrism as a perfect example of centering in the human world. Young children are unable to decenter from their own mental processes. They don't realize that what is in their mind is not in everyone else's awareness, too.

Getting on the Adult Wavelength

Piaget discovered that the transition away from preoperations happens gradually. First, children are preoperational in every area. Then, between ages 5 and 7, their thinking gets less static, or "thaws out" (Flavell, 1963). In the conservation-of-liquid task, for instance, a 6-year-old might first say the taller glass had more liquid, but then, after seeing the liquid poured back into a wide glass, become unsure: "Is it bigger or not?" She has reached the tipping point where she is poised to reason on a higher cognitive plane.

By age 8, the child has reached this higher-level, concrete operational state: "Even though the second glass is taller, the first is wider" (showing decentering); "You can pour the liquid right back into the short glass and it would look the same" (illustrating reversibility). Now, she doesn't realize that she ever thought differently: "Are you silly? Of course it's the same!"

Piaget found that specific conservations appear at different ages. First, children master conservation of number and then mass and liquid. They may not figure out the most difficult conservations until age 11 or 12. Imagine the challenge of understanding the last task in Figure 5.1 — realizing that when sugar is dissolved in water and seems to disappear, it exists, but in a different molecular form.

Still, according to Piaget, age 7 or 8 is a landmark for looking beyond immediate appearances, for understanding categories, for decentering in the physical and social worlds, for abandoning the tooth fairy and the idea that stuffed animals are alive, for entering the mental planet of adults.

Table 5.4 shows examples of different preoperational ideas. Now test yourself by seeing if you can classify each statement in Piagetian terms.

Table 5.4: Can You Identify the Type of Preoperational Thought from These Examples?

Here are your possible choices: (a) no identity constancy, (b) animism, (c) artificialism, (d) egocentrism, (e) no conservation, and (f) inability to use classification.

_____ 1. At lunch, you give your son and his playmate peanut butter and jelly sandwiches and cut your child's sandwich in a diagonal shape and his buddy's in a square. Suddenly, your son erupts, "Mom, that's not fair. You gave Bruno more!"

_____ 2. My 2-year-old son and I were taking our yearly trip to visit Grandma in Florida. As the plane took off and gained altitude, Thomas looked out the window and said with a delighted grin, "Mommy, TOYS!"

_____ 3. Dewi watches her father, a professional dancer, put on a skeleton outfit. Dewi suddenly runs screaming from the room, terrified of the monster.

_____ 4. Your child can't understand that she can live in your town and nation at the same time. She tells you angrily, "I live in Newark, not the United States."

_____ 5. As the ship moves into the ocean at the beginning of your Caribbean cruise, your child asks, "Did the same people who built the boat also make the ocean?"

Answers: 1. (e); 2. (d); 3. (a); 4. (f); 5. (c)

Using Piaget's Ideas at Home and at Work

Piaget's concepts provide marvelous insights into young children's minds. For teachers, the theory explains why you need the same-sized cups at a kindergarten lunch table or an argument will erupt, even if you poured each drink from identical cans. Nurses understand that rationally explaining a medical procedure to a 4-year-old is less effective than providing a magic doll to help the child cope.

The theory makes sense of why organizing a baseball team is impossible with 4- or 5-year-olds. Grasping the rules of games requires abstract conceptualization — skills that preoperational children do not possess. It tells us why young children are terrified of the dark and scary amusement park clowns. So for parents who are uneasy about playing into children's fantasies when they provide "anti-monster spray" to calm bedtime fears, one justification is that, according to Piaget, when a child is ready, she will naturally grow out of these ideas.

Piaget's concepts explain the power of pretending (more about this later) and the lure of that favorite childhood holiday, Halloween. When a 4-year-old child dresses up as Batman, he is grappling with understanding that you can look different, yet remain your essential self. The theory accounts for why fourth graders become captivated with soccer and can be avid collectors of baseball cards. Now that they understand rules and categories, concrete operational children are passionate to exercise their conceptual and classification skills.

The theory explains why "real school," the academic part, begins at about age 7. Before middle childhood, we don't have the intellectual tools to understand reversibility, a concept critical to mathematics (if 2 plus 4 is 6, then 6 minus 4 must equal 2). Even empathizing with the teacher's agenda is a concrete operational skill.

The fact that age 7 or 8 is a coming-of-age marker was the message of the classic movie *Home Alone*. The plot of this film would be unthinkable if its hero were 5, or even 6. If the star were 11, the movie would not be as interesting because, by this age, a child could competently take care of himself. Age 8 is when we make the transition to being "home alone." It is the time when we shift from worrying about imaginary threats such as monsters to grappling with the realistic dangers we face during life. ■

Evaluating Piaget

Piaget clearly transformed our ideas about young children. Still, in important areas, Piaget was incorrect.

I described a major problem with Piaget's theory in Chapter 3: Just as he minimized what babies know, Piaget overstated young children's egocentrism. If babies can decode intentions, the awareness that we live in "different heads" must dawn on children at a far younger age than 8! (Much more about this mindreading ability soon.)

We might also disagree with Piaget that children abandon animism by age 7 or 8. Maybe he was giving us too *much* credit here. Do you have a good luck charm that keeps a plane from crashing, or a magic spell that protected you from the coronavirus, or a place you go for comfort where you can hear the trees whispering to you?

Children worldwide do learn to conserve (Dasen, 1977, 1984). But because nature interacts with nurture, the ages at which they master specific conservation tasks vary from place to place. An example comes from a village in Mexico, where weaving is the main occupation. Young children in this collectivist culture grasp conservation tasks involving spatial concepts earlier than age 7 or 8 because they have so much hands-on training in this skill (Maynard & Greenfield, 2003). This brings up the dimension Piaget's theory leaves out: how teaching promotes cognitive growth.

Vygotsky's Zone of Proximal Development

Piaget implies that we can't convince preschoolers that their dolls are not alive or that the width of one glass makes up for the height of the other. Children naturally grow out of those ideas while manipulating objects on their own. The Russian psychologist Lev Vygotsky (1962, 1978) had a different perspective: People propel mental growth.

Vygotsky was born in the same year as Piaget. He showed as much brilliance at a young age, but — unlike Piaget, who lived to old age — he died of tuberculosis in his late thirties. Still, Vygotsky's writings have given him towering status in developmental science. One reason is that Vygotsky was an educator. He believed that adults make children mentally advance.

Vygotsky theorized that learning takes place within the **zone of proximal development (ZPD)**, which he defined as the difference between what children can do by themselves and their levels of "potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86; also, see the diagram in Figure 5.2). Teachers must tailor their instruction to a child's proximal zone. Then, as children become more competent, adults should slowly back off and allow students more responsibility for directing learning on their own. This sensitive pacing has a special name: **scaffolding** (Wood, Bruner, & Ross, 1976).

zone of proximal development (ZPD) In Vygotsky's theory, the gap between children's ability to solve a problem totally on their own and their potential knowledge if taught by a more accomplished person.

scaffolding The process of teaching new skills by entering a child's zone of proximal development and tailoring one's efforts to that person's competence level.

I gave an illustration of scaffolding in Chapter 3's discussion of *infant-directed speech (IDS)*. IDS, or baby talk, permits caregivers to penetrate a young child's proximal zone for language and so scaffolds emerging speech. In the opening vignette, you saw Ms. Angela draw on Vygotsky's ideas when she embodied the practices good teachers adopt: Encourage students to stretch their capacities, but operate within their proximal zones. Now let's explore scaffolding as a mother teaches her 5-year-old daughter how to play her first board game, Chutes and Ladders:

> Tiffany threw the dice. . . . Her mother said, "How many is that?" . . . Tiffany . . . stared. Her mother counted the dots aloud, and then said . . . , "Now you count them," which Tiffany did. This was repeated for . . . five turns . . . On her sixth move, however, Tiffany . . . threw the dice and counted the dots herself.
>
> (Bjorklund & Rosenblum, 2001)

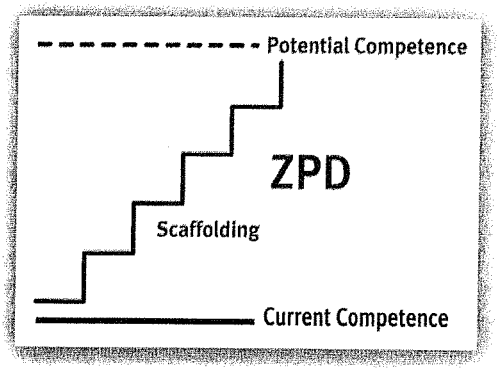


Figure 5.2: Vygotsky's zone of proximal development
These lines illustrate the ZPD — the gap between a child's current and potential intellectual ability. If a teacher sensitively teaches within this zone and employs scaffolding (see stepwise lines) — providing support, then backing off when help is no longer needed — students will reach their full intellectual potential.

Daryl Benson/Masterfile

This young girl in Thailand is learning to weave just by observing her mother—a strategy that is unusual in our teaching-oriented culture.

Notice that this mother was a superb scaffolder. By pacing her interventions to Tiffany's capacities, she paved the way for her child to master the game. But this process did not just flow from parent to child. Tiffany was also teaching her mother how to respond. Just as your professor is gaining new insights into children while teaching this class — or at this minute, as I struggle to write this page, I'm learning to better connect with Vygotsky's ideas — education is a *bidirectional*, mind-expanding duet (Scrimsher & Tudge, 2003).

In our teaching-oriented culture, we have definite ideas about how skilled scaffolders behave — actively instruct, but be sensitive to a child's responses. However, in collectivist societies, such as among the Maya living in Mexico's Yucatán Peninsula, children listen. They watch adults. They are not explicitly taught the skills for adult life (Rogoff and others, 2003). So the qualities our culture sees as vital to socializing children are not necessarily part of the ideology of good parenting around the globe.

Becoming an Effective Scaffolder

In our teaching-oriented society, what do superior scaffolders do? Let's list a few techniques:

- They foster a secure attachment, as responsive, *mind-minded* interactions (described in depth in the next section) are a foundation for learning.
- They break a larger cognitive challenge, such as learning Chutes and Ladders, into manageable steps (Berk & Winsler, 1999).
- They continue helping until the child has fully mastered the concept before moving on, as Tiffany's mother did earlier. ■

Table 5.5 compares Vygotsky's and Piaget's ideas and summarizes these world-class geniuses' backgrounds (Vianna & Stetsenko, 2006). Although often described in opposing terms, these theories form an ideal pair. Piaget gave us a roadmap for how cognition develops. Vygotsky offered us an engine to transform children's lives.

Language

So far, I have been discussing the mental milestones in this chapter as if they occurred in a vacuum. But language, that uniquely human cognitive skill, is the motor that helps scaffold everything we learn. Vygotsky (1978) actually put speaking front and center in children's ability to think.

Inner Speech

According to Vygotsky, thinking happens when the words a child hears from parents and other scaffolders migrate inward to become talk directed at the self. Using the earlier Chutes and Ladders example, after listening to her mother say "Count them" a number of times, Tiffany learned the game by repeating "Count them" to herself. Thinking, according to Vygotsky, is really **inner speech**.

inner speech In Vygotsky's theory, the way in which human beings learn to regulate their behavior and master cognitive challenges, through silently repeating information or talking to themselves.

Support for this idea comes from listening to young children as they monitor their actions. A 3-year-old might say, "Don't touch!" as she moves near the stove, or reminds herself to be "a good girl" at preschool that day (Manfra & Winsler, 2006). Adults behave the same way. In addition to counting on your fingers to ensure you

Table 5.5: Vygotskian and Piagetian Perspectives on Life and Learning

	Vygotsky 	Piaget 
Biography	Russian, Jewish, communist (reached teenage years during the Russian Revolution), believed in Marx	Swiss, middle-class family
Basic interests	Education, literature, literary criticism, biology, mollusks	Wanted to know how to stimulate thinking and 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	1. We develop intellectually through social interactions. 2. Development is a collaborative endeavor. 3. People cause cognitive growth.	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.

don't forget items at the store, if you *really* need to remember something — and no one is listening — have you ever told yourself, "Be sure to do X, Y, and Z" out loud?

Developing Speech

How does language *itself* unfold? Actually, during early childhood, language does more than unfold. It explodes.

By our second birthday, we are beginning to put together words (see Chapter 3). By kindergarten, we basically have adult language nailed down. Considering the challenges involved in mastering language, this achievement is remarkable. To speak like adults, children must articulate word sounds. They must string units of meaning together in sentences. They must produce sentences that are grammatically correct. They must understand the meanings of individual words.

The word sounds of language are called **phonemes**. When infants begin to speak, they produce single phonemes — for instance, they call their bottle *ba*. They repeat sounds that seem similar, such as calling their bottle *baba*, when they cannot form the next syllable of the word. By age 3, while children have made tremendous strides in producing phonemes, they still — as you saw in the chapter-opening vignette — have trouble pronouncing multisyllabic words (like *psghetti*). Then, early in elementary school, these articulation problems disappear — but not completely. Have you ever had a problem pronouncing a difficult word that you silently read on a page?

phoneme The sound units that convey meaning in a given language — for example, in English, the *c* sound of *cat* and the *b* sound of *bat*.

The meaning units of language are called **morphemes** (for example, the word *boys* has two units of meaning: *boy* and the plural suffix *-s*). As children get older, their average number of morphemes per sentence — called their **mean length of utterance** (MLU) — expands. A 2-year-old's telegraphic utterance of "Me juice"

morpheme The smallest unit of meaning in a particular language — for example, *boys* contains two morphemes: *boy* and the plural suffix *-s*.

mean length of utterance (MLU) The average number of morphemes per sentence.

(2 MLUs) grows to "Me want juice" (3 MLUs) and then, at age 4, to "Please give me the juice" (5 MLUs). Also around age 3 or 4, children are fascinated by producing long, jumbled-together sentences strung together by *and* ("Give me juice and crackers and milk and cookies and . . .").

syntax The system of grammatical rules in a particular language.

This brings up the steps to mastering grammar, or **syntax**. What's interesting here are the classic mistakes that young children make. As parents are well aware, one of the first words that children utter is *no*. First, children add this word to the beginning of a sentence ("No eat cheese" or "No go inside"). Then, they move the negative term inside the sentence, next to the main verb ("I no sing" or "He no do it"). A question starts out as a declarative sentence with a rising intonation: "I have a drink, Daddy?" Then it, too, is replaced by the correctly worded question: "Can I have a drink, Daddy?" Children typically produce grammatically correct sentences by the time they enter school.

semantics The meaning system of a language—that is, what the words stand for.

The most amazing changes occur in **semantics** — understanding word meanings. Here, children go from three- or four-word vocabularies at age 1 to knowing about 10,000 words by age 6! (See Slobin, 1972; Smith, 1926.) While we have the other core abilities under our belts by the end of early childhood, our vocabularies continue to grow from age 2 to 102.

overregularization An error in early language development, in which young children apply the rules for plurals and past tenses even to exceptions, so irregular forms sound like regular forms.

One mistake young children make while learning language is called **overregularization**. At approximately age 3 or 4, they apply general rules for plurals or past tenses even to exceptions. A preschooler will say *runned, goed, teached, sawed, mouses, feets,* and *cup of sugars* rather than using the correct irregular form (Berko, 1958).

overextension An error in early language development in which young children apply verbal labels too broadly.

underextension An error in early language development in which young children apply verbal labels too narrowly.

Another error lies in children's semantic mistakes. Also around age 3, children may use **overextensions** — extending a verbal label too broadly. In Piaget's terminology, they assimilate the word *horsey* to all four-legged creatures, such as dogs, cats, and lions in the zoo. Or they use **underextensions** — making name categories too narrow. A 3-year-old may insist that only her own pet is a dog and all the other neighborhood dogs must be called something else. As children get older, through continual assimilation and accommodation, they sort out these glitches.

Table 5.6 summarizes these challenges. Now you might want to have a conversation with a 3- or 4-year-old child. Can you pick out examples of overregularization, overextensions or underextensions, problems with syntax (grammar), or difficulties pronouncing phonemes (word sounds)? Can you figure out the child's MLU?

Table 5.6: Challenges on the Language Pathway: A Summary Table

Type of Challenge	Description	Example
Phonemes	Has trouble forming sounds	*Baba, psghetti*
Morphemes	Uses few meaning units per sentence	*Me go home*
Syntax (grammar)	Makes mistakes in applying rules for forming sentences	*Me come out*
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 older man "grandpa"; tells another child he can't have a grandpa because "grandpa" is the name for his grandfather alone

Tying It All Together

1. When you take your 3-year-old son to a children's museum, you notice many examples of preoperational thought. Give the Piagetian label — *egocentrism, animism, no conservation, artificialism, no identity constancy* — for each of the following:
   a. Your child says that the statue in the lobby is watching him.
   b. If you fall down while climbing the stairs, your son gives you his stuffed animal.
   c. When it's getting dark and time to leave, your child explains that "Daddy will make the moon come out."
   d. At lunch, your child says, "There's more now, Mommy" when you pour apple juice from a wide carton into a skinny glass.
   e. Your son explains that the man in the gorilla costume at the animal exhibit turns into a gorilla during the day and then becomes a person at night.
2. In a sentence, explain the basic mental difference between an 8-year-old in the concrete operational stage and a preoperational 4-year-old.
3. Six-year-old Chul has recently begun to read. Drawing on Vygotsky's theory, Chul's parents should (choose one): *buy picture books, because their son will easily recognize each word; buy books with stories just above their son's skill level; challenge Chul by getting him books with complicated stories.*
4. You watch your 3-year-old cousin making comments out loud to herself such as "Mommy won't let me eat candy before dinner." What would Vygotsky say about this behavior?
5. You are listening to a preschooler named Joshua. Pick out the example of overregularization and overextension from the following comments:
   a. Seeing a dog run away, Joshua says, "The doggie runned away."
   b. Taken to a petting zoo, Joshua points excitedly at a goat and says, "Horsey!"

Answers to the Tying It All Together questions can be found at the end of this chapter.

SOMETHING TO CONSIDER: Childhood: Physical and Cognitive Development: Applying the Research Achieve

Emotional Development

Learning Outcomes

- Explain autobiographical memory.
- Outline theory of mind, mentioning its importance, benefits, and variations.
- Discuss autism spectrum disorders.

Language makes us capable of the uniquely human talents described at the beginning of this chapter. We are the only species that reflects on our past (Fivush, 2011). The essence of being human is that we effortlessly transport ourselves into each other's heads, decoding what people are thinking from their own point of view. How do children learn to articulate their past experiences? When do we *fully* grasp that other people's perspectives are different from our own?

Constructing Our Personal Past

Autobiographical memories refer to reflecting on our life histories: from our earliest memories at age 3 or 4 to that incredible experience at work last week. Children's understanding that they have a personal autobiography is scaffolded through a specific kind of talk. Caregivers reminisce with young children: "Remember going on a train to visit Grandma?" "What did we do at the zoo last week?" These *past-talk conversations* are teaching a lesson: "You have a past and future. You are an enduring self."

autobiographical memories Recollections of events and experiences that make up one's life history.

Past-talk conversations typically begin with parents doing the "remembering" when toddlers begin to speak (Harley & Reese, 1999). Then, during preschool,

Dan76/Shutterstock

When they get home, this mother can help her daughter construct her "personal autobiography" by starting a dialogue about their wonderful day at the zoo.

children become partners in these mutual stories and, at age 4 or 5, initiate past-talk conversations on their own (Nelson & Fivush, 2004). Listen to this vivid autobiographical memory produced by a 6-year-old:

> INTERVIEWER: . . . [T]ell me about the ballet recital[.]
> CHILD: I was . . . scared because . . . I couldn't see mom and dad. . . . Ummm, we were on a slippery surface and we . . . did "Where the Wild Things Are" and we . . . Mine had horns sticking out of it . . . And I had baggy pants.
>
> (Nelson & Fivush, 2004)

As this girl reaches adolescence, she will link these memories to each other and construct a timeline of her life (Chen, McAnally, & Reese, 2013; Habermas, Negele, & Mayer, 2010). By about age 16, she will use these events to reflect on her enduring personality ("This is the kind of person I am, as shown by how I felt at age 4 or 5 or 9"). Then she will have achieved that Eriksonian milestone — an *identity* to carry through life (more about this topic in Chapter 10).

Caregivers can stimulate autobiographical memory by sensitively asking open-ended questions about exciting experiences they shared with their child (Valentino and others, 2014). ("Wasn't the zoo amazing? What did you like best?") They actively shape memory by deciding what to focus on and what to omit. For instance, after that zoo trip, if you encourage a child to talk about the thrilling elephants, she is less apt to recall the frightening tarantulas (Glynn, Salmon, & Low, 2018).

But demanding doesn't work. To stimulate rich personal autobiographies, adults should engage preschoolers in loving, mutual, give-and-take talks (Salmon & Reese, 2015; Wu & Jobson, 2019). And discussing negative events can be helpful if caregivers sensitively follow a child's lead. In one study, parents who used this approach in discussing upsetting situations had sons and daughters who were better able to regulate their anger during a stressful laboratory task (Leyva and others, 2020).

Conversely, when caregiving is exceptionally insensitive, autobiographical recall can fail (Salmon & Reese, 2015). The most chilling example of this process, called *repression*, occurs when children are removed from an abusive home. A boy or girl who is insecurely attached may deny remembering anything about the traumatic events (Melinder and others, 2013).

The take-home message is that our personal autobiography (or sense of self) is scaffolded through *mind-minded* interactions. By nonjudgmentally getting into children's heads and labeling their emotions ("I know you are feeling sad, just like you did yesterday when X, Y, and Z happened"), adults teach children to have an enduring self.

At the same time, as we begin to understand who we are, we reach that other uniquely human landmark, discussed earlier in this chapter: understanding that other people live in a different mental space.

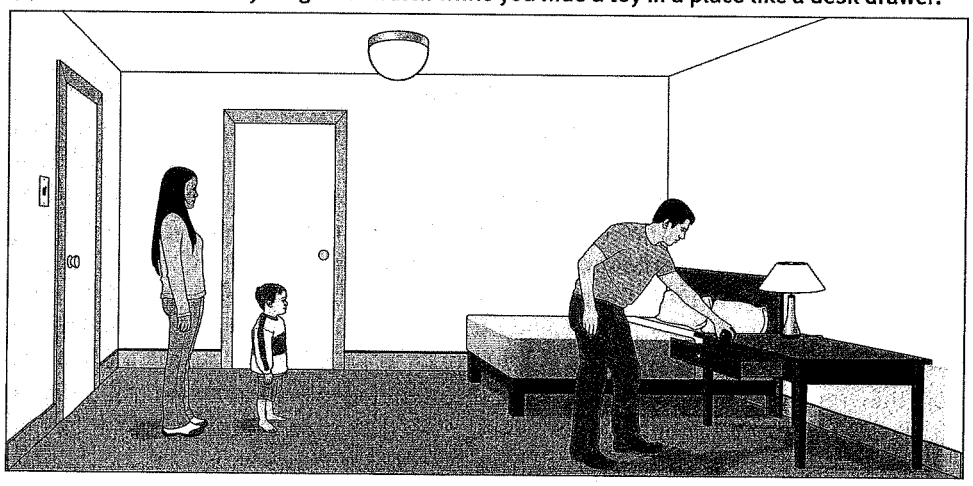
Making Sense of Other People's Minds

theory of mind Children's first cognitive understanding, which appears at about age 4, that other people have different beliefs and perspectives from their own.

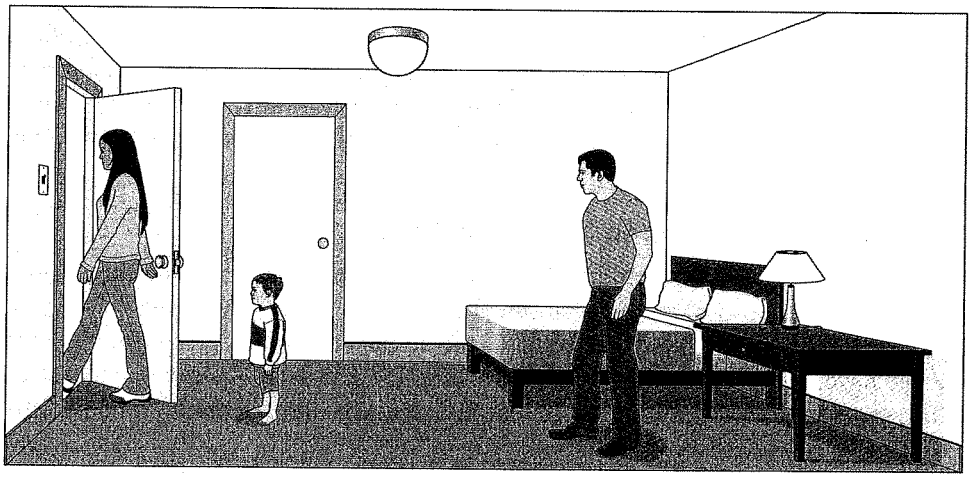
Listen to 3-year-olds having a conversation, and it's as if you're hearing separate monologues, like mental ships passing in the night. Around age 4 or 5, children relate in a *give-and-take* way. They have reached that landmark called **theory of mind**, the understanding that other people have perspectives different from their own. Developmentalists use a creative procedure to demonstrate this milestone — *the false-belief task.*

With a friend and a young child, see if you can perform the classic theory-of-mind task illustrated in Figure 5.3 (Wimmer & Perner, 1983). Hide a toy somewhere (location A) while the child and your friend watch. Then have your friend leave the room. Once she is gone, move the toy to another hiding place (location B). Next, ask the child where *your friend* will look for the toy when she returns. If the child is under age 4, he will typically answer the second hiding place (location B), even though your

(1) Another adult and a young child watch while you hide a toy in a place like a desk drawer.



(2) The other adult [Ms. X] leaves the room.



(3) You hide the toy under the bed and then ask the child, "Where will Ms. X look for the toy?"

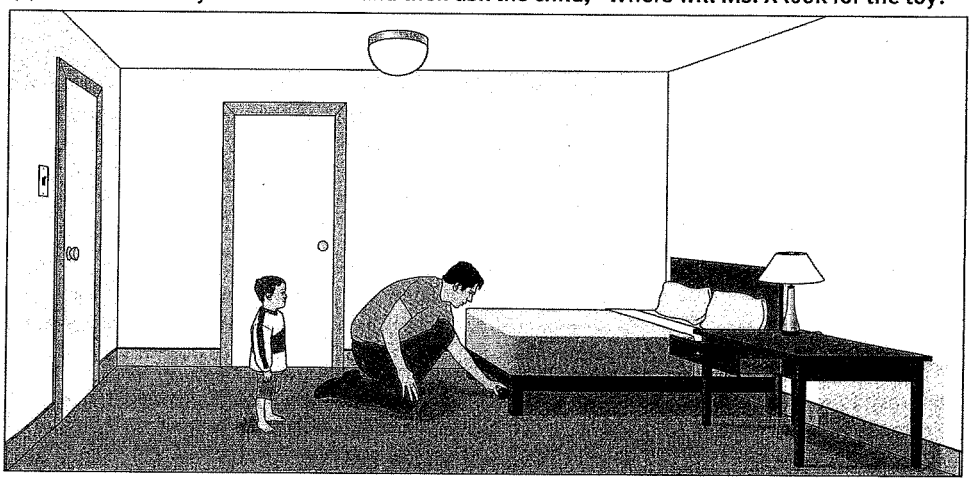


Figure 5.3: The false-belief task In this classic test for *theory of mind*, children under age 4 are likely to say that Ms. X will look for the toy under the bed, even though Ms. X could not possibly know the toy was moved to this new location.

Data from Wimmer & Perner, 1983

friend could not know the toy has been moved. It's as if the child doesn't grasp the fact that what *he* observed can't be in your friend's head, too.

What Happens When Children Have a Theory of Mind?

Having a theory of mind is not only vital to having a real conversation — it is crucial to convincing someone to do what you say. Researchers asked children to persuade a puppet to do something aversive, such as eat broccoli or brush its teeth. Even

controlling for verbal abilities, the number of arguments a given boy or girl made was linked to advanced theory of mind (Slaughter, Peterson, & Moore, 2013).

Theory of mind is essential to understanding that people may not have your best interests at heart. One developmentalist had children play a game with "Mean Monkey," a puppet the experimenter controlled (Peskin, 1992). Beforehand, the researcher had asked the children which sticker they wanted. Then, she had Mean Monkey pick each child's favorite choice. Most 4-year-olds figured out how to play the game and told Mean Monkey the opposite of what they wanted. Three-year-olds never caught on. They always pointed to their favorite sticker and got the "yucky" one instead.

A student brought home the real-world message of this research. She commented that her 4-year-old nephew had reached the stage where he was deliberately lying. Three-year-olds can effortlessly lie. If told to say "It's a fish" after seeing a video of a dog, they immediately agree with what a researcher asks (Williams, Ahern, & Lyon, 2019). (That's why we shouldn't trust young children's reports of abuse, if adults lead them on.) But when children have a theory of mind, their lies become more strategic and sophisticated. So having the talent to lie effectively is a crucial life skill! (See Evans, Xu, & Lee, 2011; O'Connor, Dykstra, & Evans, 2020.)

The false-belief studies, conducted during the last decades of the twentieth century, convinced developmentalists that Piaget's ideas about preoperational egocentrism were wrong. Although theory-of-mind abilities (and lying talents!) mature as we grow up, even by late preschool, children grasp the principle that other people live in different heads.

Individual Differences in Theory of Mind

Boys and girls around the world typically pass false-belief tasks at around age 4 or 5. But perhaps because parents in nations such as Iran and China strongly socialize obedience, children in these collectivist cultures take longer to grasp the idea that people have conflicting opinions than do Western 4-year-olds (Shahaeian and others, 2011; see Table 5.7 for fascinating neural findings related to theory of mind and the collectivist/individualistic distinction).

Table 5.7: 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 Westerners are asked to recall autobiographical memories, 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. Therefore, thinking about ourselves and decoding other people's emotions involves distinctive (but closely aligned) brain areas.
Interesting cultural variation: This classic neural separation, however, does not exist 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 view as similar, such as a good 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's feelings). But, inferring the mental states of dissimilar others — people you view as very different — activates truly separate brain areas. Research also suggests that when people are asked to imagine the feelings of disliked out-group members (for example, a Palestinian person is told to empathize with the perspective of a Jewish-Israeli West Bank settler), this instruction elicits reduced activity in the "social" brain.
Conclusion: Our attitudes about the self in relation to other human beings are mirrored in the physical architecture of our brain.

Information from Abu-Akel & Shamay-Tsoory, 2011; Heatherton, 2011; Oddo and others, 2010; Rabin and others, 2010.

Conversely, because they have extensive hands-on experience colliding (that is, arguing) with opposing sibling perspectives — "Hey, I want that toy!" "No, I do!" — Western preschoolers who have older brothers and sisters tend to pass theory-of-mind tasks at somewhat earlier ages than only children do (McAlister & Peterson, 2013).

Bilingual preschoolers — because they must switch languages — and boys and girls with superior language skills also reach this social milestone earlier than the typical child (Chertkow and others, 2010; Ebert, 2020; Hughes & Devine, 2015). Preschoolers' ability to control themselves is *strongly* related to mastering false-belief tasks (Carlson, Claxton, & Moses, 2016; Qureshi and others, 2020; Williams, Ahern, & Lyon, 2020; more about self-control in Chapter 6). Actually, being early (or late) in theory of mind has *widespread* emotional and social benefits (or costs).

Exploring the Benefits of Theory of Mind

Children (especially girls) with superior theory-of-mind skills are more popular. Moreover, this social advantage stays stable with age, which suggests that the talent of understanding other people's mental states is an asset we carry into the adult years (Slaughter, Peterson, & Moore, 2013).

Theory-of-mind abilities are linked to sharing and helping — especially during elementary school (Longobardi, Spataro, & Rossi-Arnaud, 2019). Again, advanced theory of mind is more linked to behaving in a caring way for girls (Kuhnert and others, 2017).

Theory of mind predicts emerging conscience (Goffin, Kochanska, & Yoon, 2020), perhaps because immersing ourselves in other people's perspectives makes us feel guilty when we do wrong (more about the critical function of guilt in Chapter 6).

Children with theory of mind are more reluctant to cheat (O'Connor & Evans, 2019) and dislike inequity. When offered "unfair" gifts by a researcher, boys and girls with advanced theory of mind tend to reject items they do not deserve (Tsoi & McAuliffe, 2020). Even as early as preschool, children with early-developing theory of mind are less prejudiced against minority groups (Hoyo, Rueda, & Rodríguez-Bailón, 2019). Theory of mind helps promote that ideal human trait called character — the quality we most want to cultivate in human beings!

Enhancing children's theory of mind is critical for healthy development. But nowhere is the need to develop theory of mind more important than with autism spectrum disorders.

Trending in Developmental Science: Autism Spectrum Disorders

Autism spectrum disorders (ASDs) are *syndromes* defined by differences in theory of mind — difficulties in having back-and-forth conversations, sharing feelings, and connecting with adults and peers. According to the most recent *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, these social problems can be accompanied by restricted, stereotyped, and repetitive behavior: rocking, flipping objects, being hypersensitive to sensory input, and preferring strict routines and rituals (American Psychiatric Association, 2013). The qualities predicting ASDs — poor social referencing (Dequinzio and others, 2016), delayed language (Kover, Edmunds, & Weismer, 2016), attachment issues — appear during the first two years of life (Song and others, 2019).

autism spectrum disorders (ASDs) Conditions characterized by persistent social and conversational deficits; and repetitive, restricted behavior patterns, such as rocking, ritualized behavior, hypersensitivity to sensory input, and a fixation on inanimate objects. A core characteristic of these disorders is difficulties with theory of mind.

Even though many parents report realizing that their child was different as a toddler, one Hong Kong study showed that getting a formal evaluation can take a frustratingly long time (Yi & Siu, 2020). Pediatricians may tell worried parents, "Just wait, it's probably nothing." I must emphasize that high-functioning children labeled "on the spectrum" can flourish in adult life. Still, in its most severe form, autism is a devastating *lifelong* sentence.

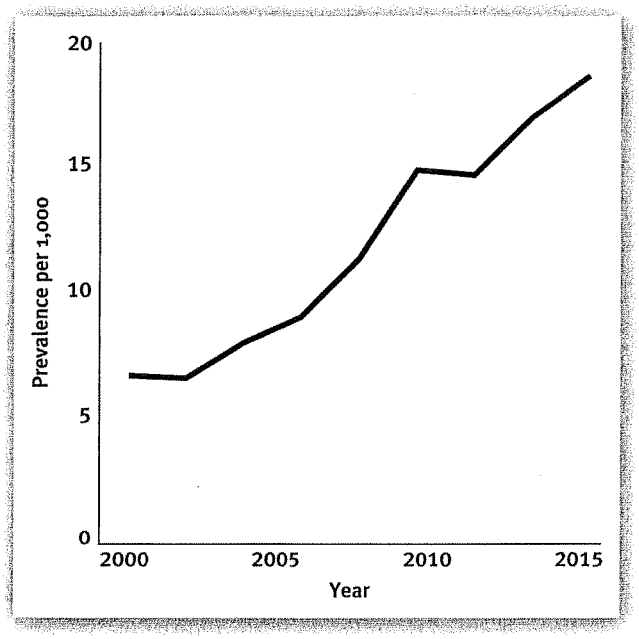


Figure 5.4: Time trends of U.S. autism spectrum diagnoses in recent decades
This chart vividly shows the rise in ASD diagnoses in young children over the past two decades. Is this increase mainly due to the fact that, in the current diagnostic manual, the symptoms qualifying for this diagnosis greatly expanded? Many young people labeled with ASD under today's criteria vigorously dispute the idea that they suffer from a debilitating disease.
Data from CDC, 2020d

fMRI studies reveal children with these disorders show disrupted activity in the social brain (Richardson and others, 2020).

Although we hear so much about these conditions today, ASDs are actually rare. In one epidemiological European comparison, prevalence rates varied from a high of over 3 percent in Iceland to a low of 0.48 percent in France (Delobel-Ayoub and others, 2020). But the frequency of these diagnoses has escalated in recent decades (see Figure 5.4). ASD diagnoses are several times more frequent in boys than girls (Delobel-Ayoub and others, 2020).

What causes these conditions? The fact that autism may run in families leads scientists to believe there are genetic causes (Fischbach and others, 2016). A puzzling array of environmental risk factors have also been linked to ASD, from air pollution (Volk and others, 2013) to maternal abusive relationships (Roberts and others, 2013), from prenatal medication use (Christensen and others, 2013) to—very important—being born extremely premature (Verhaeghe and others, 2016). Given its strong tie to prematurity, it's no surprise that older parents are at higher risk of having children with ASD. But astonishingly, one study traced the risk back a generation—to the advanced age of grandfathers (see Frans and others, 2013)!

At this point, it's critical to set the record straight. Despite what some adults still believe, vaccines do *not* cause autism (Fischbach and others, 2016). The initial small study suggesting this link was discredited as methodologically flawed. Multiple clinical trials (experiments) confirm that there is *no link* between autism spectrum disorders and vaccines (see Centers for Disease Control and Prevention, 2017b). Moreover, when parents decide not to vaccinate their babies, this choice puts *every* child at risk—because it prevents herd immunity and exposes everyone to illnesses, such as measles, which vaccines prevent. As I spelled out in Chapter 1—and as you should understand by having lived through the COVID-19 pandemic—vaccines qualify as landmark medical miracles. If we want to "blame" medicine for the recent rise in autism, the most reasonable culprit would be the (also landmark) advances in saving very tiny, at-risk babies, described in Chapter 2.

When a child is diagnosed with a severe form of autism spectrum disorder, what are the options? The classic intervention involves operant conditioning. Children receive services from different professionals—speech pathologists, psychologists, and others—while their parents get training in reinforcing adaptive behavior (Scahill and others, 2016).

School-based peer interventions can be somewhat effective (Chang & Locke, 2016), as are videos that teach life skills, such as how to begin a conversation, ask for help, or cook a meal (Marcotte and others, 2020). Unfortunately, neither dietary modifications (such as providing gluten-free foods) nor standard psychotropic drugs make a substantial impact (González-Domenech and others, 2020), though mood-altering medicines can mute the emotional distress that these disorders may provoke.

Do teenagers with autism spectrum disorders *really* experience intense emotional stress? When researchers (Berkovits, Moody, & Blacher, 2020) asked these teens to reflect on their actions, adolescents reported being bothered by classic autism signs: "I sometimes talk to myself and make weird sounds," "I talk louder than most people." But they described self-esteem benefits, too: "I got into an arts high school, so I thank Asperger's for that." "My creativity level is like 15 times more than my sister's." "I guess [having autism] will make me more inclined not to judge." Do some people develop exceptional character traits despite (or because of!) having deficits in theory of mind?


Jerod Harris/FilmMagic/Getty Images

Dr. Temple Grandin did not utter a word until age 4. Diagnosed with autism, doctors suggested she be institutionalized. Instead, she grew up to become a beloved college professor, passionate advocate for animal rights, and prolific author, and was cited as one of the most important people in the world by *Time Magazine*. Temple's remarkable life story proves that children with ASD can make a tremendous difference for humankind.

The core challenge of ASDs — difficulties with theory of mind — takes center stage when we look at that defining preschool social activity — pretending.

Tying It All Together

1. Andrew said to Madison, his 3-year-old son, "Remember when we went to Grandma and Grandpa's last year? . . . It was your birthday, and what did Grandma make for you?" This _____ conversation will help stimulate Madison's _____.
2. Pick the statement that would *not* signify that a child has developed a full-fledged theory of mind:
   a. He's having a give-and-take conversation with you.
   b. He realizes that if you weren't there, you can't know what's gone on — and tries to explain what happened while you were absent.
   c. When he has done something he shouldn't do, he feels guilty.
   d. He's learning to read.
3. Autism spectrum disorders are *relatively rare/common* and involve difficulties with *learning/theory of mind.* These conditions are *caused/not caused* by vaccines. Teenagers with this diagnosis *feel terrible/have mixed emotions* about ASD. (Select the correct phrases.)

Answers to the Tying It All Together questions can be found at the end of this chapter.

Social Development

Think back to your hours pretending to be a superhero or supermodel, or playing with battleships and Barbies with your friends. Why is pretend play a core preschool passion, and why do boys and girls play in different ways?

Play: The Work of Early Childhood

Developmentalists divide young children's play (the nonsports-oriented kind) into different categories. **Exercise play** involves the running and chasing behavior you saw in the opening vignette. **Rough-and-tumble play** refers to the excited shoving and wrestling that is most apparent with boys.

exercise play Running and chasing play that exercises children's physical skills.

rough-and-tumble play Play that involves shoving, wrestling, and hitting, but in which no actual harm is intended; especially characteristic of boys.

Learning Outcomes

- List the different play types.
- Outline the development and functions that pretending serves.
- Describe the characteristics and causes of gender-segregated play.
- Evaluate the impact of screen time.

rbsf_96/Photodisc/Getty Images

Rough-and-tumble play is not only tremendously exciting, but it seems to be genetically built into being "male."

Actually, rough-and-tumble play is male behavior. Boys (but not girls) who engage in rough-and-tumble play *with their own sex* are especially popular with their peers (Perry & Ostrov, 2019). Rough-and-tumble play, evolutionary psychologists believe, is biologically built into being male (Bjorklund & Pellegrini, 2002; Flanders and others, 2013; Pellegrini, 2006).

Pretending

Fantasy play, or *pretending,* is different. Here, the child takes a stance apart from reality and makes up a scene, often with a toy or other prop. While fantasy play also can be intensely physical, this "as if" quality makes it unique. Children must pretend to be soldiers or superheroes as they wrestle and chase.

fantasy play Pretend play in which a child makes up a scene, often with a toy or other prop.

collaborative pretend play Fantasy play in which children work together to develop and act out scenes.

The Development and Decline of Pretending Research suggests that the roots of pretending emerge in later infancy, and mothers scaffold this skill. In a classic study, developmentalists watched 1-year-olds with their mothers at home. Although toddlers often initiated a fantasy episode, they needed a parent to expand on the scene (Dunn, Wooding, & Hermann, 1977). For example, a child would pretend to make a phone call, and his mother would pick up the real phone and say, "Hello, this is Mommy. Should I come home now?"

At about age 3, children transfer pretending with mothers to pretending with peers. **Collaborative pretend play,** fantasizing *together* with another child, gets going at about age 4 (Smolucha & Smolucha, 1998). Because they must work together to develop the scene, collaboratively pretending shows that preschoolers have a theory of mind. (You need to understand that your fellow playwright has a different script in his head.) Collaboratively pretending, in turn, helps teach young children to make better sense of other people's minds (Nicolopoulou and others, 2010).

Anyone with a child can see these changes firsthand. When a 2-year-old has his "best friend" over, they play in parallel orbits — if things go well. More likely, a titanic battle erupts, as each child exerts autonomy and initiative by attempting to gain possession of the toys. By age 4, children can play *together.* At age 5, they can often pretend together for hours — with only a few world-class fights that are usually resolved.

Although fantasy play can continue into early adolescence, when children reach concrete operations, their interest shifts to structured games (Bjorklund & Pellegrini, 2002). At age 3, a child pretends to bake in the kitchen corner; at 9, he wants to bake a cake. At age 4, you ran around playing pirates; at 9, you tried to hit the ball like the Pittsburgh Pirates do.

FatCamera/iStock/Getty Images

For these 4-year-old girls (aka women who have dressed up to go to a party), their collaborative pretend play is teaching them vital theory-of-mind skills.

The Purposes of Pretending Interestingly, around the world, when children pretend, their play has similar plots. Let's eavesdrop at a U.S. preschool:

> BOY 2: I don't want to be a kitty anymore.
> GIRL: You are a husband?
> BOY 2: Yeah.
> BOYS 1 AND 2: Husbands, husbands! *(Yell and run around the playhouse)*
> GIRL: Hold it, Bill, I can't have two husbands.
> BOYS 1 AND 2: Two husbands! Two husbands!
> GIRL: We gonna marry ourselves, right?
>
> (Corsaro, 1985, pp. 102–104)

Why do young children play "family," and assume the "correct" roles when they play mommy and daddy? For answers, let's turn to the insights of that genius, Lev Vygotsky, again.

Play allows children to practice adult roles. Vygotsky (1978) believed that pretending allows children to rehearse being adults. The reason girls pretend to be mommy and baby is that they realize women are the main child-care providers around the world. Boys play soldiers because this activity offers them built-in training for the wars they may face as adults (Pellegrini & Smith, 2005).

Play allows children a sense of control. As the following preschool conversation suggests, pretending has a deeper psychological function, too:

> GIRL 1: Yeah, and let's pretend when Mommy's out until later.
> GIRL 2: Ooooh. Well, I'm not the boss around here, though. 'Cause mommies are the bosses.
> GIRL 1: *(Doubtfully)* But maybe we won't know how to punish.
> GIRL 2: I will. I'll put my hand up and spank. That's what my mom does.
> GIRL 1: My mom does too.
>
> (Corsaro, 1985, p. 96)

While reading this chapter and Chapter 4, you may have been thinking that the supposedly carefree early childhood years are far from stress-free. We expect 3- and 4-year-olds to "sit still," "share," and use their "inside voice" at the same age when, Erikson believed, their mission is to passionately explore life. We discipline preschoolers when they don't have the concrete operational talents to make sense of abstract adult rules. Vygotsky (1978) believed that, confronted by these frustrations, young children enter "an illusory role" in which they take control. In play, *you* can be the spanking mommy or the queen of the castle, even when you are small and sometimes feel insignificant.

To penetrate the inner world of preschool fantasy play, sociologist William Corsaro (1985, 1997) went undercover, entering a nursery school as a member of the class. (No problem. The children welcomed their new playmate, whom they called Big Bill, as a clumsy, enlarged version of themselves.) As Vygotsky would predict, Corsaro found that preschool play plots often centered on mastering upsetting events. There were separation/reunion scenarios ("Help! I'm lost in the forest." "I'll find you.") and danger/rescue plots ("Get in the house. It's gonna be a rainstorm!"). Sometimes, play scenarios centered on that ultimate frightening event, death:

> CHILD 1: We are dead, we are dead! Help, we are dead! *(Puts animals on their sides)*
> CHILD 2: You can't talk if you are dead.
> CHILD 1: Oh, well, Leah's talked when she was dead, so mine have to talk when they are dead. Help, help, we are dead!
>
> (Corsaro, 1985, p. 204)

Notice that these themes are basic to Disney movies and fairy tales. From *Finding Nemo*, *Bambi*, and *The Lion King* to — my personal favorite — *Dumbo*, there is nothing more heart-wrenching than being separated from your parent. From the greedy old witch in *Hansel and Gretel* to the jealous queen in *Snow White*, no scenario is as sweet as triumphing over evil and possible death.

Play furthers our understanding of social norms. Corsaro (1985) found that death was a touchy play topic. When children proposed these plots, their partners might try to change the script. This relates to Vygotsky's third insight about play: Although children's play looks unstructured, it has boundaries and rules. Plots involving dead animals waking up make children uncomfortable because they violate the conditions of life. Children get especially uneasy when a play partner proposes scenarios with gory themes, such as cutting off people's heads (Dunn & Hughes, 2001). Therefore, play teaches children how to act and how not to behave. Wouldn't you want to retreat if someone showed an intense interest in decapitation while having a conversation with you?

The idea that play teaches social norms brings me to that basic childhood play rule — girls and boys behave in different ways.

Girls' and Boys' Play Worlds

> [Some] girls, all about five . . . years old, are looking through department store catalogues, . . . concentrating on what they call "girls' stuff" and referring to some of the other items as "yucky boys' stuff." . . . Shirley points to a picture of a couch . . . "All we want is the pretty stuff," says Ruth. Peggy now announces, "If you come to my birthday, every girl in the school is invited. I'm going to put a sign up that says, 'No boys allowed!'"
>
> "Oh good, good, good," says Vickie. "I hate boys."
>
> (Corsaro, 1997, p. 155)

gender-segregated play Play in which boys and girls associate only with members of their own gender — typical of childhood.

Does this conversation bring back memories of being age 5 or 6? How does **gender-segregated play** develop? What are the differences in boy versus girl play, and what causes the sexes to separate into these different camps?

Exploring the Separate Societies

Visit a playground and observe children of different ages. Notice that toddlers show few signs of gender-segregated play. In preschool, children start to play in sex-segregated groups (Martin & Ruble, 2010). By age 5 or 6, gender-segregated play is typical, although boys and girls do occasionally play in mixed-sex groups (Fabes, Martin, & Hanish, 2003).

Now, go back to the playground and look at the *way* boys and girls relate. Do you notice that boy and girl play differs in the following ways?

Boys Excitedly Run Around; Girls Calmly Talk Boys' play is rambunctious. Boys hit, yell, and fight (Perry & Ostrov, 2019). Girls play together in calmer, more subdued ways (Maccoby, 1998; Pellegrini, 2006). The difference in activity levels is striking if you have the pleasure of witnessing one sex playing with the other sex's toys. In one memorable episode, after my 4-year-old son and a friend invaded a girl's stash of dolls, they gleefully ran around the house bashing Barbie into Barbie and using their booty as swords.

Boys Compete in Groups; Girls Play Collaboratively, One-on-One Their exuberant, rough-and-tumble play explains why boys tend to take over preschool playgrounds, running and yelling, filling most of the physical space. Another difference lies in playgroup *size*. Boys get together in packs. Girls play in smaller, more intimate groups (Maccoby, 1990, 1998; Ruble, Martin, & Berenbaum, 2006).

Boys and girls differ in the *way* they relate. Boys try to establish dominance and compete to be the best. This competitive versus cooperative style spills over into children's talk. Girl-to-girl collaborative play sounds collaborative ("I'll be the doctor, OK?"). Boys give bossy commands: "I'm doing the operation. Lie down, now!" (see Maccoby, 1998). Girl-to-girl fantasy play involves nurturing themes. Boys prefer the warrior, superhero mode.

A visit to this first-grade lunchroom vividly brings home the fact that, by middle childhood, gender segregation is entrenched.

© Bill Aron/PhotoEdit

The stereotypic quality of girls' fantasy play came as a shock when I spent three days playing with a visiting 5-year-old niece. We devoted day 1 to setting up a beauty shop, complete with nail polishes and shampoos. We had a table for massages and a makeover section featuring every cosmetic I owned. Then we opened for business with our relatives and (of course!) — by charging for our services — made money for toys. We spent the last day playing with a "pool party" Barbie combo my niece selected at Walmart that afternoon.

Boys' and girls' different play interests show why the kindergartners in the vignette at the beginning of this section hated those "yucky" boys. Another reason why girls turn off to the other gender is the unpleasant reception they get from the different camp. Researchers observing at a preschool found

that, while active girls played with the boys early in the year, they eventually were rejected and forced to play with their own sex (Pellegrini and others, 2007). Actually, the gender barriers are generally more rigid for boys.

Boys Live in a More Exclusionary, Separate World My niece did choose to buy Barbies, but she also plays with trucks. She loves chasing and jumping, not just doing her nails. So, even though they may dislike the other sex, girls cross the divide. Boys avoid that chasm — typically refusing to venture down the Barbie aisle or buy a toy labeled "girl." Therefore, boys live in a more roped-off gender world (Boyle, Marshall, & Robeson, 2003).

Now, you might be interested to know what happened during my final day pretending with the pool party toys. After my niece said, "Aunt Janet, let's pretend we are the popular girls," our Barbies tried on fancy dresses ("What shall I wear, Jane?") in preparation for a pool party, where the dolls met up to discuss — *guess what* — shopping and where they did their nails!

What Causes Gender-Stereotyped Play?

Why do children, such as my niece, play in such gender-stereotyped ways? Answers come from exploring three forces: biology (nature), socialization (nurture), and cognitions (thoughts).

A Biological Underpinning Gender-segregated play — primate observations show — seems biologically built in. Troops of juvenile rhesus monkeys behave *exactly* like human children. The males segregate into their own groups and engage in rough-and-tumble play (Pellegrini, 2006).

In our species, gender-typed play is tied to hormone levels during prenatal development and the first months of life. When researchers looked at the naturally occurring amount of salivary testosterone in 3-month-old boys and girls (women also produce this classic male sex hormone), both sexes with high concentrations of testosterone displayed more male play behaviors at age 2 (Saenz & Alexander, 2013). Female fetuses exposed to high levels of in utero testosterone also show more masculine interests as teens and emerging adults (Udry, 2000). Therefore, testosterone levels near birth, to some extent, *epigenetically* program more "feminized" or "masculinized" brains.

The Amplifying Effect of Socialization The wider world magnifies this biological tendency. Mothers buy gender-typed toys for infants — pink is for girls, but verboten for boys (Weisgram & Bruun, 2018). (I confess to making the same choice when a puffy *pink* bear chair on Amazon leaped out to me as the *perfect* birthday present for my 1-year-old grand-niece.) If presented with a crying baby doll in the laboratory, researchers found, dads in particular encouraged their toddler daughters to respond in an empathic way (McHarg, Fink, & Hughes, 2019). As I pointed out in exploring dads' versus moms' different caregiving styles (see Chapter 4), both parents bring home an implicit message: Males and females act in different ways.

Peers powerfully accelerate this programming during preschool. Splitting into separate play societies trains children to behave in ways typical of their own sex. Boys get more physically aggressive in boy-to-boy groups. In same-sex societies, girls learn that the female way of expressing anger — and, unfortunately, being popular — lies in talking trash about peers ("She is fat and ugly! Worse yet, she acts like a boy!") (Perry & Ostrov, 2019; more about gender differences in aggression in Chapter 6).

The pressure to toe the gender line is promoted by strong social sanctions. Children reject classmates who behave in "gender atypical ways" (girls who hit and boys who play with dolls) (Lee & Troop-Gordon, 2011; Smith, Rose, & Schwartz-Mette, 2010). As early as third grade, research shows, girls report that "boys don't listen to what I say" (Xiao and others, 2019). Therefore, that classic female complaint ("men don't appreciate my mind") is a lesson that girls may learn by elementary school!


Ariel Skelley/Getty Images

Children embody gender schema theory by continually modeling their own sex.

gender schema theory Explanation for gender-stereotyped behavior that emphasizes the role of cognitions; specifically, once children know their gender label (girl or boy), they model their own sex.

The Impact of Cognitions A cognitive process reinforces these external messages. According to **gender schema theory** (Bem, 1981; Martin & Dinella, 2002), once children understand their category (girl or boy), they selectively attend to the activities of their own sex.

When do we first grasp our gender label and start this lifelong practice of modeling our group? The answer is at about age 2½ (Martin & Ruble, 2010)! Although they may not learn the real difference until much later, 3-year-olds can tell you that girls have long hair and cry a lot, whereas boys fight and play with trucks. At about age 5, when they are mastering the similar concept of identity constancy (the knowledge that your essential self doesn't change when you dress up in a gorilla costume), children grasp the idea that once you start out as a boy or girl, you typically stay that way for life (Kohlberg, 1966).

In sum, my niece's beauty-shop activities may have had a biological basis, but multiple nurture forces greatly promoted this process almost from birth.

Careers in Early Childhood: Encouraging Less Gender-Typed Play

By now you may be surprised at the many environmental forces that push young children to act in stereotypic male and female ways. These confining socialization pressures, I believe, inhibit the *natural* human fluidity of gender roles in real life. Today, we encourage young boys to dampen down their emotions ("Don't be a wimp! Crying is for girls!"), but no one blinks an eye when the toughest *adult* men tear up. We expect dads to change diapers and women to excel at professions — from construction to law enforcement — that a brief half-century ago were only available to men. The most powerful lesson, that human beings don't fit into cookie-cutter boxes defined by biological sex, are the transgender and nonbinary liberation movements (discussed in Chapter 10).

By encouraging preschool boys and girls to play in stereotypic gender-defined ways, I believe we may be limiting children's full human potential. So, here are some ideas for how educators might encourage more health-promoting — and less gender-defined — early childhood play:

- Give children ample chances to interact in mixed-sex groups by carefully planning activities in which boys and girls must work together.
- Organize the classroom to foster mixed-gender play — no doll corner or truck corner, but dolls and trucks in *every* corner of the classroom.
- Showcase role models who behave in "non-standard" ways, such as female aerospace engineers and male nurses. ■

During this entire chapter discussion — from exploring play, to Piaget's ideas, to teaching autobiographical memories and theory of mind — I've focused on the critical importance of real-world actions on children's development. Now let's look at the impact of that total transformation, the Internet, on young children's minds. Is learning on screen more or less effective compared to learning in real life?

Final Thoughts: Screen Learning Versus Real-Life Learning

> From the perspective of children developing positively, it's more important to head outside and play imaginatively.
>
> I think it's good that technology is introduced in early childhood education, as online services have become part of everyday life and knowing how to manage them is . . . a part of the civic skill set.
>
> (Mertala, 2019)

These quotations from early childhood teachers show that, with regard to preschoolers, the digital revolution provokes divergent thoughts. Some educators feel that technological

savviness is critical to twenty-first-century learning and that it's best to introduce computers, tablets, and phones early. But because hands-on activities are so vital at this age, there are worries that technology might take away from preschoolers' developing skills.

Longitudinal research suggests that the pro-technology position has pluses. Early Internet exposure (learning how to use a computer or go online) predicts later academic achievement — but only if preschoolers are taught how to use their devices (Hurwitz & Schmitt, 2020). Giving young children tablets such as iPads can promote fine motor skills (Souto and others, 2020). But just passively having preschoolers watch videos or play games is linked to poorer theory of mind abilities (Skalická and others, 2019) and lower academic performance (Hu and others, 2020). So, for parents with young children, the message is "yes, embrace technology, but only if you can personally teach its use"!

And here is a cautionary tale for readers using digital versions of this book: Fifth graders, one study showed, master information more easily if they read chapters like this one on paper, rather than screens (Halamish & Elbaz, 2020). So perhaps we need to hit the pause button before we uncritically give up that centuries-long standard learning tool — real-life books!

How do fifth graders *generally* behave? We will get answers as we now move on to Chapter 6.

Developmental Psychology Videos

The Impact of Media in Early Childhood

In this video, you will explore both the positive and negative impacts of different types of media on children's developing minds. Achieve

Tying It All Together

1. When Mark and Mathew get together, they pretend they are soldiers. Are these two boys likely to be about age 2, age 5, or age 9?
2. In watching 4-year-olds at a playground, which two observations are you likely to make?
   a. The boys are playing in larger groups.
   b. Both girls and boys love rough-and-tumble play.
   c. The girls are quieter and they are doing more negotiating.
3. Mykailo argues that gender-typed behavior is biologically built in, whereas Martha believes that the environment shapes this behavior. Drawing on this chapter, make Mykailo's and then Martha's case.
4. Conduct your own naturalistic study by observing a preschooler for a week. How much time does this child spend on a phone versus watching TV/videos versus pretending? Is this boy or girl playing in a gender-stereotyped way?

Answers to the Tying It All Together questions can be found at the end of this chapter.

SUMMARY

Setting the Context

Childhood comprises two phases — **early** and **middle childhood.** During early childhood, we learn to decode other people's mental states, the talent that makes humanity special. At this age, Erikson believed, children's mission is **initiative**, exploring their emerging skills. During the elementary school years, our task is **industry**, the need to inhibit our desires and start to work.

Physical Development

Physical growth slows down after infancy. Girls and boys are roughly the same height during preschool and much of elementary school. Boys are a bit more competent at **gross motor skills.** Girls are slightly superior in **fine motor skills.** Although fine motor skills in preschool predict elementary school success, we need to be careful not to push young children. Computers and adult fears may discourage exercising outside. Undernutrition impairs development by making children too tired to play.

Cognitive Development

Piaget's preoperational stage lasts from about ages 3 to 7. **Preoperational thinkers** focus on the way objects and substances (and people) immediately appear. **Concrete operational thinkers** can step back from their visual perceptions and reason on a more conceptual plane. In Piaget's **conservation tasks**, preoperational children believe that when the shape of a substance has changed, the amount of it has changed. One reason is that young children lack the concept of **reversibility**, the understanding that an operation can be performed in the opposite direction. Another reason is that children **center** on what first captures their eye and cannot **decenter**, or focus on several dimensions at one time. Centering also affects **class inclusion** (understanding overarching categories). Preoperational children believe that if something *looks* bigger visually, it equals "more."

Preoperational children lack **identity constancy** — they don't understand that people are "the same" in spite of changes to

their external appearance. Children's thinking is characterized by **animism** (the idea that inanimate objects are alive) and by **artificialism** (the belief that everything in nature was made by humans). They are **egocentric**, unable to understand that other people have different perspectives from their own. Although Piaget's ideas offer a wealth of insights into children's thinking, this premier theorist underestimated what young children know. Children in every culture do progress from preoperational to concrete operational thinking—but the learning demands of the particular society affect the ages at which specific conservations are attained.

Lev Vygotsky, with his concept of the **zone of proximal development**, suggested that learning occurs when adults tailor instruction to a child's capacities and then use **scaffolding** to gradually promote independent performance. Education, according to Vygotsky, is a collaborative, bidirectional learning experience.

Language makes every other childhood skill possible. Vygotsky believed that we learn everything through using **inner speech**. During early childhood, language abilities expand dramatically. **Phonemic** (sound articulation) abilities improve. As the number of **morphemes** in children's sentences increases, their **mean length of utterance (MLU)** expands. **Syntax**, or knowledge of grammatical rules, improves. **Semantic** understanding (vocabulary) shoots up. Common language mistakes young children make include **overregularization** (using regular forms for irregular verbs and nouns), **overextension** (applying word categories too broadly), and **underextension** (applying word categories too narrowly).

Emotional Development

Autobiographical memories, or the child's understanding of having a personal past, is socialized by caregivers through sensitive past-talk conversations. Not recalling salient events from one's past may be a sign of having had an unhappy or traumatic early life.

Theory of mind, our knowledge that other people have different perspectives from our own, is measured by the false-belief task. While children around the world typically pass this milestone at about age 4 or 5, a variety of forces affect this critical skill. Theory of mind is associated with many emotional and social benefits. **Autism spectrum disorders**, conditions defined by impairments in theory of mind and stereotyped behaviors, underline the vital role this capacity plays in life.

Social Development

Play, that defining activity of early childhood, comprises **exercise play** and **rough-and-tumble play** (play fighting and wrestling typical of boys). **Fantasy play** is jump-started by mothers when children are around age 1. The emergence of **collaborative play** at about age 4 signals that children can play together with peers. After reaching a peak in preschool, during concrete operations, pretending declines. Pretending may help children practice adult roles, offer young children a sense of control, and teach boys and girls appropriate social norms.

Gender-segregated play unfolds during preschool, when children begin to play mainly with their own sex. Boy-to-boy play is rambunctious, while girls play together in quiet, collaborative ways. Boys compete in groups; girls play one-to-one. Gender-stereotyped play seems to have a biological basis, as high testosterone levels during early life promote stereotypically male behaviors. Typical gender behavior is strongly socialized by parents and by preschool peers as children play in same-sex groups. According to **gender schema theory**, once children understand that they are a boy or a girl, they attend to and model behaviors of their own sex. Educators should take action to block the confining effects of stereotypic gender play. Teaching Internet skills can be valuable, but only when adults monitor children as they use this twenty-first-century learning mode.

KEY TERMS

animism, p. 140
artificialism, p. 140
autism spectrum disorders (ASDs), p. 151
autobiographical memories, p. 147
centering, p. 138
class inclusion, p. 138
collaborative pretend play, p. 154
concrete operational thinking, p. 137
conservation tasks, p. 138
decentering, p. 138
early childhood, p. 133
egocentrism, p. 141
exercise play, p. 153
fantasy play, p. 154
fine motor skills, p. 135
gender schema theory, p. 158
gender-segregated play, p. 156

gross motor skills, p. 135
identity constancy, p. 139
industry, p. 133
initiative, p. 133
inner speech, p. 144
mean length of utterance (MLU), p. 145
middle childhood, p. 133
morpheme, p. 145
overextension, p. 146
overregularization, p. 146
phoneme, p. 145
preoperational thinking, p. 137
reversibility, p. 138
rough-and-tumble play, p. 153
scaffolding, p. 143
semantics, p. 146
syntax, p. 146
theory of mind, p. 148
underextension, p. 146
zone of proximal development (ZPD), p. 143

ANSWERS TO Tying It All Together QUIZZES

Setting the Context

1. Our mindreading ability is what makes us different from other animals.
2. Third graders are working at academics; preschoolers are exploring the world.
3. Working for what you want is the challenge of elementary school; preschool is devoted to exploring the world.

Physical Development

1. Tennis, archery, and bowling tap into fine motor skills.
2. (a) Based on the principle that we should not push preschoolers, enrolling young children in specific sports would be counterproductive.

Cognitive Development

1. (a) animism; (b) egocentrism; (c) artificialism; (d) no conservation; (e) no identity constancy
2. Children in concrete operations can step back from their current perceptions and think conceptually; preoperational children can't go beyond how things immediately appear.
3. Buy Chul books that are just above his skill level.
4. Vygotsky would say it's typical—the way children learn to think through their actions and control their behavior.
5. (a) overregularization; (b) overextension

Emotional Development

1. This *past-talk* conversation will help stimulate Madison's *autobiographical memory*.
2. (d)
3. Autism spectrum disorders are *relatively rare* and involve difficulties with *theory of mind*. These conditions are *not caused* by vaccines. Teenagers with this diagnosis *have mixed emotions* about ASD.

Social Development

1. The boys are about age 5.
2. (a) and (c) Girls don't typically engage in rough-and-tumble play.
3. Mykailo's evidence for biology: Young monkeys play (and behave) in gender-defined ways. Female testosterone levels, early in development, predict having more male occupational interests. Martha's case for the environment: Gender-defined behavior is taught by parents from birth and solidified in preschool when children play in same-sex groups and reject kids who don't toe the gender line.
4. Answers here are up to you.

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