CHAPTER 1

LATER LANGUAGE DEVELOPMENT: AN OVERVIEW

“As long as one talks, one must keep on learning how to talk.”
—Mildred Berry (1969, p. 185)

This book is about language development in school-age children (ages 6–12 years), adolescents (ages 13–19 years), and young adults (ages 20–30+ years). In most Western countries, school-age children attend elementary or primary school, while adolescents attend middle school, junior high, or high school. Young adults typically attend college, university, or vocational school, and many of them are employed. The research reported in this book indicates that during these years language continues to develop in the areas of syntax, semantics, reasoning, discourse, and pragmatics. Studies also indicate that it is difficult to identify any point in the life span when the process is truly complete. Given the protracted and continuous nature of this process, “language through the life span” is the philosophy expressed throughout this book.

Mildred Berry, a pioneer in the study of child language, recognized many years ago that language continues to develop beyond the preschool years (Berry, 1969). At the time when she wrote about this topic, however, detailed descriptions of the linguistic attainments of school-age children, adolescents, and young
adults were not available, and no cohesive overview of later language development had been published. This book, first published in 1988 as a multiauthored edition, was an early effort to provide such an overview, with a focus on children and adolescents ages 9 through 19 years. In 1998, an expanded, single-authored edition was published, extending the age range to include younger school-age children as well as adolescents and young adults (ages 6–20+ years). Recently, a great deal of research has been published, and much of it has been incorporated into this third edition, which covers an even wider age range (ages 6–30+ years).

For example, new information on second language learning, the development of derivational morphology, word definition, verbal reasoning, figurative language, expository discourse, reading comprehension, and written expression has been added.

**Historical Perspective**

During the 1960s and 1970s, researchers in language development began to examine with intensity a broad range of linguistic attainments that occur during infancy and early childhood. Studies of phonological, syntactic, morphological, and semantic development were frequently conducted (e.g., Bellugi, 1965; Bloom, 1970; Bowerman, 1973; Braine, 1963; R. Brown, 1973; Cazden, 1968; E. V. Clark, 1973; De Villiers & De Villiers, 1973a, 1973b; M. L. Edwards, 1974; Ervin, 1964; Ervin-Tripp, 1974; Ingram, 1974; K. Nelson, 1973; Slobin, 1968), a pattern that continues to the present (E. V. Clark, 2003). Although some studies of later language development were conducted during those early years (e.g., Chomsky, 1969; Cromer, 1970; Hunt, 1970; Kessel, 1970; Loban, 1976), they were comparatively few in number, and the topic of later language development did not receive broad attention. Since the 1980s, however, interest in this area has escalated, in part because the linguistic bases of reading and writing have become well recognized (Catts & Kamhi, 2005; Chall, 1983; Perera, 1984).

Since the late 1990s, language development in adults has become a topic of growing interest as investigators have sought to learn more about the protracted nature of this process (e.g., Nippold & Duthie, 2003; Nippold, Hegel, Sohlberg, & Schwarz, 1999; Nippold, Hesketh, Duthie, & Mansfield, 2005; Nippold, Uhden, & Schwarz, 1997; Nippold, Ward-Lonergan, & Fanning, 2005). Studies of later language development in non-English languages, including French, Hebrew, Italian, Spanish, and Swedish, have also become more common (e.g., Berman, 2004; Blum-Kulka, 2004; Cacciari & Levorato, 1998; Jisa, 2004; Khorounjaia & Tolchinsky, 2004; Levorato & Cacciari, 1999; Pacton & Fayol, 2004; Ravid,

Although later language development has become a topic of expanding international interest (Berman, 2004), research has traditionally emphasized the linguistic attainments of young children, and to a large extent, it continues to do so. Evidence of this continued focus on early language development can be seen in the programs of recent research conferences, such as the Child Language Seminar in 2004 and the Boston University Conference on Language Development, the Stanford Child Language Research Forum, and the meeting of the International Association for the Study of Child Language, all in 2005. Obviously, research in early language development is extremely important, and children must establish their primary language before they begin their formal educations. Language development beyond this point is equally important because it contributes substantially to academic and vocational success and to personal satisfaction throughout the life span.

Nevertheless, given the traditional emphasis on early language development, some readers may question the possibility of growth during the school-age years. Moreover, the view that language continues to develop into adolescence and beyond may be especially difficult to accept. Some readers may defend their belief that language development is complete by the time a child enters kindergarten because their ears tell them so.

Consider the situation where two young sisters, ages 2 and 5 years, are playing with dolls, and their father, a psychology professor, is secretly making an audio recording of their conversation. The next day, the professor plays the recording for his undergraduate students in an introductory course in language development. After the students listen to the recording, they are asked to indicate which child is older and to explain in detail how they know this. This exercise will not be difficult for most of the professor’s students because of the obvious differences in the girls’ oral expression in all domains, including phonology, syntax, morphology, semantics, and pragmatics. For an advanced course in language development, the professor makes another secret recording, but this time it involves a conversation between his 5-year-old daughter and her 8-year-old cousin, who are talking about family pets. After listening to this recording, the professor’s graduate students may find it difficult to determine which girl is older. As one of them explains, “Both girls speak clearly and without grammatical errors, use complex sentences, contribute their own thoughts, and take turns in the conversation.”

When markers of language development are identified in the spoken mode, it is obvious that the 5-year-old is more advanced than the 2-year-old, given the
rapid changes that occur in spoken language development during the preschool years. When the 5-year-old is compared to the 8-year-old, however, the differences are rather subtle, especially in conversational discourse. At the same time, when the two girls engage in expository discourse as they attempt to explain the rules of chess to a visiting neighbor child, it becomes clear that the 8-year-old, who uses longer sentences with multiple subordinate clauses (e.g., “If your pawn moves forward two spaces and my rook is next to your pawn, my king will be in check, which means I’ll lose”), is more advanced in her spoken language development than the 5-year-old, whose ability to explain the rules of chess lags far behind. In addition, when we “broaden” the markers of development to include written forms of language in addition to spoken forms, it becomes clear that the 8-year-old, who reads fables to her younger siblings and writes imaginative stories on her home computer, is far ahead of the 5-year-old in her language development. An example of such a story, written for a school assignment by an 8-year-old girl, is contained in Figure 1.1. It is only when the professor reveals these additional pieces of information about spoken and written language that the students will appreciate the differences between the two older girls.

**Critical Period Hypothesis**

Even if some readers concede that language continues to develop during the school-age years, they still may subscribe to the notion that the process is complete by the onset of puberty. The roots of this belief run deep. Many years ago, the psychologist Eric Lenneberg (1967) set forth his influential theory concerning the existence of a critical period of language acquisition, known as the critical period hypothesis (CPH). Specifically, he argued that children are maximally ready to acquire language between the ages of 2 and 12 years, a condition resulting from biological maturational processes that regulate the onset and timing of growth. During this developmental window, children are most receptive to linguistic input from their environments and can readily master the phonology, syntax, morphology, and semantics of their native tongue. According to the CPH, language is well established by the age of 5, when children are speaking in complex sentences, having passed through a series of predictable milestones during infancy (cooing, babbling, single words) and early childhood (phrases, short sentences). Beyond age 5, further refinements in grammar occur and lexical knowledge continues to expand. With the onset of puberty, however, the capacity for language acquisition declines due to the completion of brain organization and the resulting loss of neural plasticity. According to the CPH, if an
individual has not acquired a primary language by late childhood, he or she will never do so.

According to Lenneberg (1967), puberty also marks the time when it becomes more difficult for people to acquire a second language. Specifically, he hypothesized that the end of the critical period marks the beginning of a time when the capacity to acquire the phonology and syntax of a first or second language becomes increasingly difficult. It is important to note that he did not argue that all aspects of language acquisition become restricted, conceding that lexical development may continue throughout the life span. In addition, he claimed that although acquisition of a second language becomes more difficult by the early teens, it is not impossible even for adults to learn to speak a second language, although it requires “conscious and labored effort” (p. 176). This was
said to contrast with the conditions of early childhood, a time when second-language learning is much easier.

Was Lenneberg (1967) correct? Is it true that language is well established in typically developing children by the age of 5? Does subsequent growth in language consist primarily of refinements in grammar and expansions of the lexicon? Is it indeed more difficult to acquire a second language upon reaching adolescence? To answer these questions, one must consider what has been learned about first- and second-language acquisition since the 1960s. It is important also to remember that Lenneberg’s hypothesis pertained to oral language development, not to reading and writing. At the time that he formulated the CPH, reading and writing were not widely considered to be linguistic processes, and research in language development had focused primarily on grammar and the lexicon. The study of pragmatic development did not get under way until the mid-1970s (Bates, 1976), and it was not until the 1980s that the linguistic bases of reading and writing became widely known (Chall, 1983; Perera, 1984). Research in these areas intensified during the 1990s and continues to the present, as described in this book.

First-Language Acquisition

There is no question that by age 5, most children have acquired a great deal of language and are highly competent speakers. As shown in the Appendix, most 5-year-old children routinely produce sentences that contain relative, adverbial, and nominal clauses; multiple embedding; and secondary verbs, such as infinitives and gerunds, and they are able to conjoin clauses using coordinate and subordinate conjunctions to produce compound and complex sentences (Paul, 1981).

With a mean length of utterance (MLU) exceeding 6.0 morphemes, the typical 5-year-old child has nearly mastered Brown’s grammatical morphemes and has command of wh-questions, negation, and past, present, and future tense verb forms, which are reflected in comments about topics beyond the “here and now” (“Can we make cookies today after lunch?”; J. F. Miller, 1981). Pragmatically, the child at this age exhibits many adult-like behaviors, which include participating in conversations, taking turns, staying on topic, asking and answering questions, and sharing personal anecdotes (E. V. Clark, 2003; Preece, 1987). Phonologically, the speech of a typical 5-year-old is intelligible more than 90% of the time, although the child may continue to struggle with the production of certain consonants, consonant clusters, and polysyllabic words (Ingram, 1989). The semantic development of children is similarly impressive, reflected in their knowledge of more than 10,000 different words (E. V. Clark, 2003) and
their emerging ability to comprehend jokes, riddles, and figurative expressions (McGhee, 1979; Nippold, 1985). In addition, children's literacy development is emerging, in that many 5-year-olds can read and write a few words, recite the alphabet, identify words that rhyme, and comprehend simple stories that are read to them. This is particularly true of children whose home environments value and support literate activities (Garton & Pratt, 1989).

Given this level of language development in a typical 5-year-old child, it is easy to see how one might assume that the process of language acquisition is virtually complete. As reported throughout this book, however, substantial growth continues to occur during the school-age and adolescent years, and well into adulthood—changes that surpass the grammatical refinements and lexical increases proposed by the CPH.

Second-Language Acquisition

It is commonly believed that early childhood is the optimal time for learning a second language and that as children grow older, it becomes increasingly difficult to become bilingual (Fromkin & Rodman, 1988; H. J. Neville, 2005; Pinker, 1994). As language scientist Steven Pinker has argued, adolescents and adults can learn a second language (L2) as long as they are adequately motivated, receive enough instruction, and practice it sufficiently. Pinker claimed, however, that most individuals will not master an L2, particularly its phonology and grammar, and most of them will be unable to speak it without considerable conscious effort and a lingering foreign accent. Consistent with Lenneberg (1967), Pinker argued that these difficulties reflect the existence of biological constraints on language acquisition that occur with the onset of puberty. This perspective, rooted in the CPH, is frequently used to support the argument that bilingual education programs should be implemented as early as possible (Hakuta, 2001; Neville, 2005).

Recent research has confirmed the ease with which babies and toddlers can become bilingual. Psychologist Fred Genesee (2002, 2004a), an internationally known authority in bilingualism, reported that given adequate exposure to two languages during the first year of life, children can master the phonology, vocabulary, syntax, and pragmatics of both languages without experiencing a delay or compromise in learning either language. In his view, “there are no neurocognitive limitations on infants’ innate capacity to acquire two languages simultaneously” (2004a, p. 279). In further describing this condition of simultaneous bilingualism, Genesee stated, “Key milestones in phonological, lexical, syntactic, and pragmatic development occur within the same age range for bilingual children as for monolingual children” (2004a, p. 279).
Although it is clear that young children can become bilingual, what are the possibilities for older children, adolescents, and adults? Not surprisingly, differing opinions surround this question. Some investigators have argued that older learners have greater difficulty becoming bilingual because of the existence of biological constraints (i.e., lack of neural plasticity) that affect the language-learning system, especially after puberty (J. S. Johnson & Newport, 1989, 1991; Neville & Bavelier, 1998; Newport, 1990; Weber-Fox & Neville, 1996, 1999, 2001). Other investigators are more optimistic, arguing that even late learners (adults) can attain high levels of proficiency in a second language when appropriate instructional and environmental conditions exist (e.g., Bialystok & Hakuta, 1999; Flege, Yeni-Komshian, & Liu, 1999; Genesee, 2004b).

In a study in which the results supported the existence of biological constraints on second-language learning, Weber-Fox and Neville (2001) employed event-related brain potential (ERP) techniques to compare the language processing abilities of 53 bilingual Chinese–English speakers with those of 10 monolingual English speakers. All of the study participants were adults, who ranged in age from 18 years to 36 years. The authors grouped the bilingual speakers according to their age when they moved to the United States and had begun to learn English: 1 year to 3 years, 4 to 6 years, 7 to 10 years, 11 to 13 years, and 15+ years. They asked each participant to read a set of 120 sentences silently and to indicate if each sentence made sense. Half of the sentences were semantically appropriate (e.g., “December is the last month of the year”), and half were semantically anomalous (e.g., “They placed ads in the daily nose”). The researchers presented each sentence on a screen, one word at a time. As the participant read each sentence, ERP recordings of brain activity were taken. Of interest was the speed with which the participant processed each open-class word (nouns, verbs, adjectives) and closed-class word (articles, prepositions, conjunctions). Open-class words reflect semantic processing, whereas closed-class words reflect grammatical processing. Slowness in processing the words is assumed to reflect incomplete learning. To obtain a behavioral measure of each participant’s auditory comprehension of English grammar, Weber-Fox and Neville also administered the Processing Words and Sentence Structure subtest of the Clinical Evaluation of Language Functions (CELF; Semel-Mintz & Wiig, 1982).

The results indicated that all groups were able to detect the anomalous sentences with high accuracy; however, differences occurred with respect to the processing of closed-class words. Specifically, participants who had begun to learn English after the age of 7 were slower in processing closed-class words in comparison to the monolingual English speakers and to the bilingual speakers who had begun to learn English earlier. Difficulties with closed-class words were even greater in the groups who had begun learning English beyond puberty (11–13 years, 15+ years). Processing of open-class words, in contrast, was less affected by delays in learning English. Weber-Fox and Neville (2001) also reported...
that (a) in comparison to the other groups, the participants who had begun learning English after age 7 performed more poorly on the CELF grammar subtest and (b) poorer performance on this subtest was associated with slowness in processing closed-class words.

Weber-Fox and Neville (2001) interpreted their findings to support the view that different language functions are mediated by different neural subsystems and that grammatical learning is more constrained by biological factors than is semantic learning. Their findings also suggested that when immersion in the English language is delayed, especially beyond puberty, acquiring native-like proficiency in grammar is difficult.

Collectively, the results of research using neuroimaging techniques have supported the belief that acquisition of a second language is more difficult when the learning process is delayed in comparison to situations where learning begins in early childhood (Neville, Nicol, Barss, Forster, & Garrett, 1991; Weber-Fox & Neville, 1996, 1999, 2001). Nevertheless, there is evidence that even late L2 learners can attain high levels of proficiency when there are internal and external factors available to support such learning (Bialystok & Hakuta, 1999).

When L2 learning begins after the primary language (L1) has been learned, this is called *successive bilingualism*. This occurs, for example, when children are immersed in educational settings where the only language spoken is L2, such as the French immersion programs in Canada for English-speaking students. Genesee (2004b) reported that school-age children and adolescents are able to acquire advanced levels of L2 proficiency in these settings, even when L2 learning begins in high school. Although starting younger may offer some advantages in L2 acquisition, starting later may offer the advantages of a well-developed L1 system, including literacy skills and metalinguistic competence, which can support the process of L2 acquisition (Bialystok & Hakuta, 1999; Genesee, 2004b). Gaining proficiency in L2 is also affected by the amount and consistency of exposure to the language, the type and quality of instruction offered, the learner’s motivation and aptitude, and frequent opportunities to use the new language (Genesee, 2004b).

Behavioral research has provided evidence that advanced levels of L2 proficiency can be attained even when the learning process begins in adulthood. L. White and Genesee (1996) recorded the spontaneous language samples of 89 adults who spoke English as their L2, with French being the L1 for many of them. Two judges who were native speakers of English evaluated each sample for phonology, syntax, morphology, word use, fluency, and overall nativeness. The results of the study indicated that 45 of the participants were judged to be near-native speakers of English, whereas 44 were judged to be non-native speakers. Of the near-native speakers, 9 (20%) had received their first intensive exposure to English as adults (16+ years) and 7 (17%) had received it as adolescents (12–15 years). Of the remaining near-native speakers, 22 (49%) had received
their first intensive exposure to English in early childhood (birth–7 years) and 7 (16%) had received it in later childhood (8–11 years). These results suggest that although early exposure to L2 may offer an advantage, it is possible for learners to attain high levels of proficiency even when that exposure is delayed.

Clearly, not all late L2 learners attain near-native proficiency, but the evidence indicating that many of them do is reason for optimism regarding the human capacity for second language acquisition during adolescence and adulthood. There are other reasons to be optimistic as well. One factor that may influence the degree to which native-like proficiency is attained in L2 is the extent to which the speaker continues to use L1. Reports have indicated that even in cases where L2 was acquired in early childhood, a stronger foreign accent may be heard in adults who continue to speak the L1 in comparison to those who no longer speak that language (Flege, Frieda, & Nozawa, 1997). Although researchers have often argued that a persistent accent in a late L2 learner reflects certain biological constraints on the language-learning system (e.g., Pinker, 1994), another possible explanation is that it reflects the influence of L1 through its continued use (Flege, 1999).

Motivation also seems to play an important role. If an adult L2 learner has no reason to invest the necessary time and energy in learning to speak like a native, the individual is unlikely to do so. In contrast, other individuals may be highly motivated to lose their foreign accents, for example, an executive from Taiwan who seeks the presidency of a U.S. corporation based in Illinois. Caswell (2002) found that under such conditions, and with the careful guidance of a qualified speech–language pathologist, adults can learn to speak Standard American English.

Another complicating factor is the extent to which the grammatical structures of the two languages differ. In cases where they are markedly different, the learning process may be more challenging. For example, native speakers of Japanese often have difficulty mastering the rules of English determiners (e.g., the, a, some) because a similar system does not exist in Japanese (Hakuta, 2001). In contrast, native speakers of French acquire these rules of English more easily because they already have a similar—although not identical—system in place (e.g., le, la, les, un, une).

In summary, second-language acquisition in school-age children, adolescents, and adults is a complex issue. Research that has employed neuroimaging techniques (e.g., Weber-Fox & Neville, 1996, 2001) to investigate this topic has indicated that it is easier to become fully bilingual when the learning process begins in early childhood. Although biological factors may place certain constraints upon the language acquisition system as human beings mature, behavioral research has shown that it is still possible to attain high levels of L2 proficiency even when the learning process begins in adulthood (White & Genesee,
1996), a point that is well beyond the hypothesized critical period of language acquisition (Lenneberg, 1967). When learners are immersed in a new language, have ample opportunities to speak it in meaningful situations, and are highly motivated to master it, native-like proficiency can be attained in all linguistic domains. The human capacity for bilingualism thus appears to be greater than previously believed.

Later Versus Early Language Development

Lenneberg (1967) described the years before puberty as the period of primary language acquisition. Language growth that occurs beyond that point may best be characterized as secondary, but not in the sense of being less important. This is particularly true in a world that increasingly values complex spoken and written communication in education, the workforce, and social situations. There is no question, however, that language growth that occurs during adolescence and adulthood depends upon the existence of a solid foundation that was established during infancy and early childhood. Without this foundation, the subtle linguistic attainments that characterize later language development would not be possible. I will turn now to a discussion of some of the factors that help to distinguish later from early language development.

Later language development differs from early language development in terms of its speed, salience, and substance (Nippold, 1993, 1995). For example, language development in adolescents is a gradual process, making it difficult to quantify growth. To do so, researchers must often compare the performance of adolescents representing widely separated age groups (e.g., 14-year-olds vs. 18-year-olds) on challenging tasks (e.g., defining abstract nouns; McGhee-Bidlack, 1991) or examine the use of low-frequency syntactic structures and intersentential linguistic phenomena in spoken and written contexts (N. W. Nelson, 1988; Nippold, 1993, 1995; Nippold, Schwarz, & Undlin, 1992; Scott, 1988b). Additional tasks that can reveal language growth in adolescents include asking them to (a) explain the meanings of idioms and proverbs (Nippold & Rudzinski, 1993; Nippold et al., 1997) and (b) solve verbal analogy problems that contain difficult vocabulary (Nippold, Ward-Lonergan, & Fanning, 2005b). The use of language in social situations must also be examined. Observing how adolescents modify the content and style of their speech to communicate with different listeners for varied purposes can reveal important developmental changes in oral language proficiency (e.g., Flavell, Botkin, Fry, Wright, & Jarvis, 1968; Nippold, 1995; Selman, Beardslee, Schultz, Krupa, & Podorefsky, 1986).
When processes thought to be important for language development are considered, some interesting contrasts are revealed. This is especially true when young children are compared with school-age children, adolescents, and young adults.

**Sources of Language Learning**

One important contrast concerns the sources of input for language learning. For most infants, toddlers, and preschool children, spoken communication is the primary source of input for language stimulation. For most school-age children and adolescents, however, written language plays an increasingly important role. Around the third or fourth grade (ages 8–10 years), a major transition occurs, and students begin to use their reading skills to learn advanced vocabulary, figurative meanings, and complex syntax. The ability to read suddenly frees the child to acquire a great deal of linguistic and world knowledge independently and to pursue personal interests more readily (Reed, 1986).

As a result, children become increasingly individualistic in their language development during the school-age and adolescent years (Gallatin, 1975; Nippold, 1995). For example, the special interest of a 10-year-old in dinosaurs may inspire her to read many books on the subject. As her interest expands, she may gradually acquire a specialized “dinosaur lexicon” that contains words such as *theropod*, *cretaceous*, and *triassic*, terms that may be unfamiliar to her peers, not to mention her parents. As her interest in dinosaurs continues to grow, it may eventually expand into related topics, such as archaeology or volcanology, which she may study more formally in high school or college.

As children progress through school, the greater freedom afforded to them in the selection of coursework, extracurricular activities, and social contacts also promotes the development of linguistic individualism (Nippold, 1995, p. 307). Thus, it is not uncommon to find adolescents who show average performance in their history class but outstanding performance in theater arts. This phenomenon of increasing individualism makes it difficult to establish firm guidelines for “normal” language development in school-age children, adolescents, and young adults. In semantics, for example, this is apparent in the different types of words that students acquire as a result of their academic pursuits. A high school student who elects to study advanced biology soon learns the terms *centromere*, *chromatid*, and *nucleoplasm*, whereas a peer who enrolls in auto mechanics gains a detailed understanding of *pneumatic suspension*, *catalytic converters*, and *hydraulic valves* (Nippold, 1995, p. 307). Both students are acquiring new concepts in a similar way—through meaningful exposure in challenging academic contexts—but the products that result from that process differ.
**Metalinguistic Competence**

Another contrast in processes between early and later language development concerns the role of metalinguistic competence—the ability to reflect upon and to analyze language as an entity itself. Gombert (1992) reported that around the age of 6 or 7 years, a time when children typically begin first grade, they display an increasing tendency to employ metalinguistic competence to enhance their own understanding and use of language in all domains—phonological, morphological, syntactic, semantic, and pragmatic. Language development in school-age children and adolescents heavily depends upon metalinguistic competence (Grunwell, 1986; van Kleeck, 1984, 1994). In first grade, for example, students are asked to perform such tasks as identifying the words in a sentence that sound the same but look different (e.g., “He saw the man’s son standing in the sun”) or identifying the word in a sentence that tells how an agent performed some action (e.g., “The pig walked away slowly”; Fay, Ross, & LaPray, 1981). By seventh grade (ages 12–13 years), students routinely determine the meanings of unfamiliar compound words (e.g., yachtsman, landfall, breadstuffs) by analyzing the component words and the surrounding context for more clues to meaning (Welch & Bennett, 1981b).

Metalinguistic competence also enables the school-age child, adolescent, or young adult to determine the meanings of unfamiliar figurative expressions, such as metaphors (“Camels are the trucks of the desert”), proverbs (“Falling raindrops will wear through a stone”), and idioms (“paper over the cracks”). This is accomplished by analyzing the words contained in the expression, scrutinizing the linguistic context in which it occurs, and generating a temporary interpretation that can later be confirmed or rejected as more clues become available (Nippold et al., 2001a).

**Abstract Thought**

An additional process that promotes later language development is the ability to think abstractly. As children move from preschool to elementary school, their reasoning evidences a gradual transition from concrete to abstract. For example, a 4-year-old girl may believe that Santa Claus is an older man in a red suit with a white beard who delivers toys at Christmas. In contrast, her 9-year-old sister thinks of him as a symbol of the Christmas spirit, having gone through a complex process several years earlier of questioning his literal existence and then weighing the evidence that both supports and refutes her beliefs about this holiday figure (Scheibe & Condry, 1987).
This increasing ability to think abstractly is clearly reflected in children’s language development. For example, a difference in abstractness is evident in the types of words that children acquire at different ages. For the 4-year-old, a large number of words having concrete referents will be added to her lexicon (e.g., futon, Dalmatian, tofu). In contrast, as her 9-year-old sister acquires new words, many of them will represent abstract concepts (e.g., welfare, relevance, democracy). Whereas young children are often quite literal in their interpretations of language, older children show an increasing ability to appreciate nonliteral meanings. For example, upon hearing Mom and Dad talk about “skeletons in the closet,” the 4-year-old might think about Halloween and feel frightened. In contrast, the 9-year-old will be able to determine from the situation and from past exposure to this idiom in spoken contexts that their parents are talking about old family secrets. This contrast in abstractness is also evident in children’s understanding and appreciation of linguistic ambiguity. Around second grade (ages 7–8 years), children begin to tell and laugh at jokes and riddles whose humor stems from phonological, lexical, or syntactic ambiguity (Question: “What animal can jump as high as a tree?” Answer: “All animals. Trees cannot jump”; McGhee, 1979). By eighth grade (ages 13–14 years), they enjoy more sophisticated types of ambiguity that occur, for example, in newspaper headlines (“Buick climbs the market with Rainier”), advertisements (“Introducing the Upper Crusts. Two sensational new entrees from Stouffer’s”), bumper stickers (“Midwives hold the future”), and handbills (“Oregon can’t afford a U.S. senator who doesn’t know the price of bread” Nippold, Cuyler, & Braunbeck-Price, 1988). Preschool-age children have little appreciation of these sorts of linguistic ambiguity.

**Social Perspective-Taking**

Related to abstractness is the child’s increasing ability to take the social perspective of another person. This is an additional contrast between early and later language development, and one that is critical to all aspects of pragmatics. In comparison to younger children, school-age children, adolescents, and young adults are more aware of the thoughts, feelings, and needs of their co-conversationalists and of the consequences of their own communicative behaviors. As a result, they show a greater ability to adjust the content and style of their speech accordingly. For example, adolescents demonstrate code-switching through the selective use of certain slang terms with their peers but not with their parents, teachers, or younger siblings. Moreover, older adolescents and young adults are more likely than their younger counterparts to resolve interpersonal conflicts by compromising and showing concern for the feelings of others. Having this capacity, however, does not always guarantee its use (Selman et al., 1986). For
example, although mature individuals may know that it is rude to interrupt another speaker who is struggling to express an idea, they may nonetheless do so during a passionate argument.

Contents of this Book

Chapter Topics

This book covers selected topics in later language development. Chapters 2 through 5 all address a different aspect of the lexicon: word knowledge (Chapter 2), derivational morphology (Chapter 3), word finding (Chapter 4), and word definition (Chapter 5). The information reported in those chapters reflects a large and growing database that began many years ago. Although presented as separate chapters, there is substantial interdependency among the topics. For example, without having a clear understanding of a particular word, it would be difficult to retrieve it during purposeful communication or to provide a proper definition of it when giving a lecture or writing a technical report. The act of defining a word, which requires reflection on the lexicon (Watson, 1985), may cause a person to think more carefully about subtle aspects of meaning that help to distinguish that word from another word that denotes a similar but different message. As a result of this metalexical process, knowledge of the target word may become more elaborate and firmly established in memory (Bjork & Bjork, 1992).

Investigations of word knowledge, derivational morphology, word finding, and word definition are consistent in demonstrating that competence in each of these areas is related to cognitive and linguistic development and to academic achievement (Astington & Olson, 1987; Kail & Hall, 1994; Nagy & Herman, 1987; Snow, Cancini, Gonzalez, & Shriberg, 1989; R. L. Thorndike, Hagen, & Sattler, 1986; Wechsler, 1991; Wolf & Goodglass, 1986; Wolf & Segal, 1992). Studies have also shown that quantitative and qualitative changes occur in all aspects of lexical development during the school-age and adolescent years and into adulthood. New words are added to the lexicon, old words take on new and subtle meanings, and it becomes easier to organize and to reflect upon the content of the lexicon (Nagy & Herman, 1987; Schecter & Broughton, 1991; Watson, 1985). The ability to articulate one’s knowledge of words also improves (Feifel & Lorge, 1950; Markowitz & Franz, 1988; McGhee-Bidlack, 1991), as does speed and accuracy in calling up words well into adulthood (e.g., German, 1986, 1990; Wiegel-Crump & Dennis, 1986).

As the reader progresses through the book, it will become apparent that lexical attainments are intricately related to many other aspects of later language
development, such as verbal reasoning (Chapters 6 and 7), the understanding of figurative expressions (Chapters 8, 9, 10, and 11), the production of cohesive discourse (Chapters 12 & 15), and the use of language in social settings (Chapters 13 and 14). For example, solving a verbal analogy problem (e.g., *philatelist* is to *stamps* as *entomologist* is to ______?) or interpreting a proverb (e.g., “Of idleness comes no goodness”) requires knowledge of word meanings, as does the production of cohesive discourse using subordinate conjunctions (e.g., *although, unless, whenever*) or adverbial conjuncts (e.g., *moreover, conversely, similarly*). When talking with others in social situations, speakers must be able to call up the appropriate words to express themselves quickly, accurately, and tactfully.

Chapters 6 and 7 focus specifically on the development of verbal reasoning, a mental construct where language and cognition converge. This symbiotic relationship is evidenced in the following mathematics problem for eighth-grade students:

To make spaghetti sauce, add one can of tomato paste and two cans of water to one package of mix. Add a spoonful of salad oil. How many cans of water would you use with three packages of mix? How many cans of tomato paste would you use with eight cans of water? (Harcourt Brace Jovanovich, 1978, p. 132)

To solve this problem, the student must read and understand the sentences, set up the proportions, and perform the operations of multiplication and division. Competence in verbal reasoning reflects linguistic and cognitive development, and it is predictive of academic success (Achenbach, 1969, 1970; Armour-Thomas & Allen, 1990; Feuerstein, 1979; Keating & Caramazza, 1975; Lorge & Thorndike, 1957; Sternberg, 1979, 1982).

Problems in verbal reasoning are either *inductive* or *deductive*. Inductive problems include analogies (e.g., *Bear* is to *cub* as *cow* is to ______?), proportions (e.g., “One package is to two cans as three packages is to x cans”), series completions (e.g., *June, August, October, _______?*), and classifications (e.g., “Which of the following words does not go with the others: *aunt, cousin, sister, friend*?”). Understanding figurative expressions, such as *metaphors* (e.g., “The house was a box with no lid”) and *proverbs* (e.g., “The plump pig gets all the pears”), also involves inductive reasoning. Deductive problems include syllogisms (e.g., “All blocks are green. This is a block. Therefore _______?”), probability (e.g., “You toss a coin. It can land heads or tails. Toss it 100 times. How many times can you expect it to land heads?”), and combinations (e.g., “Here are three different shapes—triangle, circle, and square. Show me all the different ways you can combine them”).

Inductive and deductive problems differ in the extent to which the information they contain is logically sufficient evidence for the solution (Sternberg, 1982). With inductive problems, the information supports the solution but is not
sufficient evidence for it. For example, to solve the “bear” analogy given earlier, the person must draw on outside information concerning the relationship between bear and cub to generate an item that goes with cow in the same way that cub goes with bear. With deductive problems, however, the information presented is logically sufficient evidence for the solution. For example, the conclusion to the “block” syllogism also given earlier is based entirely on the major (first) and minor (second) premises.

Students are called upon to reason inductively and deductively during the elementary, middle, and high school years, particularly during the formal study of mathematics, science, and debate. Given the contribution of verbal reasoning to students’ academic success, we must examine the findings from developmental studies in the areas of inductive and deductive reasoning. Because space limitations preclude a review of all types of inductive and deductive problems here, I have focused on analogies (inductive) and syllogisms (deductive). Those two types of problems have been studied extensively in school-age children, adolescents, and adults.

Chapters 8, 9, 10, and 11 address the development of figurative language. Major types of figurative language include metaphors, similes, idioms, slang, proverbs, ambiguity, and sarcasm. Figurative expressions of all types pervade the English language. For example, they often occur in spoken form during conversations, lectures, and news reports, and in written form in novels, poems, textbooks, newspapers, and magazines. Gaining competence with all types of figurative language is an important part of becoming a culturally literate and linguistically facile individual.

The development of figurative language has been studied for more than 80 years. Much of the interest in this topic stems from the belief that figurative competence reflects an individual’s cognitive level (Arlin, 1978; Billow, 1975; Cometa & Eson, 1978; Piaget, 1926; J. W. A. Smith, 1976), creativity (Gardner, Kircher, Winner, & Perkins, 1975; Paivio, 1979; Schaefer, 1975), and abstract reasoning ability (S. J. Brown, 1965; Hoffman & Honeck, 1980; Kogan, Connor, Gross, & Fava, 1980; Ortony, 1979). Although figurative language is first understood during the preschool years (Boynton & Kossan, 1981; Dent, 1984; Gardner, 1974; Gentner, 1977; Vosniadou & Ortony, 1983), comprehension steadily improves throughout childhood and adolescence, and well into adulthood (Boswell, 1979; Gorham, 1956; Lodge & Leach, 1975; Nippold et al., 1997; Richardson & Church, 1959; Watts, 1944). Students whose home and school environments place a premium on spoken and written communication may acquire competence with figurative expressions more rapidly than students whose environments place less emphasis on those areas, a position that is consistent with the language experience hypothesis of figurative development (Ortony, Turner, & Larson-Shapiro, 1985). Less is known about how figurative language develops in terms of production. Nevertheless, several researchers have
suggested that production follows a U-shaped behavioral curve such that novel, imaginative expressions are commonly produced by preschoolers during play activities (“The faucet is crying,” “Pretend the headlights are eyes”), decrease during the elementary school years, but increase again during adolescence in the form of slang (“chillin’ in the crib”; Gardner et al., 1975; Gardner, Winner, Bechhofer, & Wolf, 1978).

Improvements that occur in spoken and written syntax are discussed in Chapter 12, a topic that epitomizes the gradual, subtle, and protracted nature of later language development. To see growth in syntax beyond the preschool years, one must examine the use of low-frequency syntactic structures and look beyond the isolated sentence for evidence of complex and cohesive discourse (Scott, 1988b). One must also examine the older student’s use of syntax in formal academic settings. It is not unusual for high school students to use simple syntax when conversing with their peers at lunch but to produce long and complex sentences, coherently linked, when writing a persuasive essay on a controversial topic (Nippold, Ward-Lonergan, & Fanning, 2005a) or explaining the rules of a game or sport to an adult (Nippold, Hesketh, Duthie, & Mansfield, 2005).

I discuss the development of major genres of spoken discourse—conversation, narration, persuasion, negotiation, and explanation—in Chapters 13 and 14. Important for social, academic, and vocational success, these are distinct ways of speaking that depend, to a large extent, upon attainments in all other aspects of language. They include the understanding and use of appropriate words, the ability to engage in verbal reasoning, knowledge of figurative expressions that might be used in telling a story or convincing someone to accept a certain position or to perform a desired action, and the syntactic sophistication necessary to produce coherent discourse.

Following these chapters is one on the development of reading and writing (Chapter 15), aspects of literacy that depend upon and promote the later development of language. For example, to comprehend and produce literate text, the child, adolescent, or young adult must have knowledge of thousands of different words, many of which express subtle and abstract meanings. In addition, the individual must be able to process long and complex sentences that employ advanced syntactic structures, such as subordinate clauses, multiple embedding, the passive voice, and other low-frequency devices. In turn, exposure to literate text is a major source of word learning and can stimulate the use of complex syntax in spoken and written discourse. Unlike talking and listening, however, most individuals must receive systematic instruction in reading and writing to gain high levels of proficiency in these interrelated areas.

The final chapter (Chapter 16) summarizes the highlights of later language development (see Appendix 16.1). This summary can be compared to a similar one contained in this first chapter that highlights certain early attainments (see Appendix 1.1).
The Science of Later Language Development

If there is a constant theme throughout this book, it is that scientific inquiry should be the basis for learning about language development in youth. I thus largely derived the information in each chapter from data-based empirical research.

Ideally, in research, interesting questions are posed and answers are sought in an organized and methodical fashion that involves an unwavering respect for scientific integrity—the patient, accurate, and objective observation of behavior; careful reflection on the data obtained; and an attitude of openness and flexibility in interpreting the results, which includes a willingness to accept the possibility that one’s own theories are not supported by the data (Feynman, 1985). A certain amount of subjectivity in research is inevitable due to factors such as the investigator’s knowledge base, experiences, interests, and expectations (Prutting, 1983). Striving for scientific integrity is critical, however, because it produces research that leads to more valid and reliable information.

There is much to be gained from an exploration of the literature on later language development, especially for researchers, educators, and other professionals who have a keen interest in young people and a deep concern for their welfare. As the reader embarks on this journey, encouragement may be derived from the words of Confucius (551–479 B.C.), who commented that “wisdom is rooted in watching with affection the way people grow” (Sawyer, 1982, p. 7).
1. For many years, researchers believed that language development was basically complete by the time a child reached adolescence. What factors contributed to this belief? What factors contributed to the rejection of this belief?

2. What key factors contribute to language growth during the school-age and adolescent years? Give examples of each and explain how they operate in development.

3. Tape-record the conversational speech of two school-age children who differ in age by at least 3 years. Analyze each child’s speech for mean utterance length, then describe similarities and differences in syntax, semantics, and pragmatics.

4. With those same two children, tape-record their speech as they explain to you the rules and strategies of their favorite game or sport. Again, analyze each sample as above, then describe how their discourse differs in the two genres, and how the older child differs from the younger one. Which genre reveals more age differences?

5. It is often believed that adults have greater difficulty learning a second language (L2) than children because they have passed the “critical period of language acquisition.” Although biological constraints are important, many adults gain proficiency in an L2. List and describe three different nonbiological factors that can affect an adult’s success in learning a second language.

6. The critical period hypothesis has been debated for many years. Explain both sides of the debate, and then describe your own views, offering evidence from research.

7. It is often argued that gaining proficiency in a second language is difficult for most people who begin learning an L2 as adults because of biological constraints. A lingering foreign accent is thought to reflect these constraints, yet many U.S. actresses (e.g., Andie MacDowell, Meryl Streep,
Renee Zellweger) have been able to learn to speak various dialects of English in a very convincing manner. Explain this inconsistency.

8. Define the concept of “scientific integrity.” Explain its importance to the study of later language development.

9. Describe a situation where researchers might be tempted to violate scientific integrity. Explain the types of problems this would create for society if they did so.

10. How can research that examines the development of spoken and written language in children and adolescents be useful to teachers who work with typical K–Grade 12 students?
Appendix 1.1
Linguistic Attainments of a Typical 5-Year-Old Child

Phonology
- Produces intelligible conversational speech
- Shows mastery of all vowels and most consonants
- May struggle to articulate some sounds:
  - Liquids (l, r)
  - Sibilants (s, z)
  - Clusters (tr, sl, kr)
- May struggle to articulate some polysyllabic words (e.g., thermometer, arithmetic)

Semantics
- Knows the meanings of at least 10,000 different words
- Understands some common idioms (“pull up stakes,” “feeling blue”)
- Understands some concrete metaphors (“The giraffe is a flagpole living at the zoo”)
- Produces humor by intentionally misnaming objects or people during play (“You're a potato!”) or by creating nonsense words during repetitive rhyming activity (e.g., “Tommy, Mommy, sommy, lommy, dommy”)

Syntax and Morphology
- Mean length of utterance = 6.0+ morphemes in conversation
- Has mastered Brown's grammatical morphemes (e.g., past tense -ed, possessive -s, plural -s, third person singular -s, present progressive -ing)
- Produces sentences with relative clauses: “I like the dog that has spots.”
- Produces sentences with adverbial clauses: “If it rains, let’s make cookies.”
- Produces sentences with nominal clauses: “I know she likes chocolate chip best.”
- Uses multiple embedding: “She wants to play soccer before we go home.”
- Uses infinitives: “Let me cut it.”
- Uses gerunds: “I like talking on the phone to Grandma.”
• Produces compound sentences with coordinate conjunctions: “I'll take the red one and you can have the black one.”
• Produces complex sentences with subordinate conjunctions: “She wants the red truck because it's faster.”
• Asks wh- questions: “When are we going to Grandma’s?”
• Uses negation: “I'm not playing with Jeremy.”
• Uses past tense verbs: for example, ate, ran, cooked
• Uses present tense verbs: for example, eating, running, cooking
• Uses future tense verbs: for example, will eat, will be eating

**Verbal Reasoning**
• Can solve some analogy problems presented in picture format
• Understands analogies that involve common objects and events
• Understands logical syllogisms that involve simple concepts

**Discourse and Pragmatics**
• Actively participates in conversations with children and adults
• Takes turns with co-conversationalist
• Maintains topic of conversation
• Asks and answers questions
• Shares anecdotes in narrative fashion
• Tells simple narratives (e.g., retells familiar story)

**Literacy**
• Sight-reads a few common words (e.g., dog, cat, go, McDonald's)
• Writes the names of some family members (e.g., Mom, Dad, Jimmy)
• Sings the “Alphabet Song”
• Identifies words that rhyme (e.g., cat, sat, bat, rat)
• Comprehends simple stories that an adult reads aloud, such as fairy tales and fables (e.g., Little Red Riding Hood, The Fox and the Grapes)