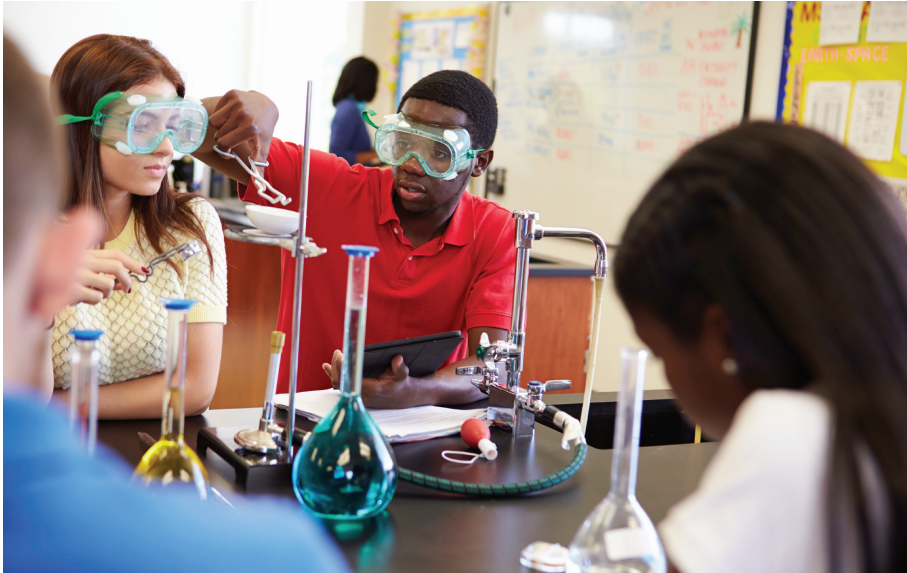


Cognitive Development during Adolescence

CHAPTER

15



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Chapter Outline

- COGNITIVE DEVELOPMENT**
Beyond Concrete Operational Thinking
- Moral Development: Beliefs about Justice and Care**
- Information-Processing**
Features of Adolescent Thought
- The Influence of School**

Focusing Questions

- To what extent are adolescents capable of abstract reasoning?
- How does cognitive development affect adolescents' knowledge and beliefs about their identities and about morality?
- How do adolescents show improved information processing in everyday activities?
- What cognitive and social effects do school and work have on adolescent development?

COGNITIVE DEVELOPMENT

Teenagers' growing cognitive competencies broaden the horizons of their world substantially. For example, the question "What if the United States went to war again when I'm older?" is more meaningful to an adolescent than to a child, even though both are equally inexperienced with the realities of war. So is the question "What if I had been born really poor or fabulously rich?" Adolescents can imagine what these situations might be like even though they have not experienced them in a concrete way. In general, thinking about the possible creates a new skill for speculating about important events and guessing about daily experiences (Keating & Sasse, 1996). It also

stimulates adolescents to daydream or fantasize about their actions and feelings. And it helps them to make more astute inferences about human motivations (“Perhaps she did that because . . .”) and to critique their own and others’ actions.

Psychologists have explained and interpreted these new talents from two major points of view. The first is the *cognitive developmental viewpoint*, often associated with the work of Piaget. The second is the more recent approach of *information-processing theory*, which analyzes human thinking as a complex storage, retrieval, and organizing system for information, much like a computer. Both theories have been discussed elsewhere in this book (see especially Chapter 2); here we focus on how they relate to adolescence in particular.

Beyond Concrete Operational Thinking

During adolescence, many teenagers go beyond the *concrete operational thought* described in Chapters 6 and 8 and begin developing a more abstract way of thinking called **formal operational thought**. Piaget (1983) saw this new operational thinking emerging around age eleven in many though not all adolescents. This new form of thinking frees individuals from reasoning only about the here-and-now, and allows them to be more fully logical and systematic in analyzing ideas. When using formal operational thought, individuals show some combination of three skills: they can imagine the possible rather than being limited to the real, they use scientific reasoning, and they combine ideas skillfully. Although these skills represent cognitive advances over the concrete thinking of childhood, it is important to note that they are not necessarily the “final,” most mature forms of cognitive development. Later research indicates that there is a wide range of variance with how, when, and how often adolescents and young adults use formal operation thinking (Keating, 2004; Kuhn, 2008). Some teenagers and young adults never develop formal operational thought at all, and as we will see in later discussions of adult thinking (Chapters 12, 14, and 16), other kinds of thinking develop later in life that might best be called “wisdom.” Before we get to those chapters, though, let us look in more detail at the main features of formal operational thought.

Possibilities versus Realities

Formal thought involves attention to possibilities rather than merely to actual realities. A parent discovers this when presenting a problem to be solved by her two children, ages nine and fifteen. When asked how to get the cable television signal working again, the nine-year-old said call the cable company, while the fifteen-year-old offered three possible fixes (like checking the cable hook-up, rebooting the system, checking the input device on the TV) that could be tried before calling cable company help line. All offerings were

formal operational thought

Thinking based on previously acquired concrete mental operations and involving hypothetical reasoning and attention to the structure or form of ideas.

Many teenagers become able to solve problems scientifically. But like these students in a biology laboratory class—and like most adults—they still need ample concrete experiences to support their abstract thinking. It is also common for them to have trouble using scientific thought outside a structured school situation.

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possible solutions; the difference was that the younger child, using concrete operational thought, saw one option, while the teenager, using formal operational thought, imagined multiple solutions and their outcomes when reasoning through the problem. Even though the teenager is not a “cable repair-person,” she is knowledgeable about electronics from personal experience, and more importantly, understands that there is more than one solution to any problem. In fact, this young adolescent is approaching the problem more scientifically than her younger brother, utilizing the second new skill developed at this stage.

Scientific Reasoning

Formal thought also involves scientific reasoning, the same kind psychologists use in designing many of their studies of human development. This quality reveals itself when adolescent students must solve some problem systematically. Piaget called this newly developed ability *hypothetical-deductive reasoning*, thinking that involves forming a hypothesis, testing possible solutions, and making judgments about the outcomes (Inhelder & Piaget, 1958). For example, how do youngsters in an art class figure out methods for mixing basic colors of paint to produce various intermediate shades and other colors? Those capable of formal operations in effect design an experiment to test all the available combinations of colors. They form hypotheses, or hunches, about how certain colors affect each other when mixed. Then they try out their hypotheses by mixing each basic color with every other basic color, being careful to try every possibility. By carefully observing the results of this procedure, they can draw logical conclusions about how to mix colors. This procedure in effect uses the scientific method.

The major difference with using this skill compared to a concrete operational child is the systematic way the older teen works toward a solution. A younger child would play around with the paint, mixing colors as well, but doing so in a more random and haphazard manner, most likely taking little formal notice of the results of her random actions. A precocious ten-year-old, familiar with painting, may solve the problem, but it is more likely this solution is a blend of experience and memory, rather than hypothetical-deductive reasoning. Even very bright kids in middle childhood do not use combinatorial thinking with the skill and persistence of a teen who is capable of formal operational thought.

Logical Combination of Ideas

The third feature of formal operational thought involves combining ideas logically. Unlike less cognitively mature children, formal thinkers can hold several ideas in mind at once and combine or integrate them in logical ways. When asked to explain why some students perform better in school than others do, concrete operational thinkers are likely to latch on to one reason or another: “Some kids are smarter” or “Some kids work harder.” In contrast, formal operational thinkers often give combinations of reasons, as this first-year college student did:

Well, I think it depends. Sometimes it pays just to be smart. But it also helps to work hard—except when the teacher doesn’t notice. Some kids do better because they have taken courses before in the same area. Your first class in literature is likely to be harder than your fifth class in that subject.

As this example shows, the ability to combine ideas sometimes makes formal operational thinkers qualify their opinions more than preformal operational thinkers do. The world is no longer black and white. It has many more shades of gray for the adolescent than it does for a concrete operational thinker.

Cognitive Development Beyond Formal Thought

Piaget and other psychologists have identified formal, or abstract, thought as a major achievement of the adolescent years. But for most human beings, it may not be the final or highest cognitive achievement. One clue to this possibility comes from adolescents

themselves: some teenagers overuse logical thinking when they first achieve facility with it (Leadbetter, 1991). They may believe all problems, including ambiguous ones such as achieving world peace, can be solved by the proper application of rational principles and careful reasoning. Teenagers may fail to notice that some problems by nature resist the application of general logic and may inherently have multiple, partial solutions. Later, as adults, they will take a more ad hoc, pragmatic approach to most problem solving (Sinnott, 1998). Additionally, the use of formal operational skills may not prove helpful when applied to problems or situations that are more emotional than logical or rational.

Consider Ana, a twelfth-grader who recently has begun a sexual relationship with her boyfriend. Ana gets along well with her parents, and respects their values. She knows they will worry and feel hurt if they learn of her sexual intimacy. She further believes that, generally, friends and family should have no secrets. By continuing her sexual activities, she seems to be violating this principle. On the other hand, she and her boyfriend regard their behavior as a personal and private matter, and she worries that telling her parents would violate this privacy, which she also considers her right. Telling her parents might also create a lot of bad feelings among Ana, her boyfriend, and her parents. In this case, her principles do not seem to point her toward a good solution: Ana believes that no matter what she does, somebody will get hurt, some ethical principle will be violated, or both.

Ana's situation suggests the importance of nonrational choices or judgments in solving real-life problems. Like Ana, many people may wish to be reasonable; that is, they may wish to rely on formal logic and may even believe they use it a lot. But in practice, most people use formal logic consistently only when solving academic problems posed by teachers, especially when the problems are deliberately scientific in nature (Bartsch, 1993). Less systematic reasoning serves as well or better for solving daily problems.

For older adolescents, the cognitive challenge consists of converting formal reasoning from a goal in itself to a *tool* used for broader purposes and tailored to the problems at hand (Myers, 1993). Ana cannot reach a sound decision about informing her parents of her sexual activities if she focuses on formal principles about truthfulness and privacy to the exclusion of more personal facts, which in this case include her knowledge of her boyfriend's and her own parents' probable responses and feelings. Taking these circumstances into account leads to the "best," or most mature, solution, but it may not lead to a solution that is fully logical in Piaget's sense. As adolescents grow into young adults, this sort of postformal thought becomes more common.

Implications of the Cognitive Developmental Viewpoint

As indicated earlier, formal operations begin developing early in adolescence and are fully formed by the end of the high school years (Piaget, 1983). All teenagers supposedly develop wide-ranging thinking abilities that have a formal, abstract nature and apply to many specific experiences and daily problems. In reality, however, the actual cognitive performances of adolescents fail to conform to this picture in several ways. First, a majority of adolescents (and even adults) use formal thinking inconsistently or even fail to use it at all (Lakoff, 1994). In explaining why a car is not working properly, for example, many adolescents and adults merely describe the car's symptoms: "The brakes are making a weird noise" or "It won't shift into third gear." An adolescent must have both an *experience base* and a *skill base* to mechanically resolve the problem using a structured and logical approach to the problem (Flavell et al., 1993). Yet, the inconsistency remains when this skilled teenage mechanic has difficulty applying the same logic and reason in his English classroom when trying to write a persuasive essay on gun control or on the soccer field when trying to devise strategies to neutralize an exceptionally skilled midfielder.

It seems, then, that formal operational thought does describe adolescents' thinking, but only partially or intermittently. Formal thought helps teenagers to argue with their parents more skillfully than they could as children, thereby contributing to the stereotype

What Do You Think?

Outside of school- or job-related tasks, most people actually use formal operational thinking rather little in their everyday lives. How much do *you* actually use it? Think of a situation other than school (shopping, visiting a friend, cooking) in which you need to use abstract thinking to function effectively. What does your answer imply about the place of formal thought in adolescents' overall development?

of teenagers as being relatively “rebellious.” Formal thought also makes teenagers more skillful at cultivating friendships, potential dates, and social contacts; now they can imagine and anticipate the consequences of various friendly (and unfriendly) strategies. And formal thought means teenagers are more ready than children are to grapple with philosophical and abstract topics at school; literary analysis can now begin to make sense, for example, and so can at least some theoretical concepts in science. The “Working With” interview describes how these changes look from the point of view of one high school mathematics teacher, Jerry Acton.

Moral Development: Beliefs about Justice and Care

As adolescents move into adulthood and gradually develop formal thought, allowing them to reason with concepts of greater complexity and abstract thinking, they also develop a personal **morality**, or sensitivity to and knowledge of what is right and wrong. Moral thinking develops in two ways: in the form of increasingly logical and abstract principles related to fairness and justice and in the form of increasingly sophisticated ways of caring about the welfare of friends, family, and self (Noam & Wren, 1993). Each of these trends is somewhat related to gender: boys tend to emphasize ethical thinking about justice rather abstractly, and girls typically emphasize an ethics of care. But the gender difference is not large; most individuals develop both kinds of ethical thinking to a significant extent. Lawrence Kohlberg (1963; Kohlberg et al., 1983) developed a major theory of moral development constructed around the issues of fairness and justice, while Carol Gilligan (1982) looked at the ethics of care as the basis for moral development in women. Both are stage theories in the cognitive developmental tradition, reminiscent of Piaget's approach to cognitive development.

morality Sensitivity to and knowledge about what is right and wrong.

Kohlberg's Six Stages of Moral Judgment

Lawrence Kohlberg proposed six stages of moral judgment that develop slowly across three levels, well into middle adulthood (Kohlberg & Hersh, 1977; Schrader, 1990). The stages were derived initially from interviews of boys aged ten, thirteen, and sixteen, but later research included adolescent females. The interviews were conducted in much the same style as Piaget's classic interviews about cognitive development: Children and adults of various ages responded individually to hypothetical stories that contained moral dilemmas. Kohlberg, like Piaget, believed that moral development occurred in a stage-like fashion and was based on an individual's level of cognitive development; over time, as cognitive abilities change, one's moral reasoning will also change.

Kohlberg identified three distinct levels of moral reasoning. Level 1 was *preconventional reasoning*, based on one's automatic acceptance of cultural rules of right and wrong, and the perception of the consequences (rewards or punishments) that may result from one's actions. Good behaviors are those that are rewarded, while a behavior is reasoned to be bad if punishment follows that action. Level 2 was defined as involving *conventional reasoning*. At this level, reasoning is less egocentric and embraces the expectations of others important to the individual, including family, school, and community. What is considered right is whatever conforms to the rules or values established by society at the macro level and the family at the micro level. Level 3 of moral development identified by Kohlberg was *postconventional reasoning*. Moral values, or

Blending the Social and Emotional with the Cognitive

Jerry Acton teaches math, chemistry, and physics in high school. I wanted to interview him to learn more about how students think about these traditionally “cognitive” subjects. What I learned, though, was that success in these subjects depended heavily on social and emotional factors—on students’ attitudes and motivations, and not just on their thinking abilities as such. The blending of the domains of development was especially evident in Jerry’s tenth-grade math class, the one we spent most time discussing.

Kelvin: *I’ve heard a lot of generalizations about math—stereotypes about learning it, so to speak. I’ve heard that math is inherently abstract, for example, and that it’s very sequentially organized, and that you have to be willing to work independently if you want to do well in math. What do you think about these ideas? Do they explain why some students do better in math than others? Tell me about your own classes.*

Jerry: For my classes, I would say that *maturity* makes the biggest difference. Maybe it’s because these are tenth-graders—people who have just arrived at senior high school and are still getting used to it. The more successful students in math classes are the ones who are the most mature.

Kelvin: *What do you mean by “mature”?*

Jerry: I mean the ones who are prepared to come to class to work, to listen, to ask questions, and to do work in class, as opposed to coming to class because it is a convenient place to socialize with friends. The mature ones already seem to

see value and usefulness to math, without my having to persuade them of that idea.

Kelvin: *That makes it sound like there’s not much need for you as the teacher—like students either choose to work or they don’t, and there’s not much you can do about it. Surely that’s not what you mean?*

Jerry: Oh no, there’s still lots to do! One thing I do to motivate the less self-motivated students is give them a structured environment: one where our tasks are predictable, where there’s routine. With a good routine, they know what to expect and the tasks are organized into steps that they understand and can do. We always do mental math first, then review the day’s homework, then start a new lesson, and so on. I find that variations from the format inevitably throw some students “off their stride,” and less gets done.

Kelvin: *That reminds me of the sequencing idea. People sometimes say that you have to learn math concepts in a certain sequence or else you risk getting hopelessly lost in the long term. Is that true?*

Jerry: Yes, in a sense it *is* true. But teachers can do things to keep students from getting lost as a result. In our new curriculum, for example, we use “spiral sequencing,” where we revisit topics periodically and give daily review in between visits. If you’re sick for a whole week, you don’t miss out altogether on a particular math topic. And all the teachers in my school now use cumulative testing, which gives students incentives for consolidating

what is right, are now considered independent of what an authority says is right. What is right is based on an individual’s perception of universal moral principles apart from the group’s rules or laws (Kohlberg & Hersh, 1977). Each of Kohlberg’s three levels of moral development was subdivided into two stages, resulting in a model of moral reasoning that comprised six stages.

Table 15.1 summarizes the six proposed stages. The stages form a progression in two ways. First, earlier stages represent more egocentric thinking than later stages do. Second, earlier stages by their nature require more specific or concrete thinking than later stages do. For instance, in Stage 1 (called *heteronomous morality*, which focuses on punishment and obedience), a child makes no distinction between what he believes is right and what the world tells him is right; he simply accepts the perspectives of the authorities as his own, primarily to avoid punishment for doing wrong, or “being bad.” By Stage 4 (social system orientation), when the child is an adolescent, he realizes that individuals vary in their points of view, but he still takes for granted the existing overall conventions of society as a whole. This stage is often referred to as the “law-and-order” stage because laws are needed to maintain the social order. He cannot yet imagine a society in which those

Blending the Social and Emotional with the Cognitive *continued*

what they know so that there are no “holes” in their math knowledge at the end of the course.

Kelvin: *Still, by its nature, math must be pretty abstract, even in tenth grade.*

Jerry: You’re right about that. Especially in the course called “precalculus,” which actually says in its advertising that it *is* abstract and is intended for students who already enjoy math. How do you offer concrete, hands-on activities related to factoring? What are the everyday uses for factoring? [*Smiles.*] Most students *do* learn better if you can make the material more down to earth and relate it to familiar activities.

But I have found ways to move in that direction. This year we used graphing calculators, for example, which the students really enjoy. The calculators make it a lot easier to create graphs—much faster and less laborious. With the calculators, you can actually play around with graphing different functions instead of taking fifteen minutes just to draw one by hand. When we get tire computer lab set up properly, we’ll be able to do even more.

Kelvin: *Sounds like with the calculators, students could even work together. They could do problems and projects cooperatively.*

Jerry: That’s indeed the case. Students can do problems independently, for example, and then compare their results. We’ll be able to do more joint work, in fact, when we get the computer lab set up.

Kelvin: *I often think of math as being an especially “solitary” activity, not one that lends itself to working with others. Would you agree?*

Jerry: I’ve found that there are ways for students in math to work together, like with the graphing calculators. Sometimes, in fact, I’ve actually had trouble with students cooperating *too* much; it seems like they’re always wanting to consult with each other about how to do certain problems or about what the answers are. Then I wish they would function more independently of each other. A mix is best: cooperation combined and independence combined.

What Do You Think?

1. Given Jerry Acton’s comments, would you describe mathematical success as a “cognitive” skill, a “social” skill, or as some combination? Explain your reasoning.
2. Do you believe there is indeed truth in the stereotypes or expectations about mathematics that Kelvin expressed at the beginning of the interview? How would you qualify these ideas, taking into account both Jerry’s comments and your own knowledge and beliefs?
3. Sometimes mathematics is traditionally thought of as a “boy’s” subject more than a “girl’s.” Judging by Jerry’s comments, do you think this is true for his class? Do you still think it could be true for mathematics students in general?

conventions might be purposely modified, for example, by passing laws or agreeing on new rules. Only by Stage 5 (the stage of social contract) and Stage 6 (the stage of universal principles) can he do so fully. At Stage 5, one understands that laws and authority can be questioned and that changes can be made for increased fairness and justice for the greater good of society. Stage 6—a level that few individuals exhibit—describes a person who has developed an independent moral code based on universal ethical principles, which may justify violating established laws to honor these principles.

In the school years, children most commonly show ethical reasoning at Stage 2, the instrumental-relativist orientation, but some may begin showing Stage 3 or 4 reasoning toward the end of this period (Colby & Kohlberg, 1987). For the majority of youth and adults, Stage 3 (interpersonal-conformity orientation) and Stage 4 (social system orientation) characterize their most advanced moral thinking. In Stage 3, a person’s chief concern is with the opinions of her peers: an action is morally right if her immediate circle of friends says it is right. Often, this way of thinking leads to helpful actions, such as taking turns and sharing possessions. But often it does not, such as when friends decide to shoplift from a store or bully a kid at school who is perceived as weaker and more

TABLE 15.1 Kohlberg's Stages of Moral Judgment

Stage	Nature of Stage
Preconventional Level (emphasis on avoiding punishments and getting awards)	
Stage 1 Heteronomous morality; punishment and obedience orientation	Good is what follows externally imposed rules and rewards and is whatever avoids punishment
Stage 2 Instrumental-relativist orientation purpose; ethics of market exchange as it benefits the individual. "The "I'll scratch your back, if you scratch my back" orientation.	Good is whatever is agreeable to the individual and to anyone who gives or receives favors; no long-term loyalty
Conventional Level (emphasis on social rules)	
Stage 3 Interpersonal conformity; ethics of peer opinion, the "good boy" or "good girl" orientation	Good is whatever brings approval from friends as a peer group
Stage 4 Social system orientation: conformity to social system; ethics of law and order	Good is whatever conforms to existing laws, customs, and authorities
Postconventional Level (emphasis on moral principles)	
Stage 5 Social contract, legalistic orientation; ethics of social contract and individual rights	Good is whatever conforms to existing procedures for settling disagreements in society; the actual outcome is neither good nor bad
Stage 6 Universal-ethical principles orientation. Ethics of self-chosen universal principles	Good is whatever is consistent with personal, general moral principles

vulnerable. The desire to be a "good boy" or "good girl" is often defined by what the peer group determines is the right thing to do.

In Stage 4, the person shifts from concern with peers to concern with the opinions of community or society in the abstract: now something is right if the institutions approve. This broader source of moral judgment spares Stage 4 children from the occasional tyranny of friends' opinions; now they may refuse to sneak a smoke or to experiment with alcohol or drugs just because their friends urge them to do so. This change makes teenagers less *opportunistic* than children and less inclined to judge based on immediate rewards or punishments they experience personally. Instead, they evaluate actions on the basis of principles of some sort. For the time being, the principles are rather conventional; they are borrowed either from ideas expressed by immediate peers and their parents, or from socially accepted rules and principles, whatever they may be. If friends agree that premarital sex is permissible, many teenagers are likely to adopt this idea as their own, at least as a general principle. But if friends or family believe premarital sex is morally wrong, teenagers may adopt this alternative belief as a principle. (Note, however, that whether a teenager actually acts according to these principles is another matter. Moral action does not always follow from moral belief.)

A few young adults develop **postconventional moral judgment**, meaning that for the first time ethical reasoning goes beyond the judgments society conventionally makes about right and wrong. Adolescents' growing ability to use abstract formal thought stimulates this development, though it does not guarantee it. Unlike schoolchildren, they can evaluate ethical ideas that *might* be right or wrong given certain circumstances that can only be imagined.

postconventional moral judgment In Kohlberg's theory, an orientation to moral justice that develops beyond conventional rules and beliefs.

Issues in the Development of Moral Beliefs about Justice

As Figure 15.1 indicates, Kohlberg's six stages of moral judgment have held up well when tested on a wide variety of children, adolescents, and adults. The stages of moral thinking shown in Table 15.1 do seem to describe how moral judgment develops, at least when individuals focus on hypothetical dilemmas posed in stories. When presented with

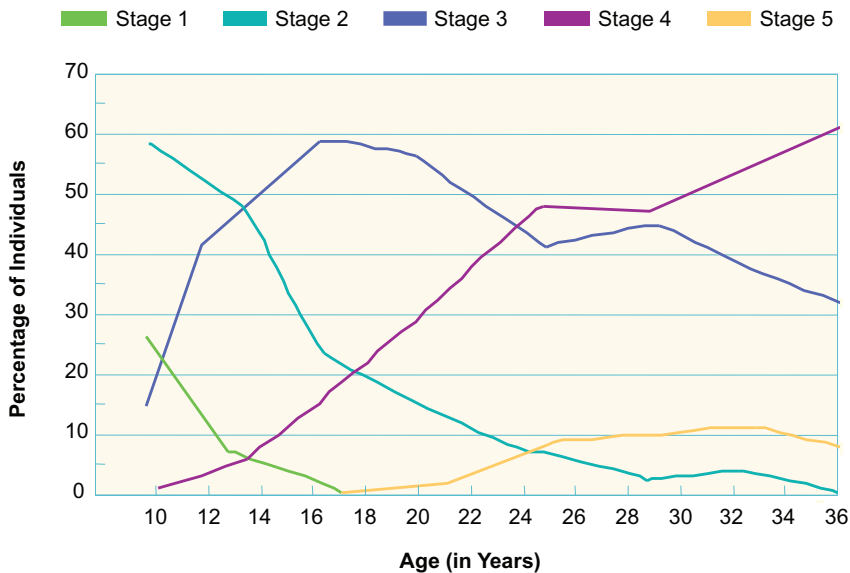


FIGURE 15.1
Longitudinal Development
of Moral Reasoning

In a longitudinal follow-up study of Kohlberg's original sample, Colby and her colleagues showed that participants showed consistent upward advances in moral reasoning with age. The graph shows the extent to which participants gave responses characteristic of each of Kohlberg's six stages from age ten through adulthood. With development, responses associated with the pre-conventional level (Stages 1 and 2) declined, whereas responses associated with the conventional level (Stages 3 and 4) increased. Few young adults moved to the post-conventional level (Stages 5 and 6) of moral reasoning.

Source: Adapted from Colby et al., 1983.

stories about risky but fictional sexual behaviors, adolescents of both sexes evaluated the actions of the stories' characters in line with Kohlberg's stages (Jadack et al., 1995).

Even so, Kohlberg's theory of moral judgment leaves a number of important questions unanswered. One is whether the theory really recognizes the impact of prior knowledge on beliefs; another is whether the theory distinguishes clearly enough between conventions and morality. One especially important question has to do with gender differences: does Kohlberg's theory really describe the moral development of girls as well as that of boys?

Issue 1: Form versus Content of Moral Beliefs

Despite the theory's plausibility, a number of developmental psychologists have questioned important aspects of it. Can the form of ethical thinking really be separated from content to the degree Kohlberg proposes? Perhaps not. Some studies have found that when people reason about familiar situations, they tend to have more mature (that is, higher-stage) ethical responses (Lickona, 1991). For instance, children have a better sense of fairness about playing four-square on the playground than about whether to steal a drug for a spouse who is dying (one of Kohlberg's fictional dilemmas). In addition, young women think in more mature (more "developed") ways about ethical problems of special concern and familiarity to women, such as whether to engage in premarital sex or whether to have an abortion (Bollerud et al., 1990). To some extent, therefore, what someone thinks about affects the ethics she or he applies.

Issue 2: Conventions versus Morality

According to some psychologists, some inconsistencies in moral beliefs may arise because the theory does not fully distinguish between social conventions and morality (Nucci & Turiel, 1993). **Social conventions** refer to the arbitrary customs and agreements about behavior that members of society use, such as table manners and forms of greeting and dressing. *Morality*, as we already pointed out, refers to the weightier matters of justice and right and wrong. By nature, social conventions inevitably generate widespread agreement throughout society, whereas morality does not necessarily do so. Yet Kohlberg's six-stage theory glosses over these differences by defining some of its stages in terms of social conventions and others in terms of morality. Stage 4 (social system orientation), for example, seems to refer to social conventions as well as to moral matters, but Stage 5 (social contract orientation) refers only to moral judgment. It is also important to keep in mind that Kohlberg's focus was not delineating between social conventions and morality per se, but in viewing the moral reasoning used in commenting on the actions of people facing the fictional moral dilemmas.

social conventions Arbitrary customs and agreements about behavior that members of a society use.

Issue 3: Gender Differences in Morality?

One especially important criticism of Kohlberg's theory of moral justice has to do with possible gender bias. Do Kohlberg's stages describe both genders equally well? And does his theory undervalue ethical attitudes that may develop more fully in girls and women than in boys and men? The best-known investigations of these questions have been pursued by one of Kohlberg's colleagues at Harvard, Carol Gilligan, and her associates.

Gilligan's Ethics of Care

According to Gilligan and others, boys and girls tend to view moral problems differently (Taylor, Gilligan, & Sullivan, 1995; Gordon, Benner, & Noddings, 1996). As they grow up, boys learn to think more often in terms of general ethical principles that they can apply to specific moral situations. They might learn that deception is bad in principle and thus evaluate a specific instance of deception of a friend against this generalization. The principles boys learn also tend to emphasize independence, autonomy, and the rights of others. This orientation biases boys to ignore or minimize others' possible needs. Perhaps reasoning that if a friend is at home sick with a cold, it may seem better to leave him alone until he gets better, rather than check on how well he is recovering.

Girls tend to develop a different sort of morality as they grow up. Instead of seeing moral judgment as a set of abstract principles to apply to specific situations, girls tend to develop an ethics of care, a view that integrates principles with the contexts in which judgments must be made. A girl therefore may have learned that deception is usually bad, but she may also reason that deception is ethical in certain circumstances, such as when a friend needs reassurance about the quality of a term paper that is actually mediocre but took a lot of time and effort to write. Viewing ethics in context grows out of a general concern for the needs of others more than for one's independence. A friend who is depressed therefore deserves a visit or a phone call; leaving her alone seems more like neglect than like respect for her autonomy. Table 15.2 summarizes Gilligan's stages of moral development.

These differences are only tendencies, not dramatic or sharply drawn gender differences. But they are enough, argues Gilligan, to make Kohlberg's theory seem to underestimate the moral development of girls and women. Concern with context and with others' needs causes girls to score closer to the middling, conventional levels of moral judgment, where peers' opinions matter most. When asked if a child should inform authorities about a friend who often shoplifts small items from a local department store, a girl is likely to give priority to one part of the problem in particular: that of balancing each person's views and needs in the particular situation. Doing so means wondering, among other things, whether informing will alienate peers not only from the shoplifter but also from the informer. On the other hand, it also means wondering whether keeping silent will make her risk losing the trust and respect of important adults, such as parents and teachers.

TABLE 15.2 Gilligan's Stages of Moral Development

Stage	Features
Stage 1 <i>Survival orientation</i>	Egocentric concern for self, lack of awareness of others' needs; "right" action is what promotes emotional or physical survival
Stage 2 <i>Conventional care</i>	Lack of distinction between what others want and what is right; "right" action is whatever pleases others best
Stage 3 <i>Integrated care</i>	Coordination or integration of needs of self and of others; "right" action takes account of self as well as others

Source: Gilligan (1982).

It also means considering the amount of emotional pain that will befall the shoplifting friend at the hands of either angry parents or the police. Taking all of these considerations into account can make the final decision seem hesitant, tentative, and apparently lacking in principle, whichever way the decision goes.

Reviews of moral judgment have qualified Gilligan's ideas somewhat but have also lent them support. When faced with hypothetical dilemmas, females show as much capacity as males to reason in terms of abstract ethical principles (Gilligan & Wiggins, 1987). When faced with real-life dilemmas, however, girls make different choices (Taylor et al., 1995). For example, adolescent girls who personally confront the decision of whether to engage in premarital intercourse often show more concern than do boys for the context in which they make their decisions and for the impact of their decisions on relationships with others. Gilligan's claims of gender bias in Kohlberg's stages have also proven to be unfounded; studies have shown females exhibiting higher levels of ethical reasoning than males using Kohlberg's stages (White, 1999). What appears consistent across both theories is that justice-oriented moral reasoning and needs/care-oriented moral reasoning takes time—years, in fact—to develop.

The Ethics of Care during Adolescence

As with the morality of justice, young people develop an ethics of care during adolescence, but like ethical justice, it remains somewhat conventional during the teenage years. During the school years, children develop significant concern about others' needs and welfare and begin viewing actions as good if the actions take others' needs and welfare into account (Larrabee, 1993). However, egocentrism persists in that teenagers often fail to distinguish between actions that merely *please* others and actions that are "right" in a deeper, ethical sense. For example, if parents will be pleased if their adolescent enrolls in complex science and mathematics courses in high school, doing so may seem "right" to the youngster, even if he has little interest or aptitude in those areas.

As with the ethics of justice, a few individuals move beyond conventional pleasing of others toward *integrated care*, in which the young person realizes that pleasing everyone is not always possible but it is important to balance everyone's needs, including her own (Larrabee, 1993). Deciding whether or not to take a part-time job, for example, now becomes a matter of reconciling the impact of the job on family, friends, and self. Some individuals may gain (the teenager herself may earn more money and make new friends), but others may lose (parents and friends may see less of her). The gains and losses must be balanced, rather than viewed completely as gains.

Overall, then, the moralities of justice and care begin taking into account a broader array of both interpersonal circumstances and general principles than was true during the school years. Teenagers more often refer to principles in evaluating actions, although they still do not always act on their principles. Often they also regard pleasing others as ethically good or right, even though they are learning to deal with the impossibility of pleasing everyone perfectly. Like many other cognitive developments, these changes result from adolescents' growing capacities to reason abstractly.

The Development of Social Cognition

Most developmental psychologists agree that the new cognitive skills of adolescents have important effects on their **social cognition**, or their knowledge and beliefs about interpersonal and social matters. Moral beliefs are one example of social cognition; in this section we look at three others: egocentrism and its expression as beliefs in an imaginary audience and a personal fable.

social cognition Knowledge and beliefs about interpersonal and social matters.

Adolescent Egocentrism

When adolescents first begin to reason abstractly, they often become overly impressed with this skill; it seems to them that anything can be solved "if only people would be

reasonable” (that is, logical). This attitude can make teenagers idealistic and keep them from appreciating the practical limits of logic (Bowers, 1995). They may wonder why no one has ever “realized” that world war might be abolished simply by explaining to all the world powers the obvious dangers of war. Or they may wonder why their parents have not noticed the many “errors” they have made in raising children.

The development of formal thought also leads to a new kind of confusion between an adolescent’s own thoughts and those of others. This confusion of viewpoints amounts to a form of egocentrism. Unlike the egocentrism of preschoolers, which is based on concrete problems, **adolescent egocentrism** concerns more abstract thoughts and problems.

adolescent egocentrism

The tendency of adolescents to perceive the world (and themselves) from their own perspective.

imaginary audience

A characteristic of young adolescents in which they act as though they are performing for an audience and believe that others are as concerned with their appearance and behavior as they themselves are.

The Imaginary Audience

Adolescent egocentrism sometimes shows itself in teenagers’ preoccupation with the reactions of others. Thirteen-year-olds often fail to differentiate between how they feel about themselves and how others feel about them. Instead, they act as though they are performing for an **imaginary audience**, one that is as concerned with their appearance and behavior as they themselves are (Elkind, 1985).

Teenagers also reveal concern with an imaginary audience through *strategic interactions* with their peers, encounters that aim to either reveal or conceal personal information indirectly. The almost universal use of the Internet and social media by adolescents today serves as a means of interacting with real people who make up an imaginary audience. Teens use Facebook, Instagram, and Twitter posts to solicit “likes” or “followers” that create the perception of popularity to the individual and to others. In day-to-day encounters with peers, the imaginary audience can make life miserable for a self-conscious teen. Can you recall going to school the day after you got your hair cut, or the day a pimple appeared on your nose or forehead? If you were like most teenagers, you were certain that everyone would notice and that they would tease and make fun of you. Throughout the day, you likely focused on wanting to go home or hide in the restroom.

We all have experienced embarrassing moments. It is just that, during adolescence, they seem so much worse due to the natural changes inherent with the age, but also due to the existence of the imaginary audience. Alberts, Elkind, and Ginsburg (2007) acknowledge that the imaginary audience does not disappear after adolescence—adults are also egocentric. It is just that during the teenage years, it is harder to differentiate between our own perspective and the view that others have of us and of their own world.

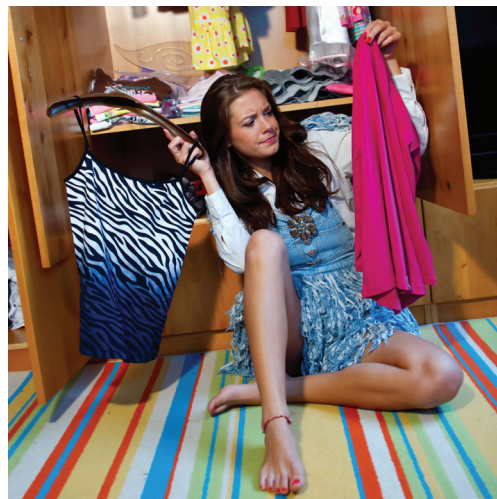
The Personal Fable

personal fable Adolescents’ belief that their own lives embody a special story that is heroic and completely unique.

As a result of their egocentrism, teenagers often believe in a **personal fable**, the notion that their own lives embody a special story that is heroic and completely unique. For example, one high school student may be convinced that no love affair has ever reached

Adolescent egocentrism is often expressed as a preoccupation with how others respond and as a belief in personal invulnerability. This girl (left photo) may be spending a lot of time choosing clothes because she is concerned about what others will think of how she looks. The boy (right photo) may be willing to risk a broken limb in skateboarding because he does not really believe that he can be injured.

Sources: (left) dean bertoncelj/Shutterstock.com; (right) bikeriderlondon/Shutterstock.com.



the romantic heights of his involvement with a classmate. Another may believe she is destined for great fame and fortune by virtue of (what she considers to be) her unparalleled combination of charm and academic talent.

In experiencing these feelings and ideas, adolescents fail to realize how other individuals feel about them as well (Alberts et al., 2007). Early in adolescence, they still have only limited empathy, or the ability to understand reliably the abstract thoughts and feelings of others and compare those thoughts and feelings with their own. In fact, much of adolescence consists of developing these social skills. So does most of adulthood, for that matter; we never really finish learning how to understand others or comparing our own experiences with those of others. But adolescence is the time when most people begin learning to consider other viewpoints in relation to their own and developing complex ideas about moral, political, and religious questions, among others, in response.

However, not all teenagers seem equally egocentric, and even those who do show this quality only when compared to adults, not to younger children. Investigations of adolescents' belief in an imaginary audience show that teenagers are just as likely to develop greater empathy or interpersonal sensitivity during this developmental period as they are to develop greater self-centeredness (Lapsley, 1991). Accurate awareness of others' opinions about oneself apparently develops alongside, and sometimes even instead of, self-conscious preoccupation with others' opinions. The relative balance between these two developments depends, among other things, on the quality of relationships between parents and the adolescent: closer and more supportive relationships lead to greater realism and less self-consciousness.

Information-Processing Features of Adolescent Thought

As we saw in Chapter 2, information-processing theory sees human cognition as a complex storage and retrieval system, governed largely by an “executive” control system that transfers information between working and long-term memory and organizes information for more efficient and meaningful handling and retrieval. When cognition is viewed this way, development consists largely of overcoming the bottlenecks in processing information, especially those caused by the limited capacities of the executive and short-term memory. As children mature into adolescents, they develop strategies for taking in, organizing, and remembering larger amounts of information more quickly and with less effort. The most important of these strategies are included in Figure 15.2 and explained more fully next.

Improved Capacity to Process Information

Typically, an adolescent can deal with, or process, more information than a child can (Gathercole et al., 2004). A first-grader may remember three or four random digits (3 9 5 1), but a teenager usually can remember six or seven. And when a first-grader asks an adult how

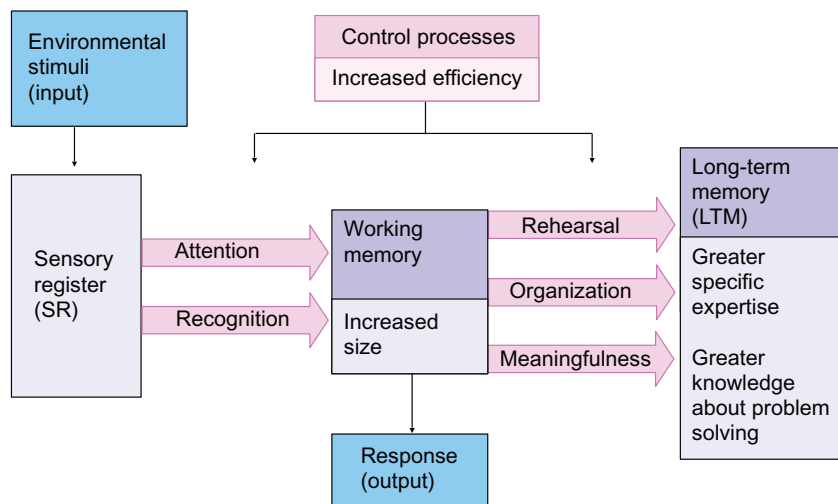


FIGURE 15.2
Developmental Changes in Information Processing

Although the basic nature of information processing remains the same from childhood to adolescence, important changes occur in several features, as the figure indicates. Working memory may increase in capacity, control processes become more efficient, and long-term memory contains more specific knowledge about problem solving, or “how to think.”

What Do You Think?

Suppose you are starting your first job in a helping profession, such as nursing or teaching. How much would you want your work to be guided by an ethics of justice and how much by an ethics of care? Exchange your feelings about this question with a classmate or a friend.

to spell a word, he can hold only two or three letters in his mind at a time; the adult has to dole them out singly or in very small groups (*LO . . . CO . . . MO . . . TI . . . VE*). A teenager, however, can more often encounter much longer groupings of letters and still reconstruct the word accurately.

Several developmental changes allow for this increase in processing capacity during adolescence. As mentioned earlier in this chapter, changes in the physiology of the brain contribute to more efficient processing of information. The streamlined neural networks that result from pruning and the myelination process are especially important changes when it comes to processing information in working memory. Because the capacity of working memory is limited with respect to quantity of information it can hold and length of time that it can be accessed, *speed of processing* is a significant determinant of how much information can be handled at one time and, therefore, the degree of complexity of the problems or situations that can be addressed at any given time (Demetriou et al., 2002).

Metacognition (awareness and regulation of one's own thought processes) also improves during adolescence, enabling teenagers to select increasingly more effective strategies for handling whatever cognitive challenges they face (Kuhn, 2009). For example, if an adolescent has an exam in one of his classes next week, he will choose a strategy that will help him best prepare for that exam based upon his knowledge about the exam structure (Will it be a multiple-choice or an essay exam?), the teacher (Does the teacher usually expect lots of details, or does the teacher focus on larger, key constructs?), his desired grade (How much time and effort will it take to get an "A" on this test?), and his current level of mastery of the content (Does the material make sense to some extent, or do I need to invest considerably more effort to comprehend the content?). And then, while studying, the adolescent's metacognitive abilities will allow him to assess his level of mastery and to change tactics if his approach to studying is not producing the desired results. Metacognition impacts processing capacity in that the adolescent does not allocate limited cognitive resources to information he already understands, and he can invoke strategies that will reduce the volume of information he needs to process at one time (e.g., mnemonics or other strategies for organizing or clustering information reduce the cognitive "load" posed by the information being processed).

Increases in *attention* also enhance information-processing capacity during adolescence. Compared to children, adolescents are able to stay on task longer, select more relevant information to the task at hand, and inhibit intrusive or distracting thoughts as they tackle challenging problems (Luna et al., 2013). Looking back at Figure 15.2, you can see how many elements of the model of information processing undergo significant changes during adolescence that result in their achievement of almost adult-like sophistication in their problem-solving abilities. What limits the information-processing capabilities of adolescents, when compared to adults, is their relative lack of expertise and experience.

Expertise in Specific Domains of Knowledge

- *Jerry can play the piano well, but his math skills are so-so.*
- *Marni cannot carry a tune, much less play one on the piano. But her math skills are excellent.*
- *Jamal has a real talent for drawing cartoon figures. But he has learned not to make or display drawings in class, because a few of his teachers regard them as "doodling."*

Like Jerry, Marni, and Jamal, many adolescents have begun to be comparative experts in specific domains of knowledge or skill. The domains may or may not have much to do with school learning, and therefore may sometimes go unnoticed by friends or teachers. Typically, the expertise results from years of interest in and practice with a skill or area of knowledge. In some cases, the area of expertise continues to develop during adulthood. Any further development that may occur will depend on whether key people continue to support the development and what alternative demands are made on the individual's time and attention.

The emergence of expertise reframes the issues about general intelligence discussed in Chapter 12, with regard to middle childhood. During adolescence, the issue is now about the nature and breadth of specialized knowledge. Instead of representing an all-purpose competence, **expertise** refers to the long, slow acquisition of specific knowledge, along with improvements in how the knowledge is organized. In the long term, highly developed expertise resembles what we often think of as a general “ability” (Sternberg, 1998). The difference between expertise and “ability” is a focus on completion versus ongoing development: *expertise* tends to refer to knowledge and skills that are still growing, whereas *ability* implies knowledge and skills that have already been formed.

expertise Specialized experience in specific domains of knowledge that enables efficient and effective performance and is not hampered by age.

A place where ability and expertise merge may be viewed in the area of problem solving. Experts in a chosen area of interest or ability, even in adolescence, show identifiable differences in how they solve problems, compared to their peers with less expertise. Teens who are considered effective problem solvers are better at (1) focusing their attention on what is important, (2) holding more information in both working and long-term memory by chunking information into procedural knowledge that is easily retrieved, (3) taking more time to analyze a problem initially, and (4) monitoring their own performance and progress (Woolfolk, 2013). Here we see that, even during adolescence, the executive functions in the prefrontal cortex of the brain can show the maturity to balance the influences of the limbic system, especially in areas where the teen is highly interested and personally motivated. Referring again to Figure 15.2, notice how much the components of “expertise” focus on the relationship between working memory and long-term memory. A fast and fluid relationship between these two memory stores, governed by enhanced executive functioning (i.e., “control processes”), is central to the thought processes of experts.

In areas outside of one's zone of expertise, an adolescent's performance may be no better than average. Studies of expertise in adulthood show the nature of this sort of competence especially clearly (Gregg & Leinhardt, 1995). A highly trained physicist knows many more concepts about physics than a beginner does, but not necessarily more about geography, English grammar, or other areas of knowledge. A mathematician knows countless formulas and solution methods, thanks to years of experience in learning them, but her talent is no guarantee that she can solve problems about business management, classroom teaching, or nursing. This is also true in athletics: an outstanding baseball player may not be as proficient in golf, or a talented figure skater may be no better at skiing than a person first taking up the sport. The sort of “earned” competence such individuals show becomes increasingly prominent in adulthood.

The Influence of School

In modern industrialized countries, school plays a formal role in developing certain forms of expertise, while at the same time introducing young people to new social relationships. From the point of view of adolescents, school is *both* a cognitive and social experience, and activities often serve both purposes at once. Participating in the school's chess club may improve your cognitive functioning and problem-solving abilities, but it may also facilitate making new friends. Listening attentively to a math teacher may help clarify some part of the math curriculum and result in a good grade, but it also may result in the teacher becoming your advocate due to your work ethic. Participating on a school sport team may enhance your athletic abilities, but it may also improve your self-discipline and group functioning skills. Unfortunately, the converse can occur: an activity may fail either to teach, to provide desirable social contact, or both. To clarify the connections between the cognitive and social effects of

What Do You Think?

Think of an activity or area of knowledge in which you consider yourself a relative expert. How much of your expertise has resulted from knowing a lot of specific facts about the area? How much has resulted from organizing your knowledge better than other people do? Compare your opinions with a classmate's or a friend's, especially if she or he is an expert in areas other than yours.

schooling, we look at each area separately in this section. As you will see, each area influences the other significantly, though not always in ways teachers and parents desire.

Cognitive Effects of Schooling

School influences adolescents' thinking through both a formal curriculum and an informal curriculum. The *formal curriculum* refers to a school's official program: the courses offered, the books required for reading, and the assignments expected for completion. The *informal curriculum* includes the unplanned activities and relationships that influence students' academic knowledge and motivation to learn—their relationships with teachers, for example, or the “gossip” and other tips related to schoolwork picked up from classmates. Both the formal and the informal curriculum are extremely diverse. One emphasizes the cognitive skills that may influence or impede success, while the other is based on how a student performs using noncognitive skills like optimism, resilience, and grit (Tough, 2012). What one student learns can be quite unlike what another learns because of differences in students' experiences in school as well as differences in their personal backgrounds.

critical thinking Reflection or thinking about complex issues, usually to make decisions or take actions.

In spite of the diversity that normally exists among teachers, students, and classroom experiences, most schools *seek* to develop students' broad ability at **critical thinking**, the ability to solve problems and to think reflectively and creatively about ideas and issues, usually for purposes of making decisions or taking actions (Keating & Sasse, 1996). Schools are also recognizing that critical-thinking skills can be encouraged when understanding how students use preferences for learning that Howard Gardner (1993b) identified as multiple intelligence or seem to excel in the noncognitive skills mentioned earlier. Whether they actually succeed is another question, which we will return to soon. First, though, let's look at what critical thinking involves and what, therefore, may be required to encourage it among students.

The Nature of Critical Thinking

Critical thinking is a broad, practical skill: it can help a person figure out why an unfamiliar appliance broke down, how to compose a term paper, how to resolve a conflict with a friend, how to decide what kind of career path to pursue, or how to evaluate the quality and the source of information provided. As these examples suggest, not all critical thinking occurs in school settings, and this fact poses a challenge to teachers and curriculum experts whose access to students generally is limited to classrooms and related environments.

What does critical thinking involve? Educators and psychologists have analyzed it in various ways, but usually point out the following elements (King & Kitchener, 1994):

1. *Basic operations of reasoning* To think critically, a person must be able to classify, generalize, deduce conclusions, and perform other logical steps mentally.
2. *Domain-specific knowledge* To deal with a problem, a person must know something about its topic or content. To evaluate a proposal for a new, fairer tax system, a person must know something about the existing tax system. To resolve a personal conflict, a person has to know something about the person with whom he is having the conflict.
3. *Metacognitive knowledge* (knowledge about how human thinking works, including one's own) Effective critical thinking requires a person to monitor when she really understands an idea, know when she needs new information, and predict how easily

she can gather and learn that information. In other words, she has to be able think about her own thinking!

4. *Values, beliefs, and dispositions* Thinking critically means valuing fairness and objectivity. It means having confidence that thinking does in fact lead to solutions. It also means having a persistent and reflective disposition when thinking.

Interestingly, research has found that students themselves understand these elements of critical thinking (Nichols et al., 1995). Furthermore, compared to grade-school children, adolescents regard critical thinking as a fairer and more appropriate purpose of schooling.

Programs to Foster Critical Thinking

Educators have devised a number of programs intended to foster the qualities needed for critical thinking (French & Rhodes, 1992), many of which serve adolescents. The programs differ in their particulars: they last for various lengths of time, emphasize different thinking skills, and draw on content from different areas of the standard school curriculum. Some programs are integrated into the curriculum, meaning they replace a traditional course in some subject area; others are taught separately and draw content from several areas at once.

But experts do agree on several general principles that enhance the quality of programs that teach critical thinking. First, critical thinking is best taught directly and explicitly. Critical thinking does not develop on its own by unconscious osmosis, so to speak (Keefe & Walberg, 1992). Watching the teacher or a classmate think critically does not guarantee that a student will become a better thinker. Neither does giving a student a lot of practice in simple mental operations, such as basic addition or simple logical puzzles.

Second, good programs for teaching thinking offer lots of practice at solving actual problems. Merely describing the elements of critical thinking (as this text is doing) does not turn students into skillful thinkers. To accommodate the need for practice, the most successful educational programs last at least a full academic year and sometimes also weave the thinking skills into other, related courses to extend the effects of the program still further.

Third, successful programs try to create an environment explicitly conducive to critical thinking. Typically, they expect teachers to model important critical-thinking skills themselves, such as thinking out loud while they explain a solution to a problem. The programs also expect teachers to convey confidence in students' ability to think while providing constructive, explicit criticism of ideas, whether their own or those of the students. For example, one technique is to invite individual students to temporarily act as teacher or constructive critic (Slavin, 1995). Teaching critical-thinking skills is not a passive enterprise. It requires active learning, timely feedback, and increasingly more challenging experiences to keep the students and teachers engaged.

No Child Left Behind Act

A fairly recent and controversial national reform effort to enhance the cognitive impact of schooling on children and adolescents likely had an impact on your school experiences if you are a traditional-aged college student. In 2002, the U.S. Congress passed the *No Child Left Behind Act (NCLB)*. This act was designed to improve school performance overall and to increase the level of academic proficiency in high school graduates. The law specified detailed educational benchmarks for many grades and mandated standardized testing to assess the learning of every child (however, many children, school districts, and even entire states have been exempted from these standards). The law has faced much criticism on several fronts. Mandating that students pass tests simply forces teachers to “teach to the tests” (Koretz, 2008); anxiety levels in students are greatly increased (Samuels, 2005); some students—especially those in low-income districts or those with learning disabilities—are greatly disadvantaged under the structure of the standardized tests (Yeh, 2008).

The long-term impact of the No Child Left Behind Act is still not clear, and the debate about its merits continues, yet educators and the public support the increases in funding that the law brought to many districts, the attempt to gather objective measures of school and student success, the emphasis on teacher training, the adoption of more effective

pedagogies, and the heightened national interest in improving K–12 education in the United States (Sunderman, 2008). In December 2015, NCLB was replaced with the Every Student Succeeds Act (ESSA), which maintains the funding increases of NCLB while providing more local control over education systems and reducing some of the testing burden placed on schools and educators by NCLB (U.S. Department of Education, 2015).

Whatever differences may exist in programs designed to improve the educational experiences of adolescents, programs that teach critical thinking develop greater expertise in academic disciplines draw on the spirit, if not the literal, research findings, of several strands of cognitive theory concerning the adolescent years. One strand is Piagetian, with its concern for how logic and reasoning gradually develop. Another is information-processing theory, with its focus on specific ways of organizing ideas and coordinating new ideas with preexisting ones. A third strand is the concern with the social and cultural context of cognitive development in adolescence: how people and settings affect a young person's thinking. As the “A Multicultural View” feature indicates, cultural differences and misunderstandings can complicate teachers' efforts to encourage critical-thinking skills and content mastery in the classroom. Social influences are so important, in fact, that we discuss them more fully in the next section.

Social Effects of Schooling

For early adolescents, the period following graduation from elementary school can be one of increased social and emotional stress: their new school is usually larger, teachers are more numerous, new friendships must be formed, and students must adjust to being the youngest, least knowledgeable members of the school community. In the United States, schools have tried to address these concerns with transitions and school buildings that are more developmentally appropriate. The older model of a K–6 elementary school, followed by junior high school for grades 7–9, and ending with a grades 10–12 high school, while still used in some areas, is no longer the norm. Research in the 1990s on the junior high school model indicated a need for change. Some of the studies found that in the course of their first year of junior high, students report less positive attitudes about school, poorer achievement, and lower levels of participation in extracurricular activities (Eccles et al., 1996; Finders, 1997; Otis et al., 2005). New students (especially girls) report feeling less positive about themselves (Benner & Graham, 2009), and instances of both bullying and being bullied—often with sexual overtones—are widespread (Lee et al., 1996). A new structural model—including less disruptive school transitions—needed to be instituted, one that was both developmentally sound and safe for young adolescents.

A major response to these stresses has been to create **middle schools**, which are deliberately organized to take students' developmental needs into account. Middle schools typically span fifth through eighth grades. They share features both of elementary schools, such as smaller size and fewer class changes per day, and of high school, such as specialization in class subjects. A primary feature of middle schools is the assignment of students to a “home-base” or homeroom class that students visit every day and where the teacher acts as an adviser to help them to navigate the new challenges of postelementary education (Galassi et al., 1997). Studies of the impact of middle schools suggest that these changes can indeed help young adolescents adjust—but only if the teachers actually understand the students' developmental needs and adjust their ways of relating to students accordingly. In general, adjustment is more likely to succeed if teachers work together collegially supporting one another's efforts to innovate in classroom practices (Louis et al., 1996; Peterson et al., 1996).

Dropping Out of High School

Despite the efforts of schools and parents to help students make the transition to high school, some adolescents may not make the adjustment. Approximately 7 percent of all students drop out of high school (U.S. Department of Education, 2014), although for several reasons the significance of this percentage is somewhat hard to interpret (Ianni & Orr, 1996). First, school jurisdictions vary in how they define “dropping out” (some leave

middle school School designed to meet the needs of young adolescents, and usually spanning approximately fifth-through eighth-grade and enrolling students of about age ten through thirteen.

Cross-Cultural Misunderstandings in the Classroom

Consider these classroom situations and their impact:

- Student 1 is quiet when his teacher speaks to him, but he generally looks down at the floor or away from her when she speaks. Even when the teacher encourages him to express his own ideas, Student 1 pauses and looks away for what feels like an eternity to the teacher.
- Student 2 writes an essay for a social studies class entitled “Jobs in the Global Economy.” To the teacher, the essay seems to meander all over the place and does not state its theme until the final paragraph. “It’s as if you were telling me what you were thinking,” the teacher wrote on the essay afterward, “instead of stating and then justifying a position.”
- Student 3 rarely answers questions completely when the teacher calls on her in class; she just mumbles an answer or remains silent. But when collaborating with a small group on a project or an activity, she is lively, talkative, and focused on the task.

There are many possible reasons for these situations. One common explanation is *cross-cultural miscommunication*, culturally based differences in how individuals interpret comments and behaviors. Observations of conversations show that cultures vary in communication styles and that children acquire the styles in the course of learning their native language (Scollon & Scollon, 1994).

Cultural communication styles can vary in the following ways, among others:

1. *Timing*: speakers expect different lengths of pauses between conversational turns, from many seconds to only a fraction of a second or even to a “negative” pause (overlapping comments).
2. *Deductiveness/inductiveness*: in some cultures, speakers are expected to state their point immediately (use a “topic sentence”) and then justify their position; in others, speakers more often lead up to the main point indirectly, describing their thought processes along the way.
3. *Politeness indicators*: in some cultures, it is especially important to indicate respect for those in authority, chiefly by listening quietly, head bowed, averting the speaker’s eyes, and expecting the authority (teacher) to determine the topic and length of a conversation.

These cultural differences can pose problems whenever members of more than one culture come together to interact. For children and adolescents, therefore, cultural mismatch is especially likely in classrooms in large urban areas or large culturally diverse suburbs, particularly in contacts between teachers and students. If the teacher “speaks the culture” of white, mainstream English, she or he will tend to use and expect relatively short pauses between conversational turns in classroom discussions. The teacher will also tend to use and expect a deductive style of turn taking, with the topic stated immediately by whoever initiates a conversational exchange. And although the teacher may expect moderate indications of respect for his or her right to initiate topics of conversation, she or he may also expect students to initiate ideas and concerns of their own.

When a student’s culture supports other communication styles, the teacher can easily misinterpret the cultural underpinnings of the behavior and view student as either unintelligent, lacking in confidence, or deliberately resistant to learning (Lustig & Koester, 1993). Yet these sorts of mismatches are precisely what occur, and always to the disadvantage of the student. What the teacher sees and hears are pauses that are too long, eye contact that is poor, comments that stray from the topic, and silence in response to invitations to speak. What the student experiences, though, may be quite different: he or she may see and hear a teacher who is too talkative, stares at individuals too much, and seems insincere in issuing invitations to ask questions.

But such misunderstandings can be overcome. Training in intercultural communication exists and is effective when focused on the key cultural misunderstandings of particular conversational partners. In the teaching profession, some of the most elaborate training occurs for teachers of English as a Second Language (Paulston, 1992), but programs are also developing in many business communities (Brislin & Yoshida, 1994; O’Hara-Devereaux & Johansen, 1994), where economic activity increasingly spans more than one country, language, and cultural community. The programs vary in detail, of course, but share a common assumption: that awkwardness between culturally different speakers is likely the result of legitimate differences in communication styles rather than of inferiority of one style or the other.

students out of their records if they are more than eighteen). Second, some dropouts—possibly as many as one-third—return to complete school in any one year; they might better be called temporary school leavers rather than permanent dropouts. Third, students drop out for a variety of reasons, ranging from general alienation from schooling, to family crises, to difficulties in fitting in with peers and teachers. Some of the reasons are more

serious and long lasting than others and contribute to variations in students' tendency to return to school to complete a diploma.

Although the dropout rate is not evenly distributed among schools and communities, the significance of concentrations of dropouts is surprisingly ambiguous. A few large, inner-city high schools have high dropout rates, for example; as many as 50 percent of each entering ninth-grade class may not graduate. Dropping out is more frequent among nonwhite students (8 to 13 percent) than among white students (4 percent); yet this trend obscures the fact that half of all dropouts are white. Furthermore, dropping out is more frequent among low-income families than among middle- and high-income families; yet this trend can distract attention from the fact that nationwide, half of all dropouts are from middle-income families. These somewhat paradoxical statistics suggest an especially important point for teachers and other people who work with youth professionally: that although social categories (race, SES, urban residence) *correlate* with dropping out, they do not *cause* it. (See Chapter 1 for a discussion of the difference between correlation and causation.) Most adolescents *do* graduate from high school, even in urban communities, as do most youth who are nonwhite or poor.

resilience Ability to withstand and even profit from stressful experiences.

Educational research therefore has looked for factors contributing to **resilience** in youth, to the factors that allow individual adolescents to cope with and overcome difficult circumstances. In general, the studies point to the importance of adults seeing and responding to the potential of individual teenagers, whether the adults be parents, school personnel, members of the community, or some combination of the three (Altenbaugh, 1995; Caterall, 1998). This is supported by research showing that adolescents, particularly those at risk for dropping out, who are engaged in extracurricular pursuits are less likely to drop out (Mahoney & Cairns, 1997; Wang & Fredricks, 2014). The research also suggests that teenagers do not necessarily get discouraged, nor necessarily drop out, because they become aware of belonging to social categories that have high dropout rates. One study of urban African American youth found that those with the most conscious, articulate knowledge of racial discrimination were precisely the individuals most likely to *stay* in school and perform well (O'Connor, 1997)!

Even though the existence of dropouts implies that high schools may be limiting the potential of some students, it is important to recognize that many high schools are quite successful at providing both academic and social opportunities to which many students might not have access otherwise. Many educational observers and researchers have identified the qualities that lead to school effectiveness and success (Gallagher, 1996; Sizer, 1996; Slavin, 1998). For one thing, both teachers and students must be able to work in their own ways, even when those ways may be unconventional. Only by doing so can they honor the developmental diversity in

A supportive relationship between a teacher and student—like the one pictured here—is especially important to the academic success of the student. These students are more likely to achieve greater academic proficiency and are less likely to drop out because of this caring relationship. Of course, it is also helpful if the school district is well funded, as this one appears to be, equipped with current technology and the training to use it effectively in the classroom.

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What Do You Think?

Some educators argue that you cannot teach thinking skills in *general*, because a person always thinks about something in *particular*. Why do you think they take this position? This issue makes for a useful debate in class, especially if you adopt the position contrary to the one you truly embrace!

most high school communities. For another, schools need to focus the attention of everyone—teachers, students, and parents—on their primary purpose: to promote learning. Given the diversity among students, teachers, and communities, it can be challenging to reconcile this second purpose with the first. Yet most high schools manage to do so, even if not perfectly.

Employment

School is not the only arena in which adolescents test their growing cognitive skills. Many also join the work force, either in addition to or in place of attending school. The majority of teenagers report participating in “formal” paid work outside the home, and many others engage in “informal” paid work such as babysitting and yardwork within their own homes (Mortimer & Finch, 1996). Informal work is likely to be a first paid job. Because it is fairly continuous with the chores and responsibilities of childhood, it provides a more gradual transition to the demands of adult work. Formal adult work typically takes place in commercial or other organizational settings. It represents a greater departure from childhood work and involves more relationships with adults, closer supervision, and more systematic monitoring of job performance.

The types of jobs frequently reported by teenagers include supermarket, restaurant, or retail store worker; office worker; and semiskilled worker. Most of these jobs are on the margins of the economy, and as such tend to offer low wages and little future as a career. For teenagers from economically well-off families, these facts may be just as well, because they create little temptation to pursue the job to the exclusion of schoolwork. For a large percentage of teenagers from low-SES families, the dead-end quality of first jobs poses a serious problem: these young people often depend on employment to pay their daily living expenses as well as those of their families (Newman, 1996).

Ideally, work during adolescence serves three important functions. First, it facilitates the transition from school to work. Second, it provides structure for involvement in family- and school-related activities. Finally, it provides an arena outside of home and school for gaining social experience and the material rewards needed to have an independent life with peers. How work influences adolescent mental health and adjustment depends on the type and level of workplace stress, the relevance of job-related skills to future careers, and the compatibility between the demands and experiences of work and school (Bell et al., 1996).

The intensity of formal work as measured by the number of hours worked per month is also important. Students who work more than ten hours per week do more poorly academically, report more psychological problems (depression, anxiety fatigue, sleeping difficulty), and physical problems (headaches, stomachaches, colds) than other students. They are also more likely to use drugs, smoke cigarettes, and engage in delinquent activities, regardless of ethnicity, SES, or age. In contrast, working fewer than ten hours per week generally appears to have no negative effects (Mortimer et al., 1994). It is also possible, of course, that students with intensive work involvements had more preexisting problems.

For teenagers whose families can afford it, working more than a moderate number of hours per week may be developmentally unwise because it interferes with academic activities, exposes them to negative environments and role models, and limits the amount of monitoring and supervision they receive from parents, teachers, and other positive role models. Moreover, becoming accustomed to having a paycheck that may be

used entirely for leisure pursuits might be a financial hindrance when these adolescents become adults and the majority of their income goes to food, rent, insurance, and the like (Bachman, 1983). Many students, particularly those receiving appropriate levels of adult monitoring and support, make sensible decisions about the role of work in their lives, adjusting their choice of work and number of hours to meet their other important academic and social needs. We will look in the next chapter at the importance of interactions with adults and peers during adolescence.

Chapter Summary

- **To what extent are adolescents capable of abstract reasoning?** During adolescence, some teenagers (though not all) develop formal operational thought, or the ability to reason about ideas regardless of their content. Formal thought is characterized by an ability to think about possibilities, by scientific reasoning, and by an ability to combine ideas logically. Research on adult thinking suggests that formal operations are not the final point of cognitive development, or necessarily a step toward mature thinking.
- **How does cognitive development affect adolescents' knowledge and beliefs about their identities and about morality?** Adolescents develop two forms of morality—one oriented toward justice and one oriented toward caring for self and others. Lawrence Kohlberg proposed six stages in the development of moral judgments oriented toward justice. A number of issues regarding Kohlberg's theory have yet to be resolved, including the significance of the content (versus the form) of moral beliefs, differences between conventions and morality, and the possibility of gender differences in moral development. Carol Gilligan proposed forms of moral development oriented toward interpersonal caring; on average, these forms may be slightly more characteristic of females than males, though many exceptions exist.

Despite their improved cognitive skills, adolescents still sometimes show egocentrism by believing in an “imaginary audience” and in a “personal fable,” or biography of their lives.

- **How do adolescents show improved information processing in everyday activities?** During adolescence, information-processing skills continue to improve. Teenagers acquire greater expertise in particular areas of knowledge or skill, a trend that continues into adulthood.
- **What cognitive and social effects do school and work have on adolescent development?** School has significant effects on adolescents' lives, both cognitively and socially. Cognitively, school encourages the development of critical thinking, the ability to reflect about complex issues to make decisions or take actions. Educational programs to foster critical thinking usually do so explicitly, offer practice in solving problems, and create an environment conducive to critical thinking. Socially, school can be stressful for youngsters, especially early in adolescence. Many teenagers drop out of high school each year, though their reasons vary; the majority, however, complete school with a reasonable degree of success. Many students work part time while attending school, and the experience has diverse effects, depending on the particular job and circumstances of the student.

Key Terms

adolescent egocentrism (p. 374)
critical thinking (p. 378)
expertise (p. 377)
formal operational thought (p. 364)
imaginary audience (p. 374)

middle school (p. 380)
morality (p. 367)
personal fable (p. 374)
postconventional moral judgment
(p. 370)

resilience (p. 382)
social cognition (p. 373)
social conventions (p. 371)