

Vygotsky's Social-Historical Theory of Cognitive Development

BIOGRAPHICAL INTRODUCTION

This book focuses on theorists in the developmental tradition—scholars who have seen developmental change primarily in terms of inner forces. For example, Gesell emphasized inner maturational promptings and Piaget saw children making their own discoveries. By way of contrast, we have also examined the ideas of learning theorists, who have emphasized the role of the external environment.

Some of you may be dissatisfied with this theoretical division. Why, you might ask, must we view development in either/or terms? Can't a theory assign major roles to both inner and outer forces?

The construction of such an integrative theory is a worthy goal, but few people have made much progress in attaining it. Bandura, as we saw, pronounces behavior to be multidetermined—to be influenced by various internal and external variables—but he also discredits the developmental perspective on how change comes from within. Later we will discuss the ways Freud and Erikson weave inner and outer forces into their psychoanalytic theories. In the realm of cognitive development, the major theorist who discussed both developmental and environmental forces was the Russian L. S. Vygotsky (1896–1934).

Vygotsky had read the early writings of Gesell, Werner, and Piaget, and he recognized the importance of the kinds of intrinsic development they were addressing. At the same time, Vygotsky was a Marxist who believed that we can understand human beings only in the context of the social-historical environment. So Vygotsky tried to create a theory that allowed for the interplay between the two *lines of*

development—the natural line that emerges from within and the social-historical line that influences the child from without (Vygotsky, 1931a, p. 17).

Vygotsky was only partly successful. He had only sketched out an integrative theory of development when, at the age of 38, his life was cut short by tuberculosis. Nevertheless, many psychologists believe that if we eventually do construct a solid integrative theory, it will build on the start Vygotsky gave us.

Lev Semenovich Vygotsky grew up in Gomel, a port city in western Russia. His father was a banking executive, and his mother was a teacher, although she spent most of her life raising her eight children. The family loved interesting conversation, a trait that rubbed off on the young Vygotsky. As a teenager, he was known among his friends as the "little professor" because he was constantly leading them in discussions, mock trials, and debates. Vygotsky also loved to read history, literature, and poetry (Wertsch, 1985, pp. 3–4).

When he was 17, Vygotsky wanted to attend the University of Moscow, but because he was Jewish he had to struggle with the state's quota system; the university's enrollment was only 3% Jewish. Initially, Vygotsky seemed assured of a spot because he was so bright. But before he completed his oral examinations, the educational ministry shifted to a lottery system for Jewish applicants. Vygotsky felt he had lost all hope, but then he won a position by chance alone.

At the university, Vygotsky specialized in law, but he also took a wide variety of courses in other fields, as well as courses at Shanyavskii People's University, where a number of professors had gone after being expelled from the University of Moscow for anti-czarist leanings. Vygotsky graduated with a law degree from the University of Moscow in 1917 and returned to his home of Gomel (Wertsch, 1985, pp. 5–6).

Between 1917 (the year of the Communist Revolution) and 1924, Vygotsky taught literature in a secondary school and psychology at the local teacher's college, and he became interested in the education of the physically disabled. He also worked on his doctoral dissertation on the psychology of art. During this period he became ill with tuberculosis (Wertsch, 1985, pp. 7–8).

On January 6, 1924, Vygotsky traveled to Leningrad to deliver a lecture on the psychology of consciousness. The clarity and brilliance of his speech—by the unknown young man from the provinces—had an electrifying effect on the young psychologists in the audience. One, A. R. Luria (1902–1977), recommended Vygotsky for a position at the Moscow Institute of Psychology, which Vygotsky received. During his first year of work at the institute, he finished his dissertation and received his doctorate (p. 8).

In Moscow, Vygotsky soon became a commanding presence. When he lectured, students stood outside the packed auditorium and listened through open windows. When he traveled, students wrote poems in honor of his journey. Vygotsky inspired such enthusiasm not only because his ideas were exciting but also because he led a group of young Marxists on a mission—to create a psychology that would help build a new socialist society (p. 10).

Perhaps sensing his life would be short, Vygotsky worked at a break-neck pace. He read, lectured, and conducted research as rapidly as he could, and he also traveled extensively to help clinics working with children and adults with neurological disorders. Vygotsky's daily schedule was often so busy that he did his writing after 2 A.M., when he had a few quiet hours to himself. During the last 3 years of his life, his coughing spells became so severe that he was sometimes left exhausted for days at a time. Nevertheless, he worked until he died at the age of 38 (pp. 12–14).

A few of Vygotsky's writings were published shortly after his death in 1934, but in 1936 the Soviet government banned his work—a ban that lasted until 1956. The primary reason for the ban was that Vygotsky conducted some research with intelligence tests, which the Communist Party condemned. Actually, Vygotsky criticized the conventional use of intelligence tests and employed them in new ways, but such subtleties were lost on the authorities. Fortunately, Vygotsky's colleagues and students kept his work alive, and today his ideas are extremely popular among psychologists and educators throughout the world (Cole & Scribner, 1978; Kozulin, 1986, pp. xxiv–xxv).

MARK'S VIEWS ON HUMAN NATURE

Because Vygotsky tried to create a psychology along Marxist lines, it will be helpful to review briefly some of the ideas of Karl Marx (1818–1883) on human nature before discussing Vygotsky in detail.

Marx's comments on human nature were relatively brief, and they primarily appeared in his early writings (Marx, 1844, 1845; Marx & Engels, 1846). Marx recognized that humans have biological needs, but he emphasized the human capacity for tool use and production. It is by inventing and using tools that humans master their environments, satisfy their needs, and, ideally, fulfill their deepest creative potentials. Production, Marx also emphasized, is an inherently social process. People join together to plant and harvest crops, exchange goods, assemble machines, and so on.

Beyond these general comments, Marx had little to say about human nature. Indeed, he argued that it is a mistake to describe human nature in the abstract, apart from its social-historical context. Although humans are distinguished by their capacity for tool use and technological production, the conditions under which they work and produce change throughout history. The working conditions of the medieval artisan, for example, were quite different from those of the 19th-century factory worker. To understand humans, then, we need to understand history and the dynamics of historical change (Marx, 1845, pp. 107–109; Marx & Engels, 1846, pp. 118–121, 129).

History, in Marx's view, is a *dialectical* process, a series of conflicts and resolutions. New forces of production (e.g., new ways of manufacturing) come into conflict with the existing social system, and a new social system is

installed. For example, in 18th- and 19th-century Europe, the creation of new factories gave a rising class of capitalists the opportunity to make vast sums of money, but the ancient feudal system stood in their way. The result of this conflict was the overthrow of the feudal system and the establishment of a new system—the free enterprise system that allowed the capitalists to make as much money as they liked (Marx, 1859; Marx & Engels, 1872, pp. 336–340; Mills, 1962, pp. 82–83).

Marx believed that his own age—the second half of the 19th century—was experiencing a new phase in the dialectic of history. Technological progress was now being impeded by the free enterprise system. The resolution of this conflict would be a communist revolution in which the workers would take over the industries and organize them for the benefit of all.

We have encountered the concept of dialectic—of conflict and resolution—earlier (Chapter 6). Marx, like so many other scholars, adopted the concept from Hegel. However, Marx used the concept in a very different way.

For Hegel, the dialectic of history occurs in the realm of consciousness and ideas; one viewpoint comes into conflict with its opposite, leading to a new synthesis. Marx, in contrast, believed that conflicts in ideas are superficial. The conflicts that really matter are social and economic. In fact, most ideas and values merely justify particular social and economic interests. The medieval lords praised loyalty and honor; the rising capitalists heralded liberty and free competition; and both groups believed they were giving expression to the highest of all values. In reality, both groups were merely spouting opinions that justified their own social and economic interests.

Marx, then, was highly critical of those scholars who analyzed the nature of consciousness—people's ideas, values, and outlooks—as if these had an independent existence. What people think, Marx said, depends on their material life—the ways in which they work, produce, and exchange goods—at a certain point in historical development.

But it is not just the *content* of thinking that depends on historical development. Our species' cognitive *capacities*, too, have changed as a result of historical change, especially technological development. This, at least, was the position of Marx's collaborator Friedrich Engels (1820–1895), who forcefully argued that early technology—early tool use—gave rise to uniquely human traits such as advanced intelligence and speech.

Engels on Tool Use and Human Evolution

According to Engels (1925, pp. 47–49, 238–246), our ancestors became capable of tool use when they came down from the trees and began living on level ground. This new mode of life enabled them to develop an upright posture, which freed the hands for the production of stone implements. Once people began making tools, their minds expanded. They discovered new properties of natural objects, such as the properties of stone and wood that facilitate

cutting. They also became aware, however dimly at first, of the scientific principles underlying tool use, principles such as leverage, mass, and force.

Tool use also led to new modes of cooperation and communication. As technologies advanced, people discovered the advantages of working together. For example, they found that they could more effectively build a hut or a boat by joining forces. But they now needed some way of communicating beyond grunts and gestures. People needed to give one another instructions, such as "Turn right," and "Pull harder." "Men in the making," Engels said, "arrived at the point where *they had something to say to one another*" (p. 232), and they developed speech.

More generally, technology promoted a new orientation toward the environment. With tools in hand, humans no longer had to accept the environment as they found it. They could change it. At a certain point, they stopped picking fruit and vegetables wherever they found them; they began clearing land and planting their own crops. This new orientation promoted planning and foresight. Successful farming requires people to plan months and years ahead. Such foresight, Engels observed, has not always been a capacity that humans have exercised as well as they should. Nevertheless, once people saw the power of tools and technology, they began transforming the environment according to their own plans and designs.

VYGOTSKY'S THEORY OF PSYCHOLOGICAL TOOLS

Vygotsky was deeply impressed by Engels's writing on tool use, and he attempted to extend Engels's insights. Just as people have developed tools to master the environment, Vygotsky proposed, they also have created "psychological tools" to master their own behavior. For example, early peoples used notched sticks and knotted ropes to help them remember events, much as a person might tie a string around his or her finger today. Later, as cultures developed, they created other mental tools. Voyagers began using maps to help them retrace prior routes and plan future expeditions. Vygotsky called the various psychological tools that people use to aid their thinking and behavior *signs*, and he argued that we cannot understand human thinking without examining the signs that cultures provide (Vygotsky, 1930, pp. 39–40; 1931).

Undoubtedly, the single most important sign system is *speech*. Speech serves many functions, but most fundamentally it frees our thought and attention from the immediate situation—from the stimuli impinging on us at the moment. Because words can symbolize things and events that go beyond the present situation, speech enables us to reflect on the past and plan for the future (Luria, 1976, p. 10; Vygotsky, 1930, p. 26).

For example, I know a farming family whose vegetables were being raided by deer. For a while the family members simply reacted to each immediate

situation as it occurred. Whenever someone saw a deer eating the vegetables, he or she chased it away. After a while, however, the family sat down and discussed long-term solutions. They talked about building a new fence, how high it should be, and whether a ditch would be useful. One family member shared an idea she heard from a neighbor a few months earlier. By using words to symbolize things and events that were not immediately present—"a fence," "a ditch," "the neighbor's idea"—the family developed a plan. (They decided to build a higher fence.)

When humans use signs, Vygotsky said, they engage in *mediated* behavior. That is, they do not just respond to environmental stimuli; their behavior is also influenced or "mediated" by their own signs. In the present example, the family members did not just respond directly to the environmental stimuli (the deer); they also acted on the basis of a verbally formulated plan ("OK, we've decided to build a 10-foot fence") (Vygotsky, 1930a, pp. 19–40).

The acquisition of speech is of major importance to the growing child; it enables the child to participate intelligently in the social life of his or her group. But speech does more than this. It also facilitates the child's own, individual thinking. By the age of 3 or 4 years, Vygotsky noted, children begin to carry out the kinds of dialogues they had had with others with themselves alone. At first they do this aloud, and we can hear children at play saying things such as, "I wonder where this wheel goes? Does it go here?" After a while, at the age of 6 or 7 years, children begin to carry out such dialogues more inwardly and silently. Vygotsky believed that our ability to talk to ourselves—to think with the help of words—contributes enormously to our powers of thought.

Two other important sign systems are *writing* and *numbering systems*. The invention of writing was a great human achievement; it enabled people to keep permanent records of information. For most children, however, learning to write (and read) is a real struggle because writing forces children to detach themselves from physical, expressive speech, which comes so naturally to them, and to use abstract symbols for words. Learning to write usually requires a good deal of formal instruction (Vygotsky, 1934, p. 181; 1935, p. 105).

Numbering systems have also been of great importance in human evolution. Vygotsky suggested that early peoples created numbering systems because they found they were unable to quantify objects (such as vegetables or cattle) by sight alone. They needed sets of symbols to help them count. For example, the Papuas of New Guinea invented a method of counting that used their fingers and many parts of their bodies to stand for objects. As societies evolved, they developed other numbering systems, such as the abacus and written notation. They also increasingly dealt with quantities in abstract and theoretical ways, apart from particular objects. Algebra, for example, deals with general quantitative categories without even specifying particular numbers. If $a + 10 = b$, then $a = b - 10$, regardless of the particular values of a and b . The mastery of algebra and other theoretical uses of number, like the

mastery of reading and writing, usually require formal instruction (John-Steiner & Soubberman, 1978).

Vygotsky argued that cultural sign systems have a major impact on cognitive development—an impact overlooked by developmentalists such as Gesell and Piaget. Gesell and Piaget looked at development as if it comes from the child alone, from the child's inner maturational promptings or spontaneous discoveries. Vygotsky acknowledged that such intrinsic development, the "natural line" of development, is important. It may even dominate cognitive development up to the age of 2 years or so (Vygotsky, 1930, p. 24). But after this, the growth of the mind is increasingly influenced by the "cultural line" of development, the sign systems the culture provides. In fact, all our uniquely human powers of thought—those that distinguish us from other species—would be impossible without speech and other sign systems.

Vygotsky speculated, in addition, that the highest levels of thinking—the levels of purely abstract or theoretical reasoning—require instruction in writing, math, and other kinds of abstract concepts. Although children might develop some concepts on their own, in their everyday experience, they will not develop purely abstract modes of thought without instruction in abstract sign systems. And since this instruction is only widespread in technologically advanced societies, we will find purely abstract thinking prevalent only in these societies (Vygotsky, 1934, pp. 103, 206; 1935, p. 90; Luria, 1976, pp. 8, 161).

In 1931 Vygotsky saw a unique opportunity to test this latter hypothesis—that abstract thinking is a product of relatively advanced levels of social-historical development. At this time, there were many remote areas of the Soviet Union, including Central Asia, where peasants still lived a feudal existence. The peasants worked on small farms and were completely dependent on wealthy landowners and feudal lords. Most were illiterate. The new Soviet government, attempting to develop the entire nation into a modern socialist state, instituted collective farming practices, in which peasants met in groups to plan production, measure output, and so on. The government also gave the peasants short courses in writing, reading, and the theoretical uses of number. Because, in 1931, the government was still phasing in the new programs, Vygotsky saw the opportunity to compare the mental processes of those adults who had begun to participate in the modern forms of social life with those who were still living in the old ways.

Actually, Vygotsky himself was too ill to go to Central Asia to conduct fieldwork, but he encouraged Luria and others to do so. In one aspect of the study, the interviewers presented the subjects with syllogisms such as the following:

In the Far North, where there is snow, all bears are white. Novaya is in the Far North. What color are the bears there? (Luria, 1976, p. 108)

The nonliterate subjects refused to deal with the question in a purely theoretical way. They said things such as, "I don't know what color the bears there are, I never saw them" (p. 111). When the interviewer pressed them, asking them to answer "on the basis of my words," the peasants still refused to speak beyond their personal experience. As one said, "Your words can be answered only by someone who was there, and if a person wasn't there he can't say anything on the basis of your words" (p. 109). Those who had been participating in the new programs, in contrast, were willing to deal with the syllogisms on a theoretical plane and they answered them correctly (p. 116).

This study wasn't perfect. Luria gave the impression that the nonliterate subjects not only refused to think in syllogisms but also were incapable of doing so. However on occasion a few subjects, when pressed sufficiently, went against their deep-seated mental habits and answered the questions correctly. They were capable of abstract thinking—they just preferred not to engage in it.

But in general the study did support the Marxist contention that the mind is a product of social-historical change. The study suggested that we cannot meaningfully discuss the "principles of thinking" or "cognitive development" in the abstract, as psychologists usually do. We need to examine the culture into which the child is growing, and the sign systems the culture provides. For, as Vygotsky said, as these tools of thinking change, the mind takes on a different character.

Not all Marxist psychologists, we should note, have enthusiastically endorsed Vygotsky's ideas. Several Marxists have argued that Vygotsky stretched the metaphor of tools too far. Tools, they say, mean real tools—not speech, writing, math, and other "psychological tools" (see Kozulin, 1986, pp. xlviii–l).

But whatever his standing as a Marxist, Vygotsky pointed developmental psychology in a promising new direction. Vygotsky recognized the role of intrinsic forces, but he suggested that a complete understanding of cognitive development requires the study of the psychological tools the culture hands down to the child.

These two forces—intrinsic and cultural—generally seem to be opposed. Perhaps it is for this reason that most scholars have emphasized one force or the other, but not both. Vygotsky, in contrast, was schooled in dialectical theory and was therefore primed to consider the ways in which opposing forces interact and produce new transformations. The growing child, trying to make sense of the world in her own way, encounters a culture that expects her to use its particular psychological tools. These interactions are complex and difficult to study. Vygotsky himself only began to investigate them, and he generally focused on only one side of the dialectic—the impact of culture on the child. In the following sections, we will look at Vygotsky's insights into how some of these psychological tools are acquired.

MEMORY AIDS

Vygotsky suggested that some of humankind's earliest psychological tools were memory aids, and these tools are still very important to us today. Vygotsky and his colleagues conducted various experiments to try to gain insights into the ways in which children acquire them.

In one experiment, Vygotsky (1931a, pp. 70–71) instructed children and adults to respond in different ways when they saw different colors. He told them to lift a finger when they saw red, to press a button when they saw green, and so on. Sometimes he made the task simple, sometimes he made it difficult, and at certain points he offered memory aids.

In such experiments, the youngest children, between the ages of 4 and 8 years, typically acted as if they could remember anything. Whether the task was simple or difficult, they rushed into it as soon as they heard the instructions. When the experimenter offered them pictures and cards "to help you remember," they usually ignored the aids, or used them inappropriately. Young children, Vygotsky concluded, "do not yet know their capacities and limitations" or how to use external stimuli to help them remember things (1931b, p. 71).

Older children, from about 9 to 12 years, typically used the pictures Vygotsky offered, and these aids did improve their performance. Interestingly, the addition of such aids did not always improve the memory of the adults. But this was not because they had become like young children and no longer used memory devices. Rather, it was because they now rehearsed instructions and made mental notes to themselves inwardly, without the need for external cues (Vygotsky, 1930, pp. 41–45).

By today's standards, these experiments were very informal. But they were pioneering investigations into an area that has become a major topic in contemporary psychology. This is *metacognition*, the awareness people have of their own thought processes. (People's specific awareness of their own memory processes is sometimes called *metamemory*.) Like Vygotsky, contemporary psychologists are trying to discover how children become aware of their thinking and how they learn to use psychological tools and strategies to improve it (Flavell et al., 2002, pp. 163–167, 262–263).

SPEECH

The single-most important psychological tool is speech (Vygotsky, 1930, p. 24; 1934, p. 256). Speech frees our thought and attention from the immediate perceptual field. This freedom sets us apart from other species.

To illustrate this difference, Vygotsky called attention to research by Kohler (1925) on the problem solving of apes. Kohler found that if one places

a banana within an ape's visual field—but behind some bars so the ape cannot grab it—the ape's attention will be so riveted on the banana that it will hardly consider anything else. The ape won't consider using a stick lying nearby, unless the stick also happens to lie directly in front of the bars. The stick, that is, must also be part of the immediate visual field (Kohler, 1925, pp. 37–38; Vygotsky, 1930, pp. 35–37).

Human thinking, in contrast, can range much more freely beyond the immediate perceptual field, and it is speech that enables it to do so. Because words frequently refer to absent objects, we can, in a situation like that of the ape, ask ourselves, What object might reach that banana? Is there a stick or a pole around here that will reach it? Thus, we use words to contemplate and direct our search for objects not in our visual field.

Vygotsky suggested that the ability to engage in such internal dialogues develops in three steps.

1. Initially, references to absent objects occur in the child's interactions with others. For example, a 2-year-old girl might ask her mother to help her find something. Or the mother might say, "We're going to the park now, so get your pail and shovel," directing the girl's attention to objects she had not been looking at.
2. Next, at the age of 3 years or so, the child begins to direct similar comments to herself. While playing with her toys, she might say, "Where's my shovel? I need my shovel," and begin looking for an object that had not been within her immediate surroundings.

For a time, this self-guiding speech is said aloud; we frequently hear children talking as they play or work on problems. Then, beginning at about 6 years of age, children's self-directed speech becomes increasingly quiet, abbreviated, and less comprehensible to us.

3. Finally, by age 8 or so, we cannot hear this talk at all. But the child's self-directed speech has not disappeared; it has merely gone underground. It has turned into *inner speech*, the silent dialogue that one has with oneself (Vygotsky, 1934, pp. 29–40).

The general process, then, is one of *internalizing* social interactions. What begins as an interpersonal process, occurring between the parent and the child, becomes an intrapsychic process, occurring within the child. Vygotsky believed that this general progression characterizes the development of all the "higher mental processes," all the forms of thought and attention that depend on cultural signs. In fact, he stated that the progression is a general law:

Any function in the child's cultural development appears on the stage twice, on two planes, first on the social plane and then on the psychological. (1931a, pp. 44–45)

This law, in the view of Vygotsky and his followers, was a cornerstone of a Marxist psychology. A Marxist does not seek the origins of thinking within the individual child, spontaneously sprouting from the child's mind, but in external social existence (Vygotsky, 1930, p. 45). "The child," Vygotsky said, "learns the social forms of behavior and applies them to himself" (1931a, p. 40).

Egocentric Speech

In the process of internalizing social speech, children go through a phase (step 2) in which they spend considerable time talking to themselves aloud. The first person to call attention to this kind of speech was Piaget (1923), who called it *egocentric speech*. Piaget observed, for example, that if two 5-year-old girls are playing in a sandbox, each might talk enthusiastically about topics without considering the fact that the other couldn't possibly know what she was referring to. Piaget called this speech "egocentric" because he thought it reflects the child's general egocentrism; the child doesn't adjust her speech to the perspective of the listener because she egocentrically assumes the listener's perspective is the same as her own. Piaget estimated that between the ages of 4 and 7 years about 45% of all speech is egocentric (1923, p. 51).

Vygotsky agreed that egocentric speech is very prevalent in this age group, but he disagreed with Piaget about its theoretical meaning. In Piaget's view, egocentric speech is basically useless. It merely reflects a deficiency in the child's thinking. Vygotsky, in contrast, emphasized its positive function; it helps the child solve problems. In one of Piaget's studies (1923, p. 14), 6½-year-old Lev says to no one in particular, "I want to do that drawing, there. . . . I want to draw something, I do. I shall need a big piece of paper to do that." In Vygotsky's view, Lev's self-directed talk helps Lev plan and direct his activities (Vygotsky, 1934, p. 29).

Vygotsky also disagreed with Piaget about egocentric speech's ultimate fate. Piaget implied that as children overcome their egocentrism, egocentric speech simply dies out. Vygotsky argued that it doesn't just fade away, but it goes underground and turns into inner speech, the kind of silent dialogue we so often have with ourselves when we try to solve problems. Interpreting the decline of egocentric speech as an indication it is dying, Vygotsky said, "is like saying that the child stops counting when he ceases to use his fingers and starts adding in his head" (1934, p. 230).

Vygotsky argued, then, that egocentric speech is highly useful and an important way station on the road to inner speech. But even if we were to agree with Vygotsky on these points, we would still have to agree with Piaget that there is something puzzling about it. The child seems to be talking to someone, yet doesn't do so in any full way. For example, a child playing alone with Tinkertoys while an adult is silently seated across the room says,

The wheels go here, the wheels go here. Oh, we need to start it all over again. We need to close it up. See, it closes up. We're starting it all over

again. Do you know why we wanted to do that? Because I needed it to go in a different way. (Kohlberg, Yaeger, & Hjertholm, 1968, p. 695)

The child seems to be talking to the listener (e.g., asking him, "Do you know why . . . ?"), but the child doesn't wait for the listener to respond.

According to Vygotsky, the child's self-directed speech is puzzling because it is not yet differentiated from social speech. The child is trying to use speech to direct her own activities, but she still casts her speech in the form of social communication. It takes a while for self-directed speech to "differentiate out" and take on its own character. Only gradually does self-directed speech become quieter and more abbreviated and turn into inner speech (Vygotsky, 1934, pp. 229–232).

Research Bearing on the Vygotsky–Piaget Issue. Vygotsky tried to think of ways to test whether his view of egocentric speech was more correct than that of Piaget. In his most prominent study, Vygotsky reasoned that if egocentric speech serves a problem-solving function, it should increase when tasks become more difficult. Because Piaget saw no positive function to egocentric speech, his theory makes no such prediction.

So Vygotsky did various things to make children's tasks more difficult. "For instance, when a child was getting ready to draw, he would suddenly find that there was no paper, or no pencil of the color he needed. In other words, by obstructing his free activity, we made him face problems" (Vygotsky, 1934, pp. 29–30). In these situations, the proportion of egocentric speech (the amount of egocentric speech compared to all speech) nearly doubled among 5- to 7-year-olds (Luria, 1961, p. 33). The children tried to solve problems by talking to themselves. For example, one child said, "Where's the pencil? I need a blue pencil. Never mind, I'll draw with the red one and wet it with water; it will become dark and look like blue" (Vygotsky, 1934, pp. 29–30). This study suggested, then, that egocentric speech does serve a problem-solving function in young children, as Vygotsky suggested.

This study has been widely replicated, and the results have largely been in agreement with Vygotsky's. There is, however, one qualification. If tasks are made much too difficult for children, they do not engage in self-guiding speech. They just give up and don't say anything. As Laura Berk says, tasks must be "appropriately challenging" (2009, p. 265).

Other research has examined the contrasting positions of Piaget and Vygotsky, and most of it supports Vygotsky. It suggests that egocentric or self-directed speech serves a positive function and turns into inner speech, which continues to guide behavior (Berk, 2009, p. 265; Kohlberg et al., 1968).

Nevertheless, it still seems possible that Piaget was partly correct. Even if some egocentric speech serves the self-guiding function that Vygotsky emphasized, it also seems that *some* egocentric speech might reflect the child's inability to consider the audience's viewpoint. It may be that both Piaget and Vygotsky were correct.¹

¹In their research reports, contemporary psychologists often refer to both egocentric and vocalized self-directed speech as *private speech*.

Self-Control

So far we have focused on the way children use self-guiding speech to help them solve problems, as when they work on tasks such as drawing and building things with Tinkertoys. But verbal self-regulation also helps people gain emotional self-control, in the sense of overcoming impulses and temptations. In everyday conversations, we speak of this capacity as willpower.

According to Vygotsky, the basic question of willpower is: How is it possible for us to take action in situations in which forces pull us strongly against it? How, for instance, do we stop watching TV and go study instead?

Vygotsky's (1932) answer was that we use words to create artificial stimuli to direct our behavior. If we are watching TV, we might say to ourselves, "OK, I'm going to watch it until 8 o'clock, then I'll study." We create a new, verbal signal to control our behavior.

As usual, Vygotsky argued that we initially acquire such signals through social interactions. When we were young, adults frequently used signals to direct our behavior. They might have told us, "I want you to jump in the water on the count of three" or "You can watch TV until the big hand on the clock reaches the 12." A little later, we began applying similar signals to ourselves, at first aloud and then silently through inner speech.

As Berk observes, we can sometimes hear young children talking to themselves as they try to gain self-control. A toddler who is tempted to touch a light socket says to herself, "Don't touch," and pulls her hand back. A little boy who starts to jump on a sofa says to himself, "No, can't," and climbs down (Berk, 2001, pp. 89, 511). Several psychologists are interested in the process by which children learn to delay gratification, as when they are told to wait before eating a treat. Berk points out that this capacity emerges with the development of language and that one can often overhear young children instructing themselves to wait (2001, p. 89).

Luria's Research on the Verbal Regulation of Behavior

An especially fine-grained analysis of the verbal self-regulation of behavior was provided by Vygotsky's colleague A. R. Luria.

Luria focused on the internalization of adult commands. He wanted to see how the child comes to obey adult commands and then applies those commands to herself. Vygotsky, we should note, did not imply that all self-regulation is limited to the internalization of commands. Children internalize all kinds of dialogue. But Luria focused on commands.

Luria found that a child's ability to follow adult commands develops rather slowly. Suppose a toy fish is lying on a table. If we tell a 14-month-old child, "Bring me the fish," the child will do so. But if we place a shiny toy cat closer to the child and again say, "Bring me the fish," the child will bring us

the shiny cat. Our verbal instructions cannot overcome the power of an attractive stimulus (Luria, 1960, p. 360).

There are other difficulties as well. In one experiment, Luria gave a 2-year-old a rubber balloon and told him to press it, which the child did. But Luria noted, "He does not stop his reaction, for he presses a second, a third, and a fourth time" (p. 360). Luria gave the boy only one instruction, but the boy's action *perseverated*—it kept going.

What's more, our commands, which can so easily set a child's behavior in motion, do not have nearly the same power to *inhibit* it. If an experimenter tells a 2-year-old who is pressing a balloon, "That's enough," the command usually has little effect. In fact, in many cases the command only intensifies the child's reaction; the child presses even more energetically (Luria, 1961, p. 53).

By the ages of 3 or 3½, children can follow specific adult commands fairly well (Luria, 1961, p. 70; Slobin, 1966, p. 131). But can they follow their *own* verbal instructions?

In one experiment, Luria told children to say "Press" and press a balloon when they saw one light and to say "Don't press" and to refrain from pressing when they saw another light. But 3- and 3½-year-olds pressed at every light. They said "Press" and pressed, and they said "Don't press" and pressed. Once again, words excite action, but they have a weak inhibiting effect (Luria, 1960, pp. 374–375; 1961, pp. 90–91).

Luria believed that a good part of the difficulty is that young children respond to the *excitatory* function of speech rather than to its *meaning*. The phrase "Don't press" excites action simply because it is a signal, regardless of its meaning.

A number of Luria's experiments suggest that children can verbally regulate much of their own behavior by the age of 5 or 6 years. They can easily handle the kinds of experiments previously described. In fact, an experimenter need only give them instructions at the outset, and they will perform correctly without saying anything to themselves aloud. But Luria believed they are still giving themselves verbal instructions—only now they are doing so silently, through inner speech. To support his interpretation, Luria reported that when he made tasks more complicated or speeded them up, the 5- and 6-year-olds spontaneously began giving themselves instructions aloud once again (Luria, 1961, p. 93).

Self-Regulation and Neurological Functioning. Luria emphasized the social origins of self-regulation. First, children submit to the commands of others; then they command themselves. At the same time, Luria recognized that the child's ability to regulate her behavior depends on the maturation of the nervous system. In fact, Luria devoted a great portion of his life studying the neurological mechanisms underlying self-regulation and other mental functioning, and he is considered one of history's great neurologists.

Many of Luria's insights came during his work with patients who suffered brain injuries during the Second World War. Luria, like others, found that the kinds of difficulties the patients experienced depended greatly on the specific location of their injuries. The ability to regulate one's own behavior, Luria found, is tied to the frontal lobes, particularly in the left hemisphere. Patients who suffered frontal lobe injuries could still speak and perform simple habitual tasks, such as greeting others and dressing themselves. But in new situations, they were unable to regulate their own behavior and, as a result, they were slaves to environmental stimulation.

For example, one patient was supposed to take a train to Moscow, but when he arrived at the station he stepped onto the first train he saw boarding and traveled in the opposite direction. Apparently the call "All aboard" and the sight of the others getting onto the train was more than he could resist. He couldn't tell himself, "This isn't my train," and use these words to regulate his own behavior.

Patients with severe frontal lobe damage also have problems with perseveration; once they begin an activity, they cannot easily stop it. Luria told about a patient "who began occupational therapy after the war. He was instructed to plane a piece of wood. He planed a board down completely and continued to plane the work bench, being unable to stop" (Luria, 1982, p. 111).

In such cases, we must guess that the patients were unable to use speech to control their behavior. We suppose that they could not effectively tell themselves "Stop" or "Hold it." Some of Luria's other research added more direct support for this speculation. In one study, Luria asked patients to imitate him and raise a finger or a fist whenever he did so. This they could do. But when Luria reversed the instructions, they had difficulty. They could repeat his instructions, but they couldn't apply them to their behavior. A patient would say, "Yours is a fist, so now I must raise my finger," but he still imitated Luria and raised his fist. He couldn't use speech to regulate his actions (p. 112).

Inner Speech

Under ordinary circumstances, adults have developed the capacity to give themselves verbal instructions inwardly and silently, through inner speech. Inner speech, however, is very difficult to investigate. Vygotsky obtained some clues from writers and poets, but he relied primarily on the study of egocentric speech in children. That is, he assumed that the changes we see in egocentric speech just before it goes underground forecast what inner speech is like (Vygotsky, 1934, pp. 226–227).

Inner speech, in comparison to social speech, seems more abbreviated. It omits information that we already know and focuses on that which is new. Sometimes we can observe the same phenomenon in social situations. Vygotsky asked us to imagine several people waiting for a particular bus. "No one will say, on seeing the bus approach, 'The bus for which we are waiting is

coming.” The speaker is likely to say merely, “Coming,” or some such expression. She limits her statement to the new information—the bus’s arrival (1934, p. 236). When we talk silently to ourselves, we abbreviate our statements in a similar way.

Another characteristic of inner speech is the dominance of *sense* over *meaning*. The sense of the word is the feeling it arouses in us. For example, the word *lion* can evoke feelings ranging from fear to tender sympathy, depending on the context in which we are thinking about the animal. The meaning is the more precise definition, like that found in a dictionary. A word’s meaning is important for clear communication, but when we use words to think about something just to ourselves, we are strongly affected by the emotional sense of the words (Vygotsky, 1934, pp. 244–245).

To understand inner speech more fully, Vygotsky (1934, pp. 245–249) said we need to examine its role within a microgenetic process. Microgenesis, you will recall from Chapter 5, is the relatively brief developmental process that occurs every time we form a thought or a perception. The formation of a verbal statement, too, unfolds microgenetically, and inner speech enters this process at a critical point.

The act of making a verbal statement begins with an emotion—a desire, interest, or need. Next comes the dim stirring of a thought, which always includes something of the original feeling. At this point, inner speech comes into play. We engage in inner speech as we try to articulate our thoughts. This process is fluid and dynamic, and both our thoughts and our words undergo several transformations as we struggle to make a clear statement without losing feeling behind our original thought (pp. 249–255).

Sometimes we cannot find words to express our thoughts at all. Vygotsky referred to a novel by Gelb Uspensky, in which “a poor peasant, who must address an official with some life-important issue, cannot put his thoughts into words” (p. 249). The poor man asks the Lord for help, but to no avail.

Even great poets, who are so good with words, experience this difficulty. The poet Afanasey Fet wrote, “If only soul might speak without words!” F. Tiutcheve felt that the process of translating thoughts into words so routinely distorts the original thought that “a thought once uttered is a lie” (Vygotsky, 1934, pp. 251, 254). Vygotsky recognized this danger. Nevertheless, he argued that we need words to develop our thoughts. A thought that fails to realize itself in words remains unfulfilled. A “voiceless thought” as the poet Osip Mandelstam said, “returns to shadow’s chambers” (Vygotsky, 1934, p. 210).

PLAY

We have seen that speech frees the child from the immediate physical situation. Using words, the child can talk about objects and events beyond the here and now. The young child also gains freedom from the concrete situation

through play. In make-believe play, a piece of wood becomes a person, a stick becomes a horse. The child creates an illusory world where objects take on new meanings. Play is a big step in imaginative thinking.

But Vygotsky (1933) emphasized that the child's play, although spontaneous and imaginative, is not completely free. In the child's mind, there are rules to be followed. When two young girls pretend it is night and they have to go to sleep, they follow an implicit rule that they do not engage in any imaginary activity whatsoever, such as digging in the dirt or riding bikes; they only engage in bedtime activities. Vygotsky told about two girls, ages 5 and 7, who decided to play sisters. They followed an implicit rule that sisters do things the same. They dressed alike and talked alike.

By adhering to the rules implicit in their play, children exhibit more self-control than in the rest of their lives. They behave according to what they think a role requires, not their immediate desires. If three children pretend to be shopkeepers and customers, and let pieces of candy represent money, they don't eat the candy. They use the candy as a prop and stay in their roles.

Vygotsky said that because the child exhibits so much greater self control in play, it's as if he were "a head taller than himself" (1933, p. 102). Yet the child doesn't experience the rules in play as a burden. On the contrary, the child takes pleasure in adhering to them. Play, Vygotsky said, is the prototype for later taking pleasure in following one's guiding idea or moral principle (p. 99).

After the age of 7 or so, children begin playing games that have very set rules. Vygotsky (1934, p. 104) observed that play isn't as free and imaginative as it once was. But we should note that when Vygotsky wrote about older children's play, he was primarily thinking of structured, competitive sports, not more informal children's games, like snowball battles. In their more informal games, children feel freer to create and revise rules, as Piaget observed.

SCHOOLING

Vygotsky noted that children master language quite naturally (1935, p. 105), and he made it sound as if early play springs spontaneously from the child herself. One might ask if speech and play are as much a part of the natural line of development as the cultural line. Unfortunately, Vygotsky didn't say much on this question. But he made it clear that the acquisition of cultural sign systems such as math and writing don't usually come naturally. These are taught in schools, and most children have difficulty with these subjects. Vygotsky was one of the first psychologists to devote considerable attention to the impact of school instruction on the developing child. As was his custom, he developed his ideas by comparing them to the ideas of others, particularly those of Piaget.

Vygotsky versus Piaget

Piaget drew a sharp distinction between development and teaching. Development, he said, is a spontaneous process that comes from the child. It comes from inner maturational growth and, more importantly, from the child's own efforts to make sense of the world. The child, in Piaget's view, is a little intellectual explorer, making her own discoveries and formulating her own positions.

Piaget did not mean that the child develops in isolation, apart from the social world. Other people do have an impact on the child's thinking. But they do not help the child by trying to directly teach her things. Rather, they promote development by stimulating and challenging the child's own thinking. This often occurs, for example, when children get into discussions and debates with friends. If a girl finds that a friend has pointed out a flaw in her argument, she is stimulated to come up with a better argument, and her mind grows. But the girl's intellectual development is an independent process. For it is the girl herself—not an outside person—who must construct the new argument.

As a proponent of independent thinking, Piaget was highly critical of the teacher-directed instruction that occurs in most schools. Teachers try to take charge of the child's learning, acting as if they could somehow pour material into the child's head. They force the child into a passive position. Moreover, teachers often present abstract concepts in math, science, and other areas that are well beyond the child's own grasp. Sometimes, to be sure, children appear to have learned something, but they usually have acquired mere "verbalisms"; they repeat back the teacher's words without any genuine understanding of the concepts behind them. If adults want children to genuinely grasp concepts, they must give children opportunities to discover them on their own (Piaget, 1969).

In Vygotsky's view, spontaneous development is important, but it is not all-important, as Piaget believed. If children's minds were simply the products of their own discoveries and inventions, their minds wouldn't advance very far. In reality, children also benefit enormously from the knowledge and conceptual tools handed down to them by their cultures. In modern societies, this usually occurs in schools. Teachers do, as Piaget said, present material that is too difficult for children to learn by themselves, but this is what good instruction should do. It should march ahead of development, pulling it along, helping children master material that they cannot immediately grasp on their own. Their initial understanding might be superficial, but the instruction is still valuable, for it moves the children's minds forward.

Scientific Concepts

Vygotsky saw particular value in the kinds of abstract concepts that are taught in schools. He called them *scientific concepts*, and he included in this category concepts in math and science (e.g., Archimedes' law) as well as concepts in the social sciences (e.g., class conflict). He contrasted these concepts with the *spontaneous concepts* that children learn on their own. Because children develop most of their

spontaneous concepts outside of school, in their everyday lives, Vygotsky also referred to spontaneous concepts as *everyday concepts* (although there is no reason why schools cannot also give children opportunities to make their own discoveries, as Montessori, Dewey, and Piagetians such as Kamii have shown).

In any case, Vygotsky argued that instruction in scientific concepts is very helpful because it provides children with broader frameworks in which to place their spontaneous concepts. For example, a 7-year-old boy might have developed the spontaneous concept of *grandmother*, but his concept is primarily based on his image of his own grandmother. If we ask him to define the term, he might reply, "She has a soft lap." Formal instruction, in which the teacher diagrams abstract "family trees" (which include concepts such as *grandparents*, *parents*, and *children*) can give the child a broader framework in which to place his spontaneous concept and help him understand what a grandmother really is (Vygotsky, 1930, p. 50).

Vygotsky argued that this kind of formal instruction brings consciousness to the child's thinking. So long as the child thinks of the concept *grandmother* as a particular person, he is not really conscious of the concept. His awareness is directed to the person, not the concept. Only when he sees that *grandmother* is a category within a more general system of categories does he become aware of the concept as such (Vygotsky, 1934, p. 171).

A similar process occurs when children learn to write. Before we are introduced to writing, we have mastered a great deal of spoken language, but our mastery is not at a very conscious level. Speaking is a bit like singing; it is physically expressive and flows rather naturally. Writing, in contrast, uses more formal and abstract systems of symbols and forces us to behave much more consciously and deliberately. When we write, we are constantly making conscious decisions with respect to the proper verb form, the point at which a sentence should end, and so forth. Learning to write takes great effort, but it helps us see how language is structured. Writing, Vygotsky said, "brings awareness to speech" (p. 183).

Support for Vygotsky's views has come from the research of Sylvia Scribner and Michael Cole (1981, pp. 151–156) on the effects of literacy among the Vai people in Liberia. The investigators presented both literate and nonliterate Vai adults with several sentences, some of which were ungrammatical. Both groups were perfectly able to say which sentences were ungrammatical. But the literate Vai were better able to explain why (for example, to explain that the subject and the verb of a sentence didn't agree). Apparently, literacy training had given them a greater conceptual awareness of their speech. In contemporary terms, they had gained *metacognitive* knowledge of their own speech.

To get a better sense of what it feels like to learn on a newly conceptual level, we might recall the experience of studying a foreign language in school. The process probably felt awkward and self-conscious. But we might also have felt we were becoming aware of our native language for the first time because we were seeing it within a broader, abstract framework, as

employing one set of rules where other options are possible (Vygotsky, 1934, p. 196). As Goethe said, "He who knows no foreign language does not really know his own" (Vygotsky, 1934, p. 160).

Vygotsky, then, saw much more value in scientific concepts than Piaget did. In Vygotsky's view, both scientific and spontaneous concepts have their own specific virtues. Spontaneous concepts, such as the child's own concepts of *grandmother* and *brother*, are "saturated with experience" (p. 193); they are full of rich personal sensations and imagery. Scientific concepts, such as abstract family lineage systems, are comparatively dry. But scientific concepts give children broader frameworks in which to view their own concepts.

Interactions Between Scientific and Spontaneous Concepts. In school, the two kinds of concepts typically influence and benefit each other in the following way. Scientific concepts, which the teacher hands down "from above," lead the way. They give cognitive development a new goal, pressing children to think more abstractly than they ordinarily would.

For a while, however, children usually have difficulty understanding the new concepts. That the children understand them at all must be credited to their spontaneous concepts. When, for example, a typical Russian class of third-graders listens to the teacher discuss the concept of *class conflict*, it is only because the children have already developed spontaneous concepts of rich and poor people that they have an inkling of what the teacher is talking about. As the teacher presses on, the children are asked to think about the scientific concepts further, and after a while they may develop some understanding of how their spontaneous concepts fit into a more abstract scheme (Vygotsky, 1934, p. 194).

Instruction, then, propels the mind forward. Instruction, Vygotsky emphasized, does not just add something new to the child's development, like adding clothes to the child's body. Rather, it interacts with development, awakening it, charting new paths for it. Vygotsky said that psychologists should do all they can to learn about this interaction (1935, pp. 80, 91).

Vygotsky himself, however, found that this interaction is difficult to study; the developmental processes stimulated by instruction are largely hidden from view. The one thing that is certain, Vygotsky found, is that development does not follow instruction in any straightforward way. When he plotted the two curves—one for the course of instruction, the other for the child's subsequent mental development—he found that the curves do not coincide. For example, it often happens that three or four steps in instruction produce no change in the child's understanding of arithmetic, and then

with a fifth step, something clicks; the child has grasped a general principle, and his developmental curve rises markedly. For this child, the fifth operation was decisive, but this cannot be a general rule. The turning points at which a general principle becomes clear to the child cannot be set in advance by the curriculum. (Vygotsky, 1934, p. 185)

Thus the teacher cannot prescribe the manner in which the child learns. The teacher might create a curriculum that progresses in a step-by-step manner, but this doesn't mean the child will develop according to the teacher's plan. Development has its own rhythms. Still, adult teaching is necessary. Without it, the child's mind wouldn't advance very far (1934, p. 185).

The Zone of Proximal Development

Most teachers would probably agree with Vygotsky's general viewpoint. They would agree that it is their job to move the child's mind forward, and to do this they must directly teach children new concepts, not wait for them to make their own discoveries. At the same time, teachers know they cannot teach any concept to any child. They cannot, for example, effectively begin teaching algebra to most first-graders. Teachers need ways of determining the kinds of lessons children are ready for.

Most schools have made such decisions with the help of standardized achievement and intelligence tests. A school might give a third-grade child an achievement test, find that she is doing math at the third-grade level, and assign her to a middle-level math group. Vygotsky argued, however, that the conventional tests are inadequate. They only measure the child's actual level of development, telling us how far she has developed so far. They do not tell us about the child's ability to learn new material beyond her present level.

The reason for this shortcoming, Vygotsky said, is that conventional tests only evaluate what the child can accomplish when working independently. But before children can perform tasks alone, they can perform them in collaboration with others, receiving some guidance or support. To determine a child's potential for new learning, then, we need to see how well the child can do when offered some assistance.

Vygotsky asked us to consider two boys who scored at the 8-year-old level on a conventional intelligence test (Vygotsky, 1934, p. 187). They scored at this level, that is, when working independently, as the test requires. Then, however, the examiner presented some new problems, too difficult for the boys to solve on their own, and offered each some slight assistance, such as a leading question or the first step in a solution. With this help, one boy scored at the 9-year-old level while the other boy scored at the 12-year-old level. Clearly, the boys' potential for new learning was not the same. Vygotsky called the distance that children can perform beyond their current level the *zone of proximal development*. More precisely, he defined the zone as

the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (1935, p. 86)

Vygotsky hoped the zone of proximal development would give educators a much better indication of each child's true potential.

Actually, Vygotsky wrote just as enthusiastically about the concept's usefulness to developmental psychology. He discussed the concept as if it provides a new, improved searchlight that illuminates not only those functions that have already matured but also those that are in the process of maturing. By focusing on the activities children can accomplish with assistance, the zone reveals those abilities that are just beginning to develop, such as the ability to walk in an infant who can do so only if she has a hand to hold. The zone of proximal development casts light not so much on "the ripe as the ripening functions"—those that the child can carry out only with assistance today but will be able to perform alone tomorrow (Vygotsky, 1934, p. 188).

But how do we know Vygotsky was correct, that the zone of proximal development does illuminate the stirrings of inner development? When a *slight* amount of assistance quickly enables a child to succeed, we can be fairly certain we are observing a spontaneously developing capacity. The rapid success suggests that the adult aided a capacity that had already been emerging from within.

But Vygotsky also suggested that adults occasionally provide a *great deal* of assistance. He approvingly noted, for example, that a child could use an abstract concept "because the teacher, working with the child, [had] explained, supplied information, questioned, corrected, and made the pupil explain" (1934, p. 191). In this case, the teacher appears to have treated the child like a puppet, and it isn't clear that the teacher has stimulated anything spontaneous within the child.

Perhaps the only way to know if the child's spontaneous development is activated is to watch the child. Is the child enthusiastic, curious, and actively involved? Or does the child look off into space? In fact, some research (e.g., Regoff, Malkin, & Gilbride, 1984) suggests that adults who teach effectively within the zone of proximal development do continually look for signs of spontaneous interest on the child's part.

PRACTICAL APPLICATIONS

Vygotsky wanted to help build a new society, and he deliberately set out to construct a theory that addressed practical matters. As we have just seen, he tried to show how school instruction can promote child development, and he offered a new concept—the zone of proximal development—to assess each child's potential for new learning. If we want to know what a child is ready to learn, Vygotsky said, we cannot look at what the child can do when working alone; we must see how far ahead she can go when offered some assistance.

The zone of proximal development has captured the interest of a growing number of researchers. Some have evaluated the extent to which the zone does in fact diagnose a child's potential for new learning. The zone's diagnostic value seems promising but in need of refinement; it does not yet predict end-of-the-year achievement better than IQ tests do (Berk, 2001, p. 205).

The zone of proximal development has stimulated much more interest in the teaching process itself—how adults can help a child solve problems or use strategies that are initially beyond the child's independent abilities. Typically, psychologists and educators refer to this process as *scaffolding* (Wood, 1998). The adult (or more competent peer) at first provides a good deal of assistance, but reduces it as the child gets the hang of the activity. The assistance is like a temporary scaffold that comes down when construction is finished. For example, a parent might initially help a child pedal and steer a bicycle, but then step aside as the child seems able to ride it on her own.

Brown and Palinscar (1989) showed how teachers might scaffold reading skills using a method they call *reciprocal teaching*. Initially, the teacher shows children how to summarize and clarify reading passages. Then the children take turns "being the teacher," leading small groups of classmates in the use of the strategies. The teacher continues to guide the process but gradually shifts much of the responsibility to the children. The method has produced positive results (Berk, 2009, p. 269).

Elena Bodrova and Deborah Leong have developed a program called Tools of the Mind to help preschool and kindergarten children learn self-regulation skills such as planning activities, sticking to tasks, and ignoring distractions. Bodrova and Leong began with Vygotsky's observation that children frequently demonstrate remarkable self-regulation in their make-believe play. For example, the preschooler who has difficulty sitting still during circle time can do so when she plays the role of a pupil in a make-believe scene (Bodrova & Leong, 2007, p. 132). Using the Tools of the Mind program, the teacher helps young children initiate and sustain make-believe play.

Teachers introduce children to play themes through videos, field trips, and books. Teachers also ask children to create *play plans*. The children write down their plans (to the best of their abilities) and draw pictures of themselves engaged in the activities. Children are encouraged to make their play plans as specific as possible.

During the planning, the teachers suggest how the children "can try out new roles, add new twists to the play scenario, or think of a way to substitute for missing props" (Bodrova & Leong, 2001, p. 19). Initially, children often believe props must be realistic-looking toys. Teachers wean children away from this idea; they brainstorm with children about the different things a simple object, such as wooden block, might represent. If children have difficulty sustaining their play, the teacher intervenes. She helps them plan and act out a new scenario. If she intervenes a second time, she offers less assistance (as scaffolding requires) (Bodrova & Leong, 2007, p. 151). In general, teachers do

a considerable amount of coaching, which they gradually fade out (Tough, 2009, p. 35).

The Tools of the Mind program values both the quality of play—its richness and complexity—and the planning process itself. Planning helps children gain cognitive control over their behavior.

Tools of the Mind also employs Vygotsky's ideas with respect to academic activities such as writing. For example, teachers ask children to use private or self-directed speech while drawing letters. After observing a class, journalists Bronson and Merryman report:

When the kids are learning the capital C, they all say in unison, "Start at the top and go around" as they start to print. No one ever stops the kids from saying it out loud, but after a few minutes, the Greek chorus ends. In its place is a low murmur. A couple of minutes later, a few kids are still saying it out loud—but most of the children are saying it in their heads. (Bronson & Merryman, 2009, p. 167)

In kindergarten, children and teachers have mini-conferences to evaluate the child's activities during the past week and to plan for the next week (Tough, 2009, p. 35). These conferences, too, are designed to help children gain cognitive control over their behavior. Some research indicates that Tools of the Mind does, in fact, increase children's ability to regulate their behavior (Diamond et al., 2007).

It is interesting to note that Vygotsky didn't write about assisting children's play. He described play as if it's a spontaneous development, coming from children themselves. But Bodrova and Leong are justified in calling their project "Vygotskian" (2001, p. 17) because Vygotsky generally emphasized the way adults or more competent peers advance children's skills.

Indeed, contemporary Vygotskians believe that adults and older peers—not children themselves—initiate the first episodes of make-believe play (Bodrova & Leong, 2007, p. 120; Berk, 2009, p. 268). If a toddler is holding a doll, an adult might say, "Tell your baby to chew her food," helping the child get into the mother role. Vygotskians (Berk, 2009, p. 268; Berk & Winsler, 1995, p. 64) frequently cite two studies to demonstrate the need for parental direction, but I don't believe the studies' results warrant this conclusion.

In one study, Wendy Haight and Peggy Miller (1993) found that mothers tried to get their 1-year-olds started on imaginary play. Then, when the children were studied again at age 2, the children initiated 41% of their play episodes. It might seem that the parents introduced the children to make-believe play, which the children later initiated on their own. But what is overlooked is that the parents' efforts at age 1 had no discernable effect. The children rarely played at that age. So the children who began make-believe episodes a full year later (at age 2) might have acted spontaneously.

In a second study, Miller and Catherine Garvey (1984) found that parents provided props such as dolls for their 2-year-olds' imaginary play. The parents also allowed their children to borrow household objects such as pots and pans for other props. But the children themselves usually began the play episodes. Certainly, parents and older children can support and expand youngsters' imaginary play, but I don't find evidence that their teaching or guidance is necessary for its emergence.

In any case, it will be good to see further research on this question, which highlights a basic disagreement between the Vygotskians and Piagetians. The Vygotskians believe that development always has social origins. The Piagetians believe that development emerges from the child herself. You might remember how Piaget's daughter Jacqueline began make-believe play at about the age of 2 years, as when she moved her finger on a table and said, "Horse trotting." From Piaget's accounts, all her play at this age seemed to be her own creation.

EVALUATION

Vygotsky's work has generated great excitement because it suggests important ways to expand traditional developmental theory. Vygotsky recognized that intrinsic development, as studied by Gesell, Piaget, and others, is important; children do grow and learn from their inner maturational promptings and inventive spirit. But these forces alone, Vygotsky said, will not take children very far. To develop their minds fully, children also need the intellectual tools provided by their cultures—tools such as language, memory aids, numerical systems, writing, and scientific concepts. A major task of developmental theory is to understand how these tools are acquired.

But Vygotsky did more. He suggested we should study how intrinsic developmental and cultural forces interact and produce new transformations. It is the interaction between these conflicting forces that psychology must eventually understand.

Vygotsky's suggestion is more impressive than it might initially sound. Many psychologists have called for eclectic approaches, saying we need to consider a variety of intrinsic and environmental variables when we study development. Such statements sound reasonable, but they overlook the legitimate conflicts between theorists who emphasize one force or the other. Piagetians believe the child grasps a concept on her own; environmentalists believe she learns it from others; how can both be right? There is a logical contradiction.

Vygotsky, as a dialectical theorist, offered a new perspective. According to dialectical theory, life is full of contradictions, and what we need to study is what happens when opposing forces meet. We need to see what happens when the growing child, trying to figure things out for herself, encounters adults who try to teach her things. These interactions, Vygotsky observed, are