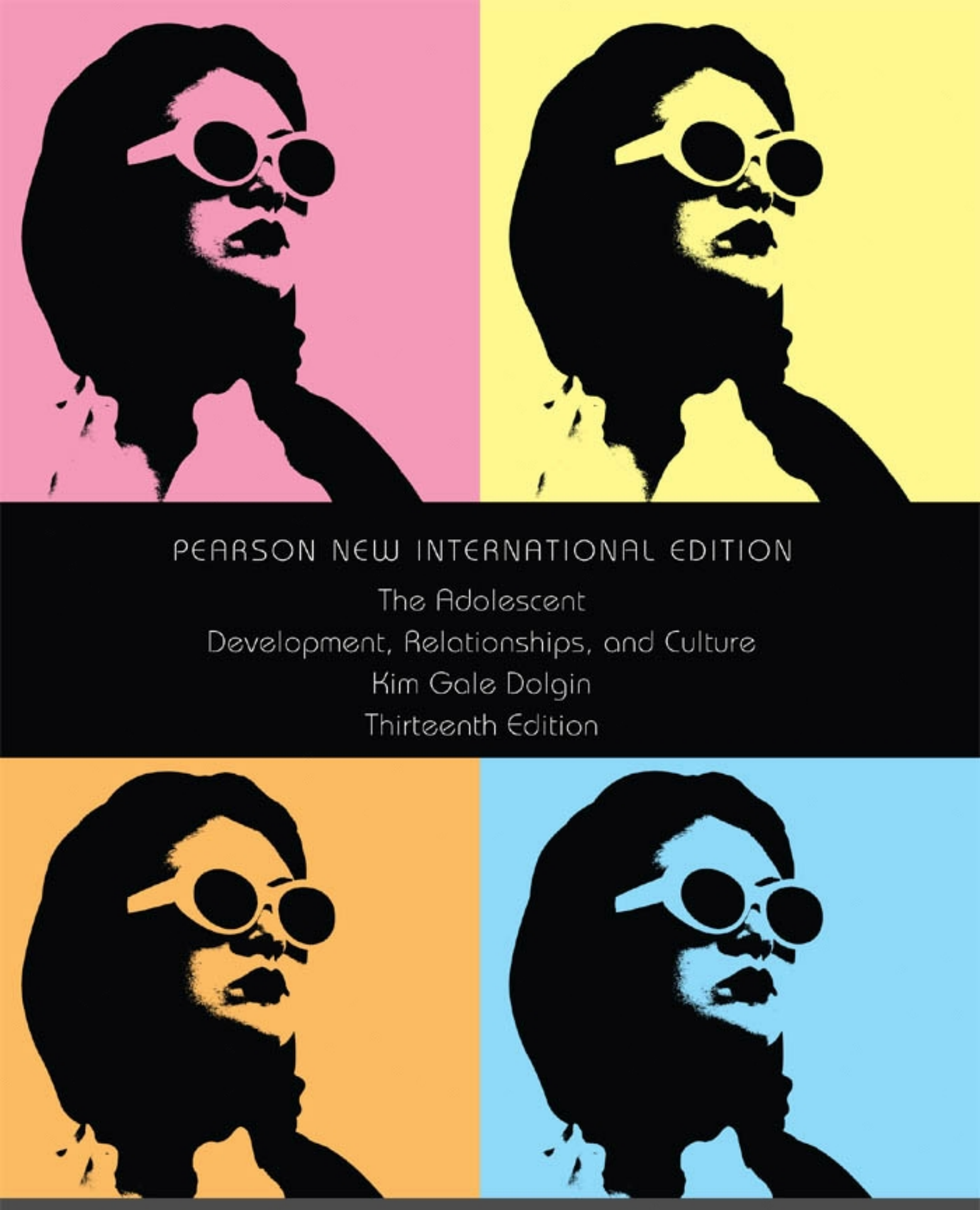

PEARSON NEW INTERNATIONAL EDITION

The Adolescent
Development, Relationships, and Culture

Kim Gale Dolgin

Thirteenth Edition

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Pearson New International Edition

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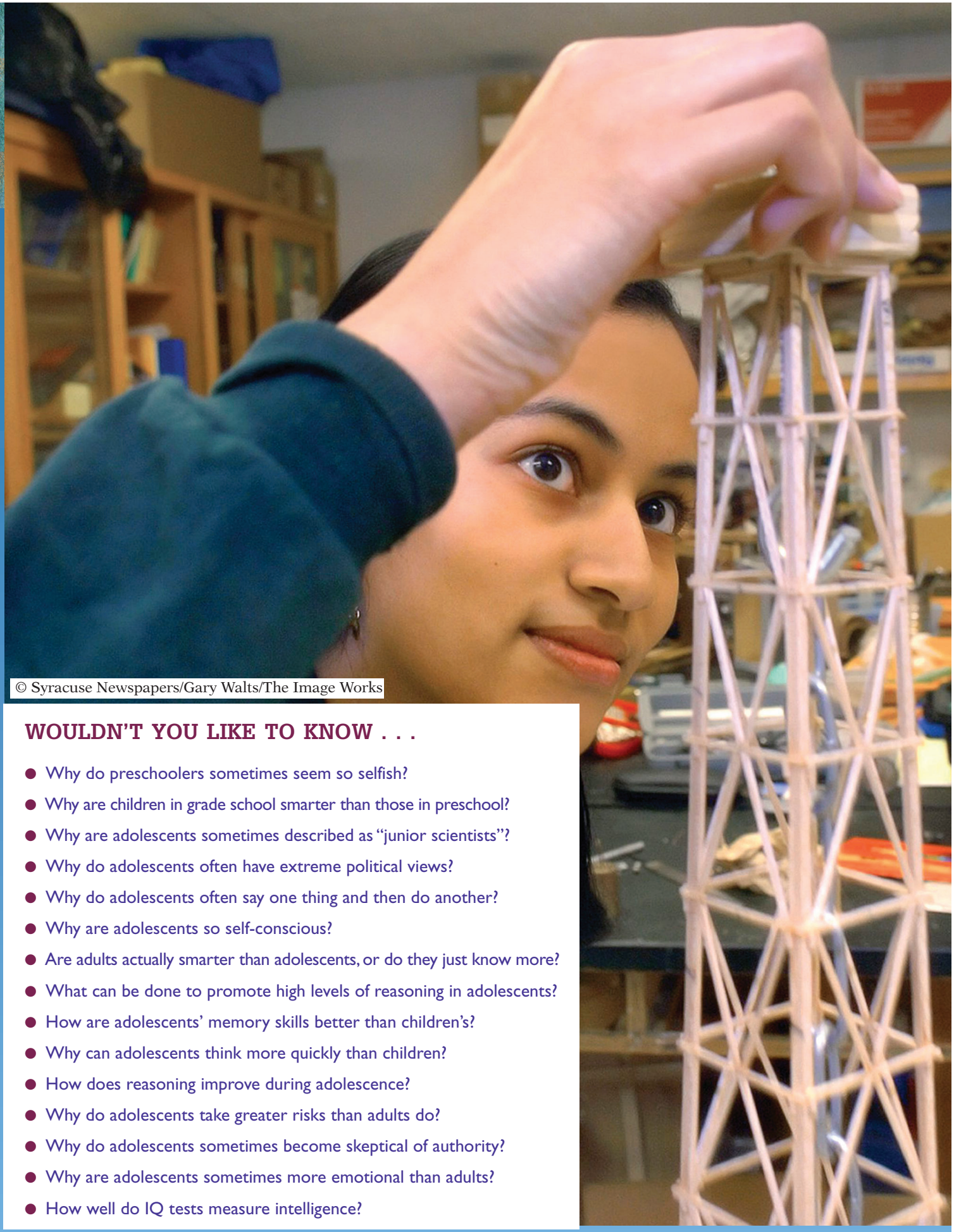
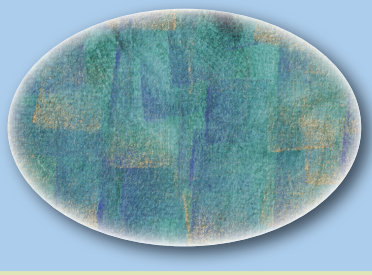


WOULDN'T YOU LIKE TO KNOW . . .

- Why do preschoolers sometimes seem so selfish?
- Why are children in grade school smarter than those in preschool?
- Why are adolescents sometimes described as "junior scientists"?
- Why do adolescents often have extreme political views?
- Why do adolescents often say one thing and then do another?
- Why are adolescents so self-conscious?
- Are adults actually smarter than adolescents, or do they just know more?
- What can be done to promote high levels of reasoning in adolescents?
- How are adolescents' memory skills better than children's?
- Why can adolescents think more quickly than children?
- How does reasoning improve during adolescence?
- Why do adolescents take greater risks than adults do?
- Why do adolescents sometimes become skeptical of authority?
- Why are adolescents sometimes more emotional than adults?
- How well do IQ tests measure intelligence?



Cognitive Development: Improvements in Thinking, Reasoning, and Decision Making

Piaget's Stages of Cognitive Development
Sensorimotor Stage ■ Preoperational Stage ■ Concrete Operational Stage ■ Formal Operational Stage

Effects of Adolescent Thought on Personality and Behavior
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The word *cognition* literally means "the act of knowing or perceiving." So, in discussing the cognitive development of adolescents, we seek to discuss the process by which they grow in knowledge. More specifically, we look at their ability to understand, think, and analyze and to utilize these abilities in solving the practical problems of everyday living.

There are basically three approaches to this study of cognition. The first is the *Piagetian approach,* which emphasizes the broad patterns and qualitative changes in the way adolescents think. The second is the *information-processing approach,* which examines the progressive steps, actions, and operations that take place when the adolescent receives, perceives, remembers, thinks about, and uses information. The third approach is the *psychometric approach,* which measures quantitative changes in adolescent intelligence. We will examine each in turn.

Piaget's Stages of Cognitive Development

Jean Piaget was the most important early researcher of cognitive development. He divided cognitive development into four major stages (Piaget, 1963):

- The *sensorimotor stage* lasts from birth to about age 2.
- The *preoperational stage* lasts from about ages 2 to 7.
- The *concrete operational stage* lasts from about ages 7 to about 11 or 12.
- The *formal operational stage* lasts from age 11 or 12 on.

The differences among the four stages have to do primarily with (1) what one can think about, (2) how flexible one's thinking is, and (3) how correctly one can use logic. In the sensorimotor stage, the individual cannot think without performing movement: to think *is* to move. Thought, therefore, is quite inflexible and so the infant does not engage in logic. In the preoperational stage, the young child can think entirely in his or her mind; he or she doesn't have to take physical action in order to imagine or consider. Thinking is *pre*operational, however, as the child at this age lacks the **mental operations** needed for flexible thinking. His or her logic is inadequate, frequently leading to erroneous conclusions. Once the child enters the concrete operational stage, those mental operations are in place. As the name of the stage indicates, however, the individual can use these mental operations only when thinking about real, concrete objects or actual behavior. Such thought is flexible and logical. Finally, with the onset of the formal operational stage, adolescents can think abstractly and hypothetically. They can reason and draw logical conclusions even when thinking about things that they have not actually experienced.

Let's look at each stage in more depth.

Sensorimotor Stage

During the **sensorimotor stage,** learning is related to the mastery of sensory-motor sequences. The infant moves from a self-centered, body-centered world to an object-centered world as the senses of vision, touch, taste, hearing, and smell bring him or her into contact with objects having various properties and relationships to other objects. The child becomes intrigued with simple motor activities such as picking up objects, falling backward on a pillow, and blowing air out of his mouth. Thinking, if there is any, occurs as a stimulus-response connection with the physical world, although the latter part of this period marks a transition to symbolic play, imitation, and the mental representation of objects.

During Piaget's sensorimotor stage, children under age 2 begin to move from a body-centered world to an object-centered world, where simple motor activities, such as picking up objects, become intriguing.

Preoperational Stage

The **preoperational stage** is the period when language is acquired. Children begin dealing with their world by learning and manipulating symbols, as well as through motor activity and direct interactions with the environment. Symbolic play, or *internalized imitation,* emerges.

During this period, there is evidence of transductive reasoning rather than more mature inductive or deductive reasoning. **Transductive reasoning** occurs when the child proceeds from particular to particular, without generalization, rather than from the particular to the general **(inductive reasoning)** or from the general to the particular **(deductive reasoning).** Transductive reasoners tend to infer cause and effect when none exists. If, for example, a 4-year-old girl meets a mean man who has a beard, she may assume that all men with beards are mean because beards make people mean. She would then worry if her father said he was planning on growing a beard because doing so would make him mean. Similarly, a young boy who once noticed he had a sore throat as he was combing his hair might thereafter believe that brushing his hair would make him sick. These examples also illustrate the concept of **syncretism,** or trying to link ideas that are not always related. For example, Mommy had a baby the last time she went to the hospital, so the next time she goes to the hospital, the child mistakenly expects Mommy to bring home another baby.

Preoperational thinking is also *egocentric;* that is, children have difficulty understanding why someone else cannot see something in the same way they do. For example, suppose you have already had three cookies and your sister has had only one. There is one more cookie on the plate. If you are in the preoperational stage, who do you believe should eat the last cookie? You, of course, because you are still hungry. At this stage, you cannot put yourself in your sister's place and imagine how she feels. Syncretism coupled with egocentrism leads to a related phenomenon called **animism.** Young children assume that inanimate objects—especially those that share features such as eyes and faces with animals—have feelings and are, in essence, alive. Since children get lonely when they are left alone, they assume that their dolls and teddy bears get lonely, too.

Related to all the preceding characteristics is **centering,** which refers to children's tendencies to focus attention on one detail and their inability to shift attention to other aspects of a situation. For example, a preoperational child may conclude there is more water in a shallow dish than in a glass because the dish is wider, even though you have already seen all the water poured from the glass into the dish (see Figure 1). She ignores the greater height of the glass and the demonstration of pouring. As a result of their inability to maintain more than one relationship in their thinking at a time, children frequently make errors of judgment. There is evidence of thinking but still an absence of operational thinking.

ANSWERS WOULDN'T YOU LIKE TO KNOW . . .

Why do preschoolers sometimes seem so selfish?

Preschoolers can seem selfish because they are egocentric. They simply cannot imagine what is going through another person's mind. Rather, they assume that what they want is what you want and that what they like is what you like. They are not deliberately ignoring others' feelings, however.

Concrete Operational Stage

Piaget described pre- and early adolescents as being in the **concrete operational stage** of cognitive development. And as we will see, even older adolescents and adults sometimes think in ways characteristic of concrete, rather than formal, operations. It is therefore important to understand what individuals in this stage can and cannot do.

During the concrete operational stage, children show a greater capacity for logical reasoning, although at a concrete, rather than abstract, level. One of the reasons they can think more logically is that they are able to arrange objects into **hierarchical classifications** and comprehend **class inclusion relationships** (the mental manipulation of objects in different levels of a hierarchy at the same time). This gives children the

mental operations logical processes that allow for flexible thought.

sensorimotor stage the first stage of cognitive development, according to Piaget, lasting from birth to about age 2.

preoperational stage the second stage of cognitive development, according to Piaget, lasting from ages 2 to 7.

transductive reasoning proceeding from particular to particular in thought, without making generalizations.

inductive reasoning gathering individual items of information and putting them together to form hypotheses or conclusions.

deductive reasoning beginning with a hypothesis or premise and breaking it down to see if it is true.

syncretism the act of trying to link ideas.

animism the preoperational belief that inanimate objects have humanlike properties and emotions.

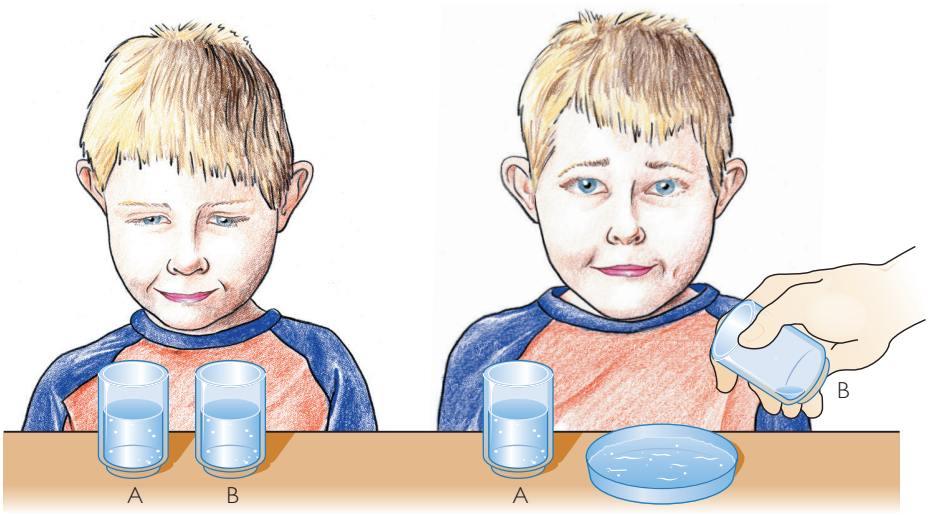
centering the tendency of children to focus attention on one detail and their inability to shift attention to other aspects of the situation.

concrete operational stage the third stage of cognitive development, according to Piaget, lasting from ages 7 to 11 or 12.

hierarchical classification the ability to divide objects into nested series of categories.

class inclusion relationships understanding that objects can be fit into different levels of hierarchies.

FIGURE 1 UNDERSTANDING THE PRINCIPLE OF CONSERVATION OF VOLUME
(a) The child agrees that glasses A and B have the same amount of water. *(b)* The water from B is poured into the dish. The child is unable to understand that glass A and the dish still have the same amount of water, because the dish appears broader even though it is shallower. The child is unable to retain one aspect (the amount) when another aspect changes (the height of the water column and the width of the column).



ability to understand the relations of the parts to the whole, the whole to the parts, and the parts to the parts.

For example, suppose you are given a randomly organized array of blue and red squares and black and white circles. If you understand inclusion relationships, you discover there are two major collections (squares and circles) and two subtypes of each (blue versus red squares and black versus white circles). The higher level of the hierarchy is defined by shape and the lower level by color. This enables you to say that all squares are either blue or red; that there are more squares than blue squares; that there are more squares than red squares; that if the red squares are taken away, the blue ones are left; and so on.

Children at this stage learn that different objects may be grouped by size, by alphabetical order, by age, and so on, or that an object may simultaneously belong to more than one class. A child may be a girl, a fourth-grader, an athlete, and a redhead, all at the same time. Children learn that some relationships are *symmetrical,* or *reciprocal*—such as two brothers are brothers to each other—while some others are not—for example, I am Florence's daughter but she is my mother. In dealing with numbers, children learn that different combinations of numbers make the same total and that *substitutions* may be made with the same result. In dealing with liquids and solids, they learn that a change in shape does not necessarily change volume or mass.

For the first time, children can make **transitive inferences.** Transitive inference problems can be easy or difficult, but they all have a similar form. A typical transitive inference problem is "Oranges cost more than grapefruit, and grapefruit cost more than apples. Do apples cost more than oranges?" In order to solve such a problem, you must be able to **seriate,** or mentally arrange items in order from large to small or small to large. Preoperational children can seriate (although it is often difficult for them), but they cannot perform the mental manipulations necessary for transitive inferences.

Piaget calls this stage the *concrete operational stage* of cognitive development because it involves concrete elements (objects, relations, or dimensions) and mental operations (such as addition or subtraction) that describe the way the operations may be performed. Four mental operations are especially important:

1. *Reversibility:* All actions, even mental actions, have an opposite. For example, "canaries" and "turtles" can be lumped together into the category of "pets," and "pets" can be divided into the subcategories of "canaries" and "turtles." Understanding reversibility, in effect, lets you think backward, imagining an item's state before some action was performed on it. For example, when we see a wet washcloth, we know that it must have been dunked in water, since removing the water would make it dry again.
2. *Identity or nullifiability:* This operation involves understanding that if we do something to an object and then do its opposite, the net effect is that the object is unchanged. For example, imagine that you have six pennies. If your brother gives you two more but then your sister takes two of them away, you will be back to having six pennies. Another

way of thinking about identity is that anything plus zero stays the same. So, if you take a glass of water and pour it into a differently shaped container, you will still have the same amount you started with (assuming you didn't add or spill any water).

3. *Associativity:* This operation involves understanding that the same outcome can result from different combinations or clusterings or actions. For instance, if we want to make fruit salad, we can mix blueberries and strawberries and then add some pineapple. If we instead mix the strawberries and pineapple and only later add the blueberries, the results will be identical.
4. *Combinativity:* Classes can always be combined to form larger, broader categories. For example, "boxes" and "jars" can be conceptually combined to form the category "containers."

Piaget used **conservation problems** to determine whether children had entered the concrete operational stage of cognitive development. *Conservation* refers to the recognition that properties of things such as weight and volume are not altered by changing their shape or the container they are in. Conservation tasks involve some manipulation of the shape of matter that does not alter the mass or volume of the matter (Piaget & Inhelder, 1969). Look again at Figure 1. Whereas a preoperational child would tell you that there is more water in the glass than in the petrie dish ("It's taller!"), a child in concrete operations would recognize that both containers have the same amount of liquid regardless of their appearance.

It is important to remember that the child's thinking is still linked to empirical reality (Piaget, 1967). Children have made some progress toward extending their thoughts from the actual toward the potential, but the starting point must still be real because concrete operational children can logically reason only about those things with which they have had direct, personal experience. When children have to start with any hypothetical or contrary-to-fact proposition, they have difficulty.

ANSWERS WOULDN'T YOU LIKE TO KNOW . . .

Why are children in grade school smarter than those in preschool?

Grade-schoolers are smarter than preschoolers because they better understand hierarchies and part/whole relationships. They can arrange items in their minds from small to large. They can also think backward and infer the past from the present. Finally, they know that not all changes in appearance are meaningful. Taken together, these skills mark a big change in development.

Formal Operational Stage

The last stage of cognitive development, the **formal operational stage,** begins during early adolescence. Piaget subdivided this stage further into substages III-A, almost full formal function (ages 11 or 12 to 14 or 15), and III-B, full formal function (ages 14 or 15 and up). Substage III-A is a preparatory stage in which adolescents may make correct discoveries and handle certain formal operations, but their approach is crude and they are not yet able to provide systematic and rigorous proof of their assertions; these early adolescents are able to exhibit formal operations in some situations but not in others. Many adolescents and adults never truly reach the second substage. They seem to remain fixated in substage III-A, often thinking formally only in situations with which they are familiar (Flavell, Miller, & Miller, 1993).

Formal operational thinking differs radically from that of concrete operations. Although the concrete operational child can perform mental operations and has some understanding of classes and relations, his or her ability to use induction and deduction is significantly limited. A child at this stage will get lost when asked to juggle multiple dimensions of a problem at the same time or to ignore his or her own past experiences in problem solving. Conversely, adolescents are able, through inductive reasoning, to systematize their ideas and deal critically with their own thinking and so are able to construct theories about it. Furthermore, they can test these theories logically and scientifically, considering several variables, and are able to discover truth through deductive reasoning (Inhelder & Piaget, 1958). In this sense, adolescents are able to assume the role of scientists because they have the capacity to construct and test theories.

This is illustrated by one of the experiments Piaget conducted that led him to discover the strategies adolescents use in solving problems. Adolescent participants were shown a pendulum suspended by a string (see Figure 2). The problem was to discover which factors would affect the speed by which the pendulum

transitive inferences the ability to solve problems such as "Tom is taller than Fred, and Fred is taller than Marty. Is Tom taller than Marty?"

seriate the act of lining things up in order from large to small or small to large.

conservation problems tests used by Piaget to determine whether children had mastered concrete operations, such as understanding that changing an object's appearance does not alter its fundamental properties.

formal operational stage the fourth stage of cognitive development, according to Piaget, during which people develop abstract thought independent of concrete objects.