

CHAPTER FIVE



CULTURE, LANGUAGE, AND COGNITION

Deratu lives in one of the oldest nations in Africa—Ethiopia, a Greek word meaning “sunburned faces.” Like almost 80 percent of the people in this nation in northeastern Africa, she lives in a rural village where her family grows sugarcane and raises goats and chickens. Deratu, like more than half the children in the country, does not attend school nor does she have many toys. What she needs to know, she learns in an informal manner from the work she has been assigned according to her age and gender, since this is the way new members of each generation learn what is expected of them. At five years of age, she helped her mother fetch water and gather wood for the fire. Now, at the age of eleven, she helps with the cooking and cares for her younger brothers and sisters. In just a few years, at about fifteen, she will start a family of her own. Deratu’s learning is very much a social activity guided by her mother, who teaches her the important cultural and practical lessons she will need in order to survive in her rural Ethiopian village.



Maria, two weeks away from her twelfth birthday, lives in Brazil, in São Paulo, the seventh most populated city in the world. Brazil is the largest country in South America, occupying almost half the continent. She has attended the country’s free public schools since she was six years old. Maria’s parents and teachers have always described her as a naturally curious and inquisitive child. Learning how to read and write came easily to her. As a newly emerging adolescent, she is beginning to look more abstractly at the world and is using more logical problem-solving skills than she would have been able to use just two years ago. Now, Maria spends much time with her elderly grandmother. Although the girl sometimes gets impatient with the grandmother’s deliberate speech, she enjoys the stories of the “old days” and admires her grandmother’s excellent memory of even small details.



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Deratu and Maria live worlds apart physically as well as psychologically. In this chapter, we look at culture, cognition, language and their effects on development. We consider two opposing theoretical viewpoints and some of the cross-cultural evidence that supports or refutes these views. As you progress through this chapter, you will be better able to understand and explain the cognitive and linguistic behavior of these two young women using key concepts from these theories.

First, let us explain what we mean when we use the terms *language* and *cognition*. **Cognition** can be thought of as *the act or process of obtaining knowledge, including perceiving, recognizing, reasoning, and judging* (Gander & Gardiner, 1981). Cognition involves thinking, knowing, remembering, categorizing, and problem solving. **Language** refers to a *system of symbols that is used to communicate information and knowledge*. How does thinking affect language? How does language affect thinking? How do they influence each other? Later in this chapter, we discuss the links between cognition and language as they occur throughout life. Two of the major theoretical frameworks discussed in Chapter 2 will guide us in this discussion: Piaget's cognitive developmental theory, and Vygotsky's concept of the "zone of proximal development."

◆ THE LANGUAGE-COGNITION-CULTURE LINK

One of the early debates linking culture, language, and cognition surrounds the question "Do people who speak different languages think about and experience the world differently?" And if so, are these differences in thinking due to the structural and lexical (language or vocabulary) differences in the languages spoken? Linguists Benjamin Whorf and Edward Sapir are the original proponents of this line of thought, which is known as the "linguistic relativity hypothesis." Elgin (2000) provides an example by comparing the sentence "I was riding a horse" in English and Navajo. She asserts that the most likely translation in Navajo would result in "The horse and I were moving about." It is easy to see that these two sentences describe the relationship between horse and rider rather differently. The English version portrays the rider as the active subject of the action and the horse as the object that endures being ridden. In Navajo, the act of riding is a joint endeavor without expressed subject-object relation. A Whorfian would conclude that Navajo speakers perceive and experience relationship with animals (horses, in this case) differently than English speakers. If people's thinking really is relative to their language, perhaps we could explain cultural differences in cognition by looking at the differences in the languages spoken in different cultures. Unfortunately, research results on the linguistic relativity hypothesis are not that clear-cut. A few supporting findings exist, but there are seemingly just as many findings that contradict Sapir's and Whorf's ideas.

Researchers have come to agree on a less absolute version of the linguistic relativity hypothesis. They believe now that thinking is not entirely

determined by the language we speak. Rather, *how* we talk about people, objects, or events may make us pay more or less attention to certain aspects of these events, people, or objects. In different languages, we find different linguistic elements that make it easier to communicate about certain events or objects. For example, English has a progressive form that allows English speakers to distinguish between ongoing events and events that have concluded (“I worked all afternoon” versus “I have been working all afternoon”). Some languages (e.g., German and Hebrew) do not have a progressive form. Speakers of these languages are still able to communicate about the temporal sequence and duration of events, but they have to make a greater effort to do so. A Whorfian may argue that distinguishing between the duration of events may not be as important in German- and Hebrew-speaking cultures but is more important in English-speaking cultures. In other words, if something is encoded in a culture’s language, it must be important. This milder form of the linguistic relativity hypothesis led many institutions in the United States, in recent years, to establish “politically correct” language. Many view this as a well-intended effort to change cultural meaning by changing language; others disagree.

What is Vygotsky’s position on these issues? He claimed that cultural influence, mental processes, and language are dynamic processes that occur simultaneously. This means that constant social interaction with those around us helps shape the quality of mental abilities and language at various ages. With this theoretical perspective in mind, Vygotsky coined the expression, “*talking to learn.*” By this he meant that as children verbally interact with others, they internalize language and use it to organize their thoughts (Vygotsky, 1978).

Other researchers go even further and suggest that as parents interact with their children, the children learn language and become socialized into a particular set of cultural values and beliefs (Greenfield & Cocking, 1994; Budwig, Wertsch, & Uzgiris, 2000). For example, in her extensive studies of language acquisition in a Samoan village, Ochs (1988) showed the presence of two major ways of speaking the language: “good speech” and “bad speech.” The latter contains fewer consonants and is mainly spoken in informal contexts. Good speech is used when speaking to strangers or in formal settings such as schools, church services, and when talking to a person of high status. Along with learning both “good speech” and “bad speech,” Samoan children learn about the social contexts in which using each “language” is appropriate. An interesting ongoing debate in the United States surrounds what used to be called “Black Vernacular English” or “Ebonics.” Ebonics is spoken almost exclusively among African-Americans and is learned in informal contexts rather than in formal schooling (for an overview, see Fasold, 1999).

Consequently, as children pass through Vygotsky’s zone of proximal development in their language learning, they also acquire specific cognitive skills and they are becoming enculturated into a way of life. An effective method for achieving this is **scaffolding**, which refers to *the temporary sup-*

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port or guidance provided to a child by parents, older siblings, peers, or other adults in the process of solving a problem. In construction, scaffolding is placed around a building to provide temporary support. Once completed, the scaffolding is removed, and the building is left to stand on its own. Similarly, the amount of scaffolding, in the form of guidance and support, a child may need depends on his ability to solve a problem alone. When the problem has been solved, the parent or others can remove the temporary scaffold (guidance) until help is again needed. An example of this guidance, or scaffolding, is illustrated in the accompanying photo.

Here a mother is shown mentoring her young son as he learns shapes of objects and how to place them in the right arrangement. As with reciprocal socialization, parents carefully observe their children's behavior to determine how much help they may need in completing a task or activity. As the activity continues, parents become increasingly sensitive to their children's needs, with the result that children do better on subsequent tasks.

In conclusion, the original question "Is cognition dependent on language or vice versa?" has lost some of its relevance. In shifting from studying language(s) to studying language and culture, researchers acknowledge that both language and cognition are cultural phenomena. Consequently, language and culture are both part of a person's ecological system where they contribute jointly to an individual's experience.



A mother using scaffolding to help her child learn a new skill. (Photo courtesy of the authors.)

◆ INFANCY

Early Cognitive Development in Cultural Contexts

Piaget's and Vygotsky's interest in children's intellectual development as a focus for understanding how ideas change over time has drawn attention to several important issues related to the study of cultural differences. Over a period of thirty years, hundreds of researchers throughout the world have subjected these theories to careful scrutiny, with the result that the cross-cultural literature is immense and cannot be given here anything approaching the full attention it deserves. However, there are a number of excellent reviews that we recommend to those who would like to pursue the topic further. These include the work of Rogoff and Chavajay (1995), Gielen (1994), Bronfenbrenner (1993), and Segall, Dasen, Berry, and Poortinga (1999).

Of all Piaget's periods, the sensorimotor (occurring during infancy) has been the least studied from a cross-cultural perspective. A major reason is that observation methods and data-collecting techniques based on Piagetian concepts have only recently been standardized (Cole, 1995). According to Dasen, the first cross-cultural study of sensorimotor intelligence, using a scale developed by Corman and Escalona (1969), was conducted in Zambia (Goldberg, 1972). In general, while minor differences in behavior were noted (a slight advance for African infants over American at six months and a slight lag at nine and twelve months), Goldberg's findings tend to support Piaget's observations. A later study, conducted by Dasen and his colleagues (1978) on the Ivory Coast, suggested that African infants are advanced in their development of object permanency and other object-related cognitive behaviors. In yet another African study, this one conducted in Nigeria, Mundy-Castle & Okonji (1976) reported that while early manipulation of objects is similar for English and Igbo infants, important differences emerge in later interactions. What they have to say about these differences lends support to our emphasis on the importance of looking at cognitive behavior from an ecological point of view. Specifically, Mundy-Castle (1974) proposed that, after a certain age, European and American infants develop increased experiences in the handling of objects, with their attention "more often deliberately focused on objective properties of reality," whereas "African babies receive more social stimulation and early emotional support than European babies. The issue here is whether in the long run this divergent stimulation brings about a differential patterning of cognitive development, with Africans acquiring an intelligence that is more socially oriented, while Europeans acquire one that is more technologically oriented" (pp. 19–20). Although not specifically mentioned, since this was not the concern, the microsystem (family) and macrosystem (cultural values) have an important effect on the development of these cognitive behaviors.

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In an early review of the cross-cultural literature, Dasen and Heron (1981) recognized that differences in the ages at which the substages of this period are attained do occur. However, they go on to stress that "in emphasizing these cultural differences, we may overlook the amazing commonality reported by all these studies: in fact, the qualitative characteristics of sensorimotor development remain nearly identical in all infants studied so far, despite vast differences in their cultural environments" (p. 305). Werner (1979), however, concluded that "even in the first stage of cognitive development, that of sensorimotor intelligence, culture seems to influence the rate of development to some extent, although admittedly, the similarity of structure and process is more striking than the differences. Content seems to have little relevance to the activation of sensorimotor schemata" (p. 216).

Language Acquisition

Along with these astounding cognitive developments, infancy is also marked by the first attempts to produce speech and language. Prominent linguist Noam Chomsky believes that language ability is "hardwired" into the human brain. When born, infants have the entire range of human language possibilities available to them. Which language(s) they acquire depends on the languages to which they are exposed on a regular basis. Recent research has shown that the babbling sounds of infants show remarkably similar patterns across many languages (MacNeilage & Davis, 2000). That means that all infants produce basic sounds such as "ma," "da," "fa," "ba," and so on. At this point, parents and others in the child's social environment begin to play a crucial role in language development. If the infant produces a sound that is part of the language spoken in her environment, this sound is acknowledged and celebrated as an attempt to communicate (those of you with children or young siblings can remember the excitement surrounding the first utterance of "Dada" or "Mama"). In contrast, any sound that is not part of the language environment is dismissed as babbling. Soon, due to lack of encouragement, the infant stops producing these non-relevant sounds and focuses on combining relevant sounds into meaningful words. This account of language acquisition demonstrates Vygotsky's concept of scaffolding as well as the developmental niche. The caretakers, with their specific language characteristics, gently guide the child in developing the tools for communication within a specific cultural environment. Once the child has learned language to communicate, the basis for facilitating further cognitive and language development through social interaction is set.

An example of Vygotsky's contextualist research during the sensorimotor period is seen in the work carried out by Bornstein and his colleagues (Bornstein, 2000; Bornstein, Tal, & Tamis-LeMonda, 1991). They studied infant cognition by observing patterns of interaction between American and Japanese mothers and their infants. Interestingly, it was noted that American mothers responded more favorably to their babies' requests when the infants

were playing with physical objects. Japanese mothers, on the other hand, were more responsive when their babies were engaged in play with them. The researchers also noted how often mothers responded to their infants' vocalizations. Interestingly, maternal responsiveness appeared to be positively related to the IQ scores of Japanese children when they were about two and a half years of age and to scores of American children at the age of four years. At five months of age, infants in both cultures showed early signs of object permanence and were equally likely to engage in goal-directed behavior. Cross-cultural studies of language development show that the acquisition of certain linguistic elements such as nouns, verbs, and grammatical structure may vary (Casadio, & Bates, 1999). A variety of studies examining the child's understanding and use of these language markers in Mandarin, Italian, and English showed the following general results: an overall bias in infancy to use nouns; no differences among children in these cultures in the time they begin to use nouns; and as the use of verbs varies across languages, so does the complexity of grammar and vocabulary.

These examples clearly demonstrate Vygotsky's claim that culture plays an active role in directing cognitive activity, even in infancy. More recently, Uzgiris and Raeff (1995), in a study of parent-child play interactions, stated that the variety of activities involved in play (e.g., talking, touching, and interacting) help children to learn skills that will enable them to be active participants in later cultural interactions. You can probably see how these ideas fit into and support our major themes. For example, it is within the family context (mesosystem) that early parent-child interactions take place. It is here that infants are introduced to activities (e.g., play and the use of language) that help prepare them for successful participation in the broader cultural contexts of the workplace (exosystem) and understanding of important values and attitudes (macrosystem).

Along similar lines, Bornstein and his colleagues (1992) looked at the various ways in which young infants in Argentina, France, Japan, and the United States were engaged in conversation by their mothers. In each of these cultures, mothers were more conversant with older children (thirteen-month-olds) than they were with younger children (five-month-olds) and exhibited a variety of cultural differences in speech patterns when talking with them. For example, expressive speech was employed more often by Japanese mothers than it was by French, Argentinean, or American mothers. This behavior on the part of Japanese mothers is compatible with their culture's stress on interdependence as an important value. (You may recall our earlier discussion in Chapter 3 of interdependence and Japanese childrearing practices, the second component of the developmental niche, as they relate to socialization.)

French, American, and Argentinean mothers, on the other hand, gave greater attention to speech that communicated information to their infant or child. This is consistent with other findings in cultures characterized by individualistic behavior, such as the three Western societies represented in this

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Family playtimes can be fun and rewarding for everyone involved. (Photo courtesy of the authors.)

study. Still, not all of these mothers communicated the same kind of information to their children. For example, American mothers asked lots of questions, reflecting, in part, the view within American society that children are active participants in the learning process and often (as we saw in our earlier theoretical discussion) construct their own knowledge. In contrast, French mothers provided their infants and children with less stimulation but greater emotional support. Finally, Argentinean mothers appeared to be the most direct in their interactions with their children, which is indicative of a more authoritarian approach to dealing with children (Bornstein et al., 1992).

Early Second-Language Acquisition and Bilingualism

Contact between individuals who do not share the same language has become commonplace in today's world. Immigrants may share neighborhoods with natives, international business people may spend months abroad, refugees may seek an escape from war in their own countries. The need to communicate in a new ecological system often makes it necessary to acquire a second language—to become bilingual. We raise this discussion on bilingualism in this chapter because it illustrates the dynamics of the language–cognition–culture link within a developmental framework. Questions such as “Do children learn a second language faster or better than adults?” or “Does the age at which a person learns the language affect how the language is learned?” have been at the center of bilingualism research for many years.

Developmental Factors

A popular view claims that before a certain age children learn a language naturally and easily. This supports the idea of a “critical period” for second-language acquisition. The “critical period” lasts a specific number of years during which a second language can be learned as easily and as well as the first language. However, after this critical period a language learner will have greater difficulty being able to acquire a second language to the same extent he or she did with the native language.

The age at which this critical period is supposed to occur is one of several points debated by those interested in language. Penfield and Roberts (1959) set the first ten years of life as the critical years for language acquisition. Others suggest that no distinctions in language learning can be found until after puberty (Johnson and Newport, 1989). However, more recent studies contradict the “critical period” assumption entirely. In particular, Birdsong and Molis (2001) found that postpubescent learners were not always less proficient than younger learners and, in fact, some late-learners spoke the language as well as native speakers. This should not be the case if a true “critical period” for language acquisition exists. Hakuta, Bialystok, and Wiley (2003) report similar results in their analysis of data from over two million Spanish and Chinese immigrants. They observed a decline in second-language proficiency among older immigrants, but the decline was not as steep as might be expected outside a “critical period.”

Although research does not completely support the claim that second language acquisition is limited by a “critical period” of development, we can reliably assume that “younger is better” when it comes to learning a second language. After a thorough review of existing research, Ellis (1994) concludes that (1) children learn a second language faster than adults in the long-run and (2) early second-language learners are more likely to have a nativelike pronunciation and proficiency than late-learners. Does this mean that taking language classes in high school or at the university are useless, as students cannot expect to become proficient in a second language? We now turn to the ecological model for additional insights on bilingualism.

Ecological Factors

An easily identifiable ecological factor that influences second-language acquisition is the learning context itself. Sociolinguists distinguish two types of situations in which a second language can be learned including (1) natural settings and (2) educational settings. Examples of “natural settings” might include learning a second-language as a native language while living in a country—a setting familiar to most immigrants. A natural setting is also present when learning a second languages that serves as the “official language” of a country. For example, India maintains English as one of two “official” languages (Hindi being the other), which makes it necessary for many

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Indians to learn English as their second language. "Official" languages other than the native languages can also be found in Zaire (French) and Nigeria (English). Educational settings, on the other hand, are those in which formal second-language instruction takes place. The traditional "foreign language classroom," a common high school or college experience for many readers, comes immediately to mind. In addition, other educational settings might include bilingual education programs (for immigrant students in the United States) or education of ethnic minority children (in mainstream classrooms) as is common in Britain, Germany, and the United States.

A widespread assumption is that a second language is learned differently in different settings but that the patterns are somewhat unclear. We do know that it is not always the natural setting that leads to successful mastery of a second language. In fact, it is more likely that educational settings provide better opportunities to learn a second language, but only if they involve immersion in both the native and the second language. (e.g., bilingual programs). Speaking in "ecological terms," being immersed in a second language means language is used within multiple levels of the ecological model (e.g., school, work place, sports club, grocery store, media).

Related to these settings are important social and psychological factors. For example, there is general agreement among researchers that attitudes towards the target language and culture as well as motivation to learn the language have an enormous influence on second-language learning. In an illustrative study, Scully (2000) collected data from Filipinas (who married into Japanese households) about their attitudes towards Japanese culture and their success in learning Japanese. The author found that immersion in the culture and family life, as well as positive attitudes towards Japanese culture, predicted successful mastery of Japanese. See Table 5.1 for a depiction of the relationship of attitudes, motivation, and potential language learning outcome.

A possible answer to the question posed earlier in this section could be as follows: individuals who wish to learn a second language at an older age may indeed develop near-native proficiency if they can choose a favorable ecological system and have a positive attitude!

◆ CHILDHOOD

As we move from the infancy and early childhood periods to the school-age period, the majority of cross-cultural Piagetian studies have focused on the transition from the preoperational period to the concrete operational period and the attainment of conservation (Gardiner, 1994). These studies show great variability in their findings (Rogoff, 1990). Fishbein (1984) points out that the research literature on these topics, published during the 1960s and early 1970s, reports consistently large differences (as much as seven years) in the favor of children in Westernized cultures when compared with children

TABLE 5.1 Attitudes towards Native and Target Culture and Potential Outcomes of Second-Language Learning

ATTITUDES TOWARDS		POTENTIAL LEARNING OUTCOME
<i>Native Culture</i>	<i>Target Culture</i>	
+	+	Strong motivation and high proficiency in both languages
-	+	Strong motivation to learn target language, losing competence in the native language
+	-	Failure to acquire the second language, maintain native language only
-	-	Failure to learn second language, and losing native language competence

+ positive attitudes
 - negative attitudes

Source: Based on material from Ellis, R. (1994). *The study of second-language acquisition*. Oxford, UK: Oxford University Press.

from developing cultures. However, Kamara and Easley (1977) have drawn attention to what he feels are three serious faults with the majority of this work. He expresses the following criticisms: (1) the study of thinking in both of these periods depends heavily on the use of language, yet most of the researchers who conducted these early studies had little knowledge of either the culture or the language of their subjects; (2) although Piaget favored the use of clinical interviews for gathering information about children's thinking processes, many of these investigators attempted to employ various types of standardized measures that required little use of language; and (3) accurate birth dates of subjects were not always available, and attempts to approximate ages were frequently off by as much as two years. These are serious criticisms still deserving of further attention on the part of cross-cultural researchers.

Stages of Knowing and Learning

In an extremely interesting and creative cross-cultural study, Nyiti (1982) attempted to avoid the pitfalls mentioned by Kamara by varying the languages used and by employing three of Piaget's well-known conservation tasks for substance, weight, and volume. Subjects consisted of ten- to eleven-year-old Micmac Indian children from Cape Breton Island in Canada and white English-speaking European-Canadians. The European Canadian children were interviewed in English by an English-speaking European, while the Indian children were divided into two groups. In the first group, children were initially interviewed in English by an English-speaking European and later in

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Micmac by a Micmac-speaking Indian. In the second group, the order of interviewing was reversed. When the white European Canadians and Micmac Indian children were tested in their native languages, their performances on conservation tasks were nearly identical and were comparable to those of other European, Canadian, and American children. However, when tested in English, Micmac Indian children performed at a significantly lower level than the other two groups. More important, the results indicated that nearly twice as many children at both age levels, when interviewed in their native language, were more capable of solving each of the three conservation tasks than were the Micmac Indian children interviewed in English. Nyiti concludes his study by stating that "it appears that cognitive structures described by Piaget are universal and represent a necessary condition for any successful acculturation [and] . . . while children in different cultures may have to deal with different realities, they all apply the same operations or processes of thought" (p. 165).

In an important and exhaustive review of cross-cultural findings on conservation task performance, Dasen (1972a) sorted results into four types, each supported by several studies. These included (1) cultural groups in which conservation appears at about the same time as it does in American



These young Zinacantean girls take great pleasure in making traditional pottery figures. (D. Donne Bryant)

and European children (i.e., Nigerians, Zambians, Hong Kong Chinese, Iranians, and Australian Aborigines), (2) groups in which conservation generally develops earlier (i.e., Asians), (3) cultures in which conservation appears as much as two to six years later (i.e., African and lower-socioeconomic-status Americans and Europeans), and (4) groups in which some individuals fail to engage in concrete operations even when they reach adolescence (i.e., Algerians, Nepalese, Amazon Indians, and Senegalese). What can we conclude from this vast amount of cross-cultural data? First, support for the universality of the structures or operations underlying the preoperational period is highly convincing. Second, whether or not these structures become functional and the rate at which this might take place appear strongly influenced by factors within one's culture—further validation of the importance of looking at cognitive development from the ecological systems approach.

Finally, it appears that although the rate and level of performance at which children move through Piaget's concrete operational period depend on cultural experience, children in diverse societies still proceed in the same sequence he predicted (Mwamwenda, 1992; Segall, Dasen, Berry, & Poortinga, 1999). In an early study by Price-Williams, Gordon, and Ramirez (1969) supports this view. For example, in one of their studies, conservation tasks were administered to two groups of Zinacantean children—half from pottery-making families and half from non-pottery-making families. Those children who had helped their families by working with clay showed signs of conservation at earlier ages than those without such experience.

Language Skills and Language Socialization

Jean Piaget's theory of cognitive development also provides clues as to how cognition and language might be related, that is, the ability to understand and use symbols requires certain cognitive skills. According to Piaget, a child first demonstrates the cognitive skills necessary for language use in the preoperational stage of cognitive development. The child needs to understand that different sounds and gestures do not simply stand alone but can serve as symbols for actual objects. Once grasping the concept of "symbols," she has acquired the necessary cognitive tools to use language as a form of communication about actual objects.

Suzuki (1998) gives another specific example of a particular cognitive skill and language competence. According to Piaget, one of the characteristics of preoperational thought is the inability to take another person's perspective. Instead, the child's thinking is guided only by how the world relates to him or her, for example, a child might answer the question "Why should you not hit your brother?" by saying "So that I won't get in trouble" instead of "Because he might get hurt." Suzuki argues that the ability to use passive construction in Japanese is closely related to a child's ability to go beyond preoperational egocentric thought. The results show that children in this study, between 3.4 and 6.9 years of age, interpreted passive sentence construction

very differently, depending on their age and on their ability to adopt non-egocentric world views.

Childhood is the age in which socialization through language is most prominent. A good example of language socialization is a linguistic study by Brooks, Jia, Braine, and Da Graca Dias (1998). These researchers examined the ages at which Portuguese-, English-, and Mandarin-speaking children learn to distinguish between quantifiers such as "all" and "each" in their respective languages. The study shows that Portuguese and Mandarin Chinese speakers had learned to distinguish between "all" and "each" conceptually and linguistically by the time they were five years old. English speakers, on the other hand, were much less discriminating in their use of these quantifiers.

Once again, it is important to keep in mind the larger ecological systems in which languages are embedded. For example, China and Portugal can be considered as cultures with more collectivist belief systems (macrosystem) than the United States. The words "all" and "each" refer to objects or activities that are either collectively shared or not shared. Children in these cultures may learn words and concepts representing a relationship between "individual" and "collective" earlier than children in more individualistic societies. Eventually, through learning language and using language in social interaction, Portuguese and Chinese children also learn about social relationships that are considered important in their collectivist societies. Although certainly a simplified explanation, it may clarify the idea of language as a contributing influence to both cognitive development and socialization.

Another cognitive and linguistic challenge that faces many children between the ages of three and ten is learning how to read and write. If we consider the vast array of languages and how they are expressed in oral and written form, we can guess that the difficulties confronting children in their quest to become literate also vary greatly. For example, many European languages are phonetically based, meaning that a symbol primarily represents a sound rather than a meaningful word. Words are combinations of symbols and, therefore, sounds. Individually, the symbols and sounds d-e-s-e-r-t are not meaningful. However, when combined, they obtain meaning. This specific attribute of language allows the novice reader who knows the symbol and each sound associated with it, to find the meaning of the word by "sounding" out each symbol. This is difficult to do in languages such as Chinese, which uses a combination of phonetic symbols and logographic symbols. Logographs are symbols that primarily represent a meaning; its sound is secondary. Novice readers have to know the meaning of the symbol to understand it. Good examples of logographs in European language use are Roman numerals. The symbol "X" has a specific meaning, namely the number "ten." Sounding out "X," no matter in what language, will not help find the meaning.

Considering all of this, it should not be surprising to learn that many studies of early literacy show that learning how to read and write are affected by the characteristics of the children's language. For example, a comparison between American and Chinese first graders revealed a different pattern of



A Chinese boy practices calligraphy while writing Chinese characters with a brush. (Michael Ventura/Stone)

literacy (Stevenson & Stigler, 1992). English students had learned to break down words into sounds. This enabled them to figure out words that they had not yet been taught. Students who did not have this skill often were unable to read even the words they had already been taught. In contrast, Chinese first graders were able to read almost all the words they had been taught, but very few of the words not yet taught.

Speakers of phonetic languages can hardly imagine what is involved in learning to read and write Japanese, a language with basically three language systems: Kanji, Katakana, and Hiragana. Kanji consists of over 2,000 logographic characters, often with multiple sounds. Katakana and Hiragana are different forms of a phonetic system in which each character represents a syllable. Katakana is a "simplified" form while Hiragana is the elegant cursive form of this symbol system. Taylor (1998) points out that almost all preschoolers pick up the basics of Hiragana at home or in kindergarten while Katakana is taught in the first three grades. Instruction in Kanji is slowly introduced in the

first three grades and continues through sixth grade. This example of Japanese learning to read and write shows very nicely the interaction of different levels of the ecological system in this aspect of language acquisition. Specifically, family and peers in the microsystem aid the learning of Hiragana, as do extended family and families of peers in the exosystem. In combination, these systems assert a combined influence in the mesosystem. When learning Katakana, school and peers are the driving influence in the microsystem while government-designed curricula (in the exosystem) and the cultural value placed on literacy (in the macrosystem) exert additional influences as one moves to the outer levels of the ecological system. An ecological system vastly different from the Japanese is described by Pretorius and Naude (2002). In their study of children (5.5–7 years old) in South African townships they showed that the children's literacy and numerical skills were very poorly developed. The authors speculate that this may be because of the relative lack of emphasis on literacy both in the larger culture (child rearing practices that do not facilitate parental involvement in literacy development) and in the family (little exposure to reading and writing experience in the home).

◇ ADOLESCENCE AND EARLY ADULTHOOD

Formal Operational Thinking

Piaget's stage of formal operations also has been studied cross culturally, and it is the view of some researchers that individuals in many societies never achieve this type of thinking. In fact, a study conducted among Nigerian adolescents by Hollos and Richards (1993), using Piagetian tasks, revealed little use of formal operational thinking.

One of several tasks frequently used to measure cognitive development in the stage of formal operations is the pendulum problem. In the pendulum problem, individuals are shown several pendulums of different weights that are attached to different lengths of string. When the pendulums are swung, individuals are asked to figure out what determines the speed at which the pendulums swing back and forth. For example, is it the weight, the height from which it is dropped, the force with which it is pushed, the string's length, or perhaps a combination of all of these? According to Inhelder and Piaget (1959), children in the stage of formal operations should be able to solve the pendulum problem through the process of elimination. Several cross-cultural studies have utilized this problem to observe cognitive changes in formal operations. For example, in studies carried out among adolescents in New Guinea, no subjects performed at the formal operational level (Kelly, 1977). Similarly, few adolescents showed formal operational thought when tested in Rwanda (Laurendeau-Bendavid, 1977). On the other hand, among Chinese children exposed to the British education system in Hong Kong, for-

mal operational performance was found to be equal to or better than the performance of American or European children (Goodnow & Bethon, 1966). Some formal operational thinking was also found among schoolchildren in Central Java and New South Wales (Philip & Kelly, 1974). Based on these and similar findings, Piaget (1972) proposed that development of formal operational thinking is influenced by experience as well as by culture (Rogoff & Chavajay, 1995). As we have seen before, events taking place within one's ecological niche frequently determine how one will perceive and behave in a particular ecological setting.

These examples provide added impetus for considering the ecological setting in understanding why behavior, including cognitive activity, is expressed as it is. For example, Cole and Cole (1996) point out that "a lawyer might think in a formal manner about law cases but not when sorting the laundry . . . a baseball manager might employ formal operational thinking to choose his batting lineup but [not when doing] . . . the combination-of-chemicals task" (p. 674). As evidence, they cite a study by Retschitzki (1989) showing that when African men and older boys play a popular board game involving the capture of seeds from opponents, they make use of complex rules, complicated offensive and defensive moves, and skilled calculations. Interviews with skilled Baoule players from Cote d'Ivoire revealed that their strategies in playing this game used the types of logical thinking we usually attribute to formal operations.

The inability to show evidence for the universality of formal operational thinking among adolescents and adults is not confined to non-Western areas. In fact, earlier studies demonstrated that not all adolescents or adults living in Western technological cultures achieve this type of thinking and that they frequently show low levels of success on formal operational tasks. Even earlier studies conducted by Kohlberg & Gilligan (1971) with subjects in late adolescence reported that only between 30 and 50 percent of such individuals perform successfully on formal operational tasks. Werner (1979) sums this up by stating, "Formal-operational thinking might not appear at all or might appear in less-generalized form among cultures and individuals whose experience is limited to one or a few specialized or technical occupations. In other words, survival in a particular culture may not call for, nor be influenced by, formal logical thinking. Thus formal thought processes are probably cultural alternatives that can be learned. Humans have the capacity for it, but may not have realized it in order to 'get by' in their particular society" (p. 224). Shea (1985) has suggested that formal operational thinking (i.e., scientific reasoning) may not be valued in all cultures. For a review of fifty years of formal operational research, see Bond (1998).

Finally, in a discussion of the socialization of cognition, Goodnow (1990) concludes that Piagetian theory can be effectively applied to the conservation of weight, amount, and volume. However, she goes on to say that "if one's goal is to go beyond these domains—to construct an account of

cognitive development that cuts across many domains or that takes place in everyday life—then classical Piagetian theory will certainly need some additions” (pp. 277–278). This, of course, is a position with which we certainly agree and which we encourage other researchers to take into account when conducting future cross-cultural studies of cognition.

Analytic Thinking and Problem-Solving

Most of the research in cross-cultural human development has emphasized cognitive growth in childhood and adolescence. By comparison, few cross-cultural studies have examined cognitive development in adulthood. Piaget believed that formal operational thinking represented the highest level of cognitive development and proposed no additional stages in adulthood. He believed that an adolescent and an adult would think in the same way. However, some developmental psychologists have challenged this belief, arguing for a post-formal stage of cognitive development in adulthood. For example, Labouvie-Vief (1986) has suggested that in early adulthood, a change in thinking occurs in which individuals begin to recognize cognitive limitations and may adapt their thinking to the demands of their environment. This process is called **adaptive logic** and involves *balancing critical analyses of objective observations with one’s subjective reactions to these observations*. For example, when performing a memory task, older subjects may make a conscious decision to exclude much of the detailed information they remember, believing it may be uninteresting to the researcher or to other listeners. If this is the case, Salthouse (1987) suggests that when measuring cognitive abilities of middle-aged adults, we need to employ strategies different than those used with young adults (e.g., experience and expertise). This represents one more challenge for researchers interested in the study of cognitive development.

According to some theorists the highest level of post-formal cognition is what is called dialectical thinking. **Dialectical thinking** *suggests that for every viewpoint there is an opposing viewpoint and these two can be considered simultaneously*. The ability to synthesize and deal with such opposing ideas represents a new level of cognitive flexibility and a deepening of thought, which, in turn, facilitates developmental growth.

◇ MIDDLE AND LATER ADULTHOOD

As one gets older, one supposedly gets wiser. At middle age and late adulthood, one has greater experience, becomes more sensitive to inconsistencies, and responds differently to social, political, and economic changes. These are generally the years of greatest productivity and self-satisfaction in career, avocation, or family.

Studying and understanding cognition during the middle and late adult years presents unique challenges, in part due to a confounding or intermingling of age and experience. Since the majority of research efforts have been conducted in Western cultures, which are youth oriented, the focus has tended to be on cognitive development among children and adolescents, not on the later years of adulthood. As a result, we know very little about changes in cognitive abilities among adults and even less from a cross-cultural perspective.

Intelligence

In their efforts to investigate changes in cognitive development during middle and late adulthood, Horn & Cattell (1967) proposed a distinction between fluid and crystallized intelligence.

Fluid intelligence involves *the ability to form concepts, reason abstractly, and apply material to new situations*. It is thought to be biological or intuitive and to be uninfluenced by culture. It is reflected in an individual's ability to make inferences, draw analogies, solve problems, and understand relationships among concepts. **Crystallized intelligence** refers to *an individual's accumulated knowledge and experience in a particular culture* (e.g., ability to react to social situations or respond to classroom tests).

Previous research in developmental psychology indicates that these two types of intelligence unfold in different directions. While fluid intelligence stays the same or declines somewhat throughout adulthood, crystallized intelligence may actually improve (Horn & Hofer, 1992; Lerner, 1990). Over the years, this view has been disputed on the basis of research conceptualization and methodology (Baltes, 1987; Schaie, 1984).

How might the ideas of fluid and crystallized intelligence apply across different cultures? To apply this view would require an understanding of how different cultures value speed, experience, youth, and age. For instance, it has been shown that the speed of cognitive functioning tends to slow down in late adulthood (Salthouse & Coon, 1993; Sternberg & McGrane, 1993), but it is important to consider other factors when addressing this issue cross culturally. For example, it is not clear how the cultural environment will react to or even notice an individual's cognitive slowdown. In some cases, a lack of speed might be compensated for by experience. Individuals who are admired for their experience (or wisdom) are often expected to be more reflective in matters requiring wise decisions. For example, Yang Tsu, an eighty-four-year-old master of martial arts in China, exhibits great discipline and patience (which took many years to cultivate), when teaching his young, impulsive apprentice, Low Chi Tho, who wants to learn everything very quickly. After some time, Low Chi has come to admire Yang Tsu and to realize the need to develop a more reflective approach to learning. In short, what might be nega-

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tively viewed by some cultures as a slowdown or decline in cognitive response is positively viewed in this case as a necessary quality for achieving success. Our familiarity with cross-cultural research suggests that there are many instances in which a behavior in one culture is viewed quite differently in another. This richness of differences (as well as similarities) provides many opportunities for those interested in pursuing the study of behavior from a cross-cultural, ecological, or sociocultural perspective.

In Western societies, speed is often more highly valued, and the ability to think quickly and make rapid decisions is seen as an indicator of high intelligence. In many non-Western societies, time and speed are less valued, since individuals are encouraged to first view themselves as part of a group and to concentrate their efforts on the well-being of the family. In these societies, experience is more valuable than quick action. For example, when asked what advice he would give incoming American managers, a Japanese executive who had worked in Tokyo for fifteen years replied, "I'd tell him not to do anything for the first six months." He continued, "I've seen a lot more problems caused by Americans trying to do things too quickly than waiting too long to act." In America, it is often said, "Don't just stand there, do something." In Japan, they say, "Don't just do something, stand there" (Condon, 1984, p. 62).

Also in Western societies, youth is idolized, and displays of fluid intelligence are often synonymous with quick-mindedness. This attribute is often preferred over experience, or crystallized intelligence. Today, many corporations in the United States actively look for young employees who possess a fresh perspective and demonstrate the characteristics associated with fluid intelligence. At the same time, many senior employees, who have devoted several decades to their employers and have years of accumulated experience, find themselves confronted by the loss of their jobs or by offers of early retirement.

The issue of accumulated experience over time has been associated with wisdom (Smith & Baltes, 1990). But does age alone make an individual wiser? Not necessarily. Smith and Baltes investigated sixty German professionals and divided them into three age groups of twenty-five to thirty-five, forty to fifty, and sixty to eighty-one. Each group was presented with four made-up examples of demanding situations and was asked to prepare solutions for these problems. Their approaches and solutions were rated by a panel of human services professionals. Of the 240 respondents, eleven scored in the "wise" category but were not necessarily older. In fact, they were found in almost equal numbers in each of the three groups. Wisdom, then, would not appear to be characteristic of any particular age group. In short, individuals do not become wiser simply because they get older. Wisdom takes many forms and varies according to each culture's orientation. In this study the criterion for determining what constituted wisdom was set by the researchers, who represent a specific cultural orientation that may or may not



A martial arts instructor patiently teaches his young Chinese apprentice. (Michael K. Nichols/National Geographic Society)

apply to all cultures. Replication of this study in a variety of other cultures might produce some interesting findings.

More recent research on this topic has led Baltes and his colleagues to propose several general characteristics associated with wisdom, including the ability to focus on important issues and to exercise good judgment, the development of a broad base of experiences, and recognition of one's wisdom by others (Baltes, 1993).

In the final analysis, it is important to realize that although some aspects of cognitive functioning decline with age, how this change is viewed and evaluated depends largely on one's culture, ecological surroundings, and developmental niche.

Communicating in Later Life

Similar conclusions can be drawn with regard to language use and comprehension in later life. Undoubtedly, some actual changes occur in language with advancing age, particularly when there is a decline of cognitive functions such as memory. For example, Coupland, Coupland, and Giles (1991) point out that older speakers are a little slower and use different strategies in comprehending sentences, and they use less complex sentence structure. On the other hand, grammar, vocabulary, and speech production are relatively

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consistent across the lifespan. Despite these findings, there is the pervasive stereotype that older people are impaired in their communication. Ryan, Giles, Bartolucci, and Henwood (1986) suggest that the ability of older people to communicate is influenced by several interacting factors. In a society in which aging is associated with negative expectations, older adults are faced with a "communication predicament": physical changes of aging (e.g., hearing loss, voice quality, slowness of movement) are interpreted by others as loss of competence. As a consequence, caregivers and others communicate with the older person in a simplistic and patronizing way. This in turn leads to diminished self-esteem, social withdrawal, and, ultimately, to a decline in communicative competence. Here, negative cultural expectations actually lead to a self-fulfilling prophecy. Consider, once again, the ecological systems approach. Although scientific evidence is lacking, it is conceivable that older adults in cultures that hold their elders in higher esteem will not experience the communication predicament described above.

Just as cultural expectations differ in important ways, so do languages. Perhaps aging affects speakers of different languages in different ways. Although research on cross-language differences and aging is sparse to date, Kemper (1992) shares a few interesting observations. Some languages are very strict in their structure. For example, English has a fixed word order of subject-verb-object. Other languages, such as Russian and informally spoken Japanese, rely heavily on contextual cues and word order may vary. Kemper points out that the more "contextual" languages may make it easier for older people to comprehend and speak because they do not have to follow complex, strict language rules. This means that older adults who may have problems processing complex sentence structure can still understand and convey the meaning of a spoken sentence by interpreting the larger context.

◇ SUMMARY

Cognition is a general term referring to thinking, reasoning, decision making, remembering, categorizing, and problem solving. Cultural factors and beliefs found in the interaction among Bronfenbrenner's ecological systems, the developmental niche, and the sociocultural orientation contribute in a variety of ways to cognitive development across the lifespan.

The theories of Piaget, Vygotsky, and others provide a useful framework for conceptualizing cognitive growth and development and its relationship to language and culture. The linguistic relativity hypothesis states that different languages provide us with different frameworks within which we understand and communicate our experiences.

Vygotsky's sociocultural theory emphasizes the strong influence of social and cultural factors on both cognitive and language development. He introduced the zone of proximal development, which refers to what a child is

presently capable of doing and what she could potentially do if guided by adults or capable peers. Vygotsky argued that cognitive development is enhanced when instruction is focused on an individual's potential rather than on the level of actual development. According to Vygotsky, the development of egocentric speech, inner speech, and external speech are grounded in one's social and cultural orientation. Vygotsky also emphasized the need for guided instruction (scaffolding) in which adults provide assistance (scaffolds) for children as they attempt to solve difficult problems. Vygotsky's view of language acquisition and sociocultural influences is mirrored in the learning of a second language. Along with a strong developmental influence we have identified multiple ecological, social and psychological factors that account for the successful learning of a second, nonnative language.

According to Piaget, children's thinking differs significantly from that of adults, which is acquired only after successfully passing through a series of discrete stages. These stages have been studied from a cross-cultural perspective, and research evidence suggests that some aspects may be universal (the sequence of stages) while others (the stage of formal operations) may not.

Cross-cultural investigations of human development have tended to focus primarily on children and adolescents and devote less attention to middle and late adulthood. At the same time, research in adult cognition has revealed that a fifth stage of cognitive development (post-formal thought) may emerge after formal operations. This new thinking allows an individual to move beyond abstract conceptualization and to integrate diverse reasoning abilities with pragmatic problem-solving strategies. The work of several researchers suggests that adult cognition is characterized by adaptive logic and dialectical thinking. The ability to synthesize new ideas and to realize that there are at least two sides to every point of view provides adults with more flexibility, effective problem-solving skills, and a broadening of thought.

Cognitive development in middle and late adulthood follows a different pattern than in childhood and adolescence. Cattell and Horn have suggested that a distinction be made between fluid and crystallized intelligence. Fluid intelligence is a person's ability to solve problems, think abstractly, and to apply new material in creative ways. Crystallized intelligence is learning that is based on experience. Early cross-cultural research indicates that as we get older, fluid intelligence declines, whereas crystallized intelligence increases. More recent research by Baltes and Schaie disputes this claim and suggests the need to consider cultural and contextual factors when attempting to explain individual differences in cognitive decline during late adulthood.

While some cognitive decline may influence communication in older age, other factors also influence language competence. Negative views of the elderly embedded in culture leading to perceived incompetence may be much more influential than actual loss of language competence. Moreover, changes in language competence in older age may be more or less relevant, depending on the characteristics of the language spoken.

◆ FURTHER READINGS

J. Altarriba (2000). Bilingualism: Language, memory, and applied issues. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online Readings in Psychology and Culture* (Unit 4, Chapter 4), (<http://www.wvu.edu/~culture>), Center for Cross-Cultural Research, Western Washington University, Bellingham, Washington.

Bilingualism, or the knowledge of more than one language, is prevalent throughout the world. However, much of the cognitive literature on language processing and memory retrieval has included participants who are monolingual speakers. This on-line chapter introduces the ways in which bilingualism has been investigated in the areas of autobiographical memory, memory recall, and communication in applied settings and offers suggestions for further research.

S. H. Elgin. (2000). *The Language Imperative*. Cambridge, MA: Perseus Books.

In a conversational style, this book addresses many issues of culture and language. It discusses the linguistic relativity hypothesis, debates about multilingualism, and the power of language in different social and cultural contexts (business, family, medicine, religion).

Sandra G. Kouritzin (1999). *Face(t)s of First Language Loss*. Mahwah, NJ: Lawrence Erlbaum Associates.

This book contributes to the understanding of first language loss in both immigrant and indigenous communities in (at least) 3 ways. First, it provides insight into the process of first language loss and the factors contributing to it. Second, it attempts to define, from an insider perspective, what it means to “lose” a language. Third, it analyzes the perceived consequences of first language loss in terms of social, academic, emotional, and economic factors. Moreover, the book gives voice to 5 different story tellers who relate the histories of their first language while learning English. (From the cover.)

John Naisbitt. (1996). *Megatrends Asia: Eight Asian Megatrends That Are Reshaping Our World*. New York: Simon & Schuster.

One of the world’s leading trend forecasters describes the significant political, social, business, and cultural values and beliefs that will change the world as we know it. A “new Asian way” of thinking is emerging that reflects increased individualism and urbanization and a more modern role for women.

Barbara Rogoff. (1990). *Apprenticeship in Thinking*. New York: Oxford University Press.

This book overflows with examples of parents leading their children through rough and calm cognitive seas to new levels of thinking. Illustrations of daily activities performed in scores of cultures fill almost every page of this book, which was written by one of the most prominent proponents of the cultural context perspective.