

finely tuned account of when and where cultural variations are likely to be important within the overall common human heritage.

*Language Development.* Two major, and related, questions have organized discussion of language development and its relation to other aspects of development. First, the acquisition of language has been one of the major battlefields on which the nature–nurture controversy has been fought: Must language be acquired through a process of culturally mediated learning or constructive interaction like any other human cognitive capacity, or is language a specialized, bounded domain (module) that needs only to be triggered to spring into action? (See Bruner, 1983; Elman et al., 1996; and Pinker, 1995, for discussions of the contending viewpoints.) Second, what role does the acquisition of language play in the development of thought? If language is a structurally distinct module, then there should be no particular relation between language and thought. On the other hand, insofar as culturally organized experience is seen to be essential to the acquisition of language, then language, thought, and development are likely to be intimately connected.

In contrast to the research on attachment, but like the research on the earliest adaptations of infants to the culturally scripted schedules into which they must fit, the research on language depends more on the study of natural variations over and across cultural circumstances and less on standardized test procedures.

No one believes that language can be acquired in the total absence of interaction with other human beings who speak a language. Rather, the position of those who adopt a nativist position with respect to language assumes that its development proceeds akin to the development of any bodily organ: Any environment that sustains the life of the social group is adequate to produce the development of language without any special attention needing to be paid to the process. With respect to human beings, the environment that sustains life is one that exists in the medium of culture, which leads one to attempt to specify more carefully what minimum conditions of culturally mediated interaction between children and adults are sufficient to support development of the language organ.

Two categories of cases in which children are reared in conditions that systematically reduce their immersion in culture help to specify the universal lower limits of cultural support needed to sustain language development. The first is the well-known case of Genie (Curtiss, 1977). Genie was locked in a room by herself sometime before her second birthday. She lived chained by day to a potty and trussed up in a sleeping bag at night for 11 years, during which time she had virtually no normal linguistic input and only a minimum of social interactions that could be considered culturally normal in any culture. When she was liberated from these horrible circumstances at the age of 13 she was in pitiful shape: She was emaciated and very short. She could not walk normally, rarely made a sound, and was not toilet trained. Although on testing she showed remarkable skills for spatial analysis, she had failed to acquire language. Nor did she recover from her many years of severely deprived existence; she acquired a small vocabulary and some forms of appropriate social interaction, but her behavior remained abnormal, despite attempts at therapeutic intervention. Whether this failure should be attributed to the passing of a critical period of language acquisition, or to the inability of the adults who cared for her to create an appropriate environment, has been a matter of contention (Rymer, 1993).

There are several intermediate cases between the extreme deprivation resulting in development without language or culture (the case of Genie) and the situation of the vast majority of children. One particularly instructive situation arises among children born deaf to hearing parents who do not believe that it is useful for their children to sign, insisting instead that they learn to interact through oral language (Goldin-Meadow, 1985; Goldin-Meadow, Butcher, Mylander, & Dodge, 1994). These children are reared in an environment that is rich in culturally

mediated social interactions (including linguistic mediation), which include the child and proceed very much as they would if the child could hear; people eat meals together; the children are given baths and put to bed; they go to the store; and they are toilet trained. Thus, they live in a world suffused with meaning; it is only the linguistic behavior that fills the gaps between movements and provides accounts of the rationale and prior history of those actions that they are missing.

In these circumstances, children are known spontaneously to begin to employ *home sign*, a kind of communication through gesture. Goldin-Meadow and her colleagues (1994, 1996) showed that home sign acquired in these circumstances exhibits a number of properties also found in the early stages of natural language acquisition. Children who start signing in the absence of adult sign language knowers begin to make two, three, and longer sign sequences around their second birthdays, at about the same time that hearing children create multiword sentences. Significantly, Goldin-Meadow (1985) reported that these deaf children were able to embed sign sentences within each other ("You/Susan give me/Abe cookie round."). This kind of behavior reveals that the children could engage in recursion, a form of communicative behavior that is characteristic of all human languages and absent from the communicative system of chimpanzees or other creatures, even following extensive training. Moreover, Goldin-Meadow and Mylander (1996, p. 281) showed that the forms that home sign take appear to be the same in very different cultural and linguistic environments: Chinese and American deaf children showed the same patterns of early gesture sentences, leading them to conclude that the development of these gesture systems are "buffered against large variations in environmental conditions and in this sense can be considered 'innate'."

However, the language development of deaf children in hearing homes comes to a halt at this point in the absence of normal language experience. Unless such children are provided access to some form of language as a part of the culturally organized environments they participate in, they will not develop the more subtle features of language on which sustainable cultural formations depend. The cultural medium is simply too thin to support the development of fully mature language. It is important to add that at the other extreme, where children have access to language, but not to culturally organized activity, language development also fails to take place. Children who have been left alone for a long time with a television set broadcasting in a foreign language do not acquire that language.

It seems an inescapable conclusion from this kind of evidence that, in order for children to acquire more than the barest rudiments of language, they must not only hear (or see) language but also participate in the activities that language is helping to create. In everyday activity, words are essential material-ideal artifacts, by means of which people establish and maintain coordination, filling in the gaps between gestures and other actions, and making possible the fine-tuning of expectations and interpretations.

Bruner (1982, pp. 8-9) referred to the social interactional constraints of ongoing everyday activities as *formats*. The format, he wrote:

... is a rule-bound microcosm in which the adult and child do things to and with each other. In its most general sense, it is the instrument of patterned human interaction. Since formats pattern communicative interaction between infant and caretaker before lexico-grammatical speech begins, they are crucial vehicles in the passage from communication to language.

Later, he added that once they become conventionalized, formats seem to have a kind of exteriority that allows them to act as constraints on the actions that occur within them. In this respect, Bruner's notion of format is very similar to Nelson's (1981, 1986) concept of generalized event schemes called *scripts* ("sequentially organized structures of causally and temporally linked acts with the actors and objects specified in the most general way") mentioned

earlier (Nelson, 1981, p. 101). In effect, these event-level cultural artifacts, embodied in the vocabulary and habitual actions of adults, act as structured media within which children can experience the covariation of language and action while remaining coordinated in a general way with culturally organized forms of behavior. In the process of negotiating such events with enculturated caregivers, children discover the vast range of meanings encoded in their language at the same time as they find new ways to carry out their own intentions.

Bruner (1982, p. 15) captured the cultural view of language development when he wrote that language acquisition cannot be reduced to

... either the virtuoso cracking of a linguistic code, or the spinoff of ordinary cognitive development, or the gradual takeover of adults' speech by the child through some impossible inductive tour de force. It is rather, a subtle process by which adults artificially arrange the world so that the child can succeed culturally by doing what comes naturally, and with others similarly inclined.

Cross-cultural research on language interaction supplements intracultural studies by laying bare the incredible diversity of cultural modes of involving children in adult-run activities. Participation in culturally organized activities appears to be just as necessary as phylogenetically inherited maturational constraints for children to acquire language. Arguments over the importance of the environment in language acquisition gave rise to a large literature on the different ways that parents structure children's activities (see, e.g., de Villiers & de Villiers, 1978). Parents in many societies adopt something akin to a baby-talk mode when speaking to their children, before and while the children are acquiring language. Evidence available at the time led Ferguson (1977) to speculate that a special baby-talk register (using higher pitch and intonation, simplified vocabulary, grammatically less complex sentences, and utterances designed to highlight important aspects of the situation) is a universal, acquisition-enhancing form of adult language socialization behavior. Cross-cultural data have shown that, although adults everywhere speak to young children differently from how they speak to older children and other adults, the particular form of baby talk involving simplified grammar and vocabulary characteristic of middle-class American parents is not universal. There is some evidence that other features of baby talk, such as the use of distinctive pitch and intonation, may be universal, but the data on cultural variation remain sparse (Fernald, 1989).

In many societies, adults deliberately teach vocabulary, styles of address, and other linguistic features. The Kaluli of Papua, New Guinea, for example, are reported to hold their small infants facing away from them and toward other people while the mothers speak for them. There are also subcultures within the United States (e.g., working-class people in Baltimore, MD; Miller, 1982) in which it is firmly believed that children must be explicitly taught vocabulary, using quite rigid frames of the sort "How do you call this?" (see Schieffelin & Ochs, 1986, for a wide range of examples). However, although the adults involved in such practices may believe that such special tailoring is helpful to their children's language acquisition, the data indicate that significant benefits associated with deliberate teaching of language are found rather rarely and in restricted domains (Snow, 1995).

The most secure overall generalization at this point is that culturally organized joint activity that incorporates the child into the scene as a novice participant is one necessary ingredient in language acquisition. Conversely, language plays a central role in the process of children's participation in culturally organized activities (Nelson, 2003; Rogoff, 2003). Language bridges gaps in understanding among people, and allows them to coordinate in shared activities. The words of a language, and the ways in which these words are used in everyday contexts, provide children with ready-made templates to the meanings and distinctions that are important in their community. As Brown (1965) phrased it, words are "invitations to form concepts." This formulation points to a way in which cultural differences in language practices can have

differential effects on children's development. At least in the United States, the more adults talk with their children, the better children perform in tests of academic ability (Hart & Risley, 1999).

So, the process of language acquisition, like the relation between culture and biology, is a bidirectional one. The sociocultural niche into which a child is born provides the necessary conditions for language to emerge, and as children struggle to understand objects and social relations in order to gain control over their environments and themselves, they recreate the culture into which they are born, even as they reinvent the language of their forbearers.

### Early Childhood

In contrast to infancy, which is a good candidate for a universally acknowledged stage of development, there is some uncertainty about how one should divide later parts of the life span. Whiting and Edwards (1988), following Mead (1935), divide the period between 2<sup>1</sup>/<sub>2</sub> and 6 years of age, often designated as early childhood, into two parts: 2- to 3-year olds are referred to as "knee children," who are kept close at hand but not continuously on the mother's lap or in a crib; 4- to 5-year-olds are referred to as "yard children," because they can leave their mothers' sides but are not allowed to wander far. In many modern, industrialized countries, children between 3 and 5 to 6 years of age spend part of every day in an environment designed to prepare them for school, which has led this time of life to be called the preschool period.

*The future in the present in early childhood.* Children of this age provide another clear illustration of how adults bring the future into the present in shaping children's experiences and future development. Tobin, Wu, and Davidson (1989) conducted a comparative study of preschool socialization in Hawaii, Japan, and China. They recorded classroom interactions that they then showed to teachers and other audiences in all three countries, to evoke their interpretations and basic cultural schemata relevant to the preschool child. Only the Japanese and American data are discussed here.

When Tobin and his colleagues (1989) videotaped a day in the life of a Japanese preschool, young Hiroki was acting up. He greeted the visitors by exposing his penis and waving it at them. He initiated fights, disrupted other children's games, and made obscene comments. When American preschool teachers observed the videotape, they disapproved of Hiroki's behavior, his teacher's handling of it, and many aspects of life in the Japanese classroom in general. His teacher and other Japanese observers had a quite different interpretation. Starting first with the overall ambience of the classroom, Americans were scandalized by the fact that there were 30 preschoolers and only one teacher in the classroom. How could this be in an affluent country like Japan? They could not understand why Hiroki was not isolated as punishment.

The Japanese had a very different interpretation. First, although teachers acknowledged that it would be very pleasant for them to have a smaller classroom, they believed it would be bad for the children, who "need to have the experience of being in a large group in order to learn to relate to lots of children in lots of kinds of situations" (Tobin et al., 1989, p. 37). When asked about their ideal notion of class size, the Japanese teachers generally named 15 or more students per teacher in contrast with the 4 to 8 preferred by American preschool teachers. When Japanese preschool teachers observed a tape of an American preschool, they worried for the children. "A class that size seems kind of sad and under populated," one remarked. Another added, "I wonder how you teach a child to become a member of a group in a class that small" (Tobin et al., p. 38).

Members of the two cultures also had very different interpretations of the probable reasons for Hiroki's behavior. One American speculated that Hiroki misbehaved because he was intellectually gifted and easily became bored. The Japanese not only rejected this notion (on the grounds that speed is not the same as intelligence) but also offered a different interpretation.

To them, such words as smart and intelligent are almost synonymous with well behaved and praiseworthy, neither of which apply to Hiroki. Hiroki, they believed, had a dependency disorder. Owing to the absence of a mother in the home, he did not know how to be properly dependent and, consequently, how to be sensitive to others and obedient. Isolating Hiroki, they reasoned, would not help. Rather, he needed to learn to get along in his group and develop the proper understanding in that context.

Tobin and his colleagues (1989, p. 24) comment on the Japanese view of their preschool system and Hiroki's behavior as follows:

... Japanese teachers and Japanese society place [great value] on equality and the notion that children's success and failure and their potential to become successful versus failed adults has more to do with effort and character and thus with what can be learned and taught in school than with raw inborn ability.

The Japanese who watched the tape disapproved of the promotion of individualism that they observed in tapes of an American classroom, believing that "A child's humanity is realized most fully not so much in his ability to be independent from the group as his ability to cooperate and feel part of the group" (Tobin, p. 39). One Japanese school administrator added:

For my tastes there is something about the American approach [where children are asked to explain their feelings when they misbehave] that is a bit too heavy, too adult like, too severe and controlled for young children. (Tobin, p. 53)

There are many interesting implications to be drawn from these observations, only a tiny fraction of which are touched on here. However, in the present context my purpose is to relate them to the situation such children will encounter as adults, in particular the situation that Japanese boys will face should they pursue a career in the American pastime of baseball. This point is made in a fascinating account of the fate of American baseball players who play in the Japanese major leagues (Whiting, 1989). Despite their great skill, experience, and physical size, American ballplayers generally have a very difficult time in Japan. There are many reasons for their difficulties, but crucial is a completely different understanding of keys to success in this team sport, a difference that mirrors differences in preschool education in the two cultures to an amazing degree. The title of the book, *You Gotta Have Wa*, pinpoints one key difference. *Wa* is the Japanese word for group harmony, and, according to Whiting, it is what most clearly differentiates Japanese baseball from the American game. Although American ballplayers maintain that individual initiative and innate ability are the key ingredients to success, the Japanese emphasize that "the individual was nothing without others and that even the most talented people need constant direction" (p. 70). Linked to the emphasis on group harmony is an equivalent emphasis on *doryoku*, the ability to persevere in the face of adversity as the key to success, whereas Americans emphasized individual talent.

Whiting (1989) pointed out that the ideals of *Wa* and *doryoku* are cornerstones not only of Japanese baseball but also of Japanese business.

*Wa* is the motto of large multinational corporations, like Hitachi, while Sumimoto, Toshiba, and other leading Japanese firms send junior executives on outdoor retreats, where they meditate and perform spirit-strengthening exercises, wearing only loin-cloths and headband with *doryoku* emblazoned on them. (p. 74)

Despite their acknowledged talent, American players, whose understanding of the sources of success, the cultivation of which can clearly be seen in their preschool education, are generally

unable to submit to the Japanese way of doing things. In a remark that echoes poignantly on the Japanese disapproval of the American emphasis on verbalizing and valuing personal feelings over group harmony, one American ballplayer who had a long and acrimonious public dispute with his manager was led to ask in desperation, "Don't you think that's going too far? What about my feelings? I have my pride you know." To which the manager replied, "I understand your feelings, however there are more important things."

Here again we see how culture creates an effect conditioned not by present necessity, but by deep beliefs about "how things work"; an effect that has relatively minor consequences in the present life of the child, but major effects in terms of the long-term organization of his or her behavior.

### **Biology and Culture in Early Middle Childhood Conceptual Development**

As noted earlier, the view that a great many developmental changes that psychologists once attributed to environmentally induced learning are, in fact, highly constrained by biological heritage, has reemerged to become influential in the developmental sciences. In its contemporary form, this view is expressed in terms of biologically controlled constraints on development referred to in such terms as "mental modules," "core domains," and "privileged domains." They are assumed by many to be innately specified and develop on a species-wide maturational timetable, some appearing at or near birth. By this view, the role of culture is restricted to speeding up or slowing down a fixed course of development (Carey & Spelke, 1994).

This emphasis on the importance of biological constraints began with Chomsky's (1959, 1986) theory of language acquisition, which included the view that although the specific surface forms a language displays depend on cultural experience (French is different from Cantonese) the underlying deep structure is the same (Chomsky, Skinner, 1957). He termed this (presumably universal) maturational capacity a "Language Acquisition Device" or LAD. This view was generalized by Fodor (1983), who coined the term "mental module" to refer to any "specialized, encapsulated mental organ that has evolved to handle specific information types of particular relevance to the species" (Elman et al., 1996, p. 36). Often, as in the case of language, mental modules are associated with particular regions of the brain. Broca's area, for example, is taken to be the brain locus of language.

By this view, knowledge acquisition in a modularized domain, like language, does not require extensive experience for its development; the role of the environment is merely to "trigger" the corresponding module. Particularly important for considerations of culture and development is the assertion that modular systems are "encapsulated," by which is meant that they rapidly produce mandatory outputs from given inputs (an example would be the perceptual illusion that a stick in half-submerged water is bent, even when the perceiver knows full well that it is straight).

Many developmentalists who have been convinced of the existence of domain-specific, biological constraints resist the notion of modularity, preferring instead to speak of "core" or "privileged" domains of knowledge where biological constraints may provide "skeletal principles" that bias developing children's attention to relevant features of the domain, but are not entirely encapsulated; rather, they *require* the infusion of cultural input to develop past a rudimentary starting point (Chen & Siegler, 2000; Gelman, 1990; Gelman & Lucariello, 2002; Hatano, 1997). This same argument has been made by neuroscientists focused on the brain bases of development who refer to themselves as "cultural biologists (e.g., Quartz & Sejnowski, 2002). From this position, whatever the phylogenetic constraints on development, they are not encapsulated or entirely dedicated to a specific brain area, so when there is damage to the brain

early in life, the functions that ordinarily become located there may appear in entirely different areas (Battro, 2000; Stiles et al., 2003).

Reviewing the literature on the development of core, or privileged domains, Hatano and Inagaki (2002) argued that because innately specified knowledge is still *skeletal* it is essential to study the ways in which cultural groups organize children's experience to enhance, and perhaps in some cases, to modify the knowledge endowed by evolution. I review evidence concerning the relation phylogenetic-biological and cultural-historical constraints in the development of domain-specific knowledge in two domains where there is considerable relevant evidence—naïve biology and naïve psychology.

*The biological domain.* In their work on the domain of biology, Hatano and Inagaki (2002) argue that skeletal principles are combined with (a) a mode of explanation (a naïve theory) of living things in terms of their similarity to human beings (personification) and (b) the idea that living phenomena are produced by a vital principle, as distinct from a purely chemical or physical force (vitalism).

These skeletal principles and modes of explanation operate in a three-way relationship among food and water, activeness and liveliness (actively taking in vital power from food), and growth in size or number (the ingestion of vital power produces individual growth and production of offspring). This mode of reasoning is assumed to be universal across cultures. Although the cross-cultural data are somewhat sparse, evidence in favor of this proposition has been found in Australia and North America, as well as in Japan where children exhibit such reasoning by 6 years of age (see Hatano & Inagaki, 2002, for more details).

The importance of participation in culturally organized practices for the development of skeletal biological knowledge is illustrated by Inagaki (1990), who arranged for some 5-year-old Japanese children to raise goldfish at home while a comparison group had no such experience. Those who raised goldfish soon displayed a far richer knowledge about the development of fish than did their counterparts who had not raised fish. They could even generalize what they had learned about fish to frogs. If asked, for example, "Can you keep the frog in its bowl forever?", they answered "No, we can't, because goldfish grow bigger. My goldfish were small before and now they are big" (quoted in Hatano and Inagaki, 2002, p. 272).

Additional evidence in favor of cultural involvement in the development of biological knowledge comes from the work of Atran (1998) on the growth of biological classifications. Atran once adopted this view with respect to biological categories: that the taxonomy of living kinds is universal because it is a product of "an autonomous, natural classification scheme of the human mind" (p. 567). However, at present Atran and his colleagues (Medin et al., 2002; Ross et al., 2003) acknowledge that factors such as density of experience and local ecological significance may contribute to the development of biological understanding beyond early childhood.

In some of their studies, Atran (1998); Medin et al. (2002), and Ross et al. (2003), asked children to judge whether a particular kind of entity shares a property with a target stimulus (if humans breathe, do dogs breathe, do plants breathe, do rocks breathe?). Only after the age of 7 do they begin to develop a theory that treats humans as one of many kinds of living things, a naïve biology.

To tease out the presumed foundations of biological classification, the experiment is done with nonsense syllables. For example, the child might be shown a picture of a wolf and asked "Now, there's this stuff called andro. Andro is found inside some kinds of things. One kind of thing that has andro inside is wolves. Now, I'm going to show you some pictures of other kinds of things, and I want you to tell me if you think they have andro inside like wolves do, OK?"

This questioning frame is then used with a number of "inferential bases" (in this case, human, wolf, bee, goldenrod, water) and a larger number of "target objects" that form each of

the taxonomic categories represented by the bases (e.g., raccoon, eagle, rock, and bicycle) in order to see if the subject believes that "andro" (or some other made up property) found in the base will also be found in the target object. Two questions were of primary interest: (1) Does inference of the presence of a property ("andro") decrease as the biological similarity of the target object decreases? (2) Do subjects appear to use human beings as a unique base of inference when judging biological similarity (Is anthropomorphism a universal feature of people's development of biological classification?)? This group of researchers conducted one such study with populations they term "urban majority culture children," "rural majority children," and "rural Native American (Menominee) children" between the ages of 6 and 10 years.

With respect to the first question, they found that the urban majority children generalized on the basis of the similarity of the comparison entity to human beings. But even the youngest rural children generalized in terms of biological affinity according to adult expert taxonomies, and all ages of Native American children and the older rural majority culture children manifested ecological (systems) reasoning as well. With respect to the second question, they found that urban children displayed a bias toward using humans as a base of comparison; but the rural children, and particularly the rural Menominee children, did not, contradicting claims of anthropomorphism as a universal precursor of folk theories of biology. Such results show that both culture and expertise (exposure to nature) play roles in the development of biological thought. Such evidence fits well with the views of Hatano and Inagaki (2002), as well as of Geertz (1973) that culturally organized experience is essential for completing the work of phylogeny.

The same experimental paradigm was used to study the development of biological induction among Yucatek Mayan children and adults (Atran et al., 2001). The adults decreased their inductions from humans to other living kinds and then to non-living kinds, following the pattern predicted by standard biological taxonomies. But when bee was the base, they often made inferences of shared properties not only to other invertebrates but also to trees and humans. According to Atran et al., this pattern of inference is based on ecological reasoning: Bees build their nests in trees and bees are sought after by humans for their honey. Adults often explicitly used such ecological justifications in their responses.

Most important with respect to the issue of cultural influences on development, the Yucatek children's responses were very similar to those of Yucatek adults. Whatever the base concept, inductive inferences decrease as the target moves from mammals to trees. And, like Yucatek adults, the children showed no indication of anthropomorphism: Inferences from humans did not differ from inferences beginning with animals or trees, and they did not appear to favor humans as a basis of inference. If anything, the children preferred dogs as a basis of inference, perhaps based on their affection for and familiarity with this common household pet. Again, the evidence speaks to the importance of culturally organized experience in the development of inferences in the domain of biology.

*Theory of mind.* "Theory of the mind" "refers to the tendency to construe people in terms of their mental states and traits" (Lillard & Skibbe, 2004). These authors go on to specify quite clearly the core idea: "If we see someone grimace, we might infer that he or she is disappointed, and if we see a man running toward a bus, we probably infer that he is trying to catch it." It is referred to as a theory because we use these inferences based on invisible entities (desire, beliefs, thoughts, and emotion) to guide our action and to predict the behaviors of others.

There is still disagreement about whether chimpanzees and bonobos display behaviors associated with making inference based on mental constructs. The situation is well described by the title of a recent article in this debate, "Chimpanzees have a theory of mind; the question is, which parts" (Tomasello, Call, & Hare, 2003). Elements of a theory of mind, or precursors to a theory of mind appear before the end of the first year of life. By the time they are 3, they can



engage in deception in collaboration with an adult. Children subsequently master the ability to reason about a false belief and mental representations. Later, their theory grows to encompass secondary emotions such as surprise and pride (see Cole, Cole, & Lightfoot, 2005, for a more detailed account of these developments.)

This sequential, developmental progression of theory of mind capabilities led quickly to the suggestion that such a theory is a mental module (Fodor, 1983; Leslie, 1994). It appears to be a kind of rapid, unconscious, inference-generating device. Links between the asocial nature of autistic children and modularity are used as evidence favoring the nativist argument. Were it to be the manifestation of a module, a theory of mind would be expected to develop universally, regardless of cultural circumstances, except in the case of biological insult.

Such claims quickly produce cross-cultural research to assess whether theory of mind is a universal developmental phenomenon. And in keeping with past experience, psychologists chose a task that could be administered easily and reliably and that differentiates theoretically important parts of the theory. The false belief task appeared to have those properties in a large sample of studies submitted to a meta-analysis by Wellman, Cross, and Watson (2001). Children first attribute desire to another, and only then belief (Wellman, 2002).

If theory of mind were modular, one would expect it to be impervious to cultural variation; it would develop on a universal time scale, much as does losing one's baby teeth. This expectation has not been tested for the full set of relevant age ranges, but there is reasonable consistency in how children deal with a key test of achieving a more adult-like form of thinking—the ability to attribute a false belief to another person and to predict their behavior based on one's inferences.

The result has been by no means a forgone conclusion. There is ample evidence from cultures around the world that there is enormous variety in the extent and ways that mental states and actions are spoken about and presumably how they are conceived (Lillard, 1998; Vinden, 1998). In terms of sheer number, English is at one extreme of the continuum, possessing more than 5,000 emotion words alone. By contrast, the Chewong people of Malaysia are reported to have only five terms to cover the entire range of mental processes, translated as *want*, *want very much*, *know*, *forget*, *miss*, or *remember* (Howell, 1984). Anthropologists have also reported that in many societies there is a positive avoidance of talking about other people's minds (Paul, 1995). At present, opinion about cultural variation using locally adapted versions of theory of mind tasks is divided (Lillard & Skimme, 2004). In an early study, Avis and Harris (1991) reported that children in rural Camaroons developed the ability to make inference on the basis of other's false beliefs. But in other studies, where people were less likely to talk in terms of psychological states in the head and of performance on the theory of mind, class was absent or partial (Vinden, 1999, 2002). But was performance poor because people lacked the vocabulary or inclination? Or was it that they could not describe an intuitive understanding in words?

To solve the problem of depending on a cultural group to possess large mental vocabularies, Callaghan et al. (nd) conducted a study that sought to avoid the issue of language by using a minimally verbal procedure where it was unnecessary to use difficult-to-translate words such as belief and emotion. They hid a toy under one of three bowls with two experimenters present. Then one experimenter left and the other induced the child to put the toy under a different bowl before asking the child to point to which bowl the first experimenter would pick up when she returned. Notice that the procedure uses language at the level of behavior (picking up a bowl) with no reference to mental terms, so the prediction that the absent experimenter would look where the toy had been when she left would indicate the presence of ability to think about others' beliefs without using the term.

Under these conditions, a large number of children 3 to 6 years of age were tested in Canada, India, Samoa, and Peru. Performance improved over age, with 4 1/2 to 5 years of age being the

point where 50% of the children performed correctly, and 5 1/2 to 6 years of age the point at which all the children responded correctly. Here is a case where careful standardization of the precise, same procedure, conducted in such a way that performance does not depend on the ability to communicate about mental language with people who do not use such terms, produces universality (in line with a modularity view). But note that this invariance taps into the most skeletal core of theory of mind behavior, devoid as it is of enrichment by the local vocabulary and absence of any information about how the children would respond if they were asked to reason about beliefs. Thus, for example, Vinden (1999) found that although children from a variety of small-scale, low-technology groups in Cameroon and New Guinea were able to understand how belief affects behavior, they had difficulty predicting an emotion based on a false belief.

Using a different task, in which children were asked to explain the bad behavior of a story character, Lillard and her colleagues (nd) found culture, regional, and class differences in whether they attributed the behavior to an internal, psychological trait or to external circumstances, a plausible element in any theory of mind that a person uses to predict and interpret someone else's behavior. Lillard and her colleagues make the important point that "cultural differences are usually a matter of degrees, of different patterns and frequencies of behaviors in different cultural contexts" (a view put forward early on by Cole, Gay, Glick, & Sharp, 1971). Children in all groups gave both kinds of responses, internal and situational; it was the frequency and patterns of use that differed. They attribute the average results in this case to language socialization practices in different communities, noting, for example, that low-socioeconomic-status (SES) children or rural children are more likely to have parents who make situational attributions of behavior and model this form of interpretation for their children, whereas high-SES and urban parents are more likely to use an internal model of interpretation that they embody in their interactions with their children. It has also been shown that children's theory of mind appears more rapidly if they have older siblings, who presumably provide them with extensive experience in mind-reading and mind-interpreting talk (Ruffman, Perner, Naito, Parkin, & Clements, 1998).

Both universality and cultural specificity appear to characterize the development of theories of minds. Given evidence that many (but not all) elements of a human theory of mind can be found, using suitable procedures, among chimpanzees (Tomasello et al., 2003), it should not come as a surprise that, when a carefully stripped down version of false belief tasks are presented to people of widely different cultural backgrounds, they perform the same; whereas cultural variations appear when language and explanation are made part of the assessment. This is the pattern of results that supports the idea of Hatano and Inagaki (2002) that an account of development as a combination of "skeletal biological constraints" plus "participation in cultural practice" would lead one to expect. Both phylogeny and cultural history are necessary contributors to the development of an adult mode of thinking about the thoughts and situations of oneself and others.

### **Middle Childhood: Schooling as a Historically Specific Cultural Activity**

One of the most pervasive changes in the cultural organization of children's lives is the new social arrangements that a wide variety of societies institute when their children reach the age of 5 to 7 years (Rogoff, Sellers, Pirrotta, Fox, & White, 1975; Sameroff & Haith, 1996). Given evidence of concomitant changes in biological, behavioral, and social characteristics of children sometime around their sixth birthday makes this transition an excellent candidate for a major biological-social-behavioral shift (Cole, Cole, & Lightfoot, 2005; Janowsky & Carper, 1995).

In modern industrialized societies, this is the period during which children begin formal schooling. But even in societies in which there is no schooling, marked changes in children's activities are likely to occur. For example, among the Ngoni of Malawi in Central Africa (when Read, 1960, worked there), the boys, who have been living and socializing with other children of both sexes and with their mothers, must leave the protection of the women, stop playing childish games, and move into dormitories where they must submit to male authority and begin to engage in at least rudimentary forms of adult work.

As characterized by LeVine and White (1986) the shift from schools in preindustrialized, agrarian societies to the dominant forms found in most contemporary industrialized and industrializing societies manifests the following set of common features: (a) the internal organization of the school to include age grading, permanent buildings designed for this purpose, with sequentially organized curricula based on level of difficulty; (b) the incorporation of schools into larger bureaucratic institutions so that the teacher is effectively demoted from "master" to a low-level functionary in an explicitly standardized form of instruction; (c) the re-definition of schooling as an instrument of public policy and preparation for specific forms of economic activity—"manpower development"; and (d) the extension of schooling to previously excluded populations, most notably women and the poor.

The dominant form of schooling adopted currently around the world is based on this European model that evolved in the 19th century and that followed conquering European armies into other parts of the world (see LeVine, LeVine, & Schnell, 2001; Serpell & Hatano, 1997, for a more extensive treatment of this evolution). However, locally traditional forms of enculturation, even of schooling, have by no means been obliterated, sometimes preceding (Wagner, 1993), sometimes co-existing with (LeVine & White, 1986), the more or less universal "culture of formal schooling" supported by, and supportive of, the nation state. Often these more traditional forms emphasize local religious and ethical values (Serpell & Hatano). Nonetheless, these alternatives still retain many of the structural features already evident in the large agrarian societies of the Middle Ages.

As a consequence of these historical trends, an institutional form, somewhat crudely identifiable as "Western-style" education, has an ideal if not a reality all over the world (the Islamic world providing one alternative in favor of adherence to religious and social laws, as written in the *Q'uran* [a word means "recitation" in Arabic]). The "Western-style" approach operates in the service of the secular state, economic development, the bureaucratic structures through which rationalization of this process is attempted, and exists as a pervasive fact of contemporary life. According to a survey conducted by UNESCO in 1998, by 1990 more than 80% of children in Latin America, Asia (outside of Japan), and Africa were enrolled in public school, although there are large disparities among regions and many children only complete a few years of schooling. Nonetheless, experience of what, for a better word, I am calling "Western-style" schooling has become a pervasive fact of life the world over (Serpell & Hatano, 1997).

When we contrast the experiences of children who spend several hours a day, 5 days a week, attending formal schools where literacy and numeracy form the core of the curriculum with comparable children who remain at home helping their mothers with cooking, child care, or gardening; or who accompany their fathers into the fields or forests to assist in farming, hunting, or making mortar bricks with which to build houses, certain prominent characteristics of the classroom experience stand out quite clearly (Cole, Cole, & Lightfoot, 2005; Serpell & Hatano, 1997).

1. The settings in which schooling occurs are distinctive in that they are removed from contexts of practical activity; students are trained in the use of mediational means such as writing and provided dense exposure to the conceptual content of various cultural domains, which are supposed to provide the means for later productive activity.

2. There is a peculiar social structure to formal schooling, in which a single adult interacts with many (often as many as 40 or 50, sometimes as many as 400) students at a time. Unlike most other settings for socialization, this adult is unlikely to have any familial ties to the learner, rendering the social relationships relatively impersonal.
3. There is a peculiar value system associated with schooling that sets educated people above their peers and that, in secular education, values change and discontinuity over tradition and community.
4. There is a special mediational skill, writing, that is essential to the activity of schooling. Writing is used to represent both language and nonverbal systems (e.g., mathematics).
5. All of these factors taken together result in a situation in which language is used in quite distinctive ways. Perhaps the best documented example of this distinction is the pattern of interaction in which teachers ask children to answer questions, the answers to which the teachers already know (Mehan, 1978).
6. On-the-spot assistance is considered inappropriate, in sharp contrast with learning-teaching interactions in many other contexts, emphasizing learning as an individual achievement (Serpell & Hatano, 1997).

This characterization of the distinctive nature of the activity settings associated with formal schooling does not do justice to all the differences between formal schooling and other socialization settings that might be considered educational in the broad sense (for more extended discussions see Greenfield & Lave, 1982; Schliemann, Carraher, & Ceci, 1997). However, it is sufficient to see that cultural discontinuities occurring during middle childhood present an especially attractive proving ground for testing theories about culture and cognitive development (for reviews, see Berry, Poortinga, Segall, & Dasen, 1992; Cole, 1990; Mishra, 1997). From the many specific developmental phenomena that might be chosen for illustration, I discuss two here: the development of logical operations, as interpreted by Piaget, and the development of memory, as interpreted by American cognitive psychologists. The topic of logic is of special interest because it assumes no special role of culture, but a universal pattern of age-related development. The topic of memory is interesting because it is one in which traditional theorizing hypothesized an advantage to cultures that do not use writing systems.

*Schooling and the development of logical operations.* For purposes of discussion, I assume the logical operations in question are those that form the basis for Piagetian theory within which it is assumed that concrete operations consist of organized systems (classifications, serial ordering, and correspondences) that allow children to think through the consequences of an action (such as pouring water from one pitcher into another) and mentally to reverse that action (see Birney et al., chap. 5, this volume). However, such operations remain limited in the sense that they proceed from one partial link to the next in a step-by-step fashion, without relating each partial link to all the others, and they must be carried out on actual objects. Formal operations differ in that all of the possible combinations are considered, they can be carried out without reference to actual objects, and each partial link is grouped in relation to the "structured whole" (Inhelder & Piaget, 1958, p. 16).

Early in his career, Piaget believed that there would be large cultural differences in cognitive development associated with the difference between primitive and technologically advanced societies (Piaget 1928/1995). However, when he began to address the issue of cultural variations and cognitive development in the 1960s, he did so with no reference whatsoever to his earlier speculations about traditional-conformist and modern-differentiated societies (Piaget, 1966/1974). Rather, he assumed that the sequence of cognitive changes that he had observed in Geneva was universal, and he restricted his attention to various factors that might modify the rate at which children progressed. Three potential cultural differentia were selected for

discussion (see LCHC, 1983, for more extended discussion). The key factor was the amount of operational exercise, the constant interplay of assimilation and accommodation that drives the system to higher, more inclusive, levels of equilibration. Piaget saw two major sources of such exercise. First, insofar as children are encouraged to ask questions, work together, argue, and so on, they will be provided opportunities to notice different aspects of the same situation and achieve additional operational exercise through the need to reconcile different points of view. Second, it is possible that through such social institutions as formal schooling, some societies provide greater opportunities for operational exercise by helping children to confront and think about their environment with greater frequency. However, he was dubious about the extent to which schooling actually accomplished this task, in light of an authority structure that discouraged equilibration.

So, it would seem that here is a case in which the cross-cultural method is well suited to answering important questions about culture and development more generally. However, the history of this line of research has proved as much a cautionary tale, demonstrating how difficult it is to conduct cross-cultural research as a way to answer the initial question. The difficulties confronting researchers are well illustrated by studies initiated by Greenfield and Bruner (Greenfield, 1966; Greenfield & Bruner, 1969). Working in rural Senegal, Greenfield and Bruner observed the steady development of conservation among schooled children and its absence among about half of the noneducated adults in their sample, leading naturally to speculation that schooling might actually be necessary for the development of concrete operations. This kind of result was picked up by Hallpike (1979), who claimed that adults in nonliterate societies, as a rule, fail to develop beyond preoperational thought (a conclusion hotly denied by, among others, Jahoda, 1980).

The crucial ambiguity in this research is similar to that which we have already encountered in the work on attachment: When a social context representing a test situation with particular meanings in one cultural system is imported into another, how do we know that the participants have understood the problem in the way the experimenter intended so that the results are comparable? For at least some of the research on schooling and the development of concrete operations in which unschooled children fail, results point clearly to the fact that the individuals who failed to conserve, also failed to enter into the framework of the problem as intended by the experimenter, although they complied in a surface way with instructions. Thus, for example, in the study by Greenfield (1966) among the Wolof of Senegal, it appeared that, unless children attended school, many failed to achieve conservation of volume. However, in a follow-up study, Irvine (1978) asked children to play the role of an informant whose task it was to clarify for the experimenter the meaning of the Wolof terms for equivalence and resemblance. In their role as "subject," these individuals gave nonconserving responses when liquid was poured from one beaker into another. However, in their role as "linguistic informants," they indicated that, although the water in one beaker had increased as a result of pouring, the amounts were the same (using different vocabulary to make the appropriate distinctions). Greenfield's own research also pointed to interpretational factors that interfere with conservation judgments; when she permitted Wolof children to pour water themselves, conservation comprehension improved markedly. Greenfield (1997) currently argues for differential interpretation of the tasks associated with different discourse modes as the explanation of differential performance.

Two additional lines of evidence support the conclusion that problems in interpreting the Piagetian interview situation, not a failure to develop concrete operations, account for cases in which cultures appear to differ. First, Siegal (1991) demonstrated that even 4- to 5-year-old children display an understanding of conservation principles but misunderstand what is being asked of them by the experimenter. Second, in a number of instances no differences of conservation performance between the schooled and the unschooled children from third-world

countries have been observed when the experimenter was a member of the cultural group in question (Kamara & Easley, 1977; Nyiti, 1978).

A number of years ago Dasen (1977a, 1977b) suggested that performance factors might interfere with the expression of concrete operational competence. As a consequence, he has advocated the use of training procedures that, in effect, teach people the framework within which they were expected to perform. If the failure to perform had come about because people were not familiar with the language game of the experiment, the training would remove the deficit. In many (but not all) cases, modest amounts of conservation training were sufficient to improve performance markedly; in those cases in which training failed, it remained an open question whether different kinds of training or more training would permit the hypothesized competence (Dasen, Ngini, & Lavalee, 1979). Although some ambiguities remain in this research, it appears most sensible to conclude that concrete operational thinking is not influenced by schooling; what is influenced by schooling is peoples' ability to understand the language of testing and the presuppositions of the testing situation itself.

The situation is less clear with respect to formal operations. Inhelder and Piaget (1958, p. 10) distinguished formal operations, which they believed emerge by age 12, from concrete operations, which are characteristic of middle childhood, in the following way:

Although concrete operations consist of organized systems (classifications, serial ordering, correspondences, etc.), [children in the concrete operational stage] proceed from one partial link to the next in step-by-step fashion, without relating each partial link to all the others. Formal operations differ in that all of the possible combinations are considered in each case. Consequently, each partial link is grouped in relation to the whole; in other words, reasoning moves continually as a function of a "structured whole."

In this view, formal operational thinking is the kind of thinking needed by anyone who has to solve problems systematically. This new ability would be needed by the owner of a gasoline station who, in order to make a profit, has to take into account the current price he pays for gasoline, the kinds of customers that pass by his station, the kinds of services he needs to offer, the hours he needs to stay open, and the cost of labor. Or it might apply to a lawyer, who lays out a course of action that takes into account a wide variety of complications and who develops a far-reaching scenario for her client.

At different times in his career, Piaget (1972) adopted different positions on the universality of formal operational thinking. Within his general framework, the acquisition of formal operations should be universal, reflecting universal properties of biological growth and social interaction. Nonetheless, he entertained the notion that "in extremely disadvantageous conditions, [formal operational thought] will never really take shape" (Piaget, p. 7). This is the position that Inhelder and Piaget (1958, p. 337) adopted in their monograph on formal operations: "The age of about 11 to 12 years, which in our society we found to mark the beginning of formal thinking, must be extremely relative, since the logic of the so-called primitive societies appears to be without such structures." In such statements we see explicit rejection of formal operations as a universal cognitive ability by Piaget, coupled with a claim about differences in development among cultures.

An alternative possibility is to envisage a difference in rate of development without any modification of the order of succession of the stages. These different rates would result from the quality and frequency of intellectual stimulation received from adults or obtained from the possibilities available to children for spontaneous activity in their environment. This position, which Piaget preferred toward the end of his life, led him to conclude that all normal people attain the level of formal operations. "However," he wrote, "they reach this stage in different areas according to their aptitudes and their professional specializations (advanced

studies or different types of apprenticeship for the various trades): the way in which these formal structures are used, however, is not necessarily the same in all cases" (Piaget, 1972, p. 10).

The cross-cultural evidence is unclear with respect to the universality of formal operations. Generally speaking, when Piagetian tasks have been used as the proper measure of formal operations, third-world peoples who have not attended school fail, and even those who have attended several years of formal schooling rarely display formal operations (see Berry, Poortinga, Segall, & Dasen, 1992, for a review and additional sources). However, if one allows for evidence of systematic manipulation of variables, even if less than "all and only" the relevant variables are considered, it is possible to find evidence of formal operations in all cultures where anyone has thought to inquire into them (see Cole, Cole, & Lightfoot, 2005, for examples and discussion).

Perhaps the most reasonable conclusion given present evidence is that formal operations conceived of as thinking in (mentally) closed systems of logical relations are to be found routinely only in areas of specially dense cultural practices and even then primarily where people have developed notation systems of some kind to help keep track of required manipulations. Because such notation systems are used only in restricted contexts even in modern, technologically sophisticated societies, Piaget's (1972) later speculations about the context specificity of formal operations would appear far more plausible than any notion of their universality across cultures or across contexts within cultures.

In light of research on the context specificity of the expression of Piagetian milestones (summarized in Cole, Cole, & Lightfoot, 2005, especially chaps. 9 and 12) it appears reasonable to extend Piaget's (1972) conclusions regarding formal operations downward in terms of age and to consider it a general principle that new developmental achievements will first appear in particularly auspicious environmental circumstances, and only gradually become more general as a function of children's increasing familiarity with a wide range of activities characteristic of their cultural milieu.

*Schooling and memory.* The basic expectation underlying research on culture and memory is quite different from that of work on logical operations. The mental operations that underpin performance in Piagetian conservation tasks are presumed to be universal, as they are believed to reflect the logic of everyday action in any culture. In the case of memory, there are three different sets of expectations growing out of three different academic traditions. The first, which traces its history to Bartlett (1932), assumes that memory processes are universal; memory will be effective insofar as the to-be-remembered materials fit preexisting mental schemes of the people involved. Bartlett pointed out that cultures are made up of organized collectivities of people with shared customs, institutions, and values. Strong sentiments form around culturally valued activities that guide people's selection of information from the environment. These socially determined psychological tendencies to select certain kinds of information to be remembered and the knowledge assimilated through their operation constitute the schemes on which reconstructive remembering processes operate. In content domains where the schemas are richly elaborated, recall will be better than that in domains that are less valued because there are fewer schemas available to guide recall. In domains in which there are no preexisting schemas to guide recall, Bartlett assumed that simple temporal order would serve as the organizing principle, resulting in rote recapitulation. In effect, Bartlett asserted that the processes of remembering are culturally mediated and universal. Cultural differences would reside in the differences in strong sentiments and associated social tendencies that provide the supply of widely used schemes.

A second tradition, which one finds most often represented among anthropologists and philologists, assumes that nonliterate cultures, precisely because they cannot depend on the

written word, will have highly developed powers of memory (Havelock, 1963; Levy-Bruhl, 1966; Rivers, 1901, 1903).

A third tradition, associated with the Soviet cultural-historical school, takes a dual-process approach to the question of culture and memory (Leontiev, 1981). In a manner similar to that of Bartlett (1932), the Soviet theorists assume that there is a natural kind of memory, akin to contemporary notions of incidental remembering, in which there is no special intention to remember and no special strategy involved; such memories may or may not be evoked later depending on how directly the subsequent experience is linked to the earlier one. In addition, there is a cultural, mediated kind of remembering that involves the creation of artificial stimuli (either externally in the form of the proverbial string tied to one's finger or the Inca "quipu"—see Ascher & Ascher, 1981—or internally, in the form of mnemonic strategies). This culturally mediated kind of remembering is intentional and has been greatly amplified by the invention and diffusion of writing systems and their information-storing sequelae. Crudely speaking, this line of theorizing leads to the expectation of universality for those kinds of events that people remember naturally, and cultural differences in remembering for those events that rely on culturally elaborated mediational means.

Some combination of the positions developed by Bartlett (1932) and the Soviet cultural-historical theorists seems to fare best in accounting for cultural variations in remembering. In an early study, Nadel (1937) compared recall of a story constructed to be familiar in form and general content to members of two Nigerian groups, the Yoruba and the Nupe. On the basis of prior ethnographic analysis, Nadel predicted that the Yoruba would emphasize the logical structure of the story, whereas the Nupe would emphasize circumstantial facts and details because these two emphases fit their dominant sociocultural tendencies and associated schemes. His results confirmed his expectations as did a follow-up study many years later by Deregowski (1970).

Turning to the question of the special forms of deliberate remembering and their associated mnemotechnic means, most research has used comparison between schooled and unschooled people of different ages as a method of investigation. The reason is obvious. School confronts children with specialized information-processing tasks such as committing large amounts of esoteric information to memory in a short time, and producing lengthy written discourses on the basis of memorized information. These, and similar tasks that are a routine part of schooling, have few analogies in the lives of people from societies in which there is no formal schooling. Hence, it is only to be expected that when confronted with such tasks, which carry within them highly specialized histories and associated practices, there would be marked differences in performance, and there are.

In line with these expectations, a number of studies show that schooling promotes the ability to remember unrelated materials (Cole & Scribner, 1977; Rogoff, 1981; Wagner, 1982). For example, when a list of common items that fall into culturally recognized categories is presented repeatedly to children who are asked to recall as many of them as possible in any order, those children who have completed 6 or more years of schooling remember more and cluster items in recall more than nonschooled comparison groups (Cole et al., 1971; Scribner & Cole, 1981). By contrast, schooling effects are generally absent in tests of recall of well-structured stories (Mandler, Scribner, Cole, & de Forest, 1980).

With respect to the methodological issues of conducting cross-cultural research, the data on schooling's effects on the development of memory (schooling being a manifestly non-universal form of the cultural organization of children's lives during middle childhood) raise some interesting questions about cross-cultural methods and the role of culture in development. In a somewhat different way from the research on attachment, the cross-cultural research on schooling evokes skepticism about the generality of the conclusions that can be drawn. The difficulty amounts to the following: Schooling effects turn up in those cases in which the



form of talk, the content, and the structuring of the content of various tests of memory are very similar to those found in school. How are we to determine if anything general about the development of remembering is indexed by these results? Presumably what we would need is to find some sort of remembering activity that is engaged in equally often by those who have been to school and those who have not and see if schooling changes the way that common remembering activity is accomplished. Such conditions are approximated in cases such as recall of stories, and in those cases there appears to be little in the way of schooling effects. Yet, it could be argued, those cases are "easy" because they provide a ready-made structure for remembering, and it is exactly the creation of such structures that is what schooling teaches (so-called metamemory strategies). So we need an everyday remembering task that requires the imposition of structure on unstructured, or covertly structured materials. But this kind of experience is special to schooling! It is a vicious circle that has yet to be broken.

In summary, there is little doubt that there are vast differences in children's experiences during middle childhood, and it seems altogether plausible that one should observe equally vast differences in the psychological characteristics of children during this age period. However, cross-cultural research using standard psychological tasks appears to be limited in the degree to which it can lay bare these differences in a scientific manner.

*Cross-generational studies of schooling effects.* The most convincing evidence for the psychological impact of schooling on development comes not from cross-sectional experimental studies of cognition, but from studies of the intergenerational effect of schooling on parenting practices of mothers and the effect of these practices on subsequent generations (LeVine & LeVine, 2001; LeVine, LeVine, & Schnell, 2001; Wertsch, Minick, & Arms, 1984). Based on research among rural Mexican women who migrate to the city, Levine et al. (2001) reported that education decreases the age at which mothers begin to consider their infants conversational partners as well as the age at which they are weaned from breast to bottle, which in turn is associated with a decrease in spacing among children and increased family size. Surveying this network of changes, LeVine and LeVine (2001, p. 268) conclude that the schooling of girls

... influences their beliefs and practices as mothers so as to provide their children with the kind of skill that confers an advantage in school: verbal ability. [Study of mother child interaction] indicates the kinds of microsocial processes through which the expansion of schooling through generations can change the beliefs and practices of an entire population. [Schooling] disseminates new models of verbal communication that reshape not only parental behavior but the life cycle in its adaptive dimensions.

Casting this broader research net indicates that new forms of activity involved in schooling engender not only restricted cognitive "tricks of the literate trade" but also a more general elaboration of various verbal skills and a "modernist" ideology associated with schooling and modern work that structure the enculturation environment of subsequent generations (see also Cole et al., 1971).

Unfortunately, the most positive thing that can be said about the cross-cultural work on schooling and ontogenetic development using tasks derived from models elaborated in the industrially advanced and schooled societies is that this line of research indexes the number of years of schooling and results in changed social skills and value orientations among women that affect the next generation about the general growth of cognitive functions. But this research has nothing to say. In effect, this line of research teaches us something about our own cultural practices that should make us more cautious in our claims about the cognitive benefits of schooling, independent of the value we place on the specific abilities that children acquire

there and the modes of life made possible. Very similar remarks apply to children's social behavior, where the data are, if anything, less compelling (see Price-Williams, 1985; Berry et al., 1992, for useful summaries).

### Adolescence and Emerging Adulthood

It is rarely remembered that when H. Stanley Hall (1904) launched the modern study of adolescence a century ago, he referred to an age period in the life cycle that spanned the ages from 14 to 25. Hall was adopting common usage of the term that came into English from French and Latin, referring to "a youth between childhood and manhood" (sic) (*Oxford English Dictionary*, 2nd electronic ed., 1989).

For many decades, scholarly interest labeled in time period identified by Hall (1904) as adolescence focus only on the earlier years in Hall's proposed age period, roughly from 13 to 18, so that "teenager" and "adolescent" became virtually synonymous terms. In 1970, Kenneth Keniston (1970) claimed that new socioeconomic circumstances, at least for the educated elite in advanced industrialized countries, justified the addition of a "new" stage of development, "youth" (ages 18–25) between adolescence as it was then understood and adulthood. A decade later, the period now accepted as adolescence was further subdivided into early and late "substages" with the inauguration of *The Journal of Early Adolescence*, which focused on the years between (roughly) 12 and 14 on the grounds that there were distinctive developmental processes when contrasted with later adolescence. More recently still, the period that Keniston identified as youth has been renamed "emerging adulthood" on the grounds that during its long history, the term *youth* was used (indiscriminately) to refer to children, adolescents, and young people in their later teens and early 20s. "Emergent adulthood," much like Keniston's concept of youth, was defined by Jeffrey Arnett (1998, p. 312) as "a period of development bridging adolescence and young adulthood, during which young people are no longer adolescents but have not yet attained full adult status," much as adolescence had been treated as a period bridging childhood and adulthood in earlier eras.

Despite differences in the way these age periods are treated in the scholarly literature, they share at least one commonality particularly relevant to the discussion of culture and development: In each case, the term *culture* is used in two distinctive ways. First, there is the question of cultural and historical variation in their manifestations and developmental phenomena in different societies. Second, there is the question of the extent to which the age period itself engenders its own distinctive culture (as in the term *youth culture* or *the culture of adolescence*) regardless of the particular society in which young people making the transition from childhood to adulthood find themselves.<sup>5</sup>

### Stages or Transitions?

One of the most famous examples of the use of cross-cultural research to determine the influence of culture on the dynamics of developmental change was Mead's (1928) research on the socioemotional and behavioral changes associated with adolescence in Samoa. Mead sought to determine the validity of claims by Hall, Freud, and others that high levels of emotional stress and intergenerational conflict were necessarily associated with adolescence (here used to cover both adolescence and emerging adulthood) "as inevitably as teething is a period of misery for the small baby" (Hall, 1904, p. 109). Mead concluded that the conflict and stress associated with adolescence is a cultural-bound phenomenon that is virtually absent in Samoa

<sup>5</sup>Note that this same distinction is also sometimes applied to middle and even early childhood, as in Iona and Peter Opie's classic work on children rhymes and games (Opie & Opie, 1997).

because Samoans take a more relaxed attitude toward adolescent sexuality. Many years later, her conclusions were disputed by Freeman (1983), who claimed that Mead's own data revealed signs of conflict that she had overlooked or misinterpreted. What neither Freeman nor Mead question is the existence among Samoans of a distinct developmental stage called adolescence, with associated distinct psychological and social characteristics. Yet a developmental stage corresponding to adolescence does not appear to have been recognized by the Samoans of 1920 who, despite having names for many different statuses associated with age, had no word corresponding to the popular North American notion of adolescence. This linguistic fact raises an interesting psychological question: There may be a universal transition from childhood to adulthood, but is there a distinctive stage of adolescence independent of cultural or historical circumstances? Or is there simply a transition period that is marked as a specific stage in particular sociocultural circumstances?

The stage-versus-transition discussion is important because it speaks to the basic question of the existence of, and sources of, discontinuity in development. As ordinarily used by psychologists, the terms transition and stage are not synonymous. A *stage* is a more or less stable, patterned, and enduring system of interactions between the organism and the environment; a *transition* is a period of flux, when the "ensemble of the whole" that makes up one stage has disintegrated and a new stage is not firmly in place. According to this set of ideas, can adolescence be considered a stage, even in societies that give it a name and treat it as one? Or is it, despite popular understanding, best considered a transition between childhood and adulthood?

*Is adolescence a universal part of the life cycle?* What is indisputable is that some time near to or following the end of a decade of life (the exact onset time depends greatly on nutritional and other factors), a cascade of biochemical events begins that will alter the size, the shape, and the functioning of the human body. The most revolutionary of the changes that occurs is the development of the entirely new potential for individuals to engage in biological reproduction (Katchadourian, 1989). These biological changes have profound social implications for the simple reason that reproduction cannot be accomplished by a single human being. As their reproductive organs reach maturity, boys and girls begin to engage in new forms of social behavior because they begin to find the opposite sex attractive. According to many psychologists, some combination of biological changes in brain and changed social circumstances also give rise to new cognitive capacities.

*The evidence from phylogeny and cultural history.* Arguments for the universality of adolescence are sometimes made on the basis of studies of the fossil record in the hominid line, and sometimes on the basis of similarities to non-human primates, often chimpanzees (Bogin, 1999; Pusey, 1990). On the basis of an examination of the fossil record, Bogin concluded that the emergence of a distinctive stage of life between childhood and adulthood occurred with the evolution of *Homo sapiens* from *Homo erectus*, approximately 125,000 years ago. Bogin (p. 216) argued that "adolescence became a part of human life history because it conferred significant reproductive advantages to our species, in part by allowing the adolescent to learn and practice adult economic, social, and sexual behavior before reproducing."

The evidence concerning primates is sometimes based on biological criteria (such as the presence or absence of a growth spurt), sometimes on the basis of behavioral data such as changes in social behavior. Although Bogin (1999) argues that there is no event corresponding to the adolescent growth spurt among chimpanzees, so that adolescence is a peculiarly human part of the life cycle, others (Leigh, 1996) argue that there is a close analogy among other primates in terms of weight spurts. Pusey (1990) argues that changes associated with sexual maturation combined with social evidence (decreased association of males with their

mothers and increased association with older males, decreased play of both sexes with juveniles, and increased aggressive behaviors) all point toward the presence of adolescence among chimpanzees (see also Kraemer, Horvat, Doering, & McGinnis, 1982; Walters, 1987).

Schlegel and Barry (1991), focusing on variation across human societies, cite evidence for the present presence of adolescence among non-human primates as a starting point for their claim of adolescence as a universal stage of development among humans (after all, chimpanzees share a common ancestor with *Homo sapiens*).<sup>6</sup> They then go on to provide data from the Human Area Files, a sample of 186 societies, where they claim that there is evidence that a socially marked period of adolescence is a human universal.

Consistent with this line of reasoning, Bloch and Niederhoffer (1958) suggest that one of the universal features shared by the notion of a "transition to adulthood" and "adolescence" is a struggle for adult status. In all societies, the old eventually give way to the young. It is not easy for those in power to give it up, so it is natural to expect that, to some degree, the granting of adult status, and with it adult power, will involve a struggle. A good candidate for a second universal feature of the transition from childhood to adulthood is that it arouses tension, because children, who have long identified strongly with members of their own sex while avoiding contact with the opposite sex, must become attached to a member of the opposite sex. But although such evidence is sufficient to indicate a period of transition in which individuals from different generations must re-adjust their relations with each other, it does not indicate the presence of a distinct stage, as this term is generally used.

Sometimes the argument for the universality of adolescence as a stage of development is based on historical evidence, such as the following:

The young are in character prone to desire and ready to carry any desire they may have formed into action. Of bodily desires it is the sexual to which they are most disposed to give way, and in regard to sexual desire they exercise no self-restraint. They are changeable too, and fickle in their desires, which are as transitory as they are vehement. . . . They are passionate, irascible, and apt to be carried away by their impulses. . . . They regard themselves as omniscient and are positive in their assertions; this is, in fact, the reason for their carrying everything too far. . . . Finally, they are fond of laughter and consequently facetious, facetiousness being disciplined insolence. (Kiell, 1964, pp. 18-19)

This description has a certain timeless quality to it. It could be a description of members of a high school clique in almost any modern city or town, or it might be a description of Romeo and his friends in medieval Verona. In fact, it is a description of youth in the fourth-century B.C. Athens, written by the philosopher Aristotle. Combining such historical evidence (Gillis, 1974) with similar accounts from various nonindustrialized societies around the world today (Schlegel, 2000) leads naturally to a belief that the experience of adolescence is universal. However, the data supporting the universality of adolescence as a unified stage are by no means unequivocal.

First, reverting to the primate literature, it is striking that the evidence for marked shifts in social behavior is more frequent for *males* than for females. The same appears true when we turn to Aristotle's description of adolescents and in similar descriptions from other ancient societies (Kiell, 1964): The people being talked about are most often males. Moreover, they were urban males of the monied classes who had to undergo a period of extended training, often including formal schooling, which created a delay between puberty and full adult status. Generally speaking, women and most members of the lower classes did not undergo such specialized training, and there is a corresponding lack of evidence that they were not included

<sup>6</sup>This evidence, however, is difficult to square with Bogin's (1999) claim that evidence of an adolescent growth spurt and other anatomical changes does not occur until the advent of *Homo sapiens*.

in the category of adolescents. Among the upper classes in Athens, for example, girls were often married and sent to live in their mother-in-law's house before they had gone through puberty and did not go for institutionalized formal training to be considered adults.

Moreover, although some of the evidence from other cultures may support the idea that the transition to adult status is universally fraught with anxiety and uncertainty, it provides equally strong evidence that adolescence, as the term is used in modern industrialized societies, exists only in particular cultural circumstances. When it exists it seems more like a transition than a stage, and it is not necessarily accompanied by the kind of conflict and anxiety said to exist in modern, industrialized societies (Whiting, Burbank, & Ratner, 1986).

Among the Inuit Eskimos of the Canadian Arctic at the turn of the century, for example, special terms were used to refer to boys and girls when they entered puberty, but these terms did not coincide with Western notions of adolescence (Condon, 1987). Young women were considered fully grown (adult) at menarche, a change in status marked by the fact that they were likely to be married by this time and ready to start bearing children within a few years. Young men were not considered fully grown until they were able to build a snow house and hunt large game unassisted. This feat might occur shortly after the onset of puberty, but it was more likely for boys to achieve adult status somewhat later because they had to prove first that they could support themselves and their families. In view of the different life circumstances of these people, it is not surprising that they developed no special concept corresponding to adolescence that applied to boys and girls alike; such a concept did not correspond to their reality.

When we consider the actual organization of life in ancient Greece, Europe in the Middle Ages, or in contemporary nonindustrialized societies in terms of the role of culture in development, we are reminded that the process of biological reproduction by itself is insufficient for the continuation of our species. As indicated by Bogin (1999), Schlegel (2000), and others who argue for the universality of adolescence among humans, it must be complemented by the process of cultural reproduction (education, broadly conceived), which ensures that the designs for living evolved by the group will be transmitted to the next generation. According to this view, adolescence will exist as a distinctive period of life only in specific cultural or historical circumstances (Aries, 1962; Demos & Demos, 1969).

For example, the Aka spend most of the year in the rainforests of the Central African Republic and the Northern Congo where they live in bands of 25 to 35. There they engage in hunting which is carried out by entire families. As reported by Bentz (2001), they spend most of their days in the presence of their parents. They also report that they are extremely close to their siblings and peers, creating what Bentz refers to as an intense intimacy, closeness, and bonds of tenderness and affection.

Aka girls build their own houses when they are 9 to 10 years old, often at the first signs of puberty, but well before they are likely to bear children, whereas the boys move into what Bentz (2001) refers to as a "bachelor's pad." Girls may begin to engage in sexual activity at this time, but when and who they marry is a matter for them to decide, sometimes earlier, sometimes later. As they choose, they may or may not take their parents' advice on a suitable husband.

The result of these arrangements, in which male and female cooperate in both hunting and child care, according to Bentz (2001), is a pattern that combines presumably antithetical characteristics when viewed from a North American perspective. There is clearly a period of transition between childhood and adulthood, but it does not result in a conflict between autonomy and closeness to one's parents, or in alienation among generations but rather in additional autonomy within the family unit combined with closeness to peers and minimal levels of conflict. In this society, it appears that adolescence comes closer to a process of transition than to a distinctive stage marked off from those that proceed and follow it.

On the other hand, other societies in which technology and extended periods of formal education are absent may still produce conditions in which adolescence appears to exist for at least males or females. Such an example is provided by the Ache, a forest-dwelling, hunter-gatherer group in the forests of Paraguay (Hill & Hurtado, 1996). Until they came in contact with modern cultural institutions, the Ache lived in small groups and moved so frequently that they did not set up permanent settlements in the forest. At the age of 9 or 10, before reaching menarche, roughly 85% of Ache females had experienced sexual intercourse with at least one adult male, and many married before puberty. Nevertheless, even at such a young age, Hill and Hurtado report that "their behavior would be aggressively flirtatious but sexually coy to the point of causing frustration anxiety among most of their suitors. . . ." The major activity of girls at this time is walking around in small groups laughing and giggling and carrying on in any manner that will attract attention (p. 225). Boys, who went through puberty later than did girls exhibited behaviors reminiscent of Western teenage boys: "In particular, males of this age appear extremely insecure and often engage in obnoxious or high-risk behavior in order to gain attention" (Hill & Hurtado, p. 226).

My own conclusion is that although the biological changes associated with the ability to reproduce are universal, there is enormous variability in the extent to which the transition to adulthood can be considered a stage in the accepted sense of that term. Among human beings, the capacity for biological and cultural reproduction is intertwined in ways that continue to defy simple generalizations.

*Is there a distinctive adolescent and youth culture?* Without seeking to resolve the residual uncertainties about the universality of adolescence as a stage in the life cycle, there is widespread agreement that currently in many parts of the world a combination of increased levels of schooling, modern communications media (including rapid transportation, satellite-mediated television, and computer networking) accompanied by isolation of age-graded cohorts from adults, and a decreasing age of puberty owing to changing nutritional conditions are extending the social conditions that give rise to adolescence and youth as socially marked age categories (Schlegel, 2000).

These same conditions have given rise to an identifiable set of beliefs and practices, often associated with specific styles of dress, language use, dances, music, and games, that bespeak an age-graded "design for living," which can reasonably be identified as adolescent, or youth, culture. This culture simultaneously gives expression to and reinforces a shared sense of cultural identity.

For example, in the cross-cultural survey by Schlegel and Barry (1991) referred to earlier, in more than 80% of the societies sampled, there was evidence of distinctive age markers of adolescence including distinctive styles of clothing, hair style, or body decoration that set them off as a marked social category. Schlegel (2000) argues that adolescent and youth cultures provide a means of social bonding through manifestation of common tastes and values. Such youth culture is a means for experimenting with one's place among one's peers in relation to the adult society they are expected to become a part of, yet which simultaneously keeps them from full membership.

Of particular interest in the past decade has been the diffusion of adolescent and youth cultures as part of the world transformation referred to as *globalization* ("the rapidly expanding domination of all forms of culture by market forces and the penetrating power of communications" [Fass, 2003, p. 694]). The globalization of adolescent culture is of special interest because thus far the process has been largely one of the importation of highly commercialized and sexualized cultural products from the United States and Europe to other countries with very different cultural values (Schlegel, 2000, gives the example of Chinese adolescents copying the dress styles of American and European age-mates and Moroccan teenage girls watching

*Beverly Hills 90210*). Such activities evoke the strong disapproval of adults who consider such behavior and media fare not only as indecent but also as a form of cultural imperialism (even in the societies that give rise to such cultural phenomena in the first place). As a consequence, in its globalized form, adolescent culture markedly increases the grounds for intergenerational conflict, even in societies where such conflict has traditionally been minimal.

As anthropologists and social historians are quick to point out, the diffusion of cultural products and practices is as old as humanity itself, and there is ample evidence that the concerns evoked by contemporary globalization of adolescent and youth cultures find their counterpart in American history of earlier eras when immigrants brought their cultural practices to the "new world" (Fass, 2003). Sometimes these new cultural elements have been rejected and forgotten, at other times imitated and adopted, leading to major cultural changes in the receiving society and at other times modified to create new, hybrid cultural forms. The fear of many in the current historical circumstances is that instead of cultural diversity in the nature of adolescent and youth cultures, what is happening is the homogenization and commercialization of such cultures that will spill over and create a broader homogeneity based on Euro-American values, including patterns of consumption and gender relations. Such prognostications may or may not be justified. We are too close to the present situation to be able to judge with any certainty the outcome of current globalized intercultural interactions that find a ready vehicle in adolescent and youth cultures. What does appear certain is that the pace of technological change will continue to accelerate and proliferate making such interactions inevitable. But what kind of societies will emerge as a result, and what cultural forms will become dominant as a result, only time will tell.

*Adolescent and youth in periods of rapid social change.* An issue distinct from, but related to, concerns about the globalization of Euro-American adolescent and youth cultures is the impact on adolescents of rapid social change under conditions where one social group clearly dominates the other. There is evidence to show that such periods can be particularly destructive of development in the transition from childhood to adulthood.

Chandler, Lalonde, Sokol, and Hallett (2003) document the cause for such concern in their study of suicide among 15- to 24-year-old First Nation young people in British Columbia, Canada. For the period from 1987 to 1992 the suicide rate among First Nation adolescents and youth was 5 times greater than that for all other ethnic groups combined.

Chandler and his colleagues (2003) argue that First Nations young people are especially at risk for suicide owing to a combination of repressive policies pursued by the government that had deprived them of their land, their fishing rights, their language, their right to self-governance, and control over their own cultural institutions. Combined with poor educational facilities and job discrimination, these conditions could, indeed, produce a sense of hopelessness at a time of life when, according to the normative characterization of adolescent and emerging adulthood in most textbooks, it should be a period of adult identity formation.

Chandler and his colleagues (2003) hypothesized that the exceedingly high suicide rates among this population were the result, in part, of a failure to solve the problem of self-continuity (the understanding of oneself as the same person through time despite obvious changes in size, appearance, and knowledge). They noted a cultural difference in the ways that Canadians of European origin and First Nations people accounted for self-continuity. They used comic book renditions of classical stories where people went through marked changes during their lifetime, such as Scrooge in Dicken's *A Christmas Carol*, and asked their subjects to tell about their own sense of self-continuity. They found that the dominant mode of explanation among European-origin adolescents was self-continuity over time as the result of some essential feature such as their fingerprint or DNA. By contrast, First Nations adolescents provided narrative accounts of self-continuity based on narratives that acknowledged change but found continuity in a story of

how various events in their life produced a sequence of changes in them without negating the fact that they were the same person. This narrative construction of self-continuity, Chandler and his colleagues argue, is particularly vulnerable to conditions of cultural destruction, because the narrative tradition on which such self-construals were based was itself destroyed, leaving adolescents with a profound loss of a sense of self-continuity.

Evidence in support of this hypothesis rested on the observation that although the average rate of adolescent and youth suicide among First Nations young people was far higher than the national average, there was even greater variation among the different First Nation tribal councils—a ratio of almost 300 to 1 differentiated the tribal group with the highest and lowest levels of suicide. They identified “cultural continuity” factors that distinguished the different tribal groups: self-governance, fighting legal battles to win back tribal lands; and degree of control over their own health facilities, cultural facilities, and police and fire personnel. They then calculated the likelihood of suicide as a function of the number of such “cultural continuity” factors present in each group. Their results were clear-cut. Those with 0 to 2 such factors had a suicide rate at least double the groups with 3 to 5 such factors.

There is a great deal more to this study than can be summarized here. The results, although demonstrating clear differences in cultural forms of establishing self-continuity and linking the number of cultural continuity factors to suicide rates, only inferentially implicate the use of narrative strategies of self-continuity as a causal factor in suicide rates. Nonetheless, this study represents a convincing demonstration that cultural discontinuities in a period of rapid social change endanger a successful transition from childhood to adulthood, implicating cultural modes of thought in the process of adolescent and youth development.

### CONCLUSION: INCLUDING CULTURE IN DEVELOPMENT

At the outset of this chapter, I note the seeming paradox that, although there is consensus that the use, creation, and transmission of culture is a unique characteristic of our species, there is little discussion of culture's role in human development. Having provided some background on various approaches to the concept of culture and its inclusion in developmental-psychological research, we are in a better position to understand why culture receives relatively little attention among psychologists and what sorts of changes in theory and methodology would be necessary to bring about a major change in the status quo.

To begin with, there is an instructive parallel between the difficulties of conducting convincing cross-cultural research in the late 20th century and the dispute between Boas (1911) and evolutionary anthropologists such as Tylor (1874) in the 19th century. Recall that Tylor believed he could rank cultures with respect to level of development using a standardized criterion such as “extent of scientific knowledge” or “complexity of social organization.” Boas demurred, insisting that the very meaning of these terms shifted with its cultural context and that heterogeneity of functioning depending on the domain studied had to be taken into account. Like Tylor, cross-cultural psychologists who use standardized instruments that they carry from place to place can rank people with respect to developmental level. However, as Boas would have predicted, their conclusions are suspect because the meaning of their criterial instruments changes with its cultural context. Eventually they must engage in local ethnographic work to establish the relation of their testing procedures to the local culture and the kinds of experiences that people undergo over their life spans. It is a giant undertaking, for which there are only a few extended examples on which to draw.

Nor is success guaranteed. Some critics of the cross-cultural enterprise claim that it will fail in principle. For example, Shweder (1990, pp. 11–12) wrote: